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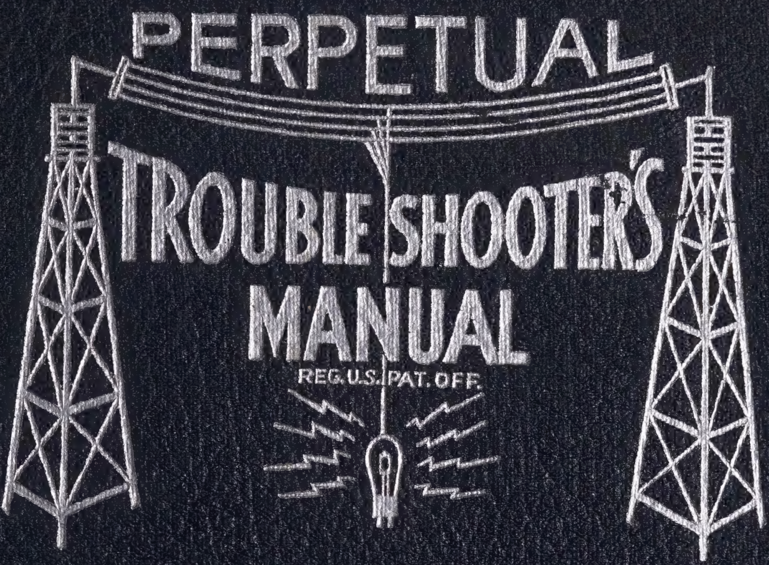

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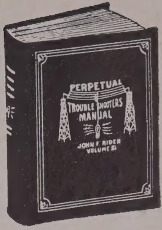

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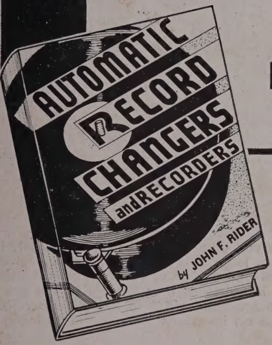

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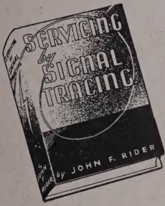

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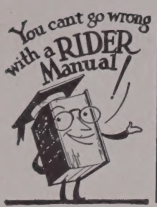
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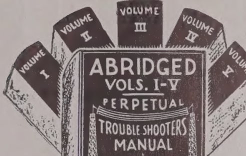

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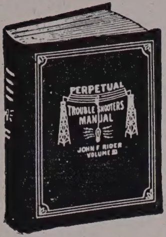

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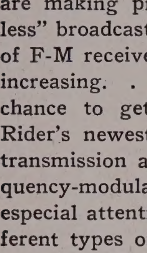

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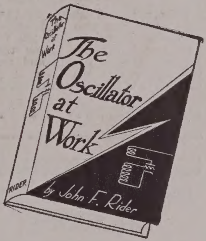

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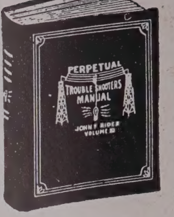

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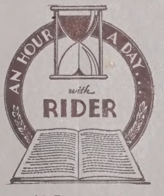

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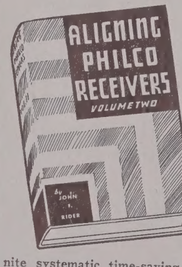

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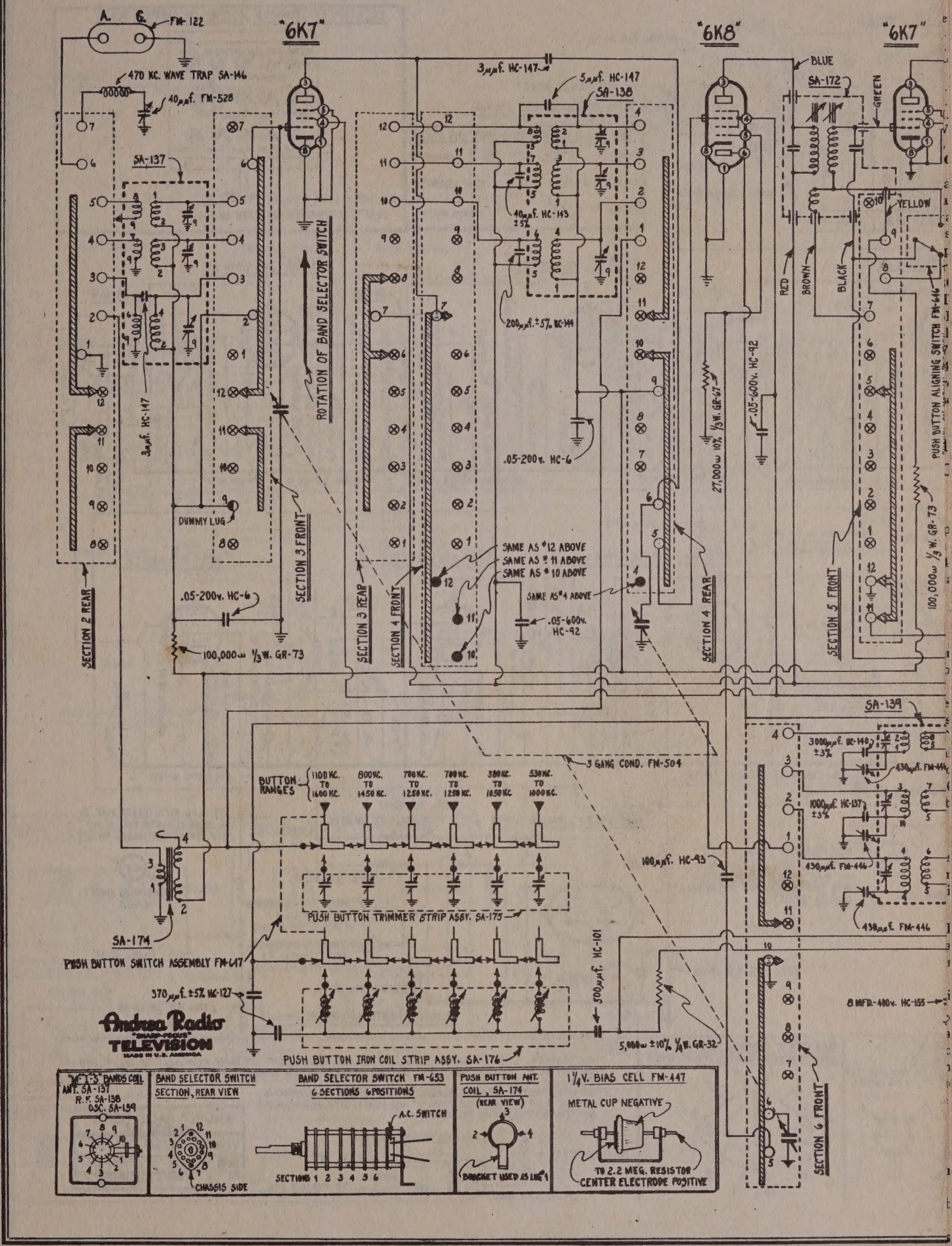

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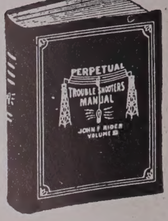

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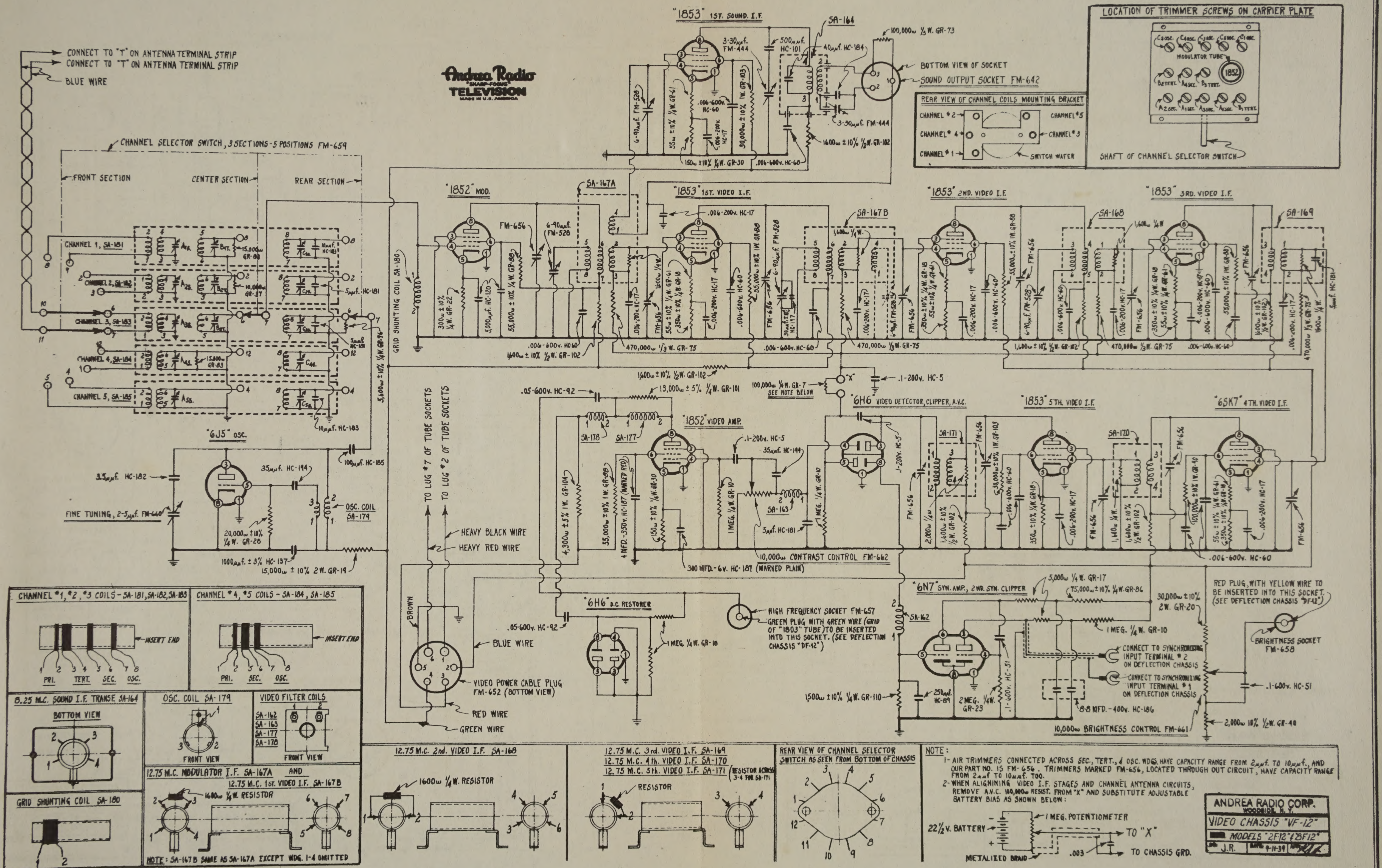
MODELS 2F-12,8F-12
Video Chassis VF-12
Schematic,Trimmers,Coils

ANDREA RADIO CORP.

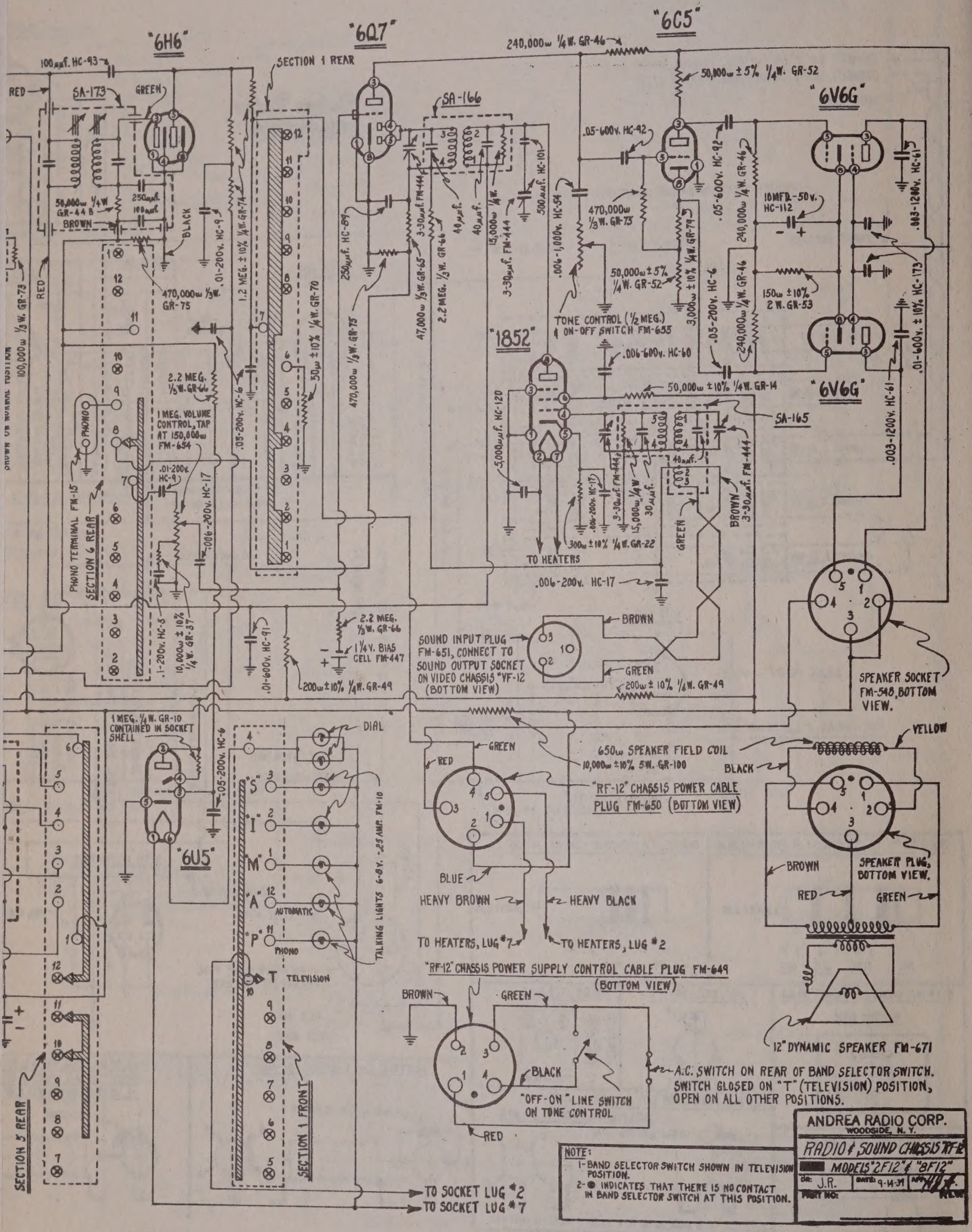


NOTE:

1- AIR TRIMMERS CONNECTED ACROSS SEC., TERT., & OSC. WDGS. HAVE CAPACITY RANGE FROM 2μμf. TO 10μμf., AND OUR PART NO. IS FM-656. TRIMMERS MARKED FM-656, LOCATED THROUGH OUT CIRCUIT, HAVE CAPACITY RANGE FROM 2μμf TO 10μμf. TOO.

2- WHEN ALIGNINING VIDEO I.F. STAGES AND CHANNEL ANTENNA CIRCUITS, REMOVE A.V.C. 100,000ω RESIST. FROM "X" AND SUBSTITUTE ADJUSTABLE BATTERY BIAS AS SHOWN BELOW:

ANDREA RADIO CORP.
WOODSIDE N. Y.
VIDEO CHASSIS "VF-12"
MODELS "2F12" & "8F12"
J.R. 9-11-39



A.C. SWITCH ON REAR OF BAND SELECTOR SWITCH. SWITCH CLOSED ON "T" (TELEVISION) POSITION, OPEN ON ALL OTHER POSITIONS.

NOTE:

1- BAND SELECTOR SWITCH SHOWN IN TELEVISION POSITION.

2- ⊗ INDICATES THAT THERE IS NO CONTACT IN BAND SELECTOR SWITCH AT THIS POSITION.

ANDREA RADIO CORP.
WOODSIDE, N. Y.
RADIO & SOUND CHASSIS "RF-12"
MODELS "2F12" & "8F12"
DR: J.R. DATE: 9-14-39
PART NO:

MODEL 985536
Circuit Data, Tuner
Alignment Notes, Parts

Parts List

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1212932		Lead Assy.	"A" Lead—Set to Fuse	1
1212933		Lead Assy.	"A" Lead—Fuse to Ammeter	2
115273		Bulb	Dial Light	3
1213883		Coil	"A" Filter Choke	4
1213884		Coil	Motor Noise Choke	5
1213641		Coil	Audio Input Choke	6
1213645		Coil	Antenna	7
1212893		Coil	Oscillator	8
1213885		Coil	Tuning Solenoid	9
1212979		Coil	R.F.	10
1213646		Coil	1st I.F. Trans. Assy.	11
1213849		Coil	2nd I.F. Trans. Assy.	12
1209055		Condenser	Molded—.00025 mfd. Ant. Coupling	13
1211535		Condenser	Antenna Series Compensating	14
1213648		Condenser	Tubular—.5 mfd. 200 Volt—H.F. Noise Filter	15
1213643		Condenser	Variable—3 Gang Tuning	16
7232390		Condenser	Tubular—.5 mfd. 160 Volt—Filter	17
7232390		Condenser	Tubular—.5 mfd. 160 Volt—Filter	18
7234975		Condenser	Thermal—Temp. Compensating (Osc.)	19
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—R.F. Return	20
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—R.F. Cathode By-Pass	21
1210275		Condenser	Molded—.0001 mfd. Mica—Osc. Coupling	22
1212316	1208600	Condenser	Tubular—.01 mfd. 650 Volt—Vib. Phasing	23
1212316	1208600	Condenser	Tubular—.01 mfd. 650 Volt—Vib. Phasing	24
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—Screen By-Pass	25
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—I.F. Cathode By-Pass	26
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—B+., R.F. By-Pass	27
1213651	7230910	Condenser	Tubular—.04 mfd. 400 Volt—2nd A.F. Output	28
1210293	7230593	Condenser	Tubular—.006 mfd. 160 Volt—V.C. Bass Compensating	29
1208942	1207893	Condenser	Tubular—.003 mfd. 400 Volt—Plate By-Pass	30
1213652		Condenser	Electrolytic—3 Section (10-10-5 mfd.) B. Filter	31
1210275		Condenser	Molded—.0001 mfd.—H.F. By-Pass	32
1210257	1207799	Condenser	Tubular—.02 mfd. 160 Volt—A.F. Coupling	33
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—1st A.F. Coupling	34
1209055		Condenser	Molded—.00025 mfd.—Diode Rectifying	35
1210275		Condenser	Molded—.0001 mfd.—Diode Coupling	36
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—A.F. Coupling	37
1213647	1212097	Condenser	Tubular—.001 mfd. 160 Volt—Bass Limiting (F.C.)	38
1213650	7233243	Condenser	Tubular—.004 mfd. 160 Volt—H.F. By-Pass (F.C.)	39
1210293	7230593	Condenser	Tubular—.006 mfd. 160 Volt—Bass Limiting (F.C.)	40
1213653		Condenser	Electrolytic—3 Section (4-20-4 mfd.) Cathode By-Pass	41
1213649	7230912	Condenser	Tubular—.005 mfd. 160 Volt—H.F. By-Pass (F.C.)	42
106653	603156	Fuse	20 Ampere	43
1211701	1208110	Resistor	Flexible—450 ohm, ½ Watt—R.F. and Det. Bias	44
1212668		Resistor	Insulated—20,000 ohm, 2 Watt—Screen Dropping	45
1210470		Resistor	Insulated—500,000 ohm, ½ Watt—AVC Filter	46
1211703	1209015	Resistor	Flexible—100 ohm, ½ Watt—Vib. Damping	47
1210881		Resistor	Insulated—60,000 ohm, ½ Watt—Osc. Grid Leak	48
1208321		Resistor	Flexible—220 ohm, 2½ Watt—Output Bias	49
1212981		Resistor	Insulated—1400 ohm, 1½ Watt—Hum Filter	50
1210834		Resistor	Insulated—10,000 ohm, ½ Watt—Audio Plate Filter	51
1211701	1208110	Resistor	Flexible—450 ohm, ½ Watt—I.F. Bias	52
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Bass Comp.	53
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—I.F. Filter	54
1209884		Resistor	Insulated—300,000 ohm, ½ Watt—A.F. Diode Load	55
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Diode Load	56
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Filter	57
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Isolating	58
1211049		Resistor	Insulated—2700 ohm, ½ Watt—2nd A.F. Bias	59
1210834		Resistor	Insulated—10,000 ohm, ½ Watt—2nd A.F. Plate	60
1211704	1208802	Resistor	Flexible—350 ohm, ½ Watt—2nd A.F. Bias	61
1210882		Resistor	Insulated—20,000 ohm, ½ Watt—1st A.F. Plate	62
1211149		Resistor	Insulated—3 megohm, ½ Watt—2nd A.F. Grid Return	63
1211104		Resistor	Insulated—40,000 ohm, ½ Watt—Voltage Divider (F.C.)	64
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)	65
1210117		Resistor	Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)	66
1210117		Resistor	Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)	67
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)	68
1211049		Resistor	Insulated—2700 ohm, ½ Watt	69

1213644		Switch	Tone Control—not to be
1213642		Transformer	Output
1213640		Transformer	Power
1213639		Switch	Volume Control and On-
7239439		Vibrator	
1213886		Coil	Clutch
1209055		Condenser	Molded—.00025 mfd.—I.
1211703	1209015	Resistor	Flexible—100 ohm, ½ W
1210470		Resistor	Insulated—500,000 ohm,

Circuit Descripti

The circuit used in this receiver is the conventiona
not use any regeneration. The eight tubes employed a
Oscillator-Modulator Tube, 262.5 kilocycle I. F.
which is triple tuned, push-pull output and power
A.V.C. voltage to the grids of the 6K7GT R. F. am
first audio amplifier. It also serves as second detector
The bias for the 6K7GT R. F. amplifier and the 6A8
ohm resistor, item No. 44. The bias for the 6K7GT
across a 450 ohm resistor, item No. 52. Bias for the 6
across a 2700 ohm resistance, item No. 69. Bias for t
two resistances, item numbers 59-350 ohms and 61-27
is developed across a 220 ohm resistance, item No. 4
plate and the 6R7GT ground is the fidelity contr
6R7GT plate is coupled through a .04 mfd. condens
audio input choke.

Explanation of Tone Control

Automatic Volume C

Automatic Volume Control

The 6R7GT diode furnishes A.V.C. voltage develop
resistor, to the 6A8GT through item 57, 1 megohm
filter through a 500,000 ohm isolating resistor (item 4
from the 1 megohm filter through a 1 megohm isol
of the 6K7GT first audio tube.

Tone Control

The fidelity control and its tone compensating netwo
and driver tube. When the switch is in the VOICE po
condenser (item 37) then through a .001 condenser
high impedance to low frequencies, limiting the fre
high range. From the .001 condenser the signal pass
and a 100,000 ohm (item 68) resistor to ground. T
divider and the signal to the 6R7GT driver grid is ta
and 100,000 ohm resistors. Likewise there is a 3 meg
grid to ground, while this is shunted across the 100,
on the circuit is negligible and its real purpose is t
fidelity switch is in the SOFT position.

The path of the audio with the fidelity switch in
Through .05 condenser (item 37) a 250,000 ohm re
resistor (item 67) to ground. Items 66 and 67 form
junction of these two resistors. This position provi
rounded with both lows and highs.

For the BASS position, the signal from the 6K7G
denser (item 37) the 250,000 ohm resistor (item 66) a
to ground. Item 79, the 500,000 ohm resistor is shu
This condenser bypasses the highs so that the lows
The grid of the 6R7GT is fed from the junction of i

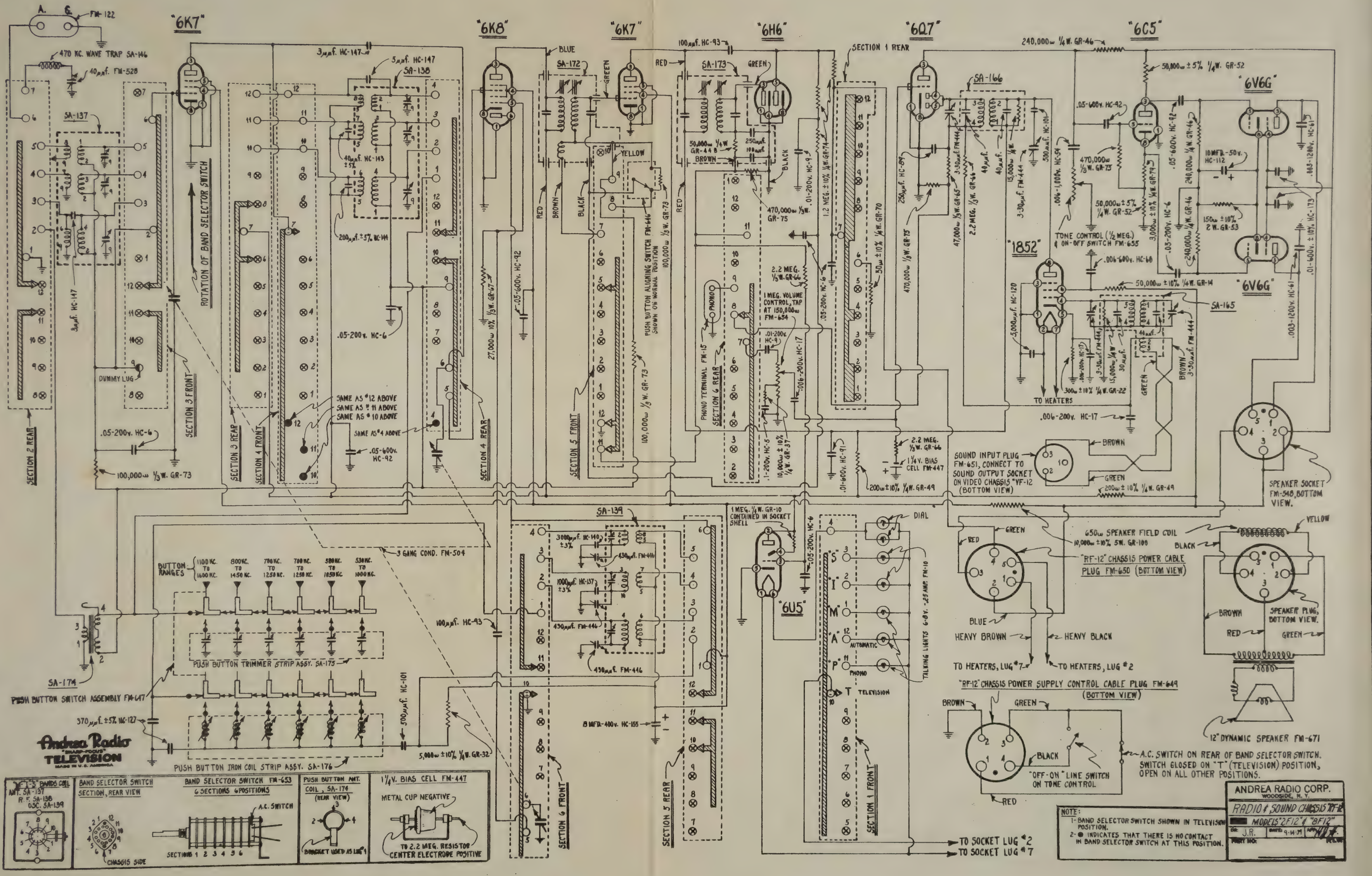
For the SOFT position the a-f is fed through the c
the 250,000 ohm resistor (item 66) then through a
100,000 ohm resistor (item 65) through a .005 uf. c
6R7GT grid is fed from the junction of items 40 an
.006 uf. condenser, is to pass highs and middle frequ
the .005 uf. condenser is to bypass the highs so the
range cutting both the highs and lows. Item 63, the
grid to ground, is the d.c. grid return.

Setting the Push Buttons

The order in which the stations are set up on the pu
the operation of the tuning unit. To set the push
but an understanding of the operation of the push-

MODELS 2F12, 8F12
Radio Chassis RF-12
Schematic, Coils

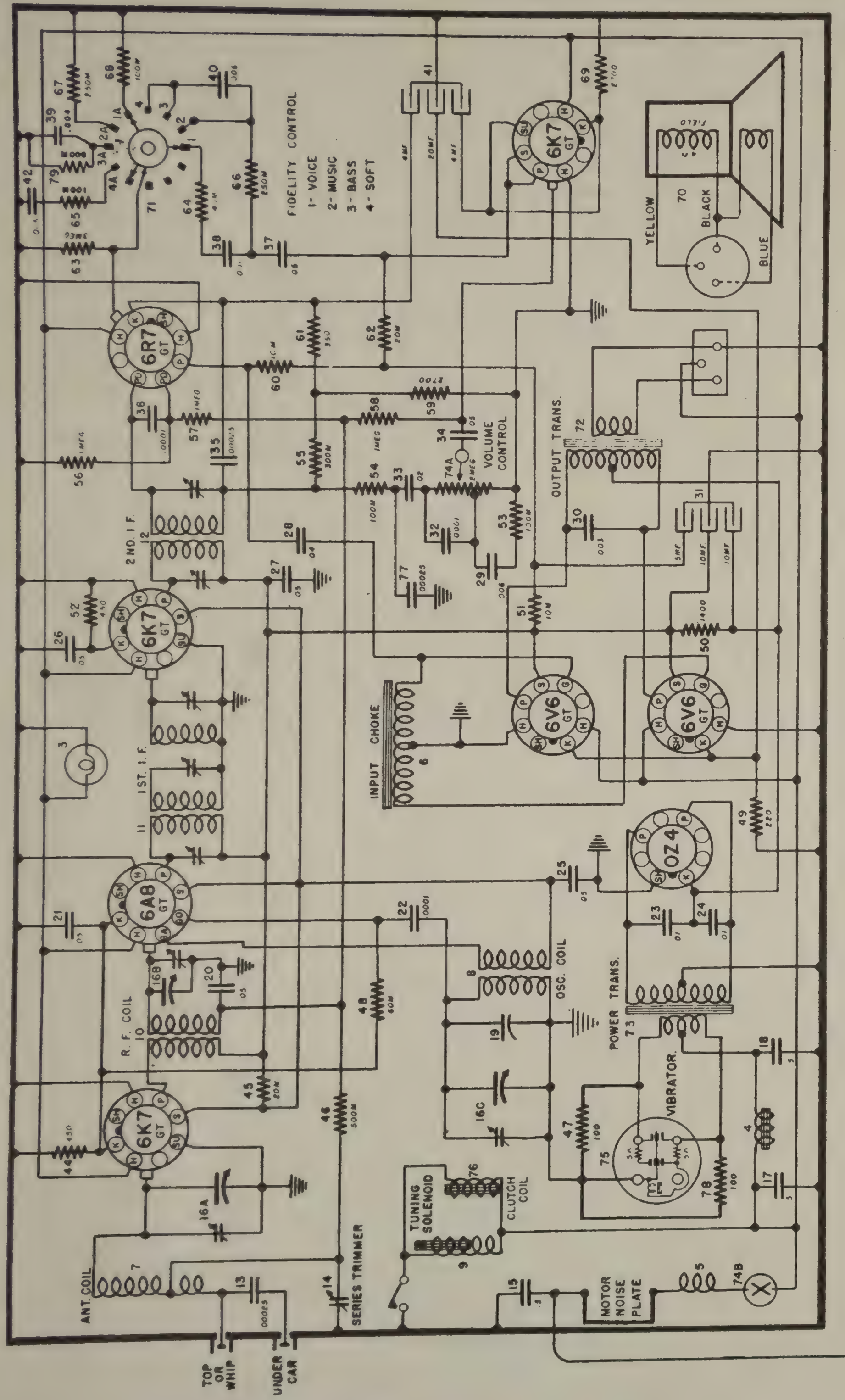
ANDREA RADIO CORP.

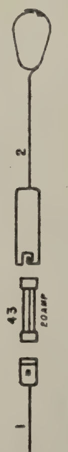


NOTE:
1- BAND SELECTOR SWITCH SHOWN IN TELEVISION POSITION.
2- ● INDICATES THAT THERE IS NO CONTACT IN BAND SELECTOR SWITCH AT THIS POSITION.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985536
Schematic





985536 CIRCUIT DIAGRAM

IF PEAK 262.5 KC

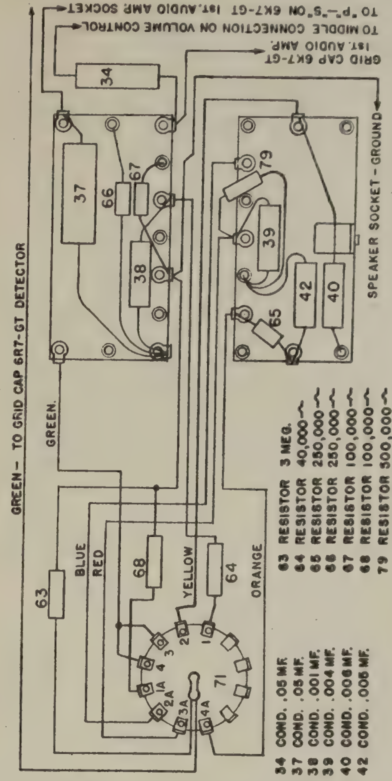
Tube Complement

Type	Function
6K7GT	R.F. Amplifier
6A8GT	Oscillator-Modulator
6K7GT	I.F. Amplifier
6R7GT	2nd Detector A.V.C. Rectifier
6K7GT	1st Audio (A.V.C. Controlled)
6V6GT	Output
OZ4	Rectifier

MODEL 985536
Voltage, Alignment
Chassis, Trimmers
Socket, Data

CHEVROLET DIV.—GEN. MOTORS

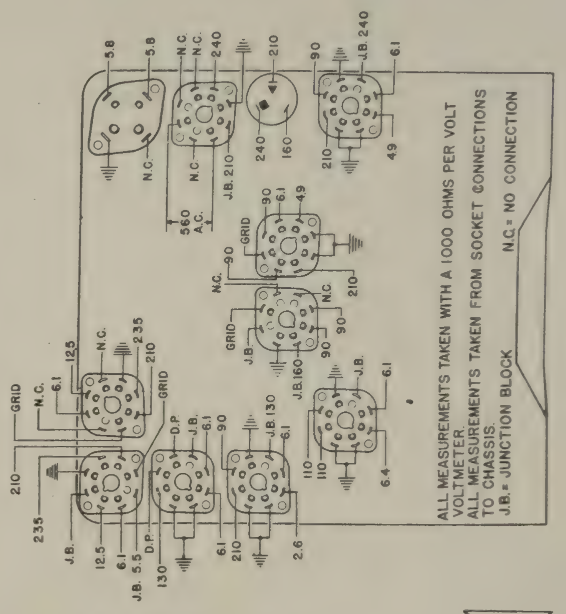
ANTENNA SYSTEM: There are three antennas available for use with this receiver; the under car, the turret-top, or the telescopic cowl. Any one of these antennas will operate very efficiently when used with this Chevrolet radio.


TO "P"-"S" ON 6K7-GT 1ST. AUDIO AMP SOCKET
TO MIDDLE CONNECTION ON VOLUME CONTROL
1st. AUDIO AMP.
GRID CAP 6K7-GT
SPEAKER SOCKET - GROUND
GREEN - TO GRID CAP 6R7-GT DETECTOR
GREEN.
BLUE
RED
YELLOW
ORANGE

34	COND.	.05 MF.
37	COND.	.05 MF.
38	COND.	.001 MF.
39	COND.	.004 MF.
40	COND.	.006 MF.
42	COND.	.006 MF.

63	RESISTOR	3 MEG.
64	RESISTOR	40,000~
65	RESISTOR	250,000~
66	RESISTOR	250,000~
67	RESISTOR	100,000~
68	RESISTOR	100,000~
79	RESISTOR	500,000~

TONE CONTROL WIRING



ALL MEASUREMENTS TAKEN WITH A 1000 OHMS PER VOLT VOLTMETER.
ALL MEASUREMENTS TAKEN FROM SOCKET CONNECTIONS TO CHASSIS.
J.B. = JUNCTION BLOCK
N.C. = NO CONNECTION

SOCKETS AND VOLTAGES DIAGRAM

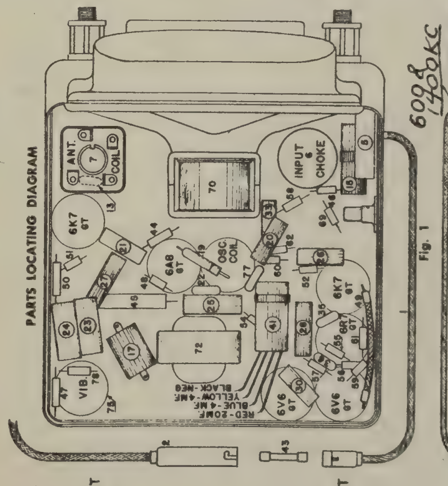


Fig. 1

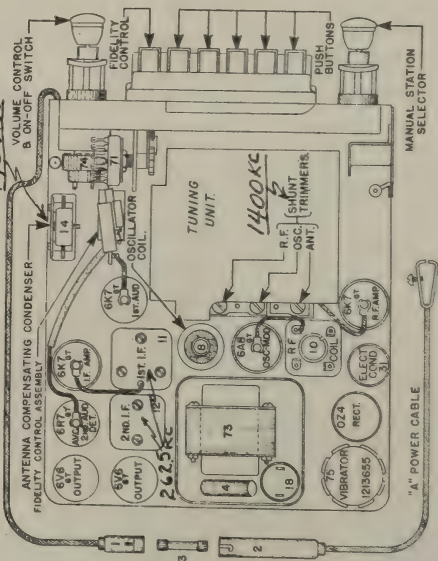
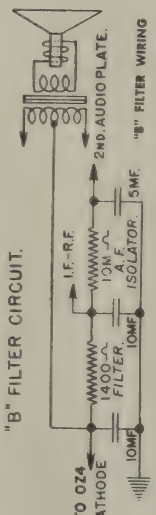
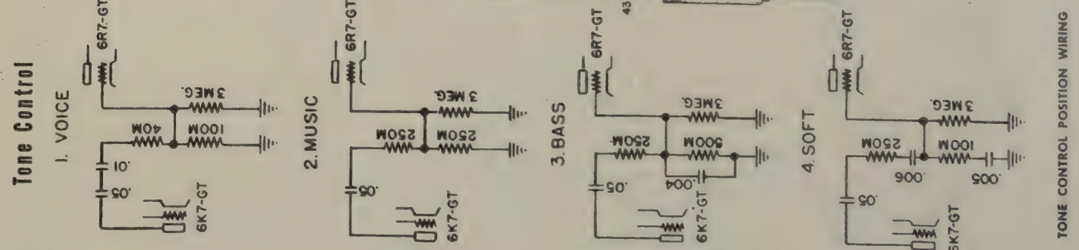


Fig. 2



"B" FILTER CIRCUIT.

"B" FILTER WIRING



TONE CONTROL POSITION WIRING

serviced	71
	72
	73
Off Switch—2 megohm	74
	75
	76
F. Filter	77
att—Vib. Damping	78
½ Watt—Bass Leveler (F.C.)	79

on

il superheterodyne type and does re an R. F. Amplifier, combination amplifier the first transformer of supply. The 6R7GT tube supplies plifier, the 6A8GT and the 6K7GT and second audio amplifier driver. GT tubes is developed across a 450 I. F. amplifier tube is developed K7GT first audio tube is developed he 6R7GT tube is developed across 00 ohms. Bias for the 6V6GT tubes 9. Between the 6K7GT first audio ol resistor capacity network. The er to one side of the center tapped

Positions and
ontrol

ed across item 56, 1 megohm load filter resistor; from the 1 megohm 6) to the R-F 6K7GT grid; likewise ating resistor (item 58) to the grid

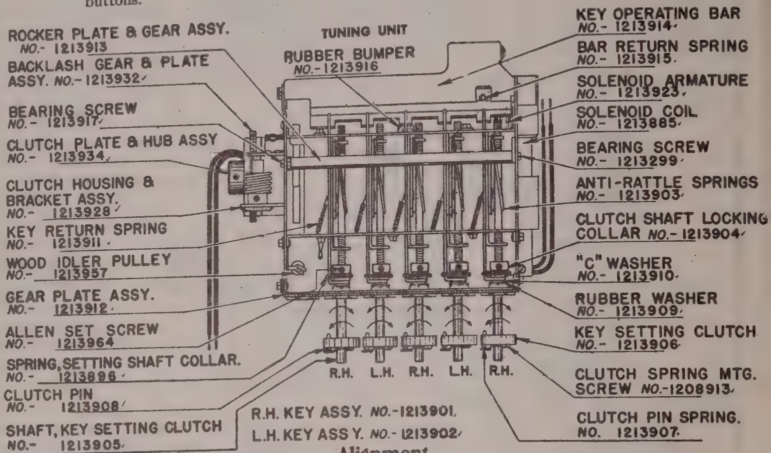
k is between the 1st audio amplifier sition the signal is fed through a .05 (item 38) which limits or acts as a quencies passed to the middle and es through a 40,000 ohm (item 64) hese two resistors act as a voltage ken off at the junction of the 40,000 hm resistor (item 63) from the 6R7 00 ohm resistor (item 68) its effect o form a d-c grid return when the

the MUSIC position is as follows: sistor (item 66) and a 250,000 ohm divider and 6R7 grid is fed from des normal response which is well

plate passes through the .05 con-nd a 500,000 ohm resistor (item 79) nted by a .004 condenser (item 39). and the middle range predominate. tems 66, 79, and 39.

oupling condenser (.05 uf. item 37) .006 uf. condenser (item 40) to a ondenser (item 42) to ground. The d 65. The function of Item 40 the encies while the purpose of Item 42, resultant output covers the middle 3 megohm resistor from the 6R7GT

sh buttons will in no way affect buttons, no tools are required, utton switch is essential. There are two definite pressures and movements required to actuate the switch. First, a slight touch and a movement of less than one-quarter inch is all that is required to tune the receiver with a push button after the button has been adjusted. Second, a heavier pressure and a movement of a little more than one-quarter inch is required when the push button is to be set to the station selected. To adjust the button, push the button all the way down and hold it in that position while you tune in as accurately as possible with the manual tuning knob the station selected. Release the button and the station is set. Follow the same procedure in setting the remaining buttons.


TUNING UNIT
ROCKER PLATE & GEAR ASSY. NO.- 1213913
BACKLASH GEAR & PLATE ASSY. NO.- 1213932
BEARING SCREW NO.- 1213917
CLUTCH PLATE & HUB ASSY NO.- 1213934
CLUTCH HOUSING & BRACKET ASSY. NO.- 1213928
KEY RETURN SPRING NO.- 1213911
WOOD IDLER PULLEY NO.- 1213957
GEAR PLATE ASSY. NO.- 1213912
ALLEN SET SCREW NO.- 1213964
SPRING, SETTING SHAFT COLLAR. NO.- 1213896
CLUTCH PIN NO.- 1213908
SHAFT, KEY SETTING CLUTCH NO.- 1213905
RUBBER BUMPER NO.-1213916
R.H.
L.H.
R.H.
L.H.
R.H.
R.H. KEY ASSY. NO.-1213901
L.H. KEY ASSY. NO.- 1213902
KEY OPERATING BAR NO.- 1213914
BAR RETURN SPRING NO.- 1213915
SOLENOID ARMATURE NO.- 1213923
SOLENOID COIL NO.- 1213885
BEARING SCREW NO.- 1213299
ANTI-RATTLE SPRINGS NO.- 1213903
CLUTCH SHAFT LOCKING COLLAR NO.- 1213904
"C" WASHER NO.- 1213910
RUBBER WASHER NO.- 1213909
KEY SETTING CLUTCH NO.- 1213906
CLUTCH SPRING MTG. SCREW NO.-1208913
CLUTCH PIN SPRING. NO. 1213907

Alignment

Aligning I.F. Stages at 262.5 Kilocycles

USE A .02 MFD. DUMMY TO GRID OF 6K7GT TUBE (LEAVE GRID CAP IN PLACE). SET AUDIO FIDELITY TO "MUSIC" POSITION. AT 262.5 KC ADJUST SECOND IF TRIMMERS. THEN APPLY SIGNAL TO GRID OF 6A8GT TUBE (LEAVE GRID CAP IN PLACE) . OPEN MIDDLE TRIMMER OF FIRST IF TRANSFORMER ADJUST TWO OTHER TRIMMERS TO MAXIMUM AND THEN THE MIDDLE TRIMMER FOR MAXIMUM.DO NOT READJUST SECOND IF.

Oscillograph Alignment

(a) Disconnect the conventional signal generator from the receiver.

(b) Connect the vertical plates of the oscillograph to the receiver connecting the (HI) terminal through a .02 mfd. condenser to the grid cap of the 6K7GT audio amplifier tube, leaving the tube's grid clip in place. (Condenser is built into most oscillographs.) Connect the ground terminal to the frame of the receiver chassis.

(c) Connect the output of the R.F. modulated signal generator, also through a .02 mfd. condenser to the grid cap of the 6A8GT tube, leaving the tube's grid clip in place. Connect the ground lead to the frame of the receiver chassis.

(d) Adjust the signal generator to 262.5 kilocycles.

(e) With the modulator switch of the signal generator turned off, a horizontal line will appear on the window of the oscillograph by means of the amplitude control on the oscillograph. Adjust the length of the line so that it is equal to the width of the celluloid scale supplied with the oscillograph.

(f) Turn the frequency modulator switch of the signal generator on.

(g) Adjust the vertical control of the oscillograph so that the image is just within the top and bottom lines of the oscillograph scale. NOTE: Use the lowest signal generator output that will give a stable image on the oscillograph window. If too much signal input is used, the humps desired on the wave form will not be visible even at perfect alignment.

(h) Readjust the middle trimmer on the 1st I.F. transformer for maximum symmetry above the vertical resonance line in the center of the celluloid scale. The hump or shoulder appearing on each side of the wave form will be equal distance from the numbers of the curve when maximum symmetry is reached.

Aligning the R.F. Amplifier

USE A ,00016 MFD. DUMMY TO ANTENNA LEAD. AT 1400 KC ADJUST OSCILLATOR TRIMMER FOR MAXIMUM. THEN ADJUST RF AND ANTENNA TRIMMER FOR MAXIMUM. READJUST STATION SELECTOR FOR MAXIMUM. DO NOT READJUST OSCILLATOR TRIMMER.

Adjusting Antenna Compensating Condenser

SET SIGNAL AND DIAL AT 600 KC, ADJUST FOR MAXIMUM. ADJUST ALSO AT 1400 KC. WHEN INSTALLED IN CAR TUNE A WEAK STATION BETWEEN 55 AND 65 ON DIAL AND ADJUST FOR MAXIMUM VOLUME IN SPEAKER.

MODEL 985536
Circuit Data, Tuner
Alignment Notes,Parts

CHEVROLET DIV.—GEN. MOTORS

Parts List

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1212932		Lead Assy.	"A" Lead—Set to Fuse	1
1212933		Lead Assy.	"A" Lead—Fuse to Ammeter	2
115273		Bulb	Dial Light	3
1213883		Coil	"A" Filter Choke	4
1213884		Coil	Motor Noise Choke	5
1213641		Coil	Audio Input Choke	6
1213645		Coil	Antenna	7
1212893		Coil	Oscillator	8
1213885		Coil	Tuning Solenoid	9
1212979		Coil	R.F.	10
1213646		Coil	1st I.F. Trans. Assy	11
1213849		Coil	2nd I.F. Trans. Assy	12
1209055		Condenser	Molded—.00025 mfd. Ant. Coupling	13
1211535		Condenser	Antenna Series Compensating	14
1213648		Condenser	Tubular—.5 mfd. 200 Volt—H.F. Noise Filter	15
1213643		Condenser	Variable—3 Gang Tuning	16
7232390		Condenser	Tubular—.5 mfd. 160 Volt—Filter	17
7232390		Condenser	Tubular—.5 mfd. 160 Volt—Filter	18
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1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—R.F. Return	20
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—R.F. Cathode By-Pass	21
1210275		Condenser	Molded—.0001 mfd. Mica—Osc. Coupling	22
1212316	1208600	Condenser	Tubular—.01 mfd. 650 Volt—Vib. Phasing	23
1212316	1208600	Condenser	Tubular—.01 mfd. 650 Volt—Vib. Phasing	24
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—Screen By-Pass	25
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—I.F. Cathode By-Pass	26
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—B+., R.F. By-Pass	27
1213651	7230910	Condenser	Tubular—.04 mfd. 400 Volt—2nd A.F. Output	28
1210293	7230593	Condenser	Tubular—.006 mfd. 160 Volt—V.C. Bass Compensating	29
1208942	1207893	Condenser	Tubular—.003 mfd. 400 Volt—Plate By-Pass	30
1213652		Condenser	Electrolytic—3 Section (10-10-5 mfd.) B. Filter	31
1210275		Condenser	Molded—.0001 mfd.—H.F. By-Pass	32
1210257	1207799	Condenser	Tubular—.02 mfd. 160 Volt—A.F. Coupling	33
1210295	7230592	Condenser	Tubular—.05 mfd. 200 Volt—1st A.F. Coupling	34
1209055		Condenser	Molded—.00025 mfd.—Diode Rectifying	35
1210275		Condenser	Molded—.0001 mfd.—Diode Coupling	36
1209308	7230592	Condenser	Tubular—.05 mfd. 400 Volt—A.F. Coupling	37
1213647	1212097	Condenser	Tubular—.001 mfd. 160 Volt—Bass Limiting (F.C.)	38
1213650	7233243	Condenser	Tubular—.004 mfd. 160 Volt—H.F. By-Pass (F.C.)	39
1210293	7230593	Condenser	Tubular—.006 mfd. 160 Volt—Bass Limiting (F.C.)	40
1213653		Condenser	Electrolytic—3 Section (4-20-4 mfd.) Cathode By-Pass	41
1213649	7230912	Condenser	Tubular—.005 mfd. 160 Volt—H.F. By-Pass (F.C.)	42
106653	603156	Fuse	20 Ampere	43
1211701	1208110	Resistor	Flexible—450 ohm, ½ Watt—R.F. and Det. Bias	44
1212668		Resistor	Insulated—20,000 ohm, 2 Watt—Screen Dropping	45
1210470		Resistor	Insulated—500,000 ohm, ½ Watt—AVC Filter	46
1211703	1209015	Resistor	Flexible—100 ohm, ½ Watt—Vib. Damping	47
1210881		Resistor	Insulated—60,000 ohm, ½ Watt—Osc. Grid Leak	48
1208321		Resistor	Flexible—220 ohm, 2½ Watt—Output Bias	49
1212981		Resistor	Insulated—1400 ohm, 1½ Watt—Hum Filter	50
1210834		Resistor	Insulated—10,000 ohm, ½ Watt—Audio Plate Filter	51
1211701	1208110	Resistor	Flexible—450 ohm, ½ Watt—I.F. Bias	52
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Bass Comp.	53
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—I.F. Filter	54
1209884		Resistor	Insulated—300,000 ohm, ½ Watt—A.F. Diode Load	55
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Diode Load	56
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Filter	57
1209885		Resistor	Insulated—1 megohm, ½ Watt—AVC Isolating	58
1211049		Resistor	Insulated—2700 ohm, ½ Watt—2nd A.F. Bias	59
1210834		Resistor	Insulated—10,000 ohm, ½ Watt—2nd A.F. Plate	60
1211704	1208802	Resistor	Flexible—350 ohm, ½ Watt—2nd A.F. Bias	61
1210882		Resistor	Insulated—20,000 ohm, ½ Watt—1st A.F. Plate	62
1211149		Resistor	Insulated—3 megohm, ½ Watt—2nd A.F. Grid Return	63
1211104		Resistor	Insulated—40,000 ohm, ½ Watt—Voltage Divider (F.C.)	64
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)	65
1210117		Resistor	Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)	66
1210117		Resistor	Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)	67
1209883		Resistor	Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)	68
1211049		Resistor	Insulated—2700 ohm, ½ Watt	69
1213644		Switch	Tone Control—not to be serviced	71
1213642		Transformer	Output	72
1213640		Transformer	Power	73
1213639		Switch	Volume Control and On-Off Switch—2 megohm	74
7239439		Vibrator		75
1213886		Coil	Clutch	76
1209055		Condenser	Molded—.00025 mfd.—I.F. Filter	77
1211703	1209015	Resistor	Flexible—100 ohm, ½ Watt—Vib. Damping	78
1210470		Resistor	Insulated—500,000 ohm, ½ Watt—Bass Leveler (F.C.)	79

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. The eight tubes employed are an R. F. Amplifier, combination Oscillator-Modulator Tube, 262.5 kilocycle I. F. amplifier the first transformer of which is triple tuned, push-pull output and power supply. The 6R7GT tube supplies A.V.C. voltage to the grids of the 6K7GT R. F. amplifier, the 6A8GT and the 6K7GT first audio amplifier. It also serves as second detector and second audio amplifier driver. The bias for the 6K7GT R. F. amplifier and the 6A8GT tubes is developed across a 450 ohm resistor, item No. 44. The bias for the 6K7GT I. F. amplifier tube is developed across a 450 ohm resistor, item No. 52. Bias for the 6K7GT first audio tube is developed across a 2700 ohm resistance, item No. 69. Bias for the 6R7GT tube is developed across two resistances, item numbers 59-350 ohms and 61-2700 ohms. Bias for the 6V6GT tubes is developed across a 220 ohm resistance, item No. 49. Between the 6K7GT first audio plate and the 6R7GT ground is the fidelity control resistor capacity network. The 6R7GT plate is coupled through a .04 mfd. condenser to one side of the center tapped audio input choke.

Explanation of Tone Control Positions and Automatic Volume Control

Automatic Volume Control

The 6R7GT diode furnishes A.V.C. voltage developed across item 56, 1 megohm load resistor, to the 6A8GT through item 57, 1 megohm filter resistor; from the 1 megohm filter through a 500,000 ohm isolating resistor (item 46) to the R-F 6K7GT grid; likewise from the 1 megohm filter through a 1 megohm isolating resistor (item 58) to the grid of the 6K7GT first audio tube.

Tone Control

The fidelity control and its tone compensating network is between the 1st audio amplifier and driver tube. When the switch is in the VOICE position the signal is fed through a .05 condenser (item 37) then through a .001 condenser (item 38) which limits or acts as a high impedance to low frequencies, limiting the frequencies passed to the middle and high range. From the .001 condenser the signal passes through a 40,000 ohm (item 64) and a 100,000 ohm (item 68) resistor to ground. These two resistors act as a voltage divider and the signal to the 6R7GT driver grid is taken off at the junction of the 40,000 and 100,000 ohm resistors. Likewise there is a 3 megohm resistor (item 63) from the 6R7 grid to ground, while this is shunted across the 100,000 ohm resistor (item 68) its effect on the circuit is negligible and its real purpose is to form a d-c grid return when the fidelity switch is in the SOFT position.

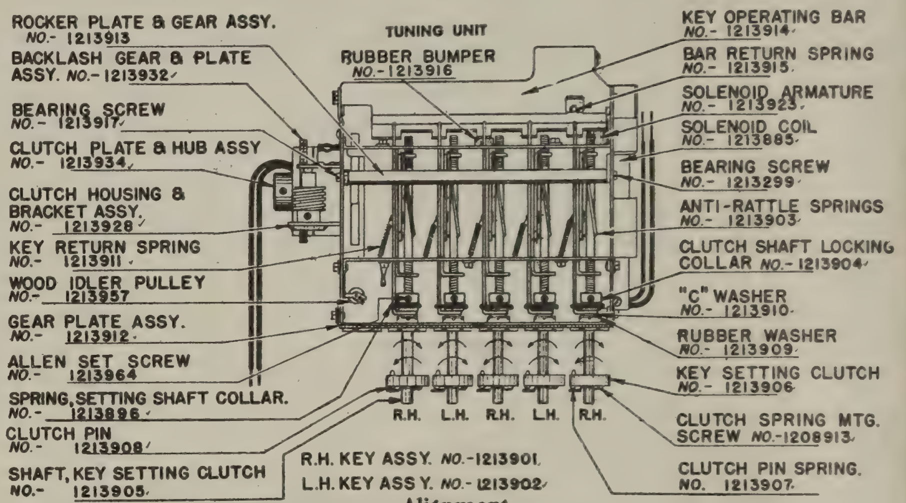
The path of the audio with the fidelity switch in the MUSIC position is as follows: Through .05 condenser (item 37) a 250,000 ohm resistor (item 66) and a 250,000 ohm resistor (item 67) to ground. Items 66 and 67 form divider and 6R7 grid is fed from junction of these two resistors. This position provides normal response which is well rounded with both lows and highs.

For the BASS position, the signal from the 6K7GT plate passes through the .05 condenser (item 37) the 250,000 ohm resistor (item 66) and a 500,000 ohm resistor (item 79) to ground. Item 79, the 500,000 ohm resistor is shunted by a .004 condenser (item 39). This condenser bypasses the highs so that the lows and the middle range predominate. The grid of the 6R7GT is fed from the junction of items 66, 79, and 39.

For the SOFT position the a-f is fed through the coupling condenser (.05 uf. item 37) the 250,000 ohm resistor (item 66) then through a .006 uf. condenser (item 40) to a 100,000 ohm resistor (item 65) through a .005 uf. condenser (item 42) to ground. The 6R7GT grid is fed from the junction of items 40 and 65. The function of Item 40 the .006 uf. condenser, is to pass highs and middle frequencies while the purpose of Item 42, the .005 uf. condenser is to bypass the highs so the resultant output covers the middle range cutting both the highs and lows. Item 63, the 3 megohm resistor from the 6R7GT grid to ground, is the d.c. grid return.

Setting the Push Buttons

The order in which the stations are set up on the push buttons will in no way affect the operation of the tuning unit. To set the push buttons, no tools are required, but an understanding of the operation of the push-button switch is essential. There are two definite pressures and movements required to actuate the switch. First, a slight touch and a movement of less than one-quarter inch is all that is required to tune the receiver with a push button after the button has been adjusted. Second, a heavier pressure and a movement of a little more than one-quarter inch is required when the push button is to be set to the station selected. To adjust the button, push the button all the way down and hold it in that position while you tune in as accurately as possible with the manual tuning knob the station selected. Release the button and the station is set. Follow the same procedure in setting the remaining buttons.


TUNING UNIT
ROCKER PLATE & GEAR ASSY. NO.- 1213913
BACKLASH GEAR & PLATE ASSY. NO.-1213932
BEARING SCREW NO.- 1213917
CLUTCH PLATE & HUB ASSY NO.- 1213934
CLUTCH HOUSING & BRACKET ASSY. NO.- 1213928
KEY RETURN SPRING NO.- 1213911
WOOD IDLER PULLEY NO.- 1213957
GEAR PLATE ASSY. NO.- 1213912
ALLEN SET SCREW NO.- 1213964
SPRING, SETTING SHAFT COLLAR. NO.- 1213896
CLUTCH PIN NO.- 1213908
SHAFT, KEY SETTING CLUTCH NO.- 1213905
RUBBER BUMPER NO.-1213916
R.H. L.H. R.H. L.H. R.H.
R.H. KEY ASSY. NO.-1213901
L.H. KEY ASSY. NO.- 1213902
KEY OPERATING BAR NO.- 1213914
BAR RETURN SPRING NO.- 1213915
SOLENOID ARMATURE NO.- 1213923
SOLENOID COIL NO.- 1213885
BEARING SCREW NO.- 1213299
ANTI-RATTLE SPRINGS NO.- 1213903
CLUTCH SHAFT LOCKING COLLAR NO.- 1213904
"C" WASHER NO.- 1213910
RUBBER WASHER NO.- 1213909
KEY SETTING CLUTCH NO.- 1213906
CLUTCH SPRING MTG. SCREW NO.-1208913
CLUTCH PIN SPRING. NO. 1213907

Alignment

Aligning I.F. Stages at 262.5 Kilocycles

USE A .02 MFD. DUMMY TO GRID OF 6K7GT TUBE (LEAVE GRID CAP IN PLACE). SET AUDIO FIDELITY TO "MUSIC" POSITION. AT 262.5 KC ADJUST SECOND IF TRIMMERS. THEN APPLY SIGNAL TO GRID OF 6A8GT TUBE (LEAVE GRID CAP IN PLACE) . OPEN MIDDLE TRIMMER OF FIRST IF TRANSFORMER ADJUST TWO OTHER TRIMMERS TO MAXIMUM AND THEN THE MIDDLE TRIMMER FOR MAXIMUM.DO NOT READJUST SECOND IF.

Oscillograph Alignment

(a) Disconnect the conventional signal generator from the receiver.

(b) Connect the vertical plates of the oscillograph to the receiver connecting the (HI) terminal through a .02 mfd. condenser to the grid cap of the 6K7GT audio amplifier tube, leaving the tube's grid clip in place. (Condenser is built into most oscillographs.) Connect the ground terminal to the frame of the receiver chassis.

(c) Connect the output of the R.F. modulated signal generator, also through a .02 mfd. condenser to the grid cap of the 6A8GT tube, leaving the tube's grid clip in place. Connect the ground lead to the frame of the receiver chassis.

(d) Adjust the signal generator to 262.5 kilocycles.

(e) With the modulator switch of the signal generator turned off, a horizontal line will appear on the window of the oscillograph by means of the amplitude control on the oscillograph. Adjust the length of the line so that it is equal to the width of the celluloid scale supplied with the oscillograph.

(f) Turn the frequency modulator switch of the signal generator on.

(g) Adjust the vertical control of the oscillograph so that the image is just within the top and bottom lines of the oscillograph scale. NOTE: Use the lowest signal generator output that will give a stable image on the oscillograph window. If too much signal input is used, the humps desired on the wave form will not be visible even at perfect alignment.

(h) Readjust the middle trimmer on the 1st I.F. transformer for maximum symmetry above the vertical resonance line in the center of the celluloid scale. The hump or shoulder appearing on each side of the wave form will be equal distance from the numbers of the curve when maximum symmetry is reached.

Aligning the R.F. Amplifier

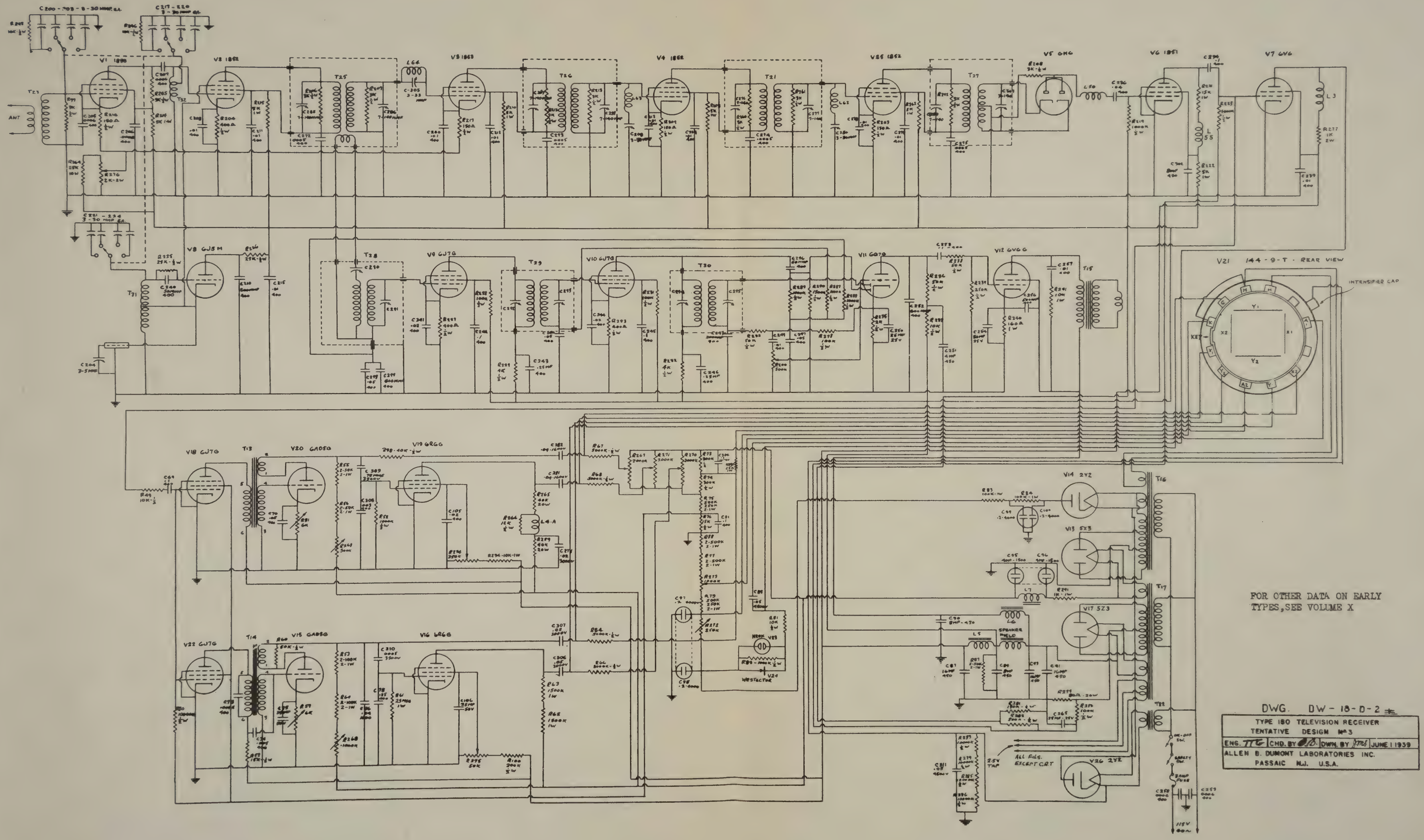
USE A ,00016 MFD. DUMMY TO ANTENNA LEAD. AT 1400 KC ADJUST OSCILLATOR TRIMMER FOR MAXIMUM. THEN ADJUST RF AND ANTENNA TRIMMER FOR MAXIMUM. READJUST STATION SELECTOR FOR MAXIMUM. DO NOT READJUST OSCILLATOR TRIMMER.

Adjusting Antenna Compensating Condenser

SET SIGNAL AND DIAL AT 600 KC, ADJUST FOR MAXIMUM. ADJUST ALSO AT 1400 KC.
WHEN INSTALLED IN CAR TUNE A WEAK STATION BETWEEN 55 AND 65 ON DIAL AND ADJUST FOR MAXIMUM VOLUME IN SPEAKER.

MODEL 180, Type 3
Schematic

ALLEN B. DUMONT LABS., INC.



FOR OTHER DATA ON EARLY TYPES, SEE VOLUME X

MODEL S7427-3,Chassis R316
Alignment,Socket,Trimmers
Coils,Tuner,Dial Drive

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC. are required.

1 Connect the output meter across the voice coil or, in series with .1 mfd. condenser, from the plate of the 6L6-G output tube to ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

2 Connect the ground lead of the signal generator to the "G" post on the antenna terminal strip at the rear of the chassis, or to the metal chassis.

The ground and doublet terminals on the antenna terminal strip must be connected together throughout the alignment procedure.

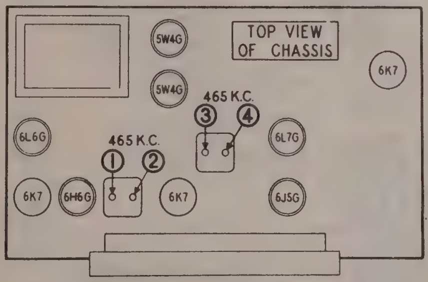
3 With the gang condenser in full mesh set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser to full mesh with the pointer properly set, then retighten the set screw.

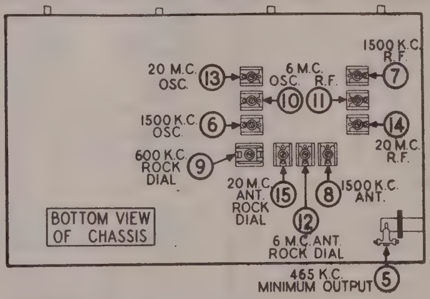
4 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. IMPORTANT:- If the remote control unit is plugged in, be sure that its volume control is also in the maximum volume position.

-IMPORTANT-

,THE FIRST PUSH-BUTTON ON THE LEFT, LABELLED "MANUAL",MUST BE PUSHED IN WHEN ALIGNING. FAILURE TO PUSH IN THIS BUTTON WILL MAKE CORRECT ALIGNMENT IMPOSSIBLE.

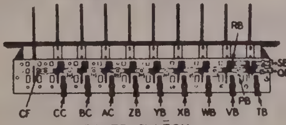
DUMMY ANT IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
1 MFD. CONDENSER	CONTROL GRID OF 6L7-G TUBE	465 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2 3-4	2ND I.F. 1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	465 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (CLOCKWISE)	1500 KC.	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (CLOCKWISE)	TUNE TO 1500 KC. GENERATOR SIGNAL	7 8	BROADCAST R. F. BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	600 KC.	BROADCAST (CLOCKWISE)	TUNE TO 600 KC. GENERATOR SIGNAL	9	BROADCAST OSCILLATOR (SERIES PAD)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	6 MC.	10	INTERMEDIATE (POLICE) OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	TUNE TO 6 MC. GENERATOR SIGNAL	11 12	INTERMEDIATE R. F. INTERMEDIATE ANTENNA	ADJUST FOR MAXIMUM OUTPUT
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	20 MC.	13	FOREIGN OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	TUNE TO 20 MC GENERATOR SIGNAL	14 15	FOREIGN R. F. FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



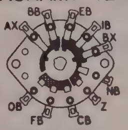


PICTORIAL VIEWS OF COILS AND SWITCHES

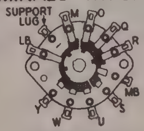
ALL TERMINALS ARE LETTERED TO CORRESPOND WITH THE SIMILARLY LETTERED TERMINALS SHOWN ON THE CIRCUIT DIAGRAM. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTERS.



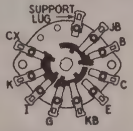
TUNER SWITCH



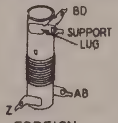
RANGE SWITCH FRONT DECK



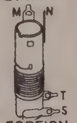
RANGE SWITCH MIDDLE DECK



RANGE SWITCH REAR DECK



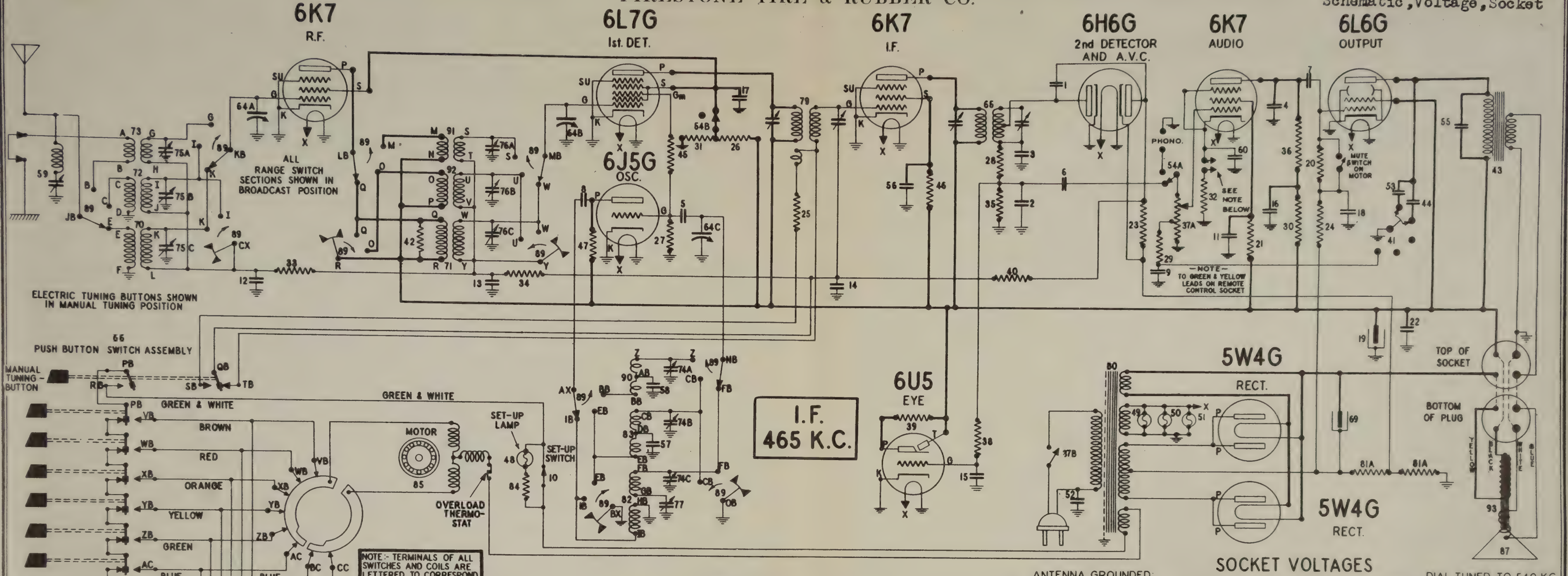
FOREIGN OSCILLATOR COIL
113607

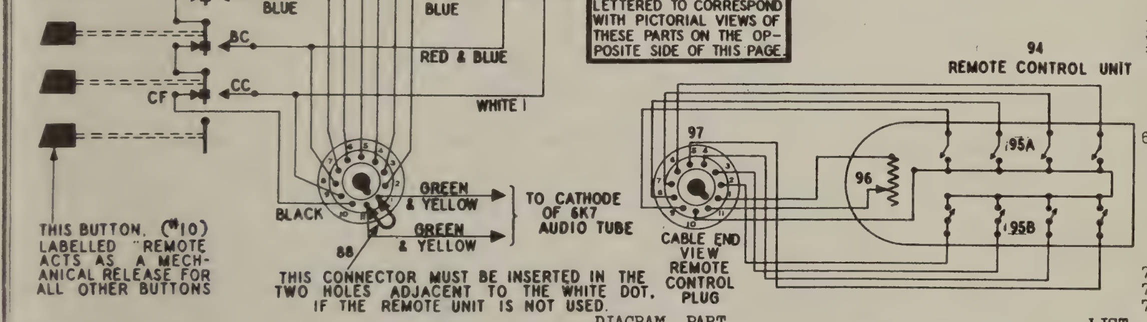


FOREIGN R.F. COIL
113608

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-3,Chassis R316
Schematic,Voltage,Socket





NOTE:- TERMINALS OF ALL SWITCHES AND COILS ARE LETTERED TO CORRESPOND WITH PICTORIAL VIEWS OF THESE PARTS ON THE OPPOSITE SIDE OF THIS PAGE.

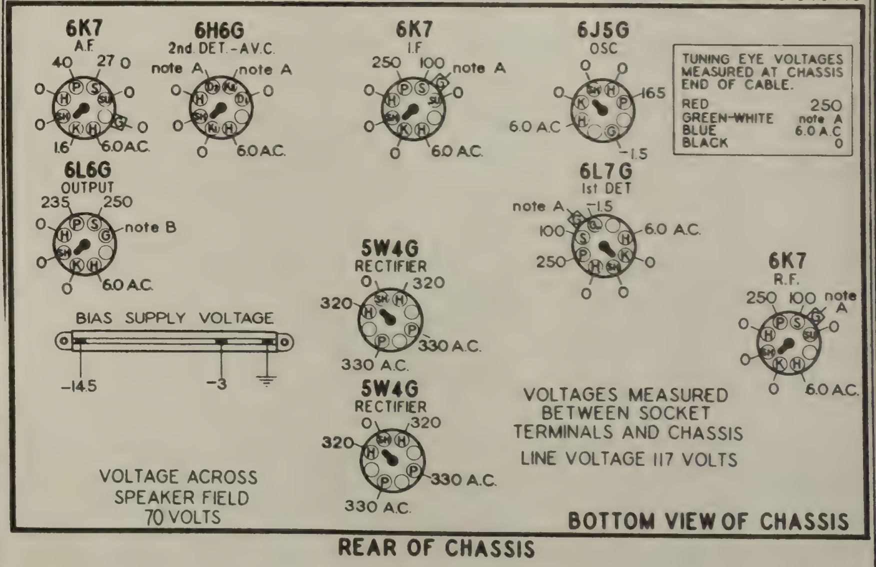
THIS BUTTON, (#10) LABELLED "REMOTE" ACTS AS A MECHANICAL RELEASE FOR ALL OTHER BUTTONS

THIS CONNECTOR MUST BE INSERTED IN THE TWO HOLES ADJACENT TO THE WHITE DOT, IF THE REMOTE UNIT IS NOT USED.

SOCKET VOLTAGES

ANTENNA GROUNDED

DIAL TUNED TO 540 KC



TUNING EYE VOLTAGES MEASURED AT CHASSIS END OF CABLE.

RED	250
GREEN-WHITE	note A
BLUE	6.0 A.C.
BLACK	0

VOLTAGE ACROSS SPEAKER FIELD 70 VOLTS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

LINE VOLTAGE 117 VOLTS

REAR OF CHASSIS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2-3	83783	Condenser - mica, 110 mmf.	.20
4	85394	Condenser - mica 510 mmf.	.25
5	85061	Condenser - mica 51 mmfd.	.15
6-7	88026	Condenser - .02 mfd. 400 volt	.25
8	88030	Condenser - .01 mfd. 400 volt	.25
9	88030	Condenser - .01 mfd. 400 volt	.25
10	88054	Switch - for set-up	.30
11	88682	Condenser - .1 mfd. 400 volt	.25
12-13 14-15	88189	Condenser - .05 mfd. 200 volt	.25
16	88682	Condenser - .1 mfd. 400 volt	.25
17	89421	Condenser - .1 mfd. 200 volt	.25
18	89532	Condenser - .25 mfd. 200 volt	.32
19	89937	Condenser - elect. 30 mfd. 450 V	1.60
20	110553	Resistor - 220,000 ohms 1/4 watt	.12
21	110554	Resistor - 1 meg. 1/4 watt	.12
22	88682	Condenser - .1 mfd. 400 volt	.25
23	110559	Resistor - 470,000 ohms 1/4 watt	.12
24	110564	Resistor - 100,000 ohms 1/4 watt	.12
25	110975	Resistor - wire 33 ohms 1/2 watt	.12
26	112953	Resistor - 10,000 ohms 3 watts	.25
27-28 29-30	110552	Resistor - 47,000 ohms 1/4 watt	.12
31	112954	Resistor - 10,000 ohms 1 watt	.16
32	112955	Resistor - 1,000 ohm ¼ W. (10%)	.12
33-34-35	110553	Resistor - 220,000 ohms 1/4 watt	.12
36	112959	Resistor - 120,000 ohms ¼ W.(10%)	.12
37A-37B	113258	Vol.Cont.-1000000 ohm(off-on sw.)	.95
38-39-40	110554	Resistor - 1 megohm 1/4 watt	.12
41	114095	Tone Control switch	.70
42	110557	Resistor - 4,700 ohms 1/4 watt	.12
43	114097	Transformer - output	2.00
44	114106	Condenser - .02 mfd. 750 volt	.25
45	110560	Resistor - 100 ohms 1/4 watt	.12
46	110564	Resistor - 100,000 ohms 1/4 watt	.12
47	110568	Resistor - 15,000 ohms 1 watt	.15
48-49 50-51	110629	Lamp - 6.3 volt - .25 amps.	.15
52	111214	Condenser - .01 mfd. 600 volt	.24
53	114108	Condenser - .03 mfd. 750 volt	.25
54A-54B	114141	Switch - radio-phono(D.P.D.T.)	.44
55	114504	Condenser - .01 mfd. 750 volt	.25
56	111252	Condenser - .05 mfd. 400 volt	.13
57	112426	Condenser - mica 1650 mmfd.(3%)	.30
58	112427	Condenser - mica 4050 mmfd.(3%)	.40
59	112796	Coil - wave trap (with trimmer)	.50
60	110377	Condenser - elect. 10 mfd. 25 V.	.80
64A-64C	113219	Condenser - variable gang	6.80
65	113229	Transformer - 2nd I.F.	1.64
66	113256	Push Button Switch Assembly	3.75
69	113261	Condenser - 30 mfd. 450 volt	1.40
70	113295	Coil - antenna (B.C.)	1.20
71	113296	Coil - R.F. (B.C.)	1.30
72	113298	Coil - antenna (police)	.50
73	113301	Coil - antenna (S.W.)	.52
74A-74C	113319	Condenser - trimmer - 3 section	.54
75A-75C 76A-76C	113320	Condenser - trimmer - 3 section	.54
77	113346	Condenser - padding	.38
79	114103	Transformer - 1st I.F.	1.90
80	114101	Transformer - 117 volt 60 cycle	9.00
81A-81B	114105	Bias Resistor - Section A-23 ohm Section B-90 ohm	.38
82	113411	Coil - oscillator (B.C.)	.50
83	113412	Coil - oscillator (police)	1.20
84	113430	Resistor - candohm 90 ohms	.26
85	114092	Motor - for electric tuner	8.00
87---R	114165	Cone - voice coil assembly	2.40
88	113499	Connector Link - for remote control plug	.01
89	113599	Switch - range	2.10
90	113607	Coil - oscillator (S.W.)	.52
91	113608	Coil - R. F. (S.W.)	.60
92	113609	Coil - R.F. (Police)	.50
93---R	115031	Speaker (dynamic) (12 inch)	9.25
94	114200	Remote control unit	
95A-95B	113644	Switch - two section (in remote control unit)	4.20
96	113646	Volume control (35,000 ohms) on remote control unit	.75
	113650	Case for remote control unit	1.20
	113651	Push Button - for remote control unit	.08

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The bias for the control grids of the 6L7-G, 6K7-R.F., 6K7-I.F. and the diode plate (D_2) and cathode (K_2) of the 6H6-G tubes is -3.0 volts measured across resistor 81A.

NOTE B: The bias for the control grid of the 6V6-G output tube is -14.5 volts measured across resistors 81A and 81B.

CHASSIS DESCRIPTION

The R-316 chassis is a 10 tube, Electric Push-Button Tuning Superheterodyne receiver. The tuning ranges are 535 to 1730 KC, 2.2 to 7.0 MC, and 3.8 to 22.5 MC.

Incorporated in each chassis is a ruggedly constructed Electric Push-Button Tuner Unit, which was primarily designed to give long-life and consistent accuracy of tuning. Aside from the automatic tuning system this receiver incorporates several features described in the following paragraph which the service man should carefully read as they may aid him in rapidly locating the source of trouble.

CIRCUIT FEATURES

VARIABLE SELECTIVITY: Two degrees of selectivity can be obtained by proper use of the first push-button labelled "Manual". When the button is in the "out" position the tuning of the receiver will be broad. With this button in the "in" position the tuning will be sharp. Broadening is accomplished by inserting a resistor and coil in series with the secondary of the first I. F. transformer. The series coil is mutually coupled into the primary of the same I.F. transformer thereby causing a flattening of the overall selectivity.

AUDIO SYSTEM: The audio voltage developed across the diode load resistor is fed to the volume control which in turn couples, the desired amount of this audio voltage to the control grid of the 6K7 1st audio tube. The output of this stage is coupled to the 6L6-G output tube. A mute switch connected across the control grid load resistor of the 6L6-G output tube is utilized to silence the receiver while the automatic tuning unit is in operation. This is accomplished by placing the mute switch on the back of the tuner motor. When the motor starts to operate the rotor pulls into the magnetic field of the stator, which causes the end of the motor shaft to push against the mute switch and close its contacts.

TUNER MOTOR

Failure of the Tuner Motor to operate will generally be found due to the following causes:

1. The small black set-up switch on the rear of the tuner must be in the left hand position. If this switch is in the right hand position, the set-up lamp is connected in series with the motor, and the motor cannot operate.

2. The overload thermostat on the motor will open when the temperature of the motor reaches a dangerous value (approximately 95° C.) The thermostat will close automatically when the motor cools down.

HOW TO SET UP THE PUSH BUTTONS

1. Be sure that your set is first connected to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Make a list of eight nearby stations which you wish to tune in with automatic tuning buttons. Be sure to select nearby powerful stations, since weak stations will generally give better results when tuned manually. Arrange the list so that the lowest frequency station appears first, then the next lowest frequency continuing in this manner until the eight stations are arranged in the numerical order of their frequency. The frequency of your local stations may be obtained from your newspaper or radio call magazine.

Only buttons No. 2 to No. 9 are used for automatic tuning. IT IS IMPERATIVE THAT THESE BUTTONS BE SET-UP IN THE FOLLOWING ORDER: Button No. 2 must be set to tune in the station whose frequency is lowest in your list of eight stations. Button No. 3 must be set to tune in the station next higher in frequency. Continue to follow this procedure until Button No. 9 will be set to tune in the station whose frequency is highest in your list.

The actual setting up of the buttons is done as follows:

4. Push in the "MANUAL" button and use the tuning knob to tune in the station (lowest frequency on your list) that you have selected for Button No. 2. Be sure to tune in the station correctly using the "Tuning Eye". The correct tuning point is indicated when the two open ends of the inverted "V" shaped shadow in the "Tuning Eye" are closest together.
5. Place the small black "set-up switch" button which appears on the back of the chassis in the right hand position. (See label on back of chassis.) LEAVE THIS SWITCH BUTTON IN THIS POSITION UNTIL ALL BUTTONS HAVE BEEN SET-UP.
6. PUSH IN BUTTON No. 2. The lamp mounted on the back of the chassis just to the right of the selector drum will be illuminated when the button is depressed. (See Fig. 1)

NOTE: If the lamp does not light up when the switch is in this position it indicates that Button No. 2 is already correctly set to the desired station and further adjustment need not be made for this button.

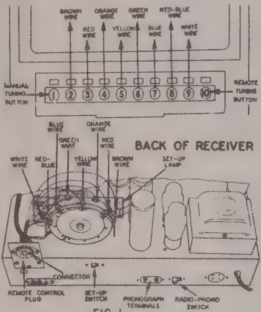


FIG. I

7. Locate the contactor corresponding to Button No. 2. This contactor has a BROWN lead attached to it (see Fig. 1 or label on back of chassis for the color of the wire associated with each button), and is the extreme right hand contact on the inner circle of the semi-circular bridge, when viewed from rear of chassis. Loosen the knurled nut on this contactor (not more than one-half turn), THEN SLIDE THIS CONTACTOR ALONG THE BRIDGE TO THE POINT INDICATED BY THE WHITE ARROWHEAD ON THE SIDE OF THE ROUND DRUM. When this point is reached, the lamp will go out. If the contactor is moved farther than the point at which the lamp extinguishes, the lamp will again be illuminated. Move the contactor back and forth between the two points at which the lamp extinguishes, and set the contactor midway between these two points. Then tighten the knurled nut as tightly as possible, with the fingers. The lamp should still be out after tightening the contactor. If it is not, the contactor must be reset.
8. Set up for Button No. 2 is now complete.
9. Set up the remaining seven buttons in a similar manner. The contactors for the remaining buttons can be identified as follows: (See Fig. 1 or label on back of chassis.)

Button No. 2 - Brown Lead.
Button No. 3 - Red Lead.
Button No. 4 - Orange Lead.
Button No. 5 - Yellow Lead.
Button No. 6 - Green Lead.
Button No. 7 - Blue Lead.
Button No. 8 - Red-Blue Lead.
Button No. 9 - White Lead.

10. AFTER ALL THE BUTTONS HAVE BEEN SET-UP YOU MUST PLACE THE SMALL BLACK SET-UP SWITCH BUTTON IN THE LEFT HAND POSITION (white dot showing). OTHERWISE THE ELECTRIC TUNER MOTOR WILL NOT OPERATE. (See label on back of chassis just below this switch.) This re-connects the motor and enables you to tune to any of the eight selected stations by pushing the proper button.
11. To use the Push Button Tuner it is only necessary to push the button for the station you desire.
12. The Push Button Tuner buttons may also be used on the Foreign or Intermediate bands. However, on these bands we recommend that rather than setting a button to a station, you set the buttons to some particular location on the dial where foreign, police, aircraft or amateur stations are frequently received. Attempts to set buttons to short-wave stations are not recommended due to the extreme sharpness of tuning on these bands.
13. Label each button with the call letters of the stations you have selected, using the call letter tabs packed with your receiver. These tabs are to be moistened on their gummed side and inserted in the recesses in the escutcheon, directly above the push buttons.

REMOTE CONTROL UNIT

This Air-Chief radio is designed to permit tuning from a remote point such as your armchair or any point within 20 ft. of the receiver cabinet. A special "Remote Tuner Kit" part No. 114200 is available to adapt your receiver for remote control. It can be purchased from any Firestone Store or Dealer. This accessory kit consists of a remote control unit incorporating eight push buttons and a remote volume control. The unit is connected by a flat flexible cable to an eleven prong plug, which fits into a corresponding socket at the left rear of the receiver chassis. Following are the instructions for installation of the remote control unit:

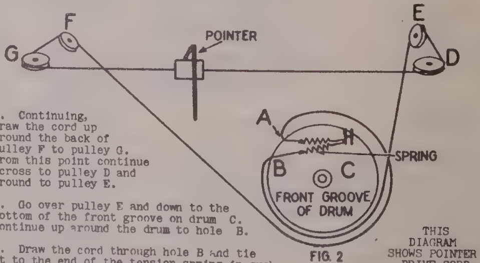
1. Turn off the radio set.
2. Remove the wire connector which joins the two holes adjoining the white dot on the eleven hole socket. IMPORTANT: If at any time you decide to discontinue the use of the remote control unit, remove the plug and reinsert this wire connector in the two holes adjoining the white dot. Failure to replace the connector will make the set inoperative.
3. Insert the remote control plug in its socket and locate the remote control unit at some convenient point within 20 ft. of the set. The connecting cable may be placed beneath the rug, or along the floor.
4. PRESS IN THE "REMOTE" BUTTON (#10) on the Push Button Tuner and the unit is now ready for operation.

REPLACING THE POINTER DRIVE CORD.

1. Tie one end of 53" of special dial cord (part No.111302) to the spring, which is attached to Lug H.

2. Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 2.

3. After pulling the cord through hole A, make one half turn around the drum C in a clockwise direction (viewed from the front) using the front groove in the drum.



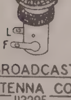
4. Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.

5. Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.

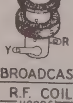
6. Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1¼" long.

FIG. 2

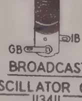
THIS
DIAGRAM
SHOWS POINTER
DRIVE CORD
ONLY



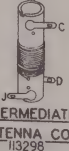
BROADCAST ANTENNA COIL
113295



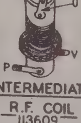
BROADCAST R.F. COIL
113296



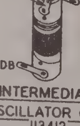
BROADCAST OSCILLATOR COIL
113411



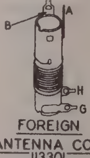
INTERMEDIATE ANTENNA COIL
113298



INTERMEDIATE R.F. COIL
113609



INTERMEDIATE OSCILLATOR COIL
113412



FOREIGN ANTENNA COIL
113301

MODEL 82A
Voltage, Sensitivity
Clock Data, Drive Data

GALVIN MFG. CORP.

VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
6-A-7*	Osc. Mod.	240	120	0	190
6-D-6*	I. F.	240	120	0	—
6Q7G**	Det.-AVC	100	—	—4.5	—
6Q7G**	Inv.	120	—	—4.5	—
41	Output	240	245	12	—
41	Output	240	245	12	—
84	Standby Rect.	AC	—	410***	—
84	Rect.	AC	—	310	—

*Bias—3.0V. measured across motor magnet.
**Bias—1.5V. measured across resistor 43
***Stand-by voltage without load.
Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.

SENSITIVITY DATA

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
2500	455 K.C.	6D6 Grid	.1 Mfd	.5 Meg	.65 Volts
30	455 K.C.	6A7 Grid	.1 Mfd	.5 Meg	.65 Volts
40	600 K.C.	6A7 Grid	.1 Mfd	.5 Meg	.65 Volts
12	600 K.C.	Ant. Lead	200 Mfd	None	.65 Volts

*For .05 Watts Output.
**Output meter connected across voice coil.

SETTING THE CLOCK

Since that part of the clock which controls the radio operates on a 24-hour basis, it is not sufficient to set the clock to the exact hour. It must also be set for day or night, as the case may be. Directly below the center of the clock dial is a small peep-hole, through which you can look to determine whether the day or night section is in control. White indicates day (6 A.M. to 6 P.M.), black indicates night (6 P.M. to 6 A.M.).

For example: If it is 12:00 o'clock noon when you set the clock, the clock hands should not only point to 12:00 o'clock, but a white surface should be visible through the peep-hole. If a black surface is seen instead, turn the clock ahead 12 hours.

IN SETTING THE CLOCK, ALWAYS TURN IT FORWARD — NEVER BACKWARDS.

Even though your setting of the clock has been fairly accurate, you will probably need to synchronize it with radio time. To do this, set up a series of programs, following the directions outlined in later paragraphs and watch carefully to see if the clock operates the electric tuner during the short interval in which program changes occur on the radio networks.

If you find that the mechanism operates a few seconds before the change in program should be accomplished, you can slow it by pulling the wall plug of the radio for the exact number of seconds that the clock was fast. If, on the other hand, the change in programs is slow, you should merely set the clock forward a few seconds by means of the time setting knob on the back of the clock. (Fig. 1). Several hours may be required to get the clock exactly synchronized with the change in radio programs. However, once this has been accomplished, it will not need to be done again until such time when you may pull the wall plug, or until your house current fails from some other cause.

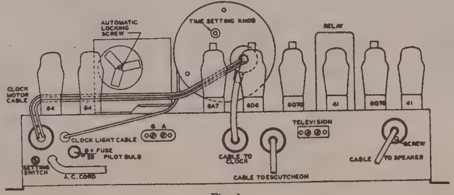


Fig. 1

TO RESTRING DIAL DRIVE CORDS

TUNING CORD

1. Cut a length of 30 lb. test silk fish cord 43 inches long.

2. Turn gang to fully meshed position.

3. Thread end of cord thru slot "A" in condenser pulley.

4. With an ordinary paper clip fasten cord to drive pulley to hold in place.

5. Wind cord in a clock-wise direction one full turn around the condenser pulley and down to the tuning shaft.

6. Wind cord in clock-wise direction three times around the drive shaft, and up to the condenser pulley.

7. Thread end of cord thru slot "A" in condenser pulley.

8. Knot both ends of cord together securely.

9. Hook one end of tension spring to cord.

10. Connect the other end of the spring to the hook "B" on the condenser pulley.

POINTER CORD

1. Cut a length of 30 lb. test silk fish cord 40 inches long and tie a ¼ inch loop in each end. Finished length should be 37 inches.

2. Place loop over front slab head set screw "C".

3. Run cord under idler pulley. No. 1.

4. Continue cord across front of chassis to idler pulley No. 2.

5. Continue cord clockwise around idler pulley No. 2.

6. Run cord under idler pulley No. 3.

7. Wrap string around rear bushing clock-wise six times.

8. Place loop over rear set screw "D".

9. Loosen front set screw and turn in counter-clockwise direction until you have ½ to ¾ turns of cord around the front bushing and all slack has been taken up. Do not pull cord too tight. Watch back lash spring "J".

10. Replace dial pointer.

11. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.

12. Secure pointer to string with a drop of shellac or a good grade of household cement.

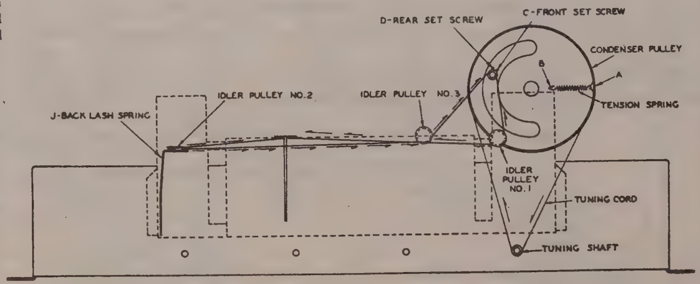


Fig. 6

MODEL S7427-3,Chassis R316
Alignment,Socket,Trimmers
Coils,Tuner,Dial Drive

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC. are required.

1 Connect the output meter across the voice coil or, in series with .1 mfd. condenser, from the plate of the 6L6-G output tube to ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

2 Connect the ground lead of the signal generator to the "G" post on the antenna terminal strip at the rear of the chassis, or to the metal chassis.

The ground and doublet terminals on the antenna terminal strip must be connected together throughout the alignment procedure.

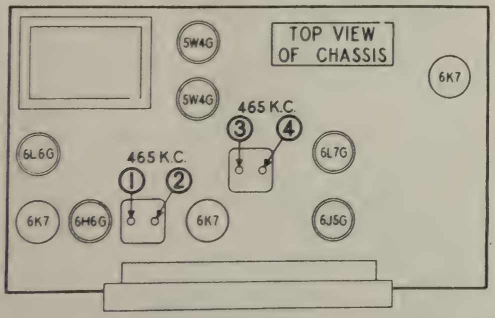
3 With the gang condenser in full mesh set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser to full mesh with the pointer properly set, then retighten the set screw.

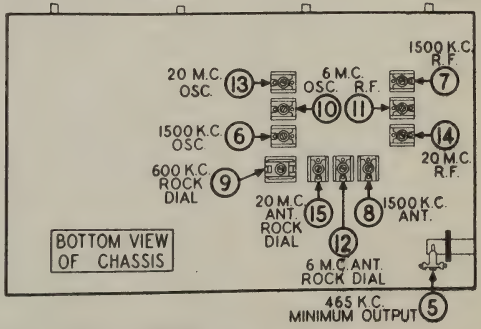
4 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. IMPORTANT:- If the remote control unit is plugged in, be sure that its volume control is also in the maximum volume position.

-IMPORTANT-

,THE FIRST PUSH-BUTTON ON THE LEFT, LABELLED "MANUAL",MUST BE PUSHED IN WHEN ALIGNING. FAILURE TO PUSH IN THIS BUTTON WILL MAKE CORRECT ALIGNMENT IMPOSSIBLE.

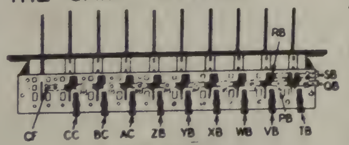
DUMMY ANT IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
1 MFD. CONDENSER	CONTROL GRID OF 6L7-G TUBE	465 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	465 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (CLOCKWISE)	1500 KC.	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (CLOCKWISE)	TUNE TO 1500 KC. GENERATOR SIGNAL	7	BROADCAST R. F.	ADJUST FOR MAXIMUM OUTPUT.
					8	BROADCAST ANTENNA	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	600 KC.	BROADCAST (CLOCKWISE)	TUNE TO 600 KC. GENERATOR SIGNAL	9	BROADCAST OSCILLATOR (SERIES PAD)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	6 MC.	10	INTERMEDIATE (POLICE) OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	TUNE TO 6 MC. GENERATOR SIGNAL	11	INTERMEDIATE R. F.	ADJUST FOR MAXIMUM OUTPUT
					12	INTERMEDIATE ANTENNA	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	20 MC.	13	FOREIGN OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	TUNE TO 20 MC GENERATOR SIGNAL	14	FOREIGN R. F.	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
					15	FOREIGN ANTENNA	



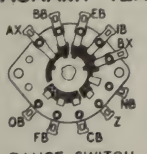


PICTORIAL VIEWS OF COILS AND SWITCHES

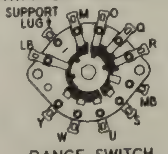
ALL TERMINALS ARE LETTERED TO CORRESPOND WITH THE SIMILARLY LETTERED TERMINALS SHOWN ON THE CIRCUIT DIAGRAM. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTERS.



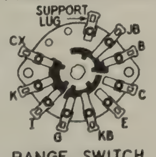
TUNER SWITCH



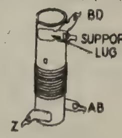
RANGE SWITCH FRONT DECK



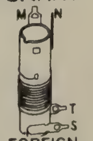
RANGE SWITCH MIDDLE DECK



RANGE SWITCH REAR DECK



FOREIGN OSCILLATOR COIL 113607



FOREIGN R.F. COIL 113608

CHASSIS DESCRIPTION

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CIRCUIT FEATURES

VARIABLE SELECTIVITY: Two degrees of selectivity can be obtained by proper use of the first push-button labelled "Manual". When the button is in the "out" position the tuning of the receiver will be broad. With this button in the "in" position the tuning will be sharp. Broadening is accomplished by inserting a resistor and coil in series with the secondary of the first I. F. transformer. The series coil is mutually coupled into the primary of the same I.F. transformer thereby causing a flattening of the overall selectivity.

AUDIO SYSTEM: The audio voltage developed across the diode load resistor is fed to the volume control which in turn couples, the desired amount of this audio voltage to the control grid of the 6K7 1st audio tube. The output of this stage is coupled to the 6L6-G output tube. A mute switch connected across the control grid load resistor of the 6L6-G output tube is utilized to silence the receiver while the automatic tuning unit is in operation. This is accomplished by placing the mute switch on the back of the tuner motor. When the motor starts to operate the rotor pulls into the magnetic field of the stator, which causes the end of the motor shaft to push against the mute switch and close its contacts.

TUNER MOTOR

Failure of the Tuner Motor to operate will generally be found due to the following causes:

1. The small black set-up switch on the rear of the tuner must be in the left hand position. If this switch is in the right hand position, the set-up lamp is connected in series with the motor, and the motor cannot operate.

2. The overload thermostat on the motor will open when the temperature of the motor reaches a dangerous value (approximately 95° C.) The thermostat will close automatically when the motor cools down.

HOW TO SET UP THE PUSH BUTTONS

1. Be sure that your set is first connected to a good antenna system.

2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.

3. Make a list of eight nearby stations which you wish to tune in with automatic tuning buttons. Be sure to select nearby powerful stations, since weak stations will generally give better results when tuned manually. Arrange the list so that the lowest frequency station appears first, then the next lowest frequency continuing in this manner until the eight stations are arranged in the numerical order of their frequency. The frequency of your local stations may be obtained from your newspaper or radio call magazine.

Only buttons No. 2 to No. 9 are used for automatic tuning. IT IS IMPERATIVE THAT THESE BUTTONS BE SET-UP IN THE FOLLOWING ORDER: Button No. 2 must be set to tune in the station whose frequency is lowest in your list of eight stations. Button No. 3 must be set to tune in the station next higher in frequency. Continue to follow this procedure until Button No. 9 will be set to tune in the station whose frequency is highest in your list.

The actual setting up of the buttons is done as follows:

4. Push in the "MANUAL" button and use the tuning knob to tune in the station (lowest frequency on your list) that you have selected for Button No. 2. Be sure to tune in the station correctly using the "Tuning Eye". The correct tuning point is indicated when the two open ends of the inverted "V" shaped shadow in the "Tuning Eye" are closest together.

5. Place the small black "set-up switch" button which appears on the back of the chassis in the right hand position. (See label on back of chassis.) LEAVE THIS SWITCH BUTTON IN THIS POSITION UNTIL ALL BUTTONS HAVE BEEN SET-UP.

6. PUSH IN BUTTON No. 2. The lamp mounted on the back of the chassis just to the right of the selector drum will be illuminated when the button is depressed. (See Fig. 1)

NOTE: If the lamp does not light up when the switch is in this position it indicates that Button No. 2 is already correctly set to the desired station and further adjustment need not be made for this button.

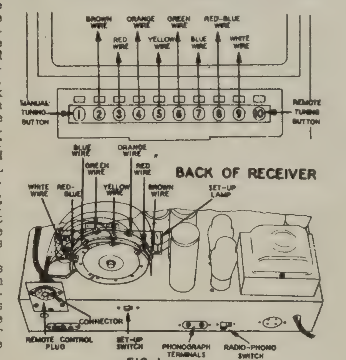


FIG. 1

7. Locate the contactor corresponding to Button No. 2. This contactor has a BROWN lead attached to it (see Fig. 1 or label on back of chassis for the color of the wire associated with each button), and is the extreme right hand contact on the inner circle of the semi-circular bridge, when viewed from rear of chassis. Loosen the knurled nut on this contactor (not more than one-half turn), THEN SLIDE THIS CONTACTOR ALONG THE BRIDGE TO THE POINT INDICATED BY THE WHITE ARROWHEAD ON THE SIDE OF THE ROUND DRUM. When this point is reached, the lamp will go out. If the contactor is moved farther than the point at which the lamp extinguishes, the lamp will again be illuminated. Move the contactor back and forth between the two points at which the lamp extinguishes, and set the contactor midway between these two points. Then tighten the knurled nut as tightly as possible, with the fingers. The lamp should still be out after tightening the contactor. If it is not, the contactor must be reset.

8. Set up for Button No. 2 is now complete.

9. Set up the remaining seven buttons in a similar manner. The contactors for the remaining buttons can be identified as follows: (See Fig. 1 or label on back of chassis.)

Button No. 2 - Brown Lead.
Button No. 3 - Red Lead.
Button No. 4 - Orange Lead.
Button No. 5 - Yellow Lead.
Button No. 6 - Green Lead.
Button No. 7 - Blue Lead.
Button No. 8 - Red-Blue Lead.
Button No. 9 - White Lead.

10. AFTER ALL THE BUTTONS HAVE BEEN SET-UP YOU MUST PLACE THE SMALL BLACK SET-UP SWITCH BUTTON IN THE LEFT HAND POSITION (white dot showing). OTHERWISE THE ELECTRIC TUNER MOTOR WILL NOT OPERATE. (See label on back of chassis just below this switch.) This re-connects the motor and enables you to tune to any of the eight selected stations by pushing the proper button.

11. To use the Push Button Tuner it is only necessary to push the button for the station you desire.

12. The Push Button Tuner buttons may also be used on the Foreign or Intermediate bands. However, on these bands we recommend that rather than setting a button to a station, you set the buttons to some particular location on the dial where foreign, police, aircraft or amateur stations are frequently received. Attempts to set buttons to short-wave stations are not recommended due to the extreme sharpness of tuning on these bands.

13. Label each button with the call letters of the stations you have selected, using the call letter tabs packed with your receiver. These tabs are to be moistened on their gummed side and inserted in the recesses in the escutcheon, directly above the push buttons.

REMOTE CONTROL UNIT

This Air-Chief radio is designed to permit tuning from a remote point such as your armchair or any point within 20 ft. of the receiver cabinet. A special "Remote Tuner Kit" part No. 114200 is available to adapt your receiver for remote control. It can be purchased from any Firestone Store or Dealer. This accessory kit consists of a remote control unit incorporating eight push buttons and a remote volume control. The unit is connected by a flat flexible cable to an eleven prong plug, which fits into a corresponding socket at the left rear of the receiver chassis. Following are the instructions for installation of the remote control unit:

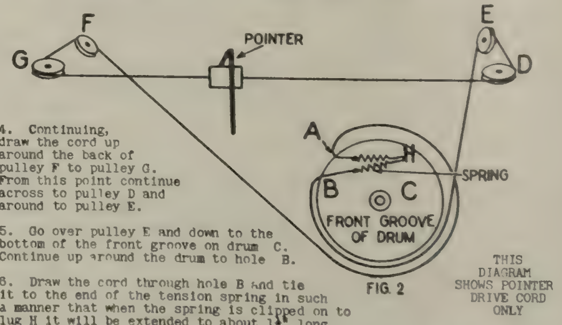
1. Turn off the radio set.
2. Remove the wire connector which joins the two holes adjoining the white dot on the eleven hole socket. IMPORTANT: If at any time you decide to discontinue the use of the remote control unit, remove the plug and reinsert this wire connector in the two holes adjoining the white dot. Failure to replace the connector will make the set inoperative.
3. Insert the remote control plug in its socket and locate the remote control unit at some convenient point within 20 ft. of the set. The connecting cable may be placed beneath the rug, or along the floor.
4. PRESS IN THE "REMOTE" BUTTON (#10) on the Push Button Tuner and the unit is now ready for operation.

REPLACING THE POINTER DRIVE CORD.

1. Tie one end of 53" of special dial cord (part No.111302) to the spring, which is attached to Lug H.

2. Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 2.

3. After pulling the cord through hole A, make one half turn around the drum C in a clockwise direction (viewed from the front) using the front groove in the drum.



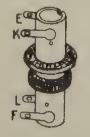
4. Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.

5. Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.

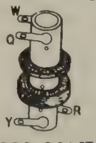
6. Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1½" long.

FIG. 2

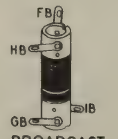
THIS DIAGRAM SHOWS POINTER DRIVE CORD ONLY



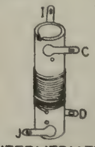
BROADCAST ANTENNA COIL 113295



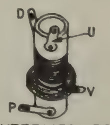
BROADCAST R.F. COIL 113296



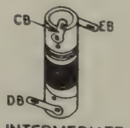
BROADCAST OSCILLATOR COIL 113411



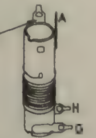
INTERMEDIATE ANTENNA COIL 113298



INTERMEDIATE R.F. COIL 113609



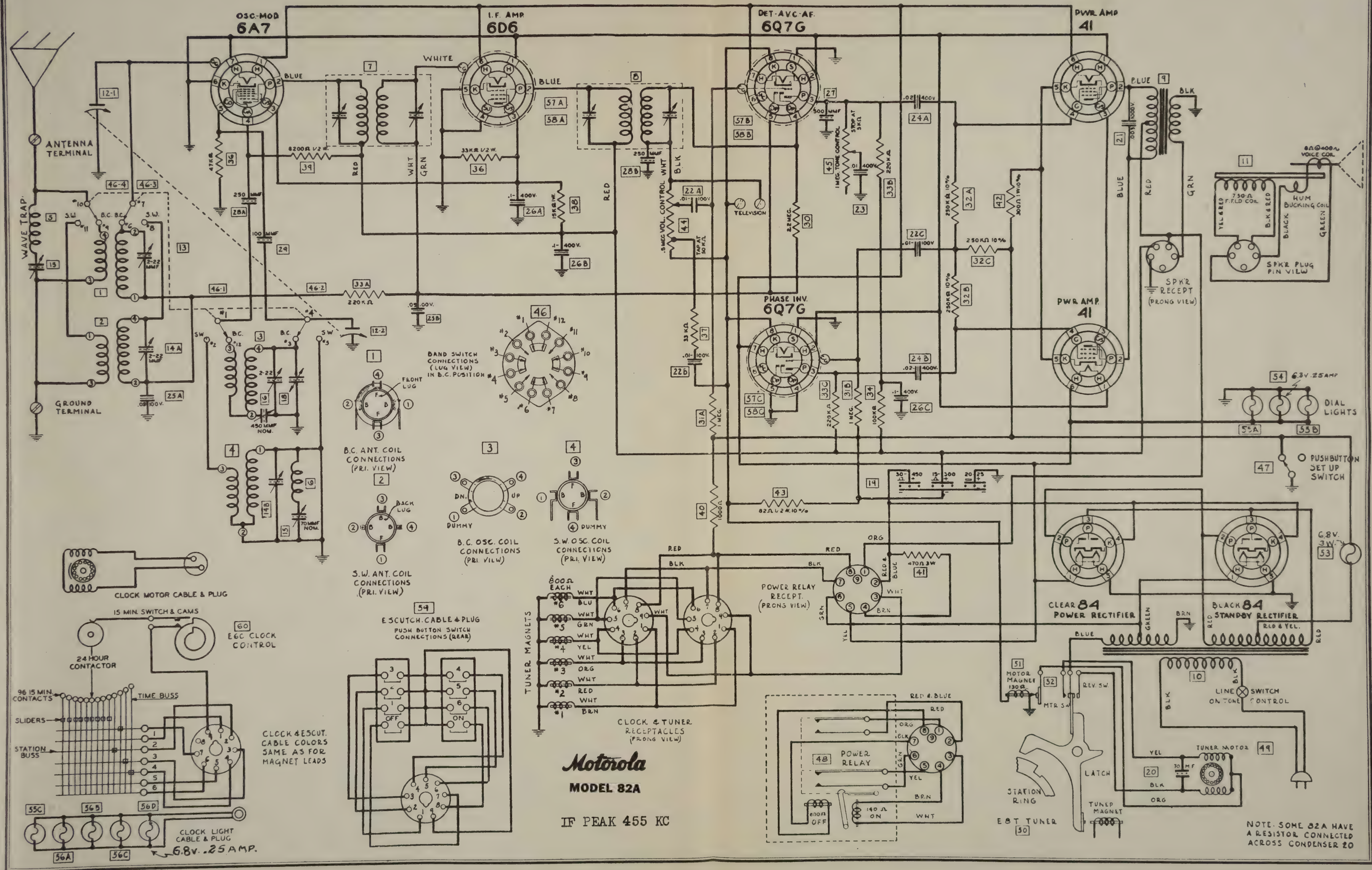
INTERMEDIATE OSCILLATOR COIL 113412



FOREIGN ANTENNA COIL 113301

MODEL 82A
Schematic

GALVIN MFG. CORP.

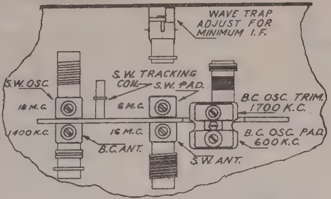


NOTE: SOME 82A HAVE A RESISTOR CONNECTED ACROSS CONDENSER 20

MODEL 82A
Alignment, Tuner Data

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE



1. Connect signal generator to control grid of Modulator tube (6A7) thru a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.

2. Set signal generator at 455 K.C. and carefully adjust the I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

3. Leave band Switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.

4. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.

6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

7. Set signal generator at 455 K.C. and adjust wave trap trimmer for minimum deflection of output meter.

8. Turn band switch to "Short Wave" position, substituting a 400 ohm carbon resistor in the antenna lead to signal generator.

9. Set signal generator and receiver dial both at 18 MC. Adjust SW OSC. trimmer until 18 MC signal is heard.

10. Set signal generator at 16 MC and turn condenser gang to the signal at 16 MC. Adjust SW ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

11. Set signal generator at 6.0 MC and rock pointer at 6.0 MC position on dial scale, while adjusting SW padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 6.0 M.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

SETTING THE TIME TUNER

To set up a series of programs requires but a few moments of your time. Proceed as follows:

1. Select and list the programs you wish to hear during the next 24-hour period. Note the time they come on the air and the stations on which they will be heard. (If your daily paper lists the radio programs by 15-minute intervals, as most of them do, all you need is to have the radio column before you as you "set up" your selections.)

2. Insert your finger in the "OFF" position of the clock FINGER DIAL and turn the dial to the LEFT (counter-clockwise) until the stop is reached. Remove your finger and permit the dial to return to its normal position (just like a telephone dial). This operation will clear or cancel any previous setting that may have been made and leave the clock control mechanism in neutral position, ready to receive the new series of programs.

3. By means of the round TIME SELECTING knob at the bottom of the clock, turn the red pointer to the desired quarter hour at which you wish to hear a radio program.

4. Insert your finger in the position of the station you want to hear at that time and turn the dial clockwise until the stop is reached, just as you would if you were dialing a telephone. Remove your finger—the dial will return to its normal position.

5. Turn the red pointer to the time of the next desired program and dial the next station you wish to hear, in the same manner.

6. For those periods throughout the twenty-four hour day when you do not wish to listen to a program, the clock can be made to turn the radio "OFF" by turning the red pointer to the desired quarter hour time, and by dialing the "OFF" position—just the same as you would dial a station position.

Try to think of the clock as doing for you exactly the same thing you do for yourself when you press a button on the front of the radio. Instead of actually pressing the button, the clock closes the same electrical circuit at the proper time, and holds the circuit closed for three seconds—long enough to tune a station or to operate the "ON" or "OFF" relays, after which interval it releases control. It will not take control again until the next quarter hour arrives and will take control then, only if something has been "dialed" for that time.

TO SET AUTOMATIC TUNER

1. Turn the motor switch OFF. This opens the motor circuit so the tuner can be set without running the motor, since a more accurate adjustment is possible.

Two types of motor switches have been used. The first type was adjustable by means of a screw driver inserted through a hole in the chassis base. This type of switch should be turned one-quarter turn to the right.

The other type was a slider switch which should be pushed down for the setting up procedure.

Refer to Fig. 1 for the exact location of the setting switch.

2. Loosen the automatic locking screw, using a screw driver or coin. This screw should be turned counter-clockwise four or five revolutions, far enough to assure plenty of looseness.

3. Turn the dial all the way to the low frequency end (535 K.C.).

4. Press the first button and hold it down. A faint "click" should be heard, indicating that the tuning magnet has attracted the latch bar.

5. Holding the magnet energized, turn the dial manually all the way to the high frequency end (1720 K.C.) and then all the way back to the low frequency end (535 K.C.).

6. Still pressing on the button, tune in the station to be set on that button.

7. Proceed to set the remaining five stations. For each station follow Steps 3, 4, 5, and 6 as outlined above. AT NO TIME IN THE SETTING-UP PROCEDURE SHOULD THE TUNING MOTOR BE PERMITTED TO RUN.

8. Tighten the automatic locking screw very securely. Do not hold the tuning knob while locking the automatic, but allow the mechanism to turn to its natural stop.

9. Turn the motor switch so the motor will run when any tuning button is pressed.

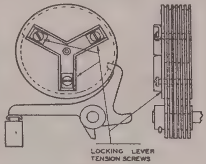


FIG. 2

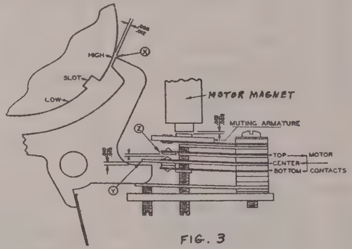


FIG. 3

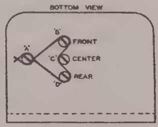


FIG 4.

REVERSING SWITCH AND MOTOR CONTACT ADJUSTMENT

NOTE: Four adjusting screws extend upward through the switch mounting plate, three of them in line, and one set off by itself. (See Fig. 4.)

1. Turn the rotor assembly until the HIGH sides of all latch rings rest opposite the latch tips.

2. Turn screw "A" in until all latch bar tips touch HIGH side of ring and then turn the screw back one-half turn. (Spacing between latch tip and high side of ring at point "X" should be 8 to 12 thousandths of an inch.)

3. Hold any latch bar tip down on HIGH side of ring and adjust screw "C" (center screw) until the bakelite insulator on the center switch leaf just barely misses touching the heel of the latch bar at point "Y". (Check adjustment by pressing other latch bars. The depressed latch bar must not lift the center contact even slightly.)

4. With latch bar at rest position adjust screw "B" (front screw) until top motor contact is lifted from center contact by 12 to 15 thousandths of an inch at point "Z". (15 thousandths = $\frac{1}{64}$").

5. Turn rotor until LOW side of ring rests under latch tip. Press any latch bar down and make sure switch actually reverses. (Bottom contact must break and top contact make sufficiently to lift the top switch leaf slightly from the bakelite spacer.)

6. Turn screw "D" (rear screw) until contact armature rests 10 to 15 thousandths of an inch from the magnet pole. (Too close spacing will cause intermittent muting due to vibration.) (15 thousandths = $\frac{1}{64}$").

ALIGNMENT PROCEDURE—MODELS 109K1 AND 109K2

1. Connect signal generator to control grid of Modulator tube (6A8G) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.

2. Set signal generator at 455 K.C. and carefully adjust the I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

3. Leave band Switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.

4. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.

6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

7. Turn band switch to "Police" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.

8. Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.

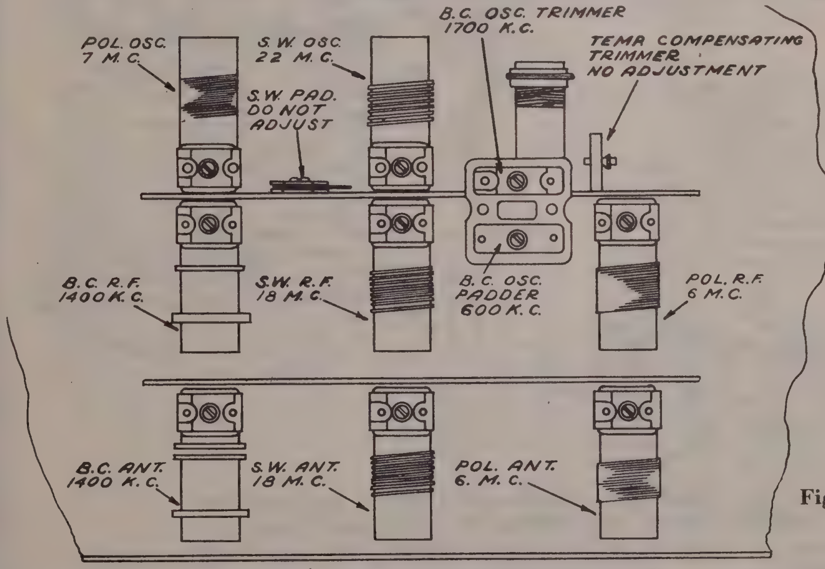
9. Set signal generator at 6.0 MC and turn condenser gang to signal at 6.0 MC. Adjust POLICE ANT. and POLICE RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

10. Turn band switch to "Short Wave" position, still using 400 ohm carbon resistor in antenna lead to signal generator.

11. Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.

12. Set signal generator at 18 MC and turn condenser gang to the signal at 18 MC. Adjust SW ANT. and SW RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

13. Padders on "Police" and "Short Wave" bands are fixed. (No adjustment necessary).



109K1 AND 109K2 TRIMMERS

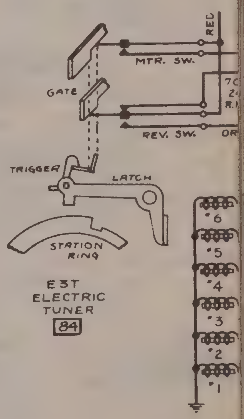


Fig. 3

Motoro

109K

MODEL 82A
Voltage,Sensitivity
Clock Data,Drive Data

GALVIN MFG. CORP.

VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
6-A-7*	Osc. Mod.	240	120	0	190
6-D-6*	I. F.	240	120	0	—
6Q7G**	Det.-AVC	100	—	—4.5	—
6Q7G**	Inv.	120	—	—4.5	—
41	Output	240	245	12	—
41	Output	240	245	12	—
84	Standby Rect.	AC	—	410***	—
84	Rect.	AC	—	310	—

*Bias—3.0V. measured across motor magnet.
**Bias—1.5V. measured across resistor 43
***Stand-by voltage without load.
Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.

SENSITIVITY DATA

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
2500	455 K.C.	6D6 Grid	.1 Mfd	.5 Meg	.65 Volts
30	455 K.C.	6A7 Grid	.1 Mfd	.5 Meg	.65 Volts
40	600 K.C.	6A7 Grid	.1 Mfd	.5 Meg	.65 Volts
12	600 K.C.	Ant. Lead	200 Mfd	None	.65 Volts

*For .05 Watts Output.
**Output meter connected across voice coil.

SETTING THE CLOCK

Since that part of the clock which controls the radio operates on a 24-hour basis, it is not sufficient to set the clock to the exact hour. It must also be set for day or night, as the case may be. Directly below the center of the clock dial is a small peep-hole, through which you can look to determine whether the day or night section is in control. White indicates day (6 A.M. to 6 P.M.), black indicates night (6 P.M. to 6 A.M.).

For example: If it is 12:00 o'clock noon when you set the clock, the clock hands should not only point to 12:00 o'clock, but a white surface should be visible through the peep-hole. If a black surface is seen instead, turn the clock ahead 12 hours.

IN SETTING THE CLOCK, ALWAYS TURN IT FORWARD — NEVER BACKWARDS.

.Even though your setting of the clock has been fairly accurate, you will probably need to synchronize it with radio time. To do this, set up a series of programs, following the directions outlined in later paragraphs and watch carefully to see if the clock operates the electric tuner during the short interval in which program changes occur on the radio networks.

If you find that the mechanism operates a few seconds before the change in program should be accomplished, you can slow it by pulling the wall plug of the radio for the exact number of seconds that the clock was fast. If, on the other hand, the change in programs is slow, you should merely set the clock forward a few seconds by means of the time setting knob on the back of the clock. (Fig. 1). Several hours may be required to get the clock exactly synchronized with the change in radio programs. However, once this has been accomplished, it will not need to be done again until such time when you may pull the wall plug, or until your house current fails from some other cause.

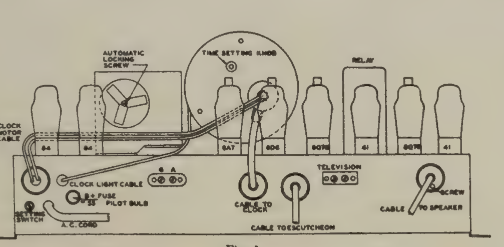


Fig. 1

TO RESTRING DIAL DRIVE CORDS

TUNING CORD

1. Cut a length of 30 lb. test silk fish cord 43 inches long.

2. Turn gang to fully meshed position.

3. Thread end of cord thru slot "A" in condenser pulley.

4. With an ordinary paper clip fasten cord to drive pulley to hold in place.

5. Wind cord in a clock-wise direction one full turn around the condenser pulley and down to the tuning shaft.

6. Wind cord in clock-wise direction three times around the drive shaft, and up to the condenser pulley.

7. Thread end of cord thru slot "A" in condenser pulley.

8. Knot both ends of cord together securely.

9. Hook one end of tension spring to cord.

10. Connect the other end of the spring to the hook "B" on the condenser pulley.

POINTER CORD

1. Cut a length of 30 lb. test silk fish cord 40 inches long and tie a ¼ inch loop in each end. Finished length should be 37 inches.

2. Place loop over front slab head set screw "C".

3. Run cord under idler pulley. No. 1.

4. Continue cord across front of chassis to idler pulley No. 2.

5. Continue cord clockwise around idler pulley No. 2.

6. Run cord under idler pulley No. 3.

7. Wrap string around rear bushing clock-wise six times.

8. Place loop over rear set screw "D".

9. Loosen front set screw and turn in counter-clockwise direction until you have ½ to ¾ turns of cord around the front bushing and all slack has been taken up. Do not pull cord too tight. Watch back lash spring "J".

10. Replace dial pointer.

11. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.

12. Secure pointer to string with a drop of shellac or a good grade of household cement.

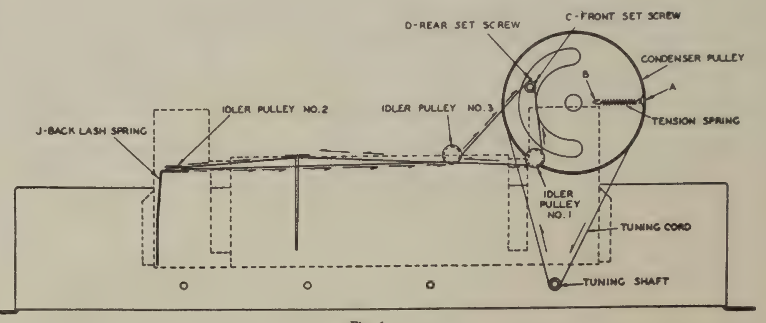


Fig. 6

MODEL 82A
Alignment,Tuner Data

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

1. Connect signal generator to control grid of Modulator tube (6A7) thru a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.

2. Set signal generator at 455 K.C. and carefully adjust the I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

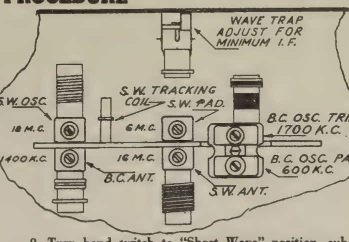
3. Leave band Switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.

4. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.

6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

7. Set signal generator at 455 K.C. and adjust wave trap trimmer for minimum deflection of output meter.



8. Turn band switch to "Short Wave" position, substituting a 400 ohm carbon resistor in the antenna lead to signal generator.

9. Set signal generator and receiver dial both at 18 MC. Adjust SW OSC. trimmer until 18 MC signal is heard.

10. Set signal generator at 16 MC and turn condenser gang to the signal at 16 MC. Adjust SW ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

11. Set signal generator at 6.0 MC and rock pointer at 6.0 MC position on dial scale, while adjusting SW padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 6.0 M.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

SETTING THE TIME TUNER

To set up a series of programs requires but a few moments of your time. Proceed as follows:

1. Select and list the programs you wish to hear during the next 24-hour period. Note the time they come on the air and the stations on which they will be heard. (If your daily paper lists the radio programs by 15-minute intervals, as most of them do, all you need is to have the radio column before you as you "set up" your selections.)

2. Insert your finger in the "OFF" position of the clock FINGER DIAL and turn the dial to the LEFT (counter-clockwise) until the stop is reached. Remove your finger and permit the dial to return to its normal position (just like a telephone dial). This operation will clear or cancel any previous setting that may have been made and leave the clock control mechanism in neutral position, ready to receive the new series of programs.

3. By means of the round TIME SELECTING knob at the bottom of the clock, turn the red pointer to the desired quarter hour at which you wish to hear a radio program.

4. Insert your finger in the position of the station you want to hear at that time and turn the dial clockwise until the stop is reached, just as you would if you were dialing a telephone. Remove your finger—the dial will return to its normal position.

5. Turn the red pointer to the time of the next desired program and dial the next station you wish to hear, in the same manner.

6. For those periods throughout the twenty-four hour day when you do not wish to listen to a program, the clock can be made to turn the radio "OFF" by turning the red pointer to the desired quarter hour time, and by dialing the "OFF" position—just the same as you would dial a station position.

Try to think of the clock as doing for you exactly the same thing you do for yourself when you press a button on the front of the radio. Instead of actually pressing the button, the clock closes the same electrical circuit at the proper time, and holds the circuit closed for three seconds—long enough to tune a station or to operate the "ON" or "OFF" relays, after which interval it releases control. It will not take control again until the next quarter hour arrives and will take control then, only if something has been "dialed" for that time.

TO SET AUTOMATIC TUNER

1. Turn the motor switch OFF. This opens the motor circuit so the tuner can be set without running the motor, since a more accurate adjustment is possible.

Two types of motor switches have been used. The first type was adjustable by means of a screw driver inserted through a hole in the chassis base. This type of switch should be turned one-quarter turn to the right.

The other type was a slider switch which should be pushed down for the setting up procedure.

Refer to Fig. 1 for the exact location of the setting switch.

2. Loosen the automatic locking screw, using a screw driver or coin. This screw should be turned counter-clockwise four or five revolutions, far enough to assure plenty of looseness.

3. Turn the dial all the way to the low frequency end (535 K.C.).

4. Press the first button and hold it down. A faint "click" should be heard, indicating that the tuning magnet has attracted the latch bar.

5. Holding the magnet energized, turn the dial manually all the way to the high frequency end (1720 K.C.) and then all the way back to the low frequency end (535 K.C.).

6. Still pressing on the button, tune in the station to be set on that button.

7. Proceed to set the remaining five stations. For each station follow Steps 3, 4, 5, and 6 as outlined above. AT NO TIME IN THE SETTING-UP PROCEDURE SHOULD THE TUNING MOTOR BE PERMITTED TO RUN.

8. Tighten the automatic locking screw very securely. Do not hold the tuning knob while locking the automatic, but allow the mechanism to turn to its natural stop.

9. Turn the motor switch so the motor will run when any tuning button is pressed.

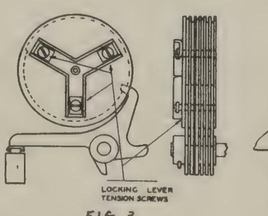


FIG. 2

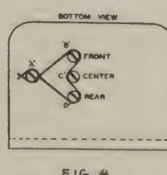


FIG 4.

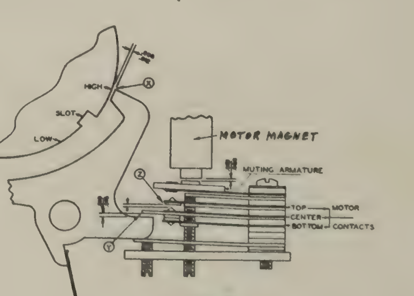


FIG. 3

REVERSING SWITCH AND MOTOR CONTACT ADJUSTMENT

NOTE: Four adjusting screws extend upward through the switch mounting plate, three of them in line, and one set off by itself. (See Fig. 4.)

1. Turn the rotor assembly until the HIGH sides of all latch rings rest opposite the latch tips.

2. Turn screw "A" in until all latch bar tips touch HIGH side of ring and then turn the screw back one-half turn. (Spacing between latch tip and high side of ring at point "X" should be 8 to 12 thousandths of an inch.)

3. Hold any latch bar tip down on HIGH side of ring and adjust screw "C" (center screw) until the bakelite insulator on the center switch leaf just barely misses touching the heel of the latch bar at point "Y". (Check adjustment by pressing other latch bars. The depressed latch bar must not lift the center contact even slightly.)

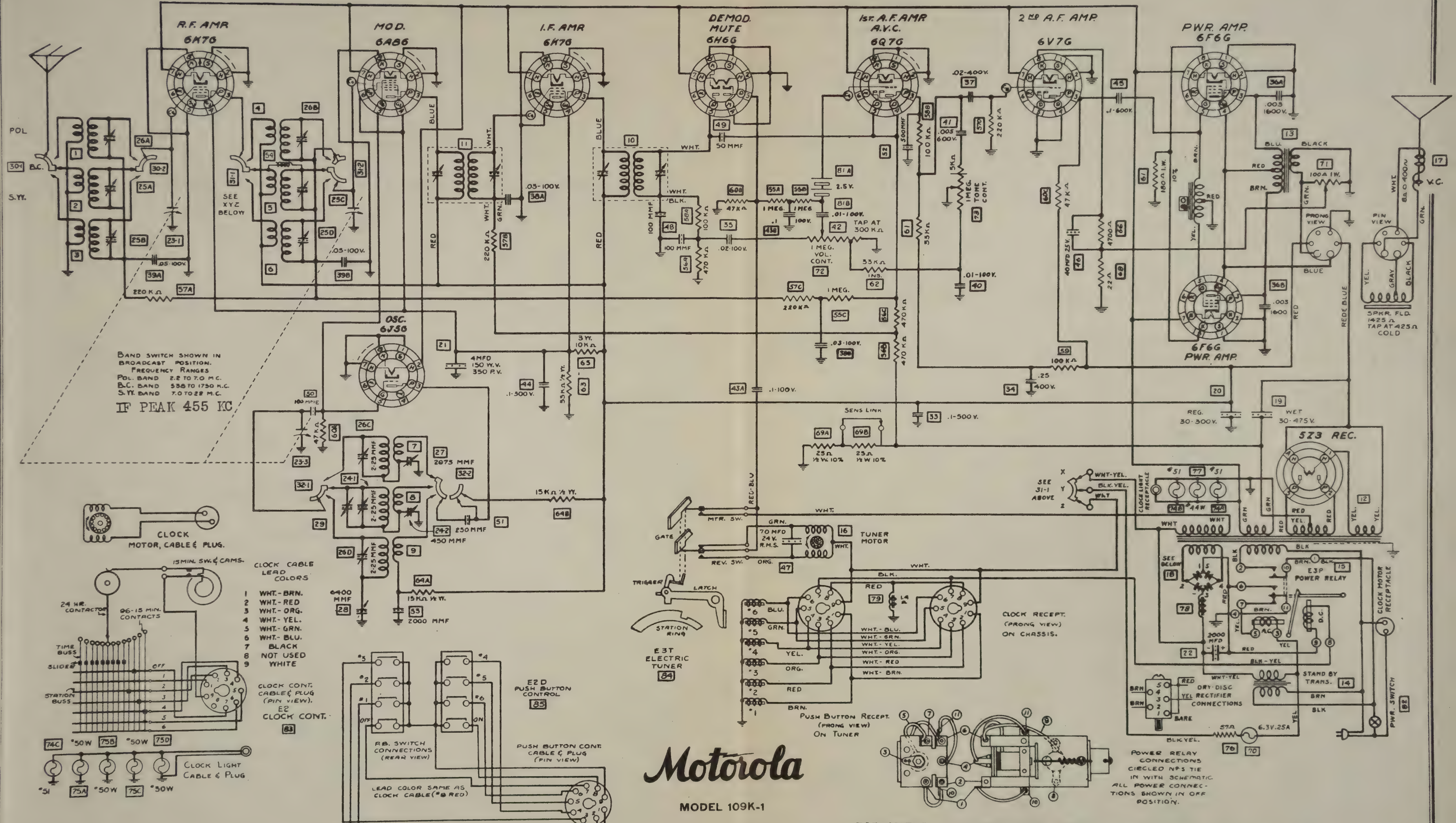
4. With latch bar at rest position adjust screw "B" (front screw) until top motor contact is lifted from center contact by 12 to 15 thousandths of an inch at point "Z". (15 thousandths — $\frac{1}{64}$").

5. Turn rotor until LOW side of ring rests under latch tip. Press any latch bar down and make sure switch actually reverses. (Bottom contact must break and top contact make sufficiently to lift the top switch leaf slightly from the bakelite spacer.)

6. Turn screw "D" (rear screw) until contact armature rests 10 to 15 thousandths of an inch from the magnet pole. (Too close spacing will cause intermittent muting due to vibration.) (15 thousandths — $\frac{1}{64}$").

MODEL 109K1,Type 1
Schematic

GALVIN MFG. CORP.



FOR MOTOR AND REVERSING SWITCH ADJUSTMENTS AND DATA ON CLOCK, REMOTE CONTROL AND AUTOMATIC ELECTRIC TUNER SEE MOTOROLA PAGES 9-33 AND 9-34 (MODELS 89K1 and 89K2) OF VOLUME 1X

SOCKET VOLTAGES—MODELS 109K1 AND 109K2

Numerals refer to socket terminals as indicated on circuit diagram.

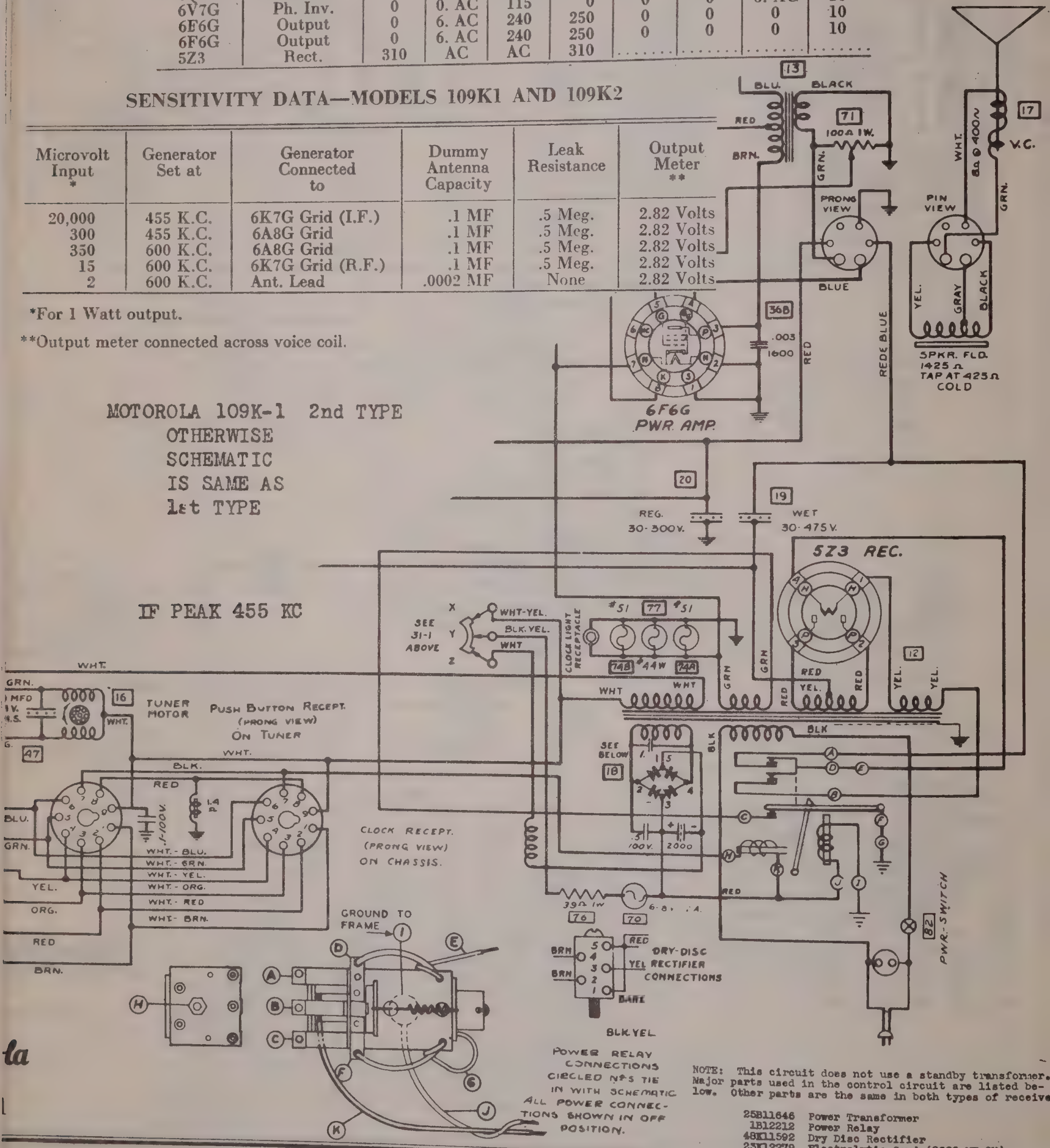
TUBE	POSITION	1	2	3	4	5	6	7	8
6K7G	R.F.	0	6. AC	210	95	0	0	0	0
6J5G	Osc.	0	6. AC	130	0	–25	0	0	0
6A8G	Mod.	0	6. AC	210	95	–25	95	0	0
6K7G	I.F.	0	6. AC	210	95	0	0	0	0
6H6G	Det.-Avc.	0	6. AC	–2	0	0	0	0	0
6Q7G	A.F. Mute	0	6. AC	115	0	0	0	0	0
6V7G	Ph. Inv.	0	0. AC	115	0	0	0	6. AC	10
6F6G	Output	0	6. AC	240	250	0	0	0	10
6F6G	Output	0	6. AC	240	250	0	0	0	10
5Z3	Rect.	310	AC	AC	310	....	....	....	....

SENSITIVITY DATA—MODELS 109K1 AND 109K2

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
20,000	455 K.C.	6K7G Grid (I.F.)	.1 MF	.5 Meg.	2.82 Volts
300	455 K.C.	6A8G Grid	.1 MF	.5 Meg.	2.82 Volts
350	600 K.C.	6A8G Grid	.1 MF	.5 Meg.	2.82 Volts
15	600 K.C.	6K7G Grid (R.F.)	.1 MF	.5 Meg.	2.82 Volts
2	600 K.C.	Ant. Lead	.0002 MF	None	2.82 Volts

*For 1 Watt output.

**Output meter connected across voice coil.



MOTOROLA 109K-1 2nd TYPE
OTHERWISE
SCHEMATIC
IS SAME AS
1st TYPE

IF PEAK 455 KC

NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receive

25B11646	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond.(2000 MF-8V)

MODEL 89K3
Alignment, Trimmers, Voltage
Sensitivity, Switch Data
MODEL 109K2, Type 2
Schematic
Switch
Data

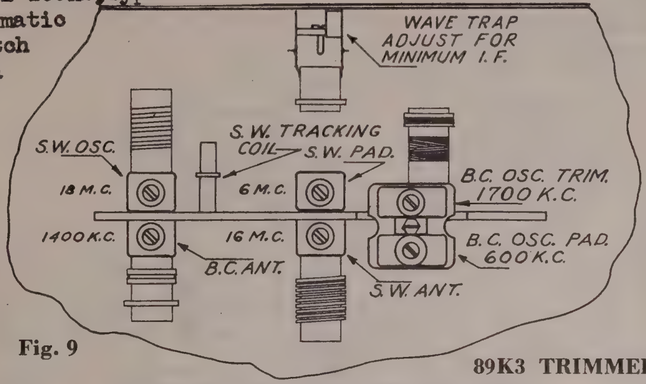


Fig. 9

89K3 TRIMMERS

SENSITIVITY DATA—MODEL 89K3

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
2800	455 K.C.	6D6 Grid	.1 MF	.5 Meg.	.65 Volts
20	455 K.C.	6A7 Grid	.1 MF	.5 Meg.	.65 Volts
25	600 K.C.	6A7 Grid	.1 MF	.5 Meg.	.65 Volts
5	600 K.C.	Ant. Lead	.0002 MF	None	.65 Volts

*For .05 Watts output. **Output meter connected across voice coil.

SOCKET VOLTAGES—MODEL 89K3

Numerals refer to socket terminals as indicated on circuit diagram.

TUBE	POSITION	1	2	3	4	5	6	7
6A7	Modulator	6. V.	220	80	80	0	0	0
6D6	I.F. Amp.	6. V.	220	80	0	0	0	....
75	Diode Det. Avc-AF	6. V.	125	0	–.5	0	0	....
75	Phase Inv.	6. V.	125	0	0	0	0	....
76	Oscillator	6. V.	155	0	0	0	....	....
42	Pwr. Audio Amp.	6. V.	250	220	0	13.	0	....
42	Pwr. Audio Amp.	0. V.	250	220	0	13.	6	....
80	Rectifier	340	AC	AC	DC	....	....	....

MODELS 89K3 AND 109K2

MOTOR AND REVERSING SWITCH ADJUSTMENTS

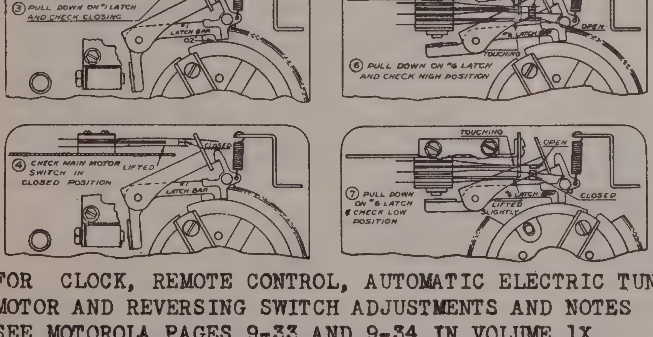


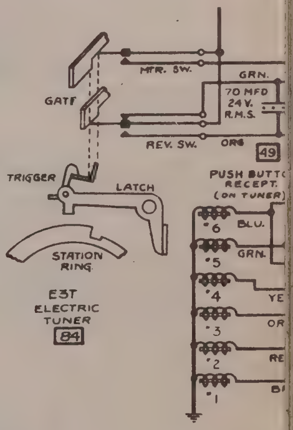
Fig. 1

FOR CLOCK, REMOTE CONTROL, AUTOMATIC ELECTRIC TUNER,
MOTOR AND REVERSING SWITCH ADJUSTMENTS AND NOTES
SEE MOTOROLA PAGES 9-33 AND 9-34 IN VOLUME 1X

GALVIN

ALIGNMENT P

1. Connect signal generator
a .05 MF. condenser and t
output meter across speak
position. Turn condenser
2. Set signal generator at 45
mers (located in top of I.
on output meter.
3. Leave band switch in "I
to antenna and ground te
lead.
4. Set signal generator at 4
minimum deflection of ou
5. Set signal generator and
OSC. trimmer until 1700
6. Set signal generator at 14
at 1400 K.C. Adjust BC A
on output meter.
7. Set signal generator at 6
on dial scale, while adju
which gives highest outp
600 K.C., padder can be
gang and without use of
necessary.
8. Turn band switch to "Sho
in signal generator lead w
9. Set signal generator and r
trimmer until 18.0 MC si
10. Set signal generator at 1
16.0 MC. Adjust S.W. A
reading. (Use non-metalli
11. Set signal generator at 6.
dial scale, while adjusting
gives highest output readi
noise.)



Motorola

109K2
2nd TYPE -
OTHERWISE SCHEMATI
THE SAME AS 1st T

MODEL 109K1,Types 1,2
MODEL 109K2,Types 1,2
Alignment,Voltage,Sensitivity,Trimmers

MODEL 109K1,Type 2
Schematic

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE—MODELS 109K1 AND 109K2

1. Connect signal generator to control grid of Modulator tube (6A8G) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.

2. Set signal generator at 455 K.C. and carefully adjust the I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

3. Leave band Switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.

4. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.

6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

7. Turn band switch to "Police" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.

8. Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.

9. Set signal generator at 6.0 MC and turn condenser gang to signal at 6.0 MC. Adjust POLICE ANT. and POLICE RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

10. Turn band switch to "Short Wave" position, still using 400 ohm carbon resistor in antenna lead to signal generator.

11. Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.

12. Set signal generator at 18 MC and turn condenser gang to the signal at 18 MC. Adjust SW ANT. and SW RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

13. Padders on "Police" and "Short Wave" bands are fixed. (No adjustment necessary).

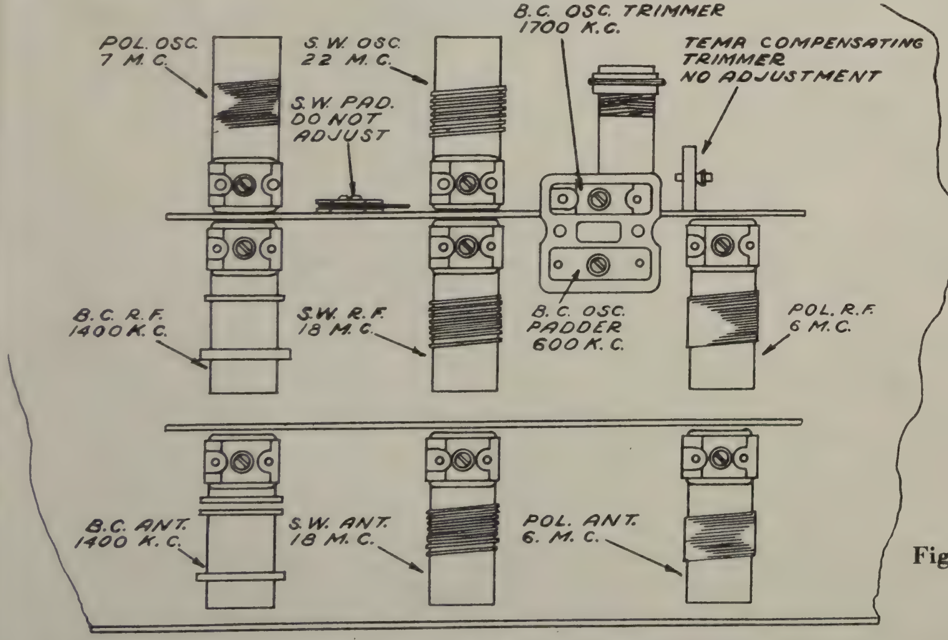


Fig. 3

109K1 AND 109K2 TRIMMERS

SOCKET VOLTAGES—MODELS 109K1 AND 109K2

Numerals refer to socket terminals as indicated on circuit diagram.

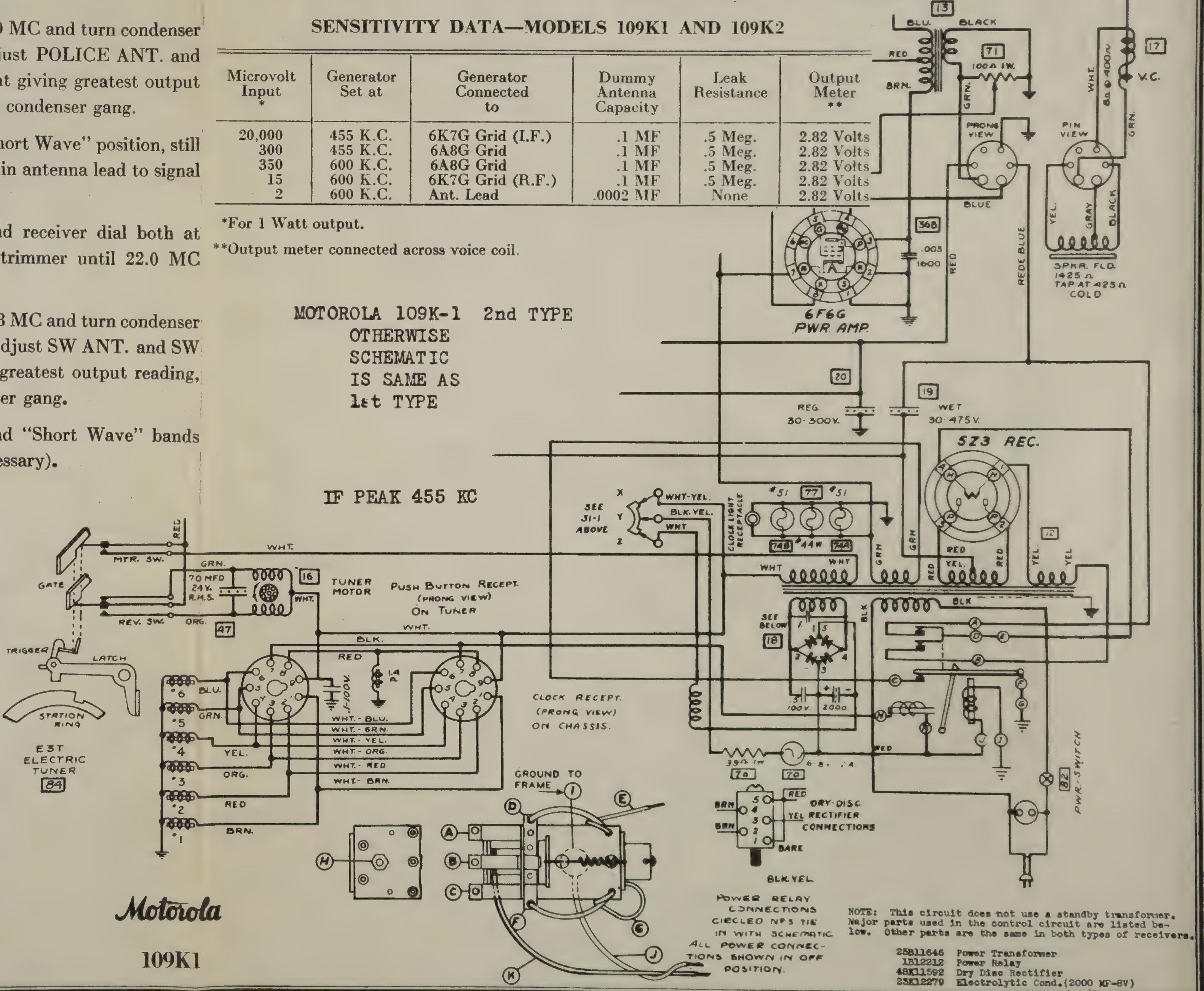
TUBE	POSITION	1	2	·3	4	5	6	7	8
6K7G	R.F.	0	6. AC	210	95	0	0	0	0
6J5G	Osc.	0	6. AC	130	0	–25	0	0	0
6A8G	Mod.	0	6. AC	210	95	–25	95	0	0
6K7G	I.F.	0	6. AC	210	95	0	0	0	0
6H6G	Det.-Avc.	0	6. AC	–2	0	0	0	0	0
6Q7G	A.F. Mute	0	6. AC	115	0	0	0	0	0
6V7G	Ph. Inv.	0	0. AC	115	0	0	0	6. AC	10
6E6G	Output	0	6. AC	240	250	0	0	0	10
6F6G	Output	0	6. AC	240	250	0	0	0	10
5Z3	Rect.	310	AC	AC	310	....	....	....	....

SENSITIVITY DATA—MODELS 109K1 AND 109K2

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
20,000	455 K.C.	6K7G Grid (I.F.)	.1 MF	.5 Meg.	2.82 Volts
300	455 K.C.	6A8G Grid	.1 MF	.5 Meg.	2.82 Volts
350	600 K.C.	6A8G Grid	.1 MF	.5 Meg.	2.82 Volts
15	600 K.C.	6K7G Grid (R.F.)	.1 MF	.5 Meg.	2.82 Volts
2	600 K.C.	Ant. Lead	.0002 MF	None	2.82 Volts

*For 1 Watt output.

**Output meter connected across voice coil.



MOTOROLA 109K-1 2nd TYPE
OTHERWISE
SCHEMATIC
IS SAME AS
1st TYPE

IF PEAK 455 KC

POWER RELAY CONNECTIONS CIRCLED NOS TIE IN WITH SCHEMATIC ALL POWER CONNECTIONS SHOWN IN OFF POSITION.

NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

25B11646	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond.(2000 MF-8V)

MODEL 109K2,Type 1
Schematic

GALVIN MFG. CORP.

FOR MOTOR AND REVERSING SWITCH ADJUSTMENTS AND DATA FOR CLOCK, REMOTE CONTROL, AND AUTOMATIC ELECTRIC TUNER, SEE MOTOROLA PAGES 9-33 AND 9-34 (MODELS 89K1,89K2) VOL.1X

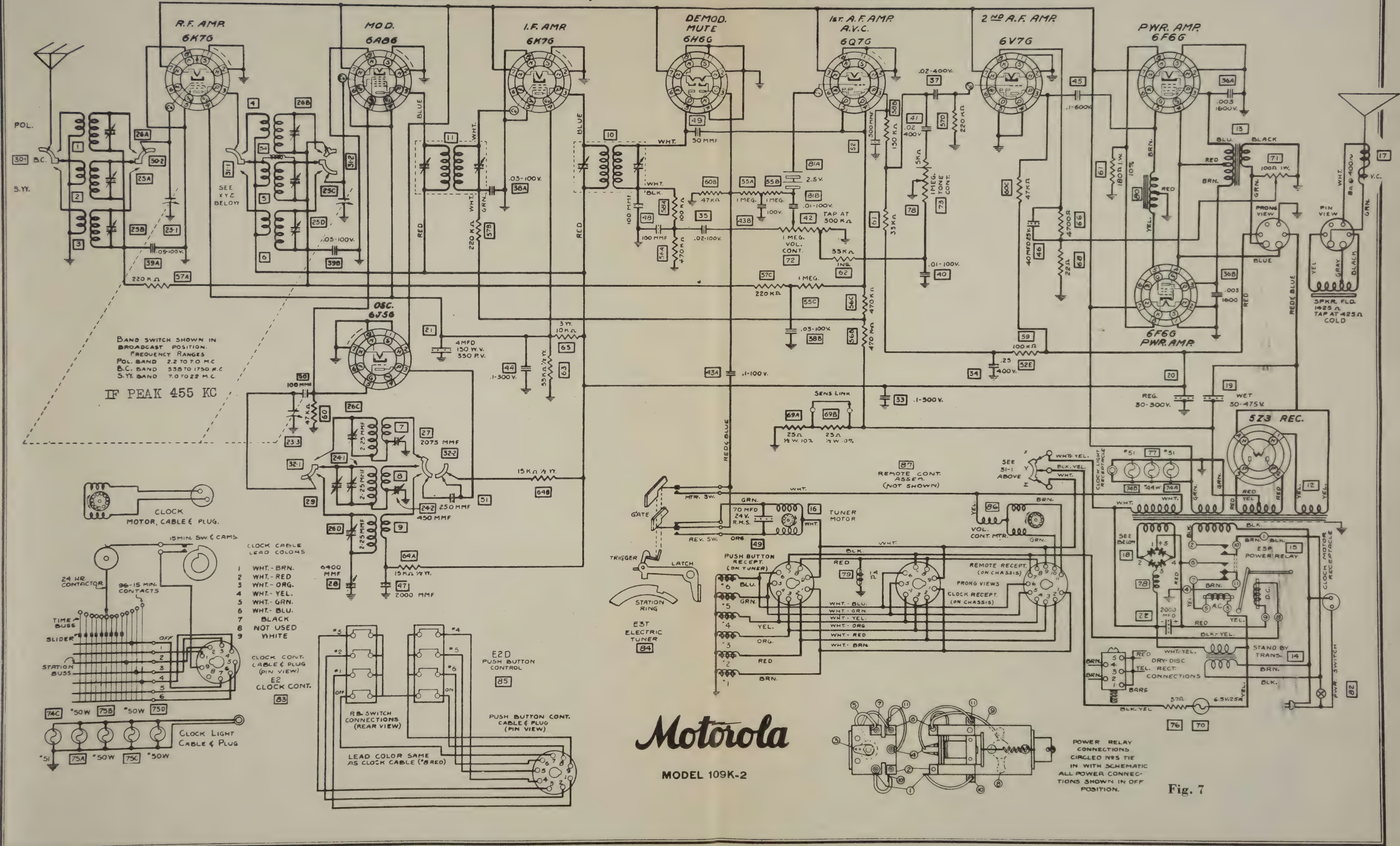


Fig. 7

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ROCEDURE—MODEL 89K3

to control grid of Mod. tube (6A7) through
o chassis. Do not remove grid cap. Also connect
er voice coil. Turn band switch to "Broadcast"
gang completely out of mesh.
5 K.C. and carefully adjust the four I.F. trim-
F. coil cans) to point showing highest reading

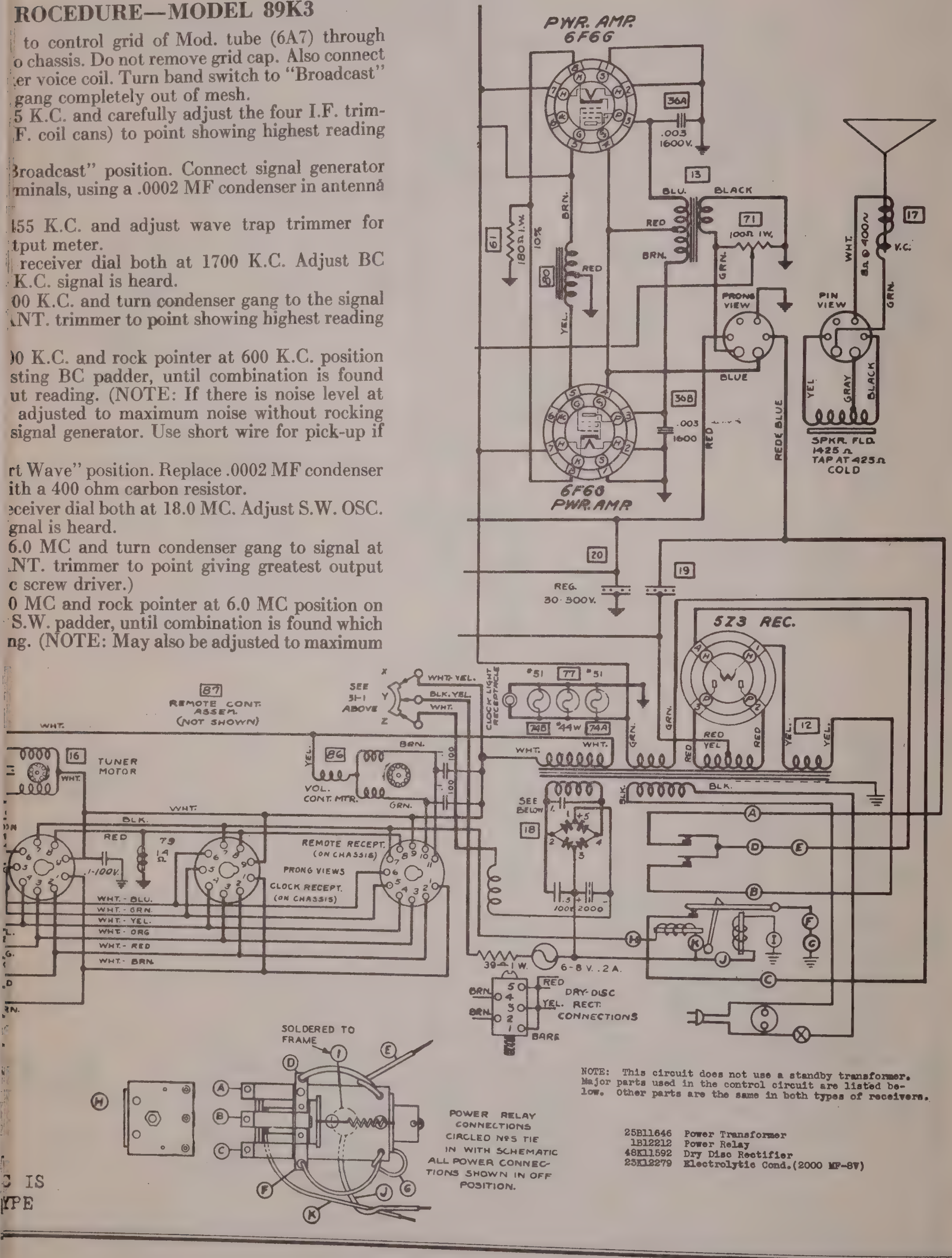
Broadcast" position. Connect signal generator
minals, using a .0002 MF condenser in antenna

455 K.C. and adjust wave trap trimmer for
tput meter.
receiver dial both at 1700 K.C. Adjust BC
K.C. signal is heard.
00 K.C. and turn condenser gang to the signal
NT. trimmer to point showing highest reading

0 K.C. and rock pointer at 600 K.C. position
sting BC padder, until combination is found
ut reading. (NOTE: If there is noise level at
adjusted to maximum noise without rocking
signal generator. Use short wire for pick-up if

rt Wave" position. Replace .0002 MF condenser
ith a 400 ohm carbon resistor.
eceiver dial both at 18.0 MC. Adjust S.W. OSC.
gnal is heard.
6.0 MC and turn condenser gang to signal at
NT. trimmer to point giving greatest output
c screw driver.)
0 MC and rock pointer at 6.0 MC position on
S.W. padder, until combination is found which
ng. (NOTE: May also be adjusted to maximum

C IS
YPE



NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

25B11646	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond.(2000 MF-8V)

MODEL 4954
Alignment,Trimmers
MODEL 4954,Issue B
Hum Change

GAMBLE-SKOGMO INC.

SPECIFICATIONS

Power Consumption - 100 Watts (At 117 volts 60 cycles)
Power Output - - - - - - - 9 Watts Undistorted; 10 Watts Maximum
Selectivity (Sharp) - 26 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - 456 KC
Speaker - - - - - - - 12" Electro-Dynamic

Tuning Frequency Range
B Range............................ 528 to 1730 KC
C Range............................2200 to 7000 KC
D Range............................7000 to 22000 KC

Sensitivity (For 0.5 Watt output)
B Range........................ 1.0 Microvolt Average
C Range........................ 1.0 Microvolt Average
D Range........................ 3.0 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Selectivity Control—Sharp Position All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

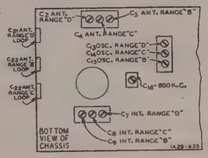
The following equipment is required for aligning:

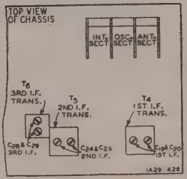
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

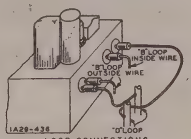
Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1st I.F. (C19) & (C20) 2nd I.F. (C24) & (C25) 3rd I.F. (C28) & (C29)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C16) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C







LOOP CONNECTIONS

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

NOTE B—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on page one.

NOTE E—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

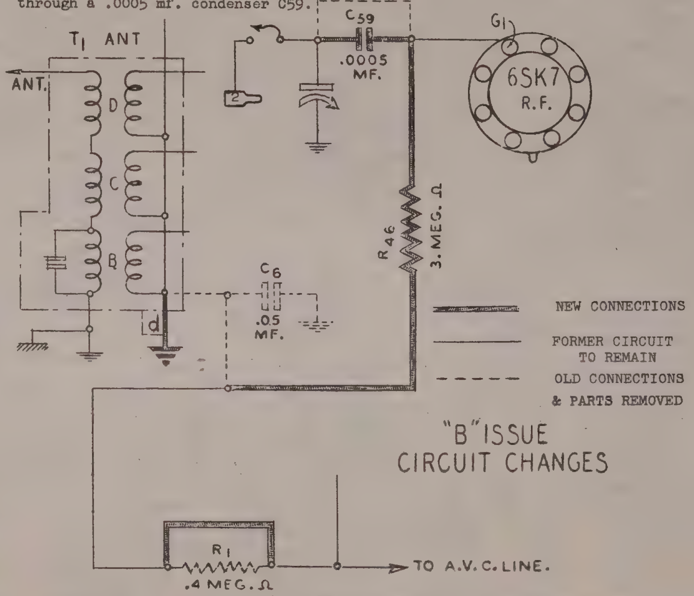
Subject CHANGES MADE FOR "B" ISSUE SETS
TO REDUCE HUM MODULATION.
Date Sept. 8, 1939

Resistor R1, 400,000 Ohms, in series with the AVC connection to the antenna coil, has been removed from the circuit.

The AVC line is no longer connected to the antenna coil at terminal "D." Instead, this terminal is connected to ground. The bypass condenser C6, .05 mf., formerly connected between the same terminal and ground, has been removed from the circuit.

The AVC line which formerly connected to the "D" terminal of the antenna coil and C6, is now connected through a 3 megohm resistor R46 to G1 of the 6SK7 R.F. tube.

G1 of the 6SK7 R.F. tube, which was formerly connected directly to the stator of the gang condenser, is now connected to this point through a .0005 mf. condenser C59.



Television Sound or Phonograph Connections

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter." Phonograph records may also be played through the radio.

On the back panel of the chassis base is a switch knob and a socket for a single shielded pin tip at which connections are made. The connector on the cable from a television receiver or from a phono pickup can be inserted in the socket. (The cable connector must be a single shielded pin tip type, Part No. M93.)

When phonograph or television sound reproduction is desired, the knob should be turned to the "Phono-Television Sound" position. For radio reception, the knob should be in the "Radio" position.

MODEL 89K3
Alignment,Trimmers,Voltage
Sensitivity,Switch Data
MODEL 109K2,Type 2
Schematic
Switch
Data

GALVIN MFG. CORP.

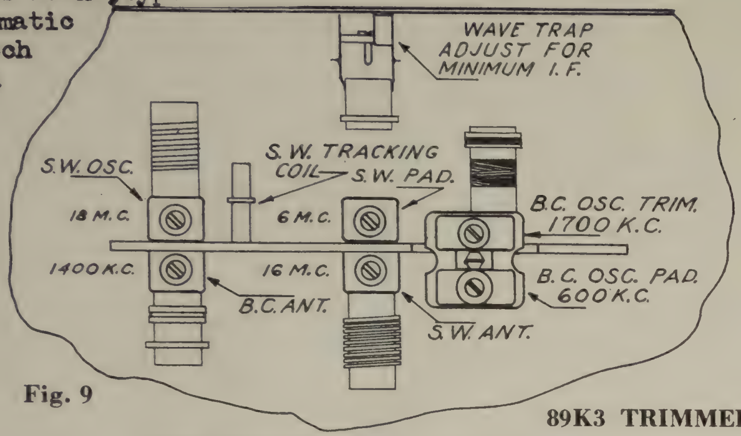


Fig. 9

89K3 TRIMMERS

SENSITIVITY DATA—MODEL 89K3

Microvolt Input *	Generator Set at	Generator Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter **
2800	455 K.C.	6D6 Grid	.1 MF	.5 Meg.	.65 Volts
20	455 K.C.	6A7 Grid	.1 MF	.5 Meg.	.65 Volts
25	600 K.C.	6A7 Grid	.1 MF	.5 Meg.	.65 Volts
5	600 K.C.	Ant. Lead	.0002 MF	None	.65 Volts

*For .05 Watts output. **Output meter connected across voice coil.

SOCKET VOLTAGES—MODEL 89K3

Numerals refer to socket terminals as indicated on circuit diagram.

TUBE	POSITION	1	2	3	4	5	6	7
6A7	Modulator	6. V.	220	80	80	0	0	0
6D6	I.F. Amp.	6. V.	220	80	0	0	0	....
75	Diode Det. Avc-AF	6. V.	125	0	–.5	0	0	....
75	Phase Inv.	6. V.	125	0	0	0	0	....
76	Oscillator	6. V.	155	0	0	0	....	....
42	Pwr. Audio Amp.	6. V.	250	220	0	13.	0	....
42	Pwr. Audio Amp.	0. V.	250	220	0	13.	6	....
80	Rectifier	340	AC	AC	DC	....	....	....

MODELS 89K3 AND 109K2

MOTOR AND REVERSING SWITCH ADJUSTMENTS

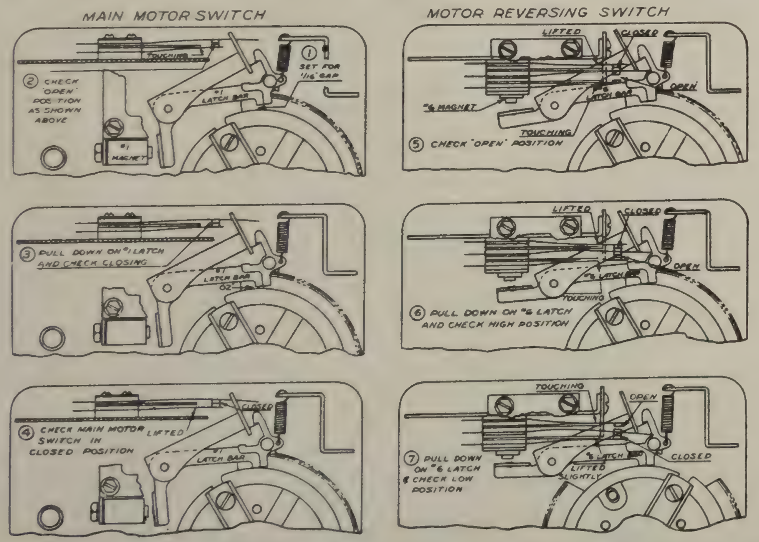
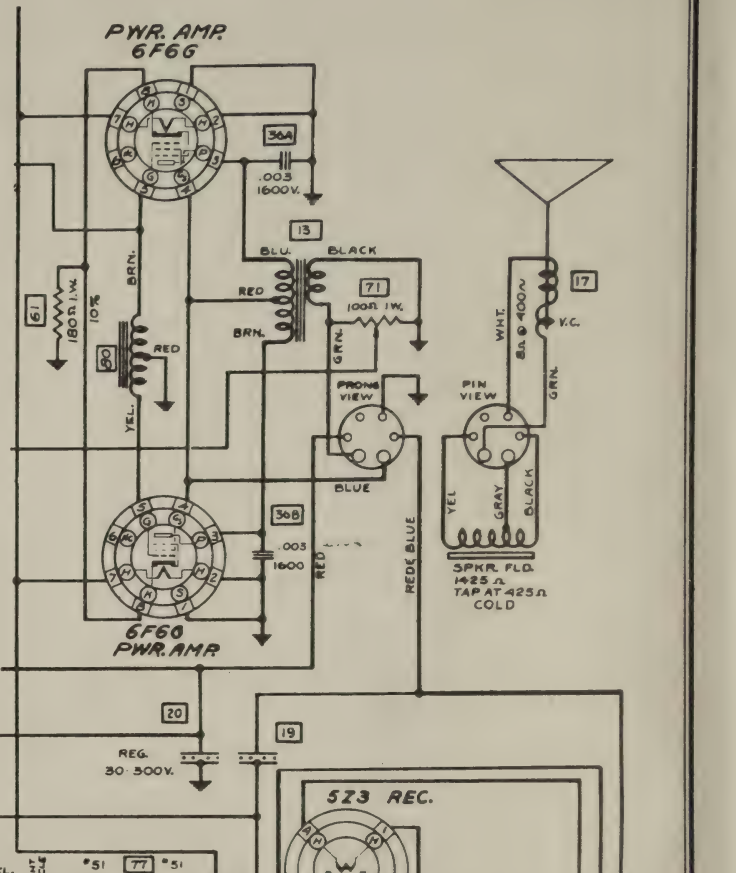


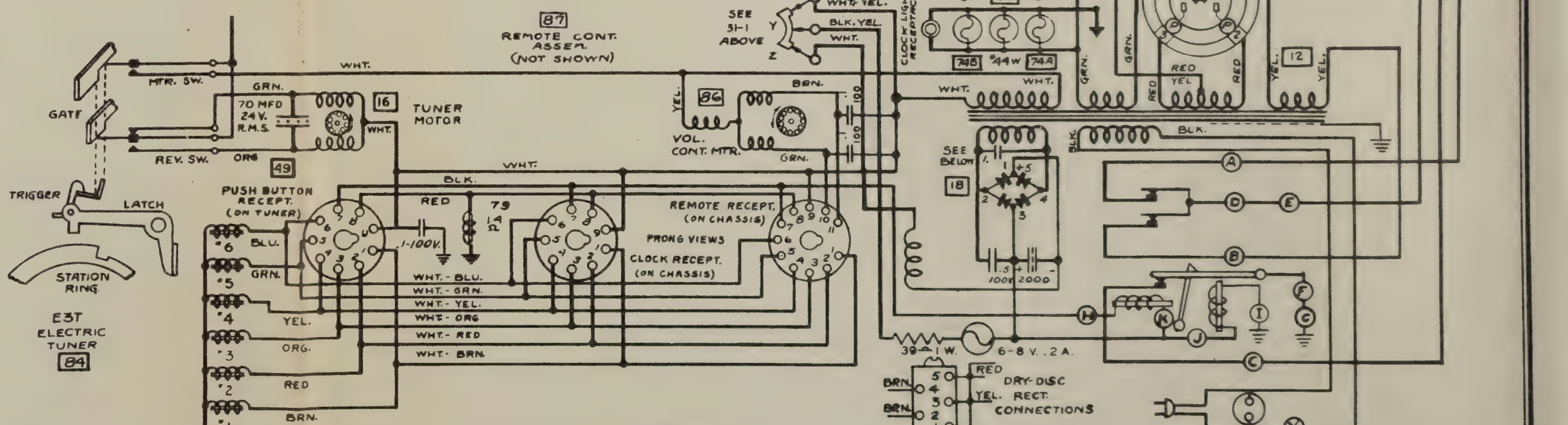
Fig. 1

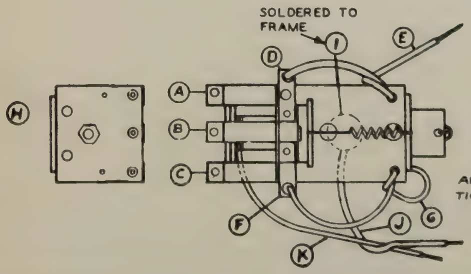
FOR CLOCK, REMOTE CONTROL, AUTOMATIC ELECTRIC TUNER, MOTOR AND REVERSING SWITCH ADJUSTMENTS AND NOTES SEE MOTOROLA PAGES 9-33 AND 9-34 IN VOLUME 1X

ALIGNMENT PROCEDURE—MODEL 89K3

1. Connect signal generator to control grid of Mod. tube (6A7) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.
2. Set signal generator at 455 K.C. and carefully adjust the four I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.
3. Leave band switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.
4. Set signal generator at 455 K.C. and adjust wave trap trimmer for minimum deflection of output meter.
5. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.
6. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. trimmer to point showing highest reading on output meter.
7. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. Use short wire for pick-up if necessary.
8. Turn band switch to "Short Wave" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.
9. Set signal generator and receiver dial both at 18.0 MC. Adjust S.W. OSC. trimmer until 18.0 MC signal is heard.
10. Set signal generator at 16.0 MC and turn condenser gang to signal at 16.0 MC. Adjust S.W. ANT. trimmer to point giving greatest output reading. (Use non-metallic screw driver.)
11. Set signal generator at 6.0 MC and rock pointer at 6.0 MC position on dial scale, while adjusting S.W. padder, until combination is found which gives highest output reading. (NOTE: May also be adjusted to maximum noise.)







POWER RELAY CONNECTIONS CIRCLED NOS TIE IN WITH SCHEMATIC ALL POWER CONNECTIONS SHOWN IN OFF POSITION.

Motorola

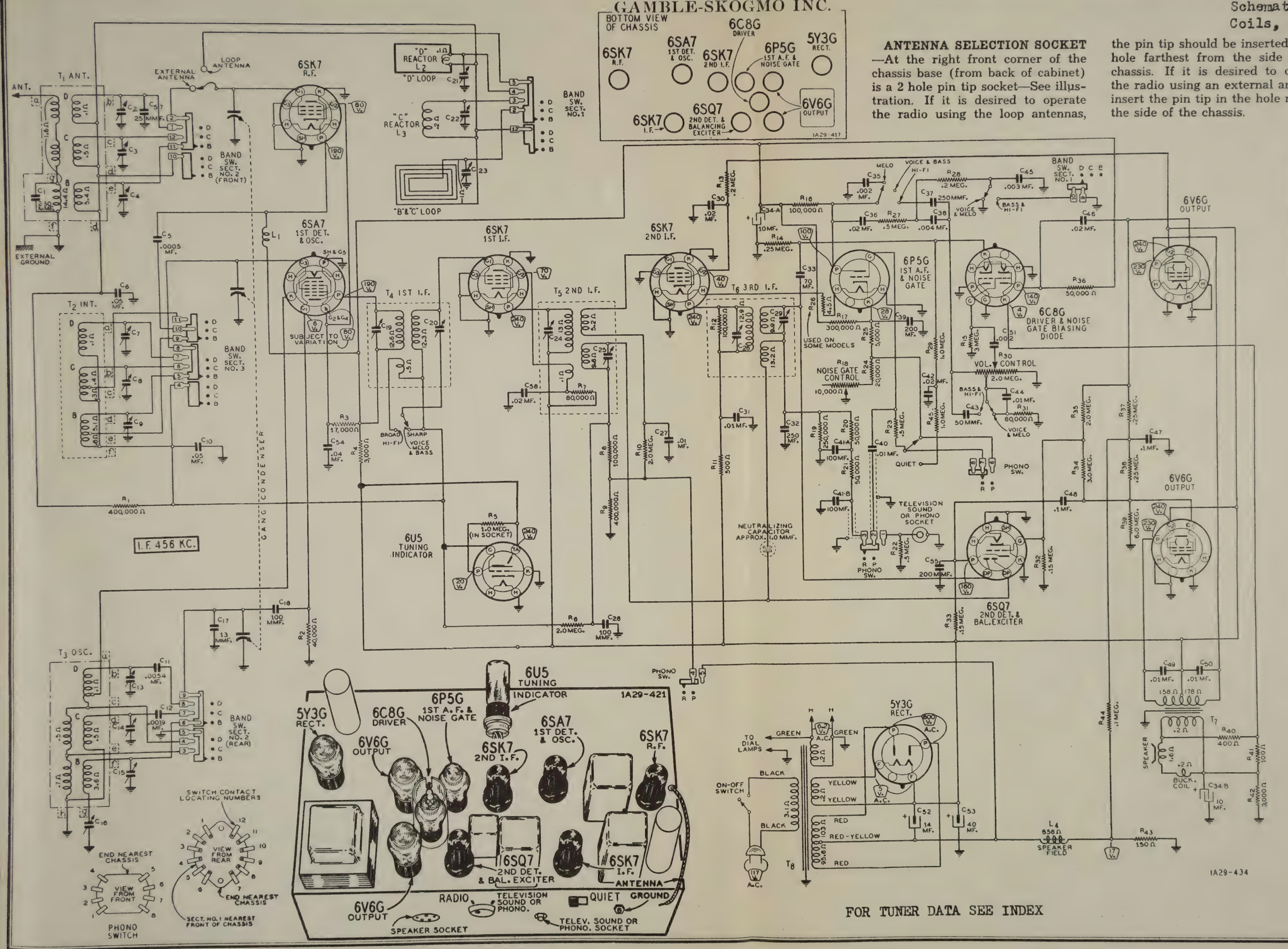
109K2
2nd TYPE -
OTHERWISE SCHEMATIC IS
THE SAME AS 1st TYPE

NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

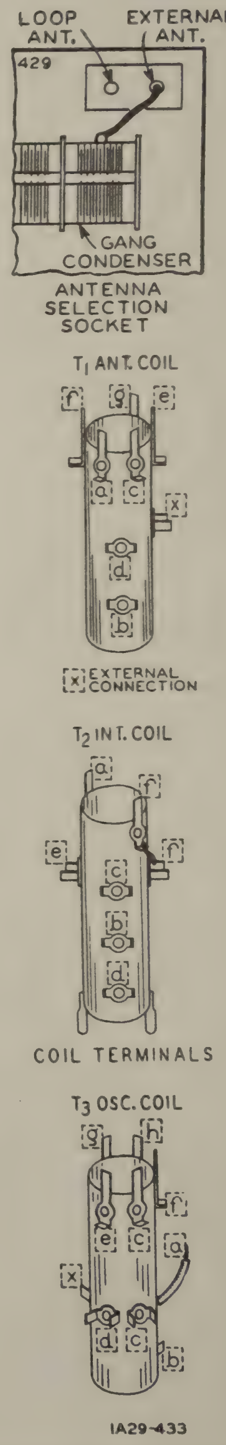
25B11646	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond.(2000 MF-8V)

MODEL 4954
Schematic, Voltage, Socket
Coils, Notes

ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.



FOR TUNER DATA SEE INDEX

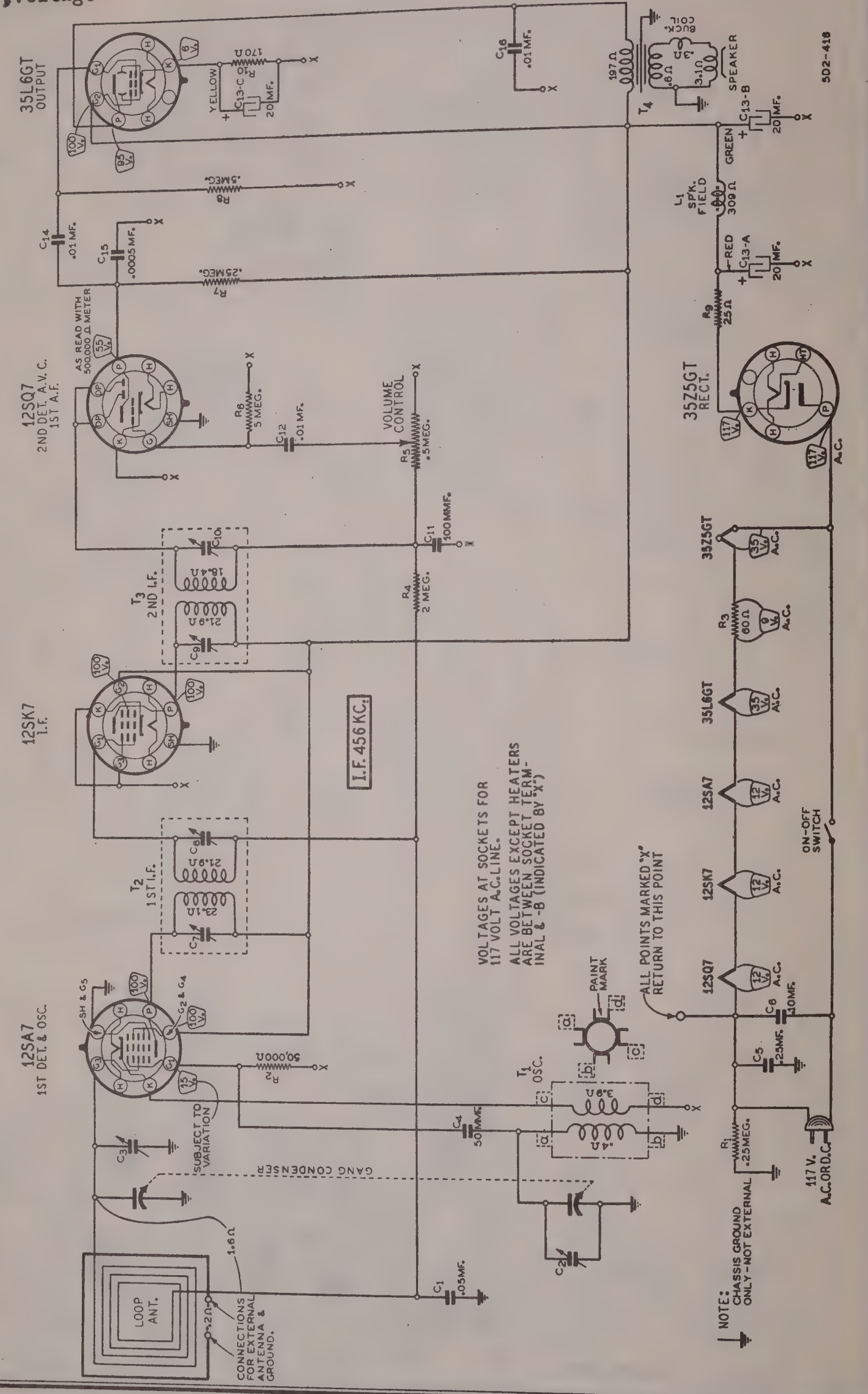


MODELS 4912,4914
Schematic,Voltage

GAMBLE-SKOGMO INC.

5 TUBE AC-DC RADIO WITH SELF CONTAINED LOOP ANTENNA

BROADCAST BAND



CONNECTIONS FOR EXTERNAL ANTENNA & GROUND.

VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.
ALL VOLTAGES EXCEPT HEATERS ARE BETWEEN SOCKET TERMINAL & -B (INDICATED BY "X")

ALL POINTS MARKED "X" RETURN TO THIS POINT

NOTE: CHASSIS GROUND ONLY - NOT EXTERNAL

GENERAL ELECTRIC CO.

MODELS H116,H118,HJ119
Chassis Wiring,Coils

Coil System

The "C" and "D" band antenna coils, L-2 and L-3 are wound on a single coil form as shown in Fig. 4. L-4, L-5 and L-6 compose the oscillator transformer for the "B" "C" and "D" bands. All switch points are numbered in Fig. 4 to facilitate in locating these switch points on the pictorial wiring diagram, Fig. 3.

The following table gives the coils in use for the various positions of the band switch:

Band-switch Position	Antenna Primary	Antenna Secondary	Oscillator Primary	Oscillator Secondary
Band "B"	Lower portion of L1	Upper portion of L1	Lower portion of L4	Upper portion of L4
Band "C"	L2 Primary (L1 Primary shorted)	L2 Secondary (Grid end of L1 to ground)	Lower portion of L5	Upper portion of L5 (High side of L4 to ground through R15. Mid tap of L4 to ground)
Band "D"	L3 Primary (L1 Primary shorted)	L3 Secondary (Grid end of L1 to ground. L2 secondary to ground)	Lower portion of L6	Upper portion of L6 (High side of L4 and L5 to ground through R15. Mid tap of L4 to ground)

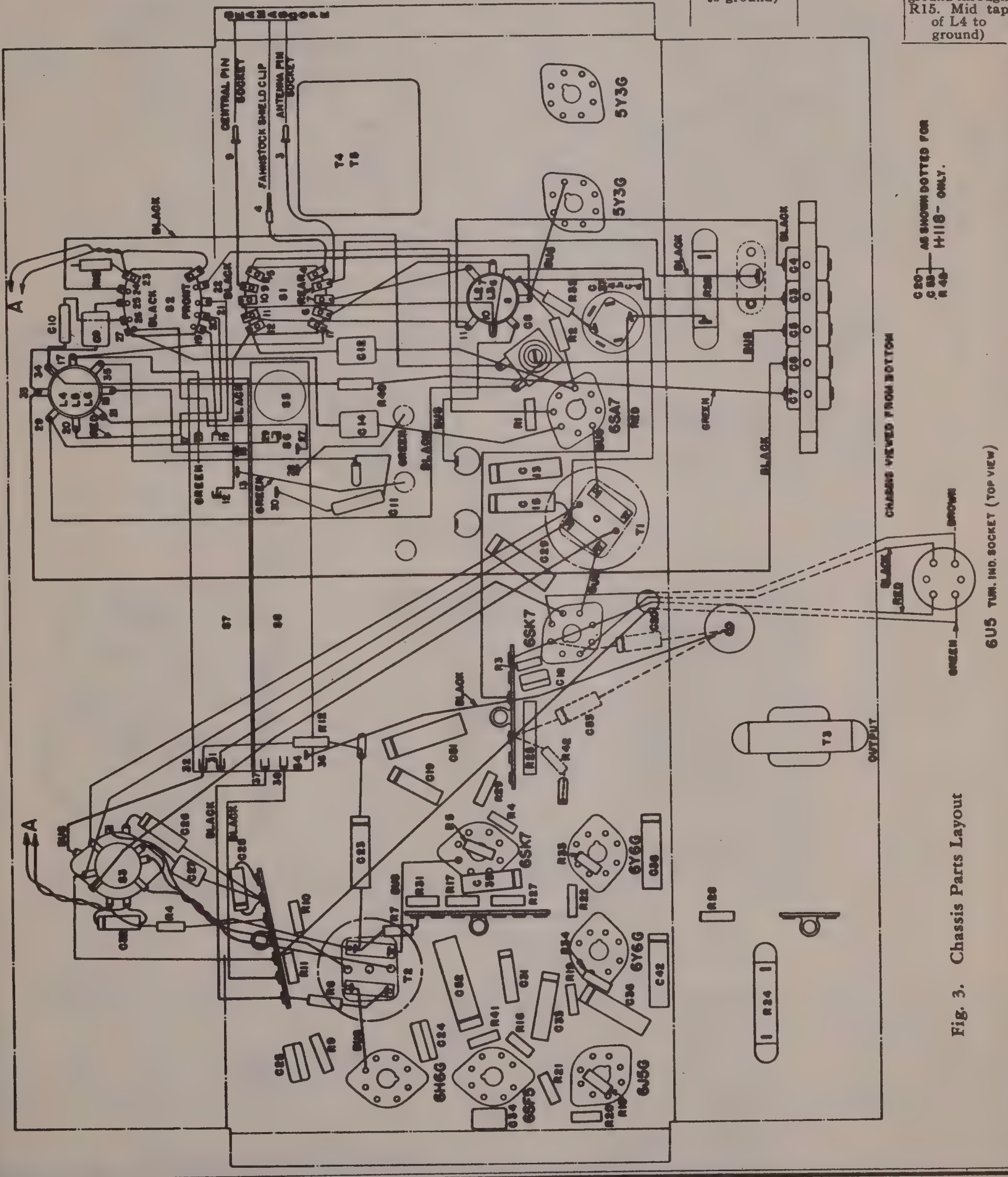


Fig. 3. Chassis Parts Layout

MODEL 4954
Alignment,Trimmers
MODEL 4954,Issue B
Hum Change

GAMBLE-SKOGMO INC.

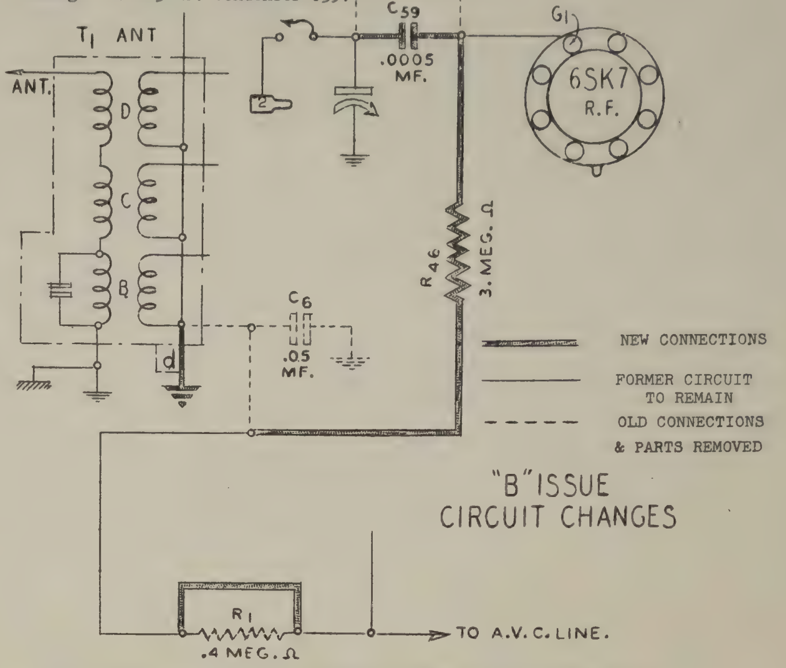
Subject CHANGES MADE FOR "B" ISSUE SETS TO REDUCE HUM MODULATION. **Date** Sept. 8, 1939

Resistor R1, 400,000 Ohms, in series with the AVC connection to the antenna coil, has been removed from the circuit.

The AVC line is no longer connected to the antenna coil at terminal "D." Instead, this terminal is connected to ground. The bypass condenser C6, .05 mf., formerly connected between the same terminal and ground, has been removed from the circuit.

The AVC line which formerly connected to the "D" terminal of the antenna coil and C6, is now connected through a 3 megohm resistor R46 to G1 of the 6SK7 R.F. tube.

G1 of the 6SK7 R.F. tube, which was formerly connected directly to the stator of the gang condensor, is now connected to this point through a .0005 mf. condenser C59.



SPECIFICATIONS

Power Consumption - 100 Watts (At 117 volts 60 cycles)	
Power Output	9 Watts Undistorted 10 Watts Maximum
Selectivity (Sharp)	26 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	12" Electro-Dynamic

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Selectivity Control—Sharp Position All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

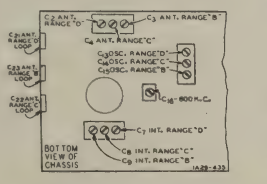
The following equipment is required for aligning:

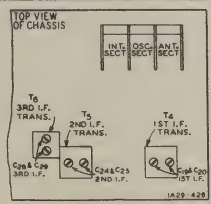
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

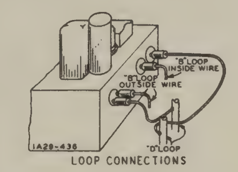
Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1st I.F. (C19) & (C20) 2nd I.F. (C24) & (C25) 3rd I.F. (C28) & (C29)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C16) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C







LOOP CONNECTIONS

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

NOTE B—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on page one.

NOTE E—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

Television Sound or Phonograph Connections

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter." Phonograph records may also be played through the radio.

On the back panel of the chassis base is a switch knob and a socket for a single shielded pin tip at which connections are made. The connector on the cable from a television receiver or from a phono pickup can be inserted in the socket. (The cable connector must be a single shielded pin tip type, Part No. M93.)

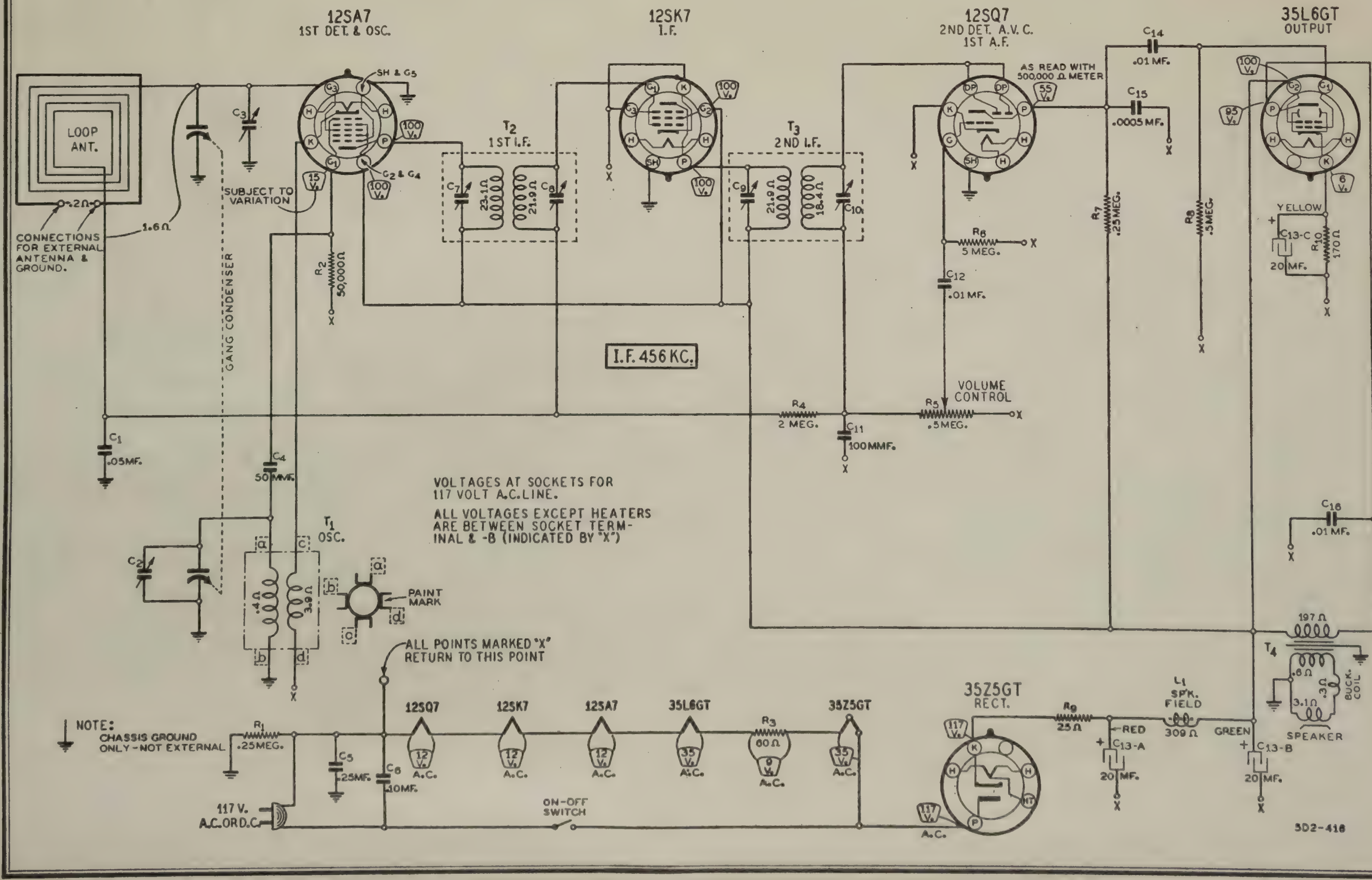
When phonograph or television sound reproduction is desired, the knob should be turned to the "Phono-Television Sound" position. For radio reception, the knob should be in the "Radio" position.

MODELS 4912,4914
Schematic,Voltage

GAMBLE-SKOGMO INC.

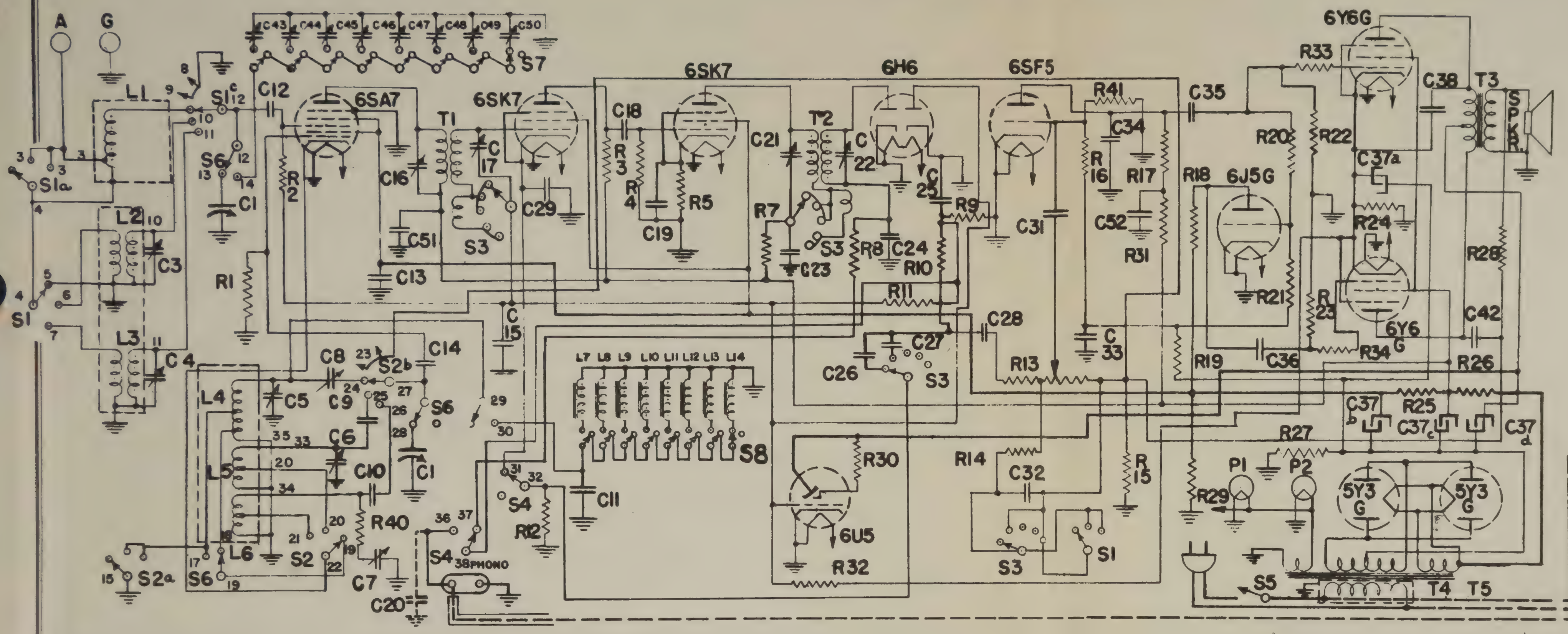
5 TUBE AC-DC RADIO WITH SELF CONTAINED LOOP ANTENNA

BROADCAST BAND



MODELS H116,H118,HJ119 (Final)
Schematic,Socket,Trimmers,Dial Drive

GENERAL ELECTRIC CO.



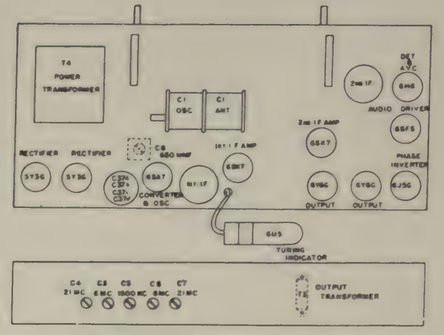
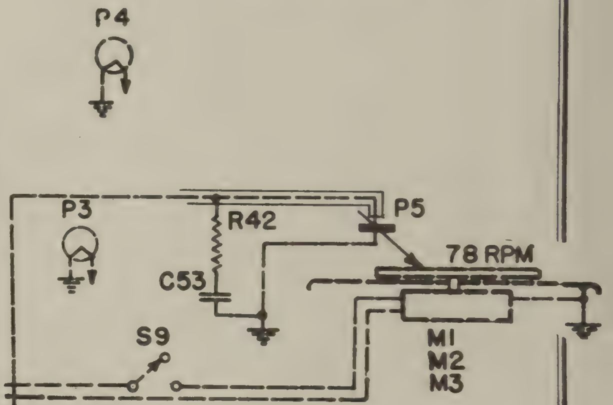


Fig. 1. Trimmer Location



Symbol	Description	Symbol	Description	Symbol	Description	Symbol	Description
C-1	Tuning Capacitor	C-33	0.1 mfd. Paper Capacitor	L-6	"D" Band Oscillator Coil	R-23	220,000 ohms, Carbon Resistor
C-3	"C" Band Antenna Trimmer	C-34	47 mmf. Mica Capacitor	L-7, -8	Tuning Coils (No code)	R-24	100 ohms, 3.4 W. Wire Wound
C-4	"D" Band Antenna Trimmer	C-35	.05 mfd. Paper Capacitor	L-9, -10, -11	Tuning Coils (Code—Red)	R-25	2400 ohms, 2 W. Carbon Resistor
C-5	"B" Band Oscillator Trimmer	C-36	.05 mfd. Paper Capacitor	L-12, -13, -14	Tuning Coils (Code—Blue)	R-26	2200 ohms, 2.6 W. Wire Wound
C-6	"C" Band Oscillator Trimmer	C-37a	20 mfd. 25 V. Dry Electrolytic	R-1	22,000 ohms, Carbon Resistor	R-27	12 ohms, Carbon Resistor
C-7	"D" Band Oscillator Trimmer	C-37b	20 mfd. 300 V. Dry Electrolytic	R-2	1.0 megohm, Carbon Resistor	R-28	68 ohms, Carbon Resistor
C-8	"B" Band Padder	C-37c	20 mfd. 300 V. Dry Electrolytic	R-3	6800 ohms, Carbon Resistor	R-29	47,000 ohms, Carbon Resistor
C-9	1600 mmf. Mica Capacitor ±5%	C-37d	40 mfd. 350 V. Dry Electrolytic	R-4	47,000 ohms, Carbon Resistor	R-30	1.0 megohm, Carbon Resistor
C-10	4300 mmf. Mica Capacitor ±5%	C-38	.02 mfd. Paper Capacitor	R-5	330 ohms, Carbon Resistor	R-31	47,000 ohms, Carbon Resistor
C-11	750 mmf. Silvered Mica Capacitor ±5%	C-42	.01 mfd. Paper Capacitor	R-7	1000 ohms, Carbon Resistor	R-32	5.6 megohms, Carbon Resistor
C-12	150 mmf. Mica Capacitor	C-43	7-65 mmf. Antenna Trimmer	R-8	47,000 ohms, Carbon Resistor	R-33	1000 ohms, Carbon Resistor
C-13	0.1 mfd. Paper Capacitor	C-44	7-65 mmf. Antenna Trimmer	R-9	220,000 ohms, Carbon Resistor	R-34	1000 ohms, Carbon Resistor
C-14	47 mmf. Mica Capacitor	C-45	20-180 mmf. Antenna Trimmer	R-10	47,000 ohms, Carbon Resistor	R-40	33 ohms, Carbon Resistor
C-15	0.1 mfd. Paper Capacitor	C-46	20-180 mmf. Antenna Trimmer	R-11	2.2 megohms, Carbon Resistor	R-41	4.7 megohms, Carbon Resistor
C-18	47 mmf. Mica Capacitor	C-47	20-180 mmf. Antenna Trimmer	R-12	470 ohms, Carbon Resistor	R-42	18,000 ohms, Carbon Resistor
C-19	.05 mfd. Paper Capacitor	C-48	100-490 mmf. Antenna Trimmer	R-13	2 megohm Volume Control	P-1, -2, -3, -4	Pilot Lights, Mazda No. 44
C-20	.002 mfd. Paper Capacitor	C-49	100-490 mmf. Antenna Trimmer	R-14	150,000 ohms, Carbon Resistor	S-1	Antenna Band Switch
C-23	.05 mfd. Paper Capacitor	C-50	100-490 mmf. Antenna Trimmer	R-15	15 ohms, Carbon Resistor	S-2	Oscillator Band Switch
C-24	100 mmf. Mica Capacitor	C-51	0.1 mfd. Paper Capacitor	R-16	4.7 megohms, Carbon Resistor	S-3	Tone Switch
C-25	47 mmf. Mica Capacitor	C-52	.25 mfd. Paper Capacitor	R-17	150,000 ohms, Carbon Resistor	S-4	Phono Switch
C-26	.001 mfd. Paper Capacitor	C-53	.01 mfd. Paper Capacitor	R-18	47,000 ohms, Carbon Resistor	S-5	Power Switch
C-27	470 mmf. Mica Capacitor	L-1	Beam-a-Scope	R-19	1.0 megohms, Carbon Resistor	S-6	Manual Switch
C-28	.01 mfd. Paper Capacitor	L-2	"C" Band Antenna Coil	R-20	3.3 megohms, Carbon Resistor	S-7	Antenna Section Touch Tuning Switch
C-29	.05 mfd. Paper Capacitor	L-3	"D" Band Antenna Coil	R-21	270,000 ohms, Carbon Resistor	S-8	Oscillator Section Touch Tuning Switch
C-31	.01 mfd. Paper Capacitor	L-4	"B" Band Oscillator Coil	R-22	220,000 ohms, Carbon Resistor	S-9	Phono Motor Power Switch
C-32	.003 mfd. Paper Capacitor	L-5	"C" Band Oscillator Coil				

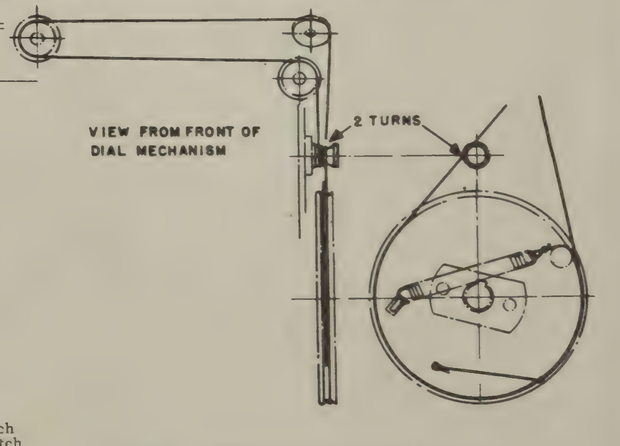


Fig 6. Dial Drive Stringing Diagram

Electrical Specifications

Model H-116
Rating "A"—110–125 volts, 50–60 cycles, 130 watts
Rating "C"—110–125 volts, 25–60 cycles, 130 watts

Model H-118
Rating "A6"—110–125 volts, 60 cycles, 150 watts
Rating "A5"—110–125 volts, 50 cycles, 150 watts
Rating "C2"—110–125 volts, 25 cycles, 150 watts

Tuning Frequency Range
Band "B"....................540–1600 KC
Band "C"....................2300–7000 KC
Band "D"....................7000–22,000 KC

Intermediate Frequency..........455 KC

Electric Power Output
Undistorted....................8.5 watts
Maximum....................10 watts

Tone Control....................5-position

Loud-speaker—"Alnico" Magnetic Dynamic
Outside Cone Diameter.........12 inches
Voice Coil Impedance..........3.5 ohms

Tubes

Converter and Oscillator	GE-6SA7
1st I.F. Amplifier	GE-6SK7
2nd I.F. Amplifier	GE-6SK7
Detector and A.V.C.	GE-6H6
Audio Driver	GE-6SF5
Audio Inverter	GE-6J5G
Audio Power Amplifier	(2)GE-6Y6G
Tuning Indicator	GE-6U5
Rectifier	(2)GE-5Y3G
Dial Lamp	(4)Mazda No. 44

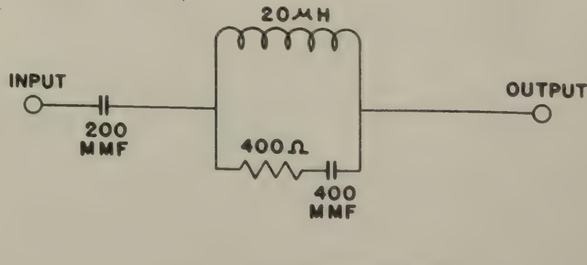


Fig. 7. I.R.E. Dummy Antenna

Super Beam-a-scope

The *Super* Beam-a-scope is essentially a tuned coil antenna wound on a frame and shielded by a Faraday screen against electrostatic disturbances. This construction favors the desired signal over a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and electromagnetic fields—the *Super* Beam-a-scope may be revolved so that a null point is found where no voltage is produced from these two components. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place, the *Super* Beam-a-scope eliminates the external return path to ground present in the case of an unshielded antenna. This reduces or eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place the *Super* Beam-a-scope discriminates against the electrostatic component of an incoming wave in comparison with the electromagnetic component, because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the electromagnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the *Super* Beam-a-scope is also the first tuned grid circuit. On the "C" and "D" bands, the *Super* Beam-a-scope is grounded at the grid end thus preventing absorption spots due to loop resonance.

ALIGNMENT PROCEDURE

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
I.F. ALIGNMENT WITH OSCILLOSCOPE*					
1 Band B	455 KC and 30 KC Sweep	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—vertical input to ground and junction at R-8, R-9, and R-10. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "Bass" position is shown in Fig. 2a.
2 Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3 Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
4 Band B	455 KC and 30 KC Sweep	Treble I	Converter 6SA7 Grid		The expanded curve taken with tone control at "Treble I" is shown in Fig. 2b. Excess sensitivity over "Bass" tone position indicates regeneration.
I.F. ALIGNMENT WITH OUTPUT METER*					
1 Band B	455 KC Modulated	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. Note.—Do not attempt alignment in the expanded position.
2 Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3 Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
R.F. ALIGNMENT					
1 Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil.
2 Band C	6 MC Modulated	Bass	Antenna Post**	Osc. (C-6) Ant. (C-3)	Set pointer to 6 MC mark and align (C-6). Peak (C-3) for maximum output.
3 Band D	21 MC Modulated	Bass	Antenna Post**	Osc. (C-7) Ant. (C-4)	Set pointer to 21 MC mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the "D" band should be 910 KC below input signal. Example: 15 MC image 14.09 MC.
4 Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Set dial pointer to 580 KC mark and tune in signal with (C-8).
5 Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Adjust (C-5) for maximum output in vicinity of 1500 KC while rocking gang condenser.
6 Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Retrim (C-8).
7 Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Repeak (C-5).

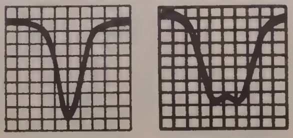
* Use "dummy" antenna consisting of .05-mfd. capacitor between signal generator and point of input.

** Use a "dummy" antenna consisting of 70-mmf. capacitor between signal generator and point of input with "Beam-a-Scope" disconnected.

*** Use an I.R.E. "dummy" antenna as shown in Fig. 7 between signal generator and the point of input.

Alignment Procedure

The alignment procedure is given in table form Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of output. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.



(a) Sharp Position (b) Expanded Position

Fig. 2. I.F. Curves Taken on G-E Oscilloscope OFM-1

SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains ‡

(a) Antenna Post to Converter Grid

Band "B" (Beam-a-Scope connected)*—3 at 1000 KC
Band "C" (Beam-a-Scope disconnected)**—3 at 4 MC
Band "D" (Beam-a-Scope disconnected)**—3 at 18 MC

(b) Converter Grid to 1st 6SK7 Grid . 30 at 455 KC
(c) 1st 6SK7 Grid to 2nd 6SK7 Grid . . 6 at 455 KC
(d) 2nd 6SK7 Grid to 6H6 Det. Plate. . 70 at 455 KC

(2) A 400 cycle signal of .05 volts across volume control will give ½ W. speaker output.‡ (Volume Control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.

Band "B" . . . . 6.5 volts
Band "C" . . . . 7 volts
Band "D" . . . . 2.8 volts

---

‡ Variations of +10%, −20% permissible.

* Use I.R.E. dummy antenna.

** Use 70 mmf. capacitor between signal generator and antenna post.

AUTOMATIC PHONOGRAPHS

Model H-79

The Model H-118 automatic phonograph mechanism plays up to twelve 10-inch records or ten 12-inch records. The record-changing mechanism is equipped with a cycle switch which during a record-changing cycle prevents power interruption, by pressing the turntable switch to "Off," until the tone arm is in the starting position.

OPERATION

Phono Key

To change from radio to phonograph reproduction press the "Phono-Tele" key. This operation likewise turns the power on if the radio has not been operating previously.

Phono Switch

This switch is located on the forward left-hand corner of the motorboard and starts or stops turntable operation.

Push-button Controls

On the forward right-hand corner of the motorboard are located four push-buttons which control the operation of the automatic record changer.

The forward button, marked "R" is the reject control. To reject a record being played or to start the record-changing cycle after the records have been placed on the holders, simply press this button down and then release.

The second button from the front, marked "M" is the manual button. When records are to be played manually, this button should be pressed down until it locks in the depressed position. The record mechanism now operates as any manual record player.

The third button, marked "12," when pressed, sets the mechanism to play automatically a series of 12-inch records.

The fourth button, marked "10," when pressed sets the mechanism to play automatically a series of 10-inch records.

Record Holder and Release Lever

Located in rear left-hand corner and in the forward right-hand corner are the record-holder posts supporting the record holders and release levers. The record holder is underneath the release lever on either post.

To load the holder with 10-inch records, clasp one of the record holders with the left hand and with the right hand lift the release-lever knob turning the release lever until the figure "10" is opposite the index. Do the same with the other record holder and release lever. Now rotate the entire record holder and release lever assembly until the holder is pointed in toward the center of the turntable. It may be necessary to raise the assembly slightly to start rotation. A certain position will be found when the holder is pointed toward the center where the assembly will settle into a recess. This is the correct position of the holder for loading.

To load the holder with 12-inch records, follow the above procedure except the release levers must be rotated with respect to the holders until the "12" markings are opposite their respective indices.

To remove records from the turntable, lift the holder assemblies and rotate the record holders until they clear the turntable area.

SERVICING

Oiling

The record-changer mechanism should be lubricated once a year with about a dozen drops of a good light machine oil at each of the following six points. All points can be reached from above, through holes in the mounting plate, as follows:

No. 1 No. 2 No. 3	Three oil holes on motor gear housing. Reach all three through two holes marked "A" on drawing.
No. 4	Through hole marked "B," drop the oil upon flat surface of cam. It will distribute itself to proper points.
No. 5	Through holes marked "C," see felt wick, and drop the oil directly upon it.
No. 6	Through hole marked "D," see felt wick, and drop the oil directly upon it.

If squeaks are heard compare the squeak with and without a load of records, stacked records themselves sometimes squeak against a center pin. See that all five wicks are in position, including three ¼-in. wicks in frame of Motor. See that each wick is thoroughly saturated (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks, with tweezers; see if old oil has become gummy (commonly due to use of low-grade oil). If necessary, **clean gummed-up wicks with kerosene.** See that each is saturated with good oil; then, before replacing them, **drop a little good oil into the holes.**

(CONT.)

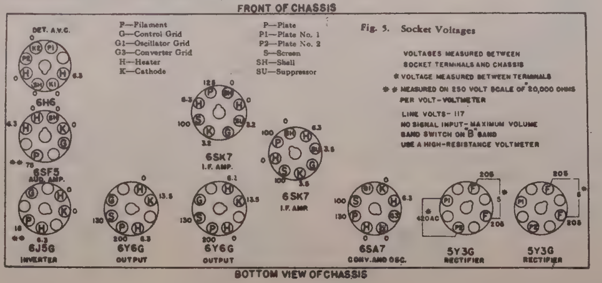


Fig. 5. Socket Voltages

MODEL HM171
MODEL HM185
Voltage,Chassis,Notes

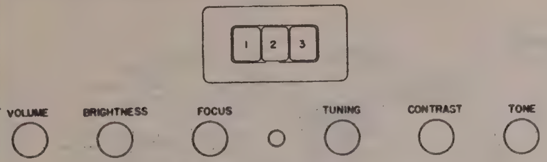


Fig. 2. Front Panel Control Location
Model HM-185

(Note—Model HM-171 Control Location is same as above with Volume and Tone Controls removed.)

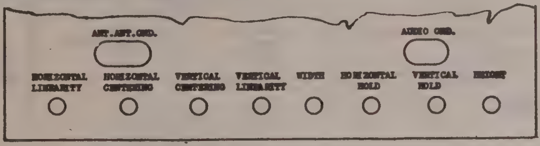


Fig. 3. Rear Cover Control Location
Models HM-171 and HM-185

RECEIVER CIRCUIT DESCRIPTION

R.F. Unit

Starting at the antenna terminal posts, there follows a single-stage high-pass filter in the antenna primary to reduce video I.F. interference, a shunt capacity coupled secondary (C-78), and a video I.F. wave trap (C-95, L-20). The wave trap is broadly tuned at 11.75 MC. Any one of the three tuned circuits for each of the three television transmission bands can be connected into the secondary circuit by pressin appropriate button. The secondary circuit when properl tuned gives a broad, flat response curve.

Converter-Oscillator and Amplifier

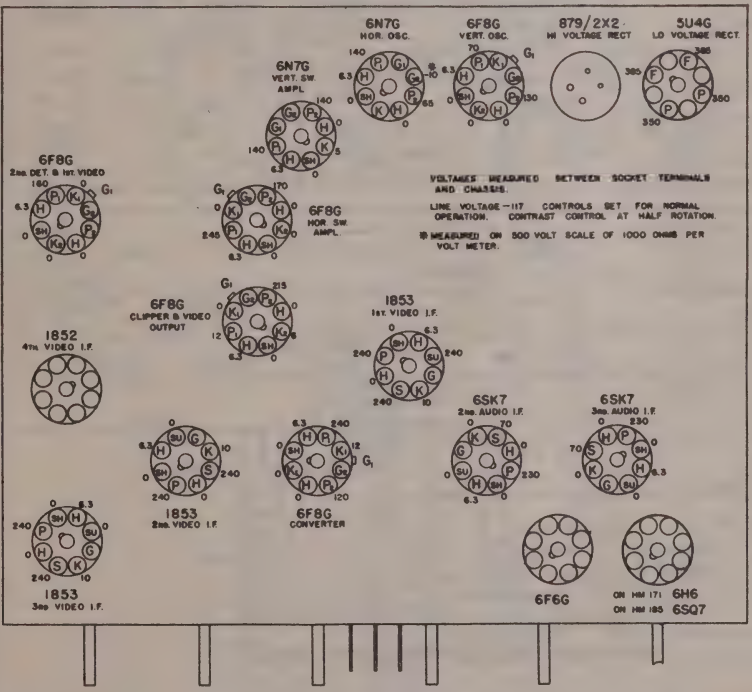
The 6F8G converter employs one half as the oscillat and the other half as the biased first detector. The oscillat is plate-tuned with vernier tuning permitted from the fro control panel through trimmer (C-3). The resultant vid I.F. signal of 12.75 MC and the audio I.F. signal of 8.2 MC developed in the converter-oscillator tube circuit coupled through transformer T-7 to the first 1853 amplifi tube.

Audio Unit

The audio I.F. signal is taken off the suppressor of th first 1853 tube. Two stages of 8.25 MC audio I.F. usin 6SK7's follow. In the case of the HM-171 the audio I. signal is then detected and the resultant audio signal is ma available at terminals for insertion into a radio output circui In Model HM-185 the 6SK7 stages are followed by a 6SQ detector and driver, and a 6F6G output stage.

Video Unit

Four stages of video I.F. follow the converter stage. T third stage incorporates a wave trap for the adjacent aud channel at 14.25 MC. The nominal pass band for the amplifiers is 12.75 to 10.75 MC. The second detector uses o half of a 6F8G connected as a diode. The other half of t 6F8G is used as the first video amplifier. The video output coupled directly to the picture tube grid.



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.

LINE VOLTAGE—117 CONTROLS SET FOR NORMAL OPERATION. CONTRAST CONTROL AT HALF ROTATION.

✱ MEASURED ON 500 VOLT SCALE OF 1000 OHMS PER VOLT METER.

Fig. 9. Socket Voltages
Models HM-171 and HM-185

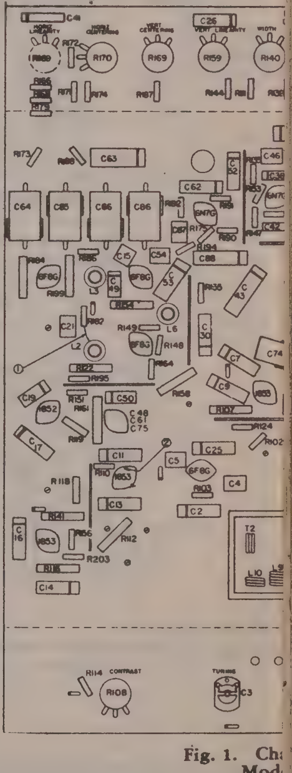


Fig. 1. Ch
Mod

GENERAL ELECTRIC CO.

MODELS H116,H118,HJ119
Chassis Wiring,Coils

Coil System

The "C" and "D" band antenna coils, L-2 and L-3 are wound on a single coil form as shown in Fig. 4. L-4, L-5 and L-6 compose the oscillator transformer for the "B" "C" and "D" bands. All switch points are numbered in Fig. 4 to facilitate in locating these switch points on the pictorial wiring diagram, Fig. 3.

The following table gives the coils in usé for the various positions of the band switch:

Band-switch Position	Antenna Primary	Antenna Secondary	Oscillator Primary	Oscillator Secondary
Band "B"	Lower portion of L1	Upper portion of L1	Lower portion of L4	Upper portion of L4
Band "C"	L2 Primary (L1 Primary shorted)	L2 Secondary (Grid end of L1 to ground)	Lower portion of L5	Upper portion of L5 (High side of L4 to ground through R15. Mid tap of L4 to ground)
Band "D"	L3 Primary (L1 Primary shorted)	L3 Secondary (Grid end of L1 to ground. L2 secondary to ground)	Lower portion of L6	Upper portion of L6 (High side of L4 and L5 to ground through R15. Mid tap of L4 to ground)

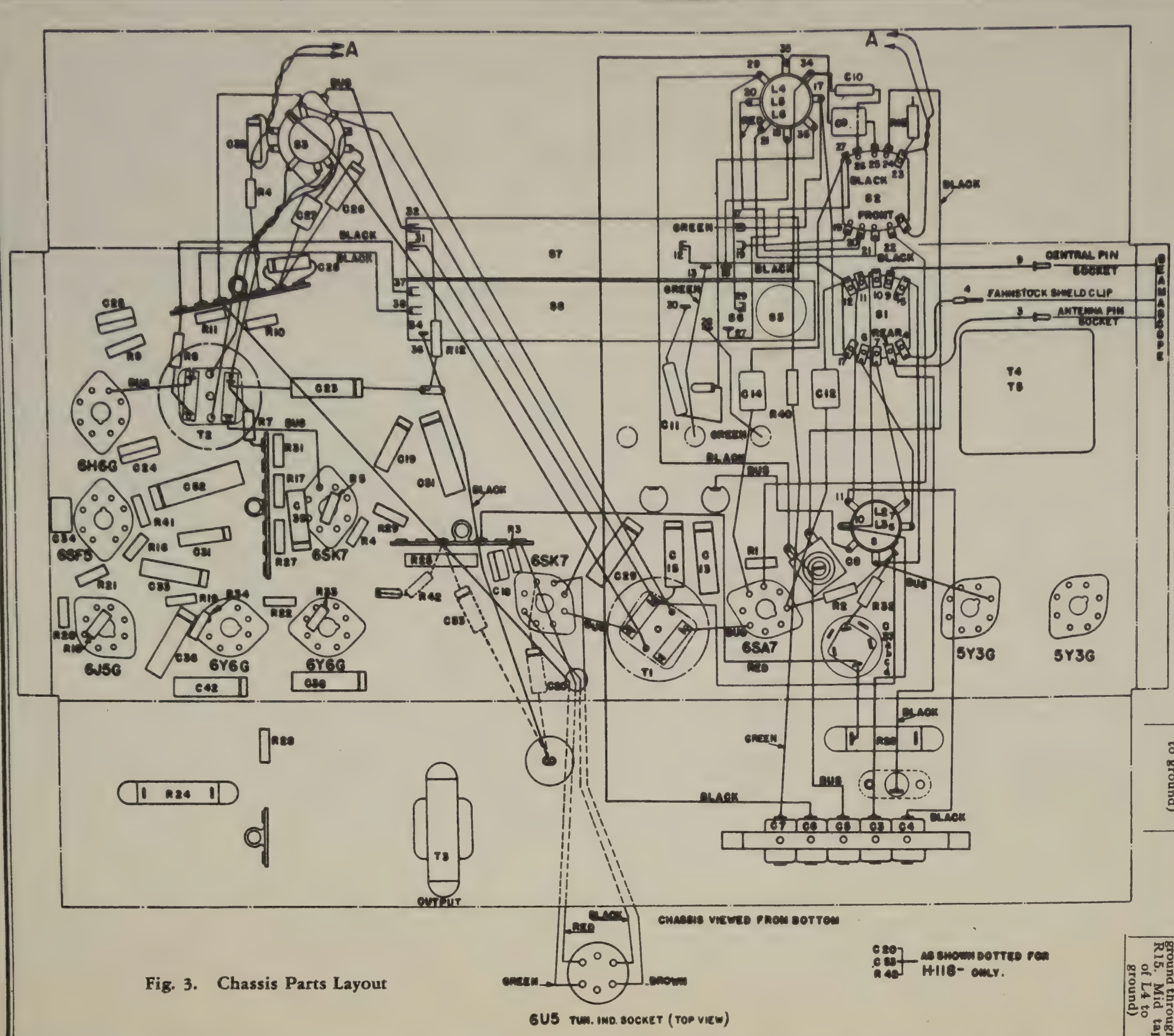


Fig. 3. Chassis Parts Layout

MODELS H116,H118,HJ119
Alignment,Gain,Voltage
Socket,Record Changer

GENERAL ELECTRIC CO.

MODEL H79
Record Changer Data

Super Beam-a-scope

The *Super* Beam-a-scope is essentially a tuned coil antenna wound on a frame and shielded by a Faraday screen against electrostatic disturbances. This construction favors the desired signal over a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and electromagnetic fields—the *Super* Beam-a-scope may be revolved so that a null point is found where no voltage is produced from these two components. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place, the *Super* Beam-a-scope eliminates the external return path to ground present in the case of an unshielded antenna. This reduces or eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place the *Super* Beam-a-scope discriminates against the electrostatic component of an incoming wave in comparison with the electromagnetic component, because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the electromagnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the *Super* Beam-a-scope is also the first tuned grid circuit. On the "C" and "D" bands, the *Super* Beam-a-scope is grounded at the grid end thus preventing absorption spots due to loop resonance.

ALIGNMENT PROCEDURE

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
I.F. ALIGNMENT WITH OSCILLOSCOPE*					
1 Band B	455 KC and 30 KC Sweep	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—vertical input to ground and junction at R-8, R-9, and R-10. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "Bass" position is shown in Fig. 2a.
2 Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3 Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
4 Band B	455 KC and 30 KC Sweep	Treble I	Converter 6SA7 Grid		The expanded curve taken with tone control at "Treble I" is shown in Fig. 2b. Excess sensitivity over "Bass" tone position indicates regeneration.
I.F. ALIGNMENT WITH OUTPUT METER*					
1 Band B	455 KC Modulated	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. Note.—Do not attempt alignment in the expanded position.
2 Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3 Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
R.F. ALIGNMENT					
1 Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil.
2 Band C	6 MC Modulated	Bass	Antenna Post**	Osc. (C-6) Ant. (C-3)	Set pointer to 6 MC mark and align (C-6). Peak (C-3) for maximum output.
3 Band D	21 MC Modulated	Bass	Antenna Post**	Osc. (C-7) Ant. (C-4)	Set pointer to 21 MC mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the "D" band should be 910 KC below input signal. Example: 15 MC image 14.09 MC.
4 Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Set dial pointer to 580 KC mark and tune in signal with (C-8).
5 Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Adjust (C-5) for maximum output in vicinity of 1500 KC while rocking gang condenser.
6 Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Retrim (C-8).
7 Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Repeak (C-5).

* Use "dummy" antenna consisting of .05-mfd. capacitor between signal generator and point of input.

** Use a "dummy" antenna consisting of 70-mmf. capacitor between signal generator and point of input with "Beam-a-Scope" disconnected.

*** Use an I.R.E. "dummy" antenna as shown in Fig. 7 between signal generator and the point of input.

Alignment Procedure

The alignment procedure is given in table form Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of output. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.

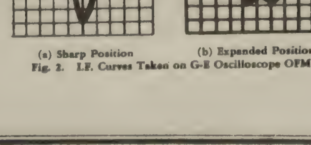

(a) Sharp Position (b) Expanded Position

Fig. 2. I.F. Curves Taken on G-E Oscilloscope OFM-1

SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains ‡

(a) Antenna Post to Converter Grid
Band "B" (Beam-a-Scope connected)*—3 at 1000 KC
Band "C" (Beam-a-Scope disconnected)**—3 at 4 MC
Band "D" (Beam-a-Scope disconnected)**—3 at 18 MC

(b) Converter Grid to 1st 6SK7 Grid. . 30 at 455 KC
(c) 1st 6SK7 Grid to 2nd 6SK7 Grid. . 6 at 455 KC
(d) 2nd 6SK7 Grid to 6H6 Det. Plate. . 70 at 455 KC

(2) A 400 cycle signal of .05 volts across volume control will give ½ W. speaker output.‡ (Volume Control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.

Band "B" . . . . 6.5 volts
Band "C" . . . . 7 volts
Band "D" . . . . 2.8 volts

---

‡ Variations of +10%, −20% permissible.

* Use I.R.E. dummy antenna.

** Use 70 mmf. capacitor between signal generator and antenna post.

AUTOMATIC PHONOGRAPHS

Model H-79

The Model H-118 automatic phonograph mechanism plays up to twelve 10-inch records or ten 12-inch records. The record-changing mechanism is equipped with a cycle switch which during a record-changing cycle prevents power interruption, by pressing the turntable switch to "Off," until the tone arm is in the starting position.

OPERATION

Phono Key

To change from radio to phonograph reproduction press the "Phono-Tele" key. This operation likewise turns the power on if the radio has not been operating previously.

Phono Switch

This switch is located on the forward left-hand corner of the motorboard and starts or stops turntable operation.

Push-button Controls

On the forward right-hand corner of the motorboard are located four push-buttons which control the operation of the automatic record changer.

The forward button, marked "R" is the reject control. To reject a record being played or to start the record-changing cycle after the records have been placed on the holders, simply press this button down and then release.

The second button from the front, marked "M" is the manual button. When records are to be played manually, this button should be pressed down until it locks in the depressed position. The record mechanism now operates as any manual record player.

The third button, marked "12," when pressed, sets the mechanism to play automatically a series of 12-inch records.

The fourth button, marked "10," when pressed sets the mechanism to play automatically a series of 10-inch records.

Record Holder and Release Lever

Located in rear left-hand corner and in the forward right-hand corner are the record-holder posts supporting the record holders and release levers. The record holder is underneath the release lever on either post.

To load the holder with 10-inch records, clasp one of the record holders with the left hand and with the right hand lift the release-lever knob turning the release lever until the figure "10" is opposite the index. Do the same with the other record holder and release lever. Now rotate the entire record holder and release lever assembly until the holder is pointed in toward the center of the turntable. It may be necessary to raise the assembly slightly to start rotation. A certain position will be found when the holder is pointed toward the center where the assembly will settle into a recess. This is the correct position of the holder for loading.

To load the holder with 12-inch records, follow the above procedure except the release levers must be rotated with respect to the holders until the "12" markings are opposite their respective indices.

To remove records from the turntable, lift the holder assemblies and rotate the record holders until they clear the turntable area.

SERVICING

Oiling

The record-changer mechanism should be lubricated once a year with about a dozen drops of a good light machine oil at each of the following six points. All points can be reached from above, through holes in the mounting plate, as follows:

No. 1 No. 2 No. 3	Three oil holes on motor gear housing. Reach all three through two holes marked "A" on drawing.
No. 4	Through hole marked "B," drop the oil upon flat surface of cam. It will distribute itself to proper points.
No. 5	Through holes marked "C," see felt wick, and drop the oil directly upon it.
No. 6	Through hole marked "D," see felt wick, and drop the oil directly upon it.

If squeaks are heard compare the squeak with and without a load of records, stacked records themselves sometimes squeak against a center pin. See that all five wicks are in position, including three ¼-in. wicks in frame of Motor. See that each wick is thoroughly saturated (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks, with tweezers; see if old oil has become gummy (commonly due to use of low-grade oil). If necessary, **clean gummed-up wicks with kerosene**. See that each is saturated with good oil; then, before replacing them, **drop a little good oil into the holes.**

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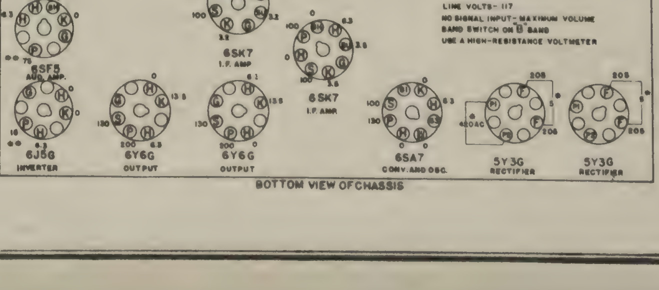


Fig. 5. Socket Voltages

GENERAL ELECTRIC CO.

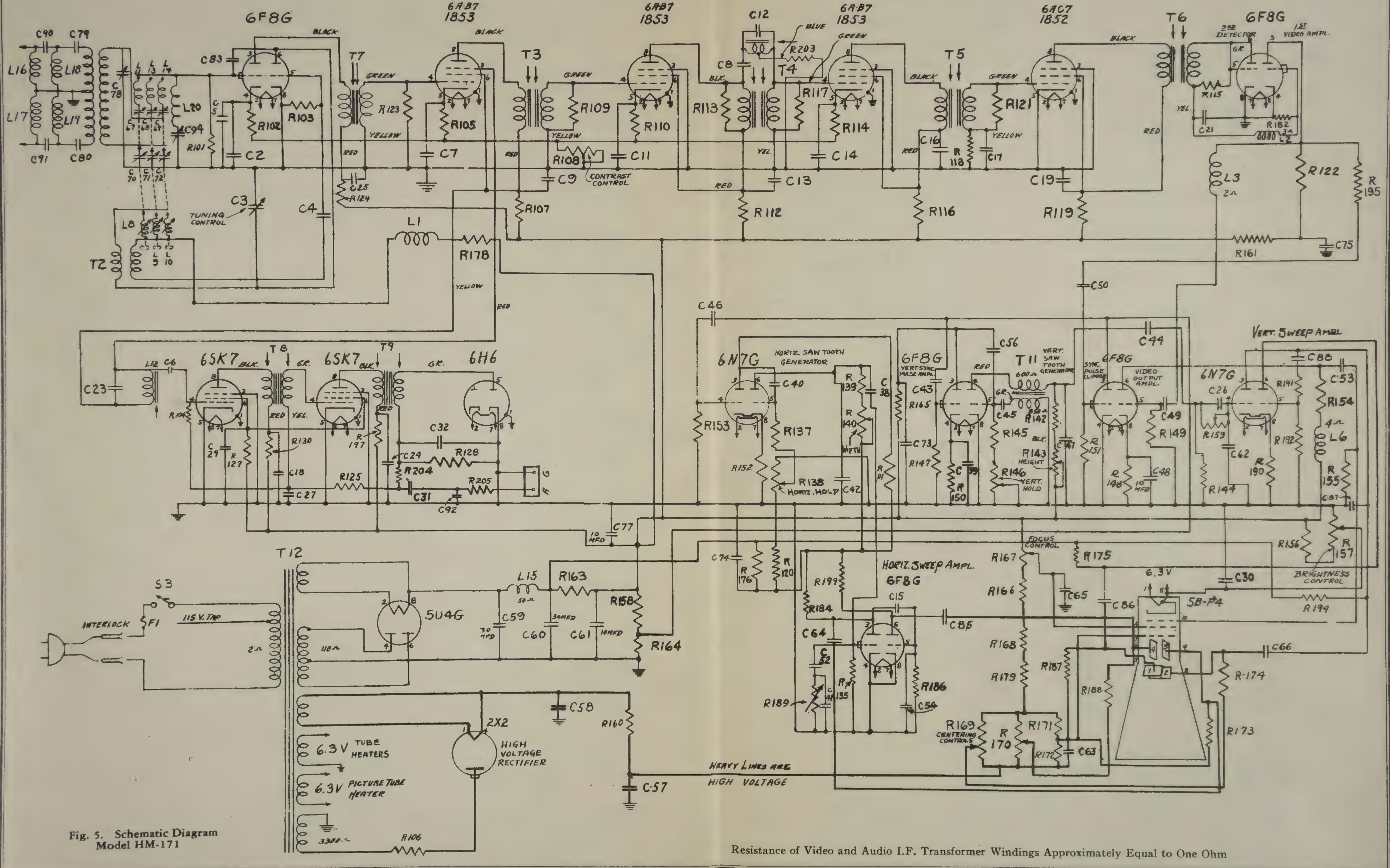


Fig. 5. Schematic Diagram
Model HM-171

Resistance of Video and Audio I.F. Transformer Windings Approximately Equal to One Ohm

Sync Pulse Clipper

Sync-pulses are taken off the plate of the clipper section of the clipper and video output tube. The video signals are separate by tube cut-off since the plate voltage is only about 12 volts.

Horizontal Oscillator-output

The clipper feeds the horizontal multivibrator 6N7G directly with needle-point, negative sync pulses. C-46 blocks the flow of vertical sync pulses, into the horizontal multivibrator since they are of a low order of frequency. The horizontal sync pulses which are amplified by the first section of the 6N7G are coupled to the grid of the second section and drive the circuit into violent oscillation. Resulting plate and grid current flow sends the tube to cut-off. The sawtooth wave so generated is applied to the horizontal sweep amplifier one section of which is a phase inverter. This push-pull sweep is coupled to the horizontal deflecting plates of the picture tube. Horizontal hold is controlled by varying the charging rate of the generator circuit, through (R-138). Compensating for high frequency loss adds a means of controlling horizontal linearity which is done through R-189. Width is varied by regulating the magnitude of the charge through R-140.

Vertical Oscillator-output

The sync pulses are also coupled into the vertical oscillator 6F8G where the circuits composed of C-73 and R-165 bypasses the horizontal sync pulses. The vertical sync pulses are coupled into the vertical sweep generator circuit causing violent oscillatory swings which result in sawtooth waves. The height control (R-146) determines the magnitude of the charge before the next oscillation thus governing the height of the picture. R-146, the horizontal hold control, governs the rate of charging. The vertical linearity control (R-159) accomplishes results similar to the horizontal linearity control. The vertical sweep amplifier produces push-pull output by phase inversion and this output is applied to the vertical deflecting plates of the picture tube.

Low Voltage Rectifier

Low voltage power is obtained from a 5U4G using one stage of choke filtering and the remaining of the resistance filter type.

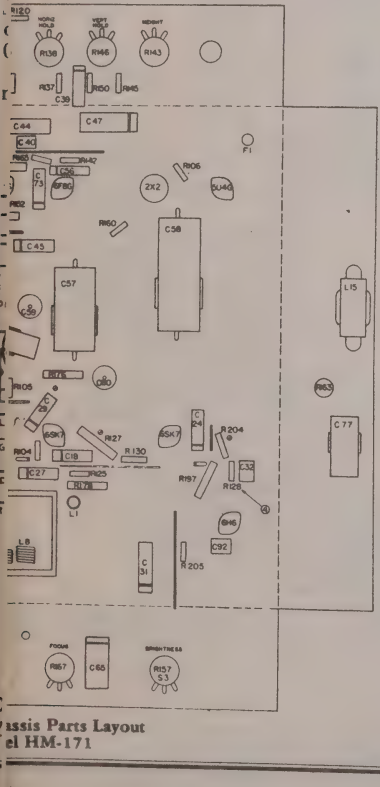
High Voltage Rectifier

The anode voltage of the picture tube is obtained from a single half-wave rectifier with a protective resistor in series with the transformer plate lead.

Loudspeaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.



assis Parts Layout
el HM-171

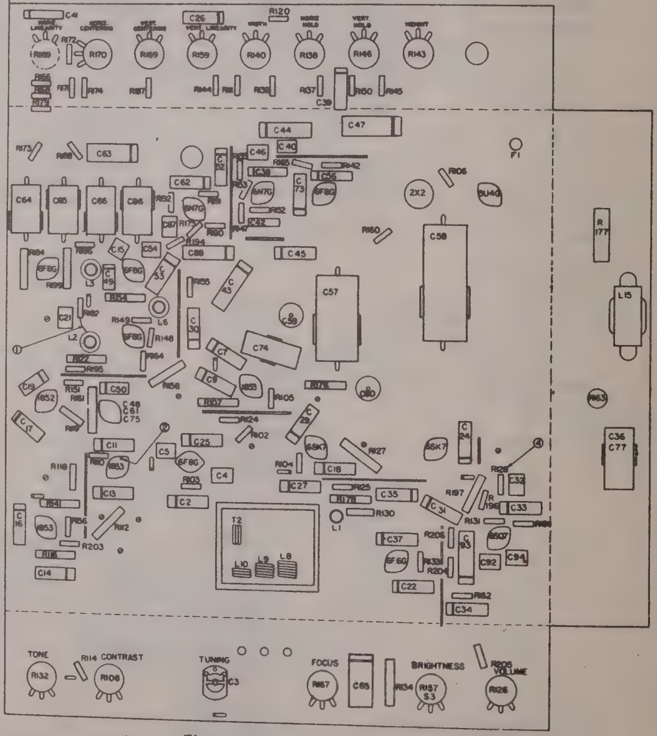


Fig. 4. Chassis Parts Layout
Model HM-185

GENERAL ELECTRIC CO.

GENERAL INFORMATION

General Electric Picture Receiver and Sound Converter Model HM-171, is a table type, 17-tube, superheterodyne receiver equipped with a 5-inch, electrostatic-deflected, picture tube. The receiver works in conjunction with any radio receiver, which is designed for phonograph reproduction, to reproduce the sound portion of the television broadcast.

General Electric Television Receiver, Model HM-185 is a console type, 18-tube, superheterodyne receiver with a complete sound channel and using a 5-inch, electrostatic-deflected picture tube.

Additional design features include iron-core I.F. tuning, automatic tone compensation, automatic volume control and constant high-gain antenna coupling circuit.

TELEVISION ALIGNMENT PROCEDURE

The problem of aligning the several circuits in a television receiver is much more involved and requires more specialized equipment than the alignment of conventional radio receivers. Fortunately, the use of stable components in carefully engineered circuits of wide-band characteristic reduces to a minimum the necessity for alignment under normal operating conditions. Should alignment become necessary the following equipment will be needed:

(A) For Video I.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide band sweep oscillator capable of sweeping from 7.5 to 15 MC.
  (3) Marker system either provided in sweep oscillator or from separate signal generator for locating 12.75 and 10.75 MC points.

(B) Sound I.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide band sweep oscillator capable of sweeping from 7.75 to 8.75 MC.

(C) R.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide-band sweep oscillator capable of sweeping the following bands.
    (a) 44 to 50
    (b) 50 to 56
    (c) 66 to 72

Electrical Specifications

Model	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
HM-171	115–125	60	170
HM-185	115–125	60	170

Tuning Frequency Range

Band No. 1	44–50 MC.
Band No. 2	50–56 MC.
Band No. 3	66–72 MC.

Intermediate Frequencies

Television Video (Picture)	12.75 MC.
Television Audio	8.25 MC.

VIDEO I.F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope across resistor R-182 of 6F8G video detector. See Fig. 1 or 4, arrow (1).
2. 7.5–15 MC Sweep	Control grid of 1853 (2nd video I.F.)		Connect output tap of video I.F. Sweep oscillator to control grid of 1853 (2nd video I.F.) See Fig. 1 or 4, arrow (2). Connect ground lead to chassis. Turn contrast control (R-108) to about half of maximum or to a point which gives satisfactory vertical deflection without overloading. Set horizontal centering and gain controls on oscilloscope to give suitable horizontal deflection. Adjust sweep phase to give curve similar to Fig. 6, curve 1.
NOTE: If sweep oscillator has marker points internally supplied, steps 3 and 4 may be omitted.			
3. Same as in No. 2 plus 12.75 MC	Same as in No. 2		Superimpose an accurately calibrated 12.75 MC signal in parallel with sweep signal. Signal will appear on sweep curve in oscilloscope as a wiggle, the center of which is a thin black line. With a pen or crayon mark this point on the screen of the oscilloscope. (NOTE: Hereafter the horizontal controls on the oscilloscope must not be touched.)
4. Same as in No. 2 plus 10.75 MC	Same as in No. 2		Superimpose an accurately calibrated 10.75 MC signal in parallel with sweep signal. Mark screen at point where signal appears on curve as in No. 3 above.
5. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of detector transformer T-6	(Do not touch horizontal controls of oscilloscope. Adjust iron cores of T-6 until curve appears similar to Fig. 6, curve 1, with relatively flat top, 12.75 MC mark at corner of one side and 10.75 MC mark at corner of other side. These conditions plus maximum amplitude insure correct alignment.
6. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of 4th video transformer T-5	Adjust iron cores for maximum gain, flatness and proper centering between markers as described in step No. 5 and illustrated in Fig. 6, curve 1.
7. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of 3rd video transformer T-4	Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 1.
8. 7.5–15 MC Sweep	Converter grid, 6F8G	Iron cores of 2nd video transformer T-3	Connect low tap to grid (On top of tube). Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 2.
9. 7.5–15 MC Sweep	Converter grid, 6F8G	Iron cores of 1st video transformer T-7	Connect low tap to grid. Adjust iron cores for maximum gain flatness and proper centering.
10. 14.25 MC	Converter grid, 6F8G	Series iron core of 3rd video transformer T-4	Connect low tap to grid. Reduce horizontal gain to minimum. Adjust iron core for minimum line length.

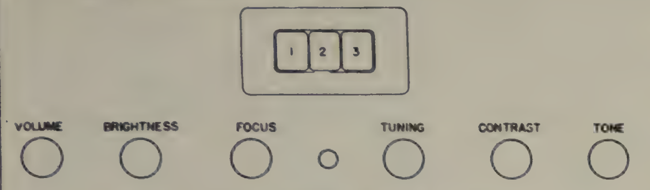


Fig. 2. Front Panel Control Location
Model HM-185

(Note—Model HM-171 Control Location is same as above with Volume and Tone Controls removed.)

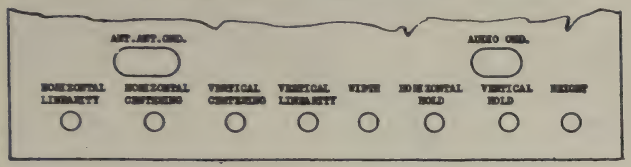


Fig. 3. Rear Cover Control Location
Models HM-171 and HM-185

RECEIVER CIRCUIT DESCRIPTION

R.F. Unit

Starting at the antenna terminal posts, there follows a single-stage high-pass filter in the antenna primary to reduce video I.F. interference, a shunt capacity coupled secondary (C-78), and a video I.F. wave trap (C-95, L-20). The wave trap is broadly tuned at 11.75 MC. Any one of the three tuned circuits for each of the three television transmission bands can be connected into the secondary circuit by pressing appropriate button. The secondary circuit when properly tuned gives a broad, flat response curve.

Converter-Oscillator and Amplifier

The 6F8G converter employs one half as the oscillator and the other half as the biased first detector. The oscillator is plate-tuned with vernier tuning permitted from the front control panel through trimmer (C-3). The resultant video I.F. signal of 12.75 MC and the audio I.F. signal of 8.25 MC developed in the converter-oscillator tube circuit is coupled through transformer T-7 to the first 1853 amplifier tube.

Audio Unit

The audio I.F. signal is taken off the suppressor of this first 1853 tube. Two stages of 8.25 MC audio I.F. using 6SK7's follow. In the case of the HM-171 the audio I.F. signal is then detected and the resultant audio signal is made available at terminals for insertion into a radio output circuit. In Model HM-185 the 6SK7 stages are followed by a 6SQ7 detector and driver, and a 6F6G output stage.

Video Unit

Four stages of video I.F. follow the converter stage. The third stage incorporates a wave trap for the adjacent audio channel at 14.25 MC. The nominal pass band for these amplifiers is 12.75 to 10.75 MC. The second detector uses one half of a 6F8G connected as a diode. The other half of the 6F8G is used as the first video amplifier. The video output is coupled directly to the picture tube grid.

Sync Pulse Clipper

Sync-pulses are taken off the plate of the clipper section of the clipper and video output tube. The video signals are separate by tube cut-off since the plate voltage is only about 12 volts.

Horizontal Oscillator-output

The clipper feeds the horizontal multivibrator 6N7G directly with needle-point, negative sync pulses. C-46 blocks the flow of vertical sync pulses, into the horizontal multivibrator since they are of a low order of frequency. The horizontal sync pulses which are amplified by the first section of the 6N7G are coupled to the grid of the second section and drive the circuit into violent oscillation. Resulting plate and grid current flow sends the tube to cut-off. The sawtooth wave so generated is applied to the horizontal sweep amplifier one section of which is a phase inverter. This push-pull sweep is coupled to the horizontal deflecting plates of the picture tube. Horizontal hold is controlled by varying the charging rate of the generator circuit, through (R-138). Compensating for high frequency loss adds a means of controlling horizontal linearity which is done through R-189. Width is varied by regulating the magnitude of the charge through R-140.

Vertical Oscillator-output

The sync pulses are also coupled into the vertical oscillator 6F8G where the circuits composed of C-73 and R-165 bypasses the horizontal sync pulses. The vertical sync pulses are coupled into the vertical sweep generator circuit causing violent oscillatory swings which result in sawtooth waves. The height control (R-146) determines the magnitude of the charge before the next oscillation thus governing the height of the picture. R-146, the horizontal hold control, governs the rate of charging. The vertical linearity control (R-159) accomplishes results similar to the horizontal linearity control. The vertical sweep amplifier produces push-pull output by phase inversion and this output is applied to the vertical deflecting plates of the picture tube.

Low Voltage Rectifier

Low voltage power is obtained from a 5U4G using one stage of choke filtering and the remaining of the resistance filter type.

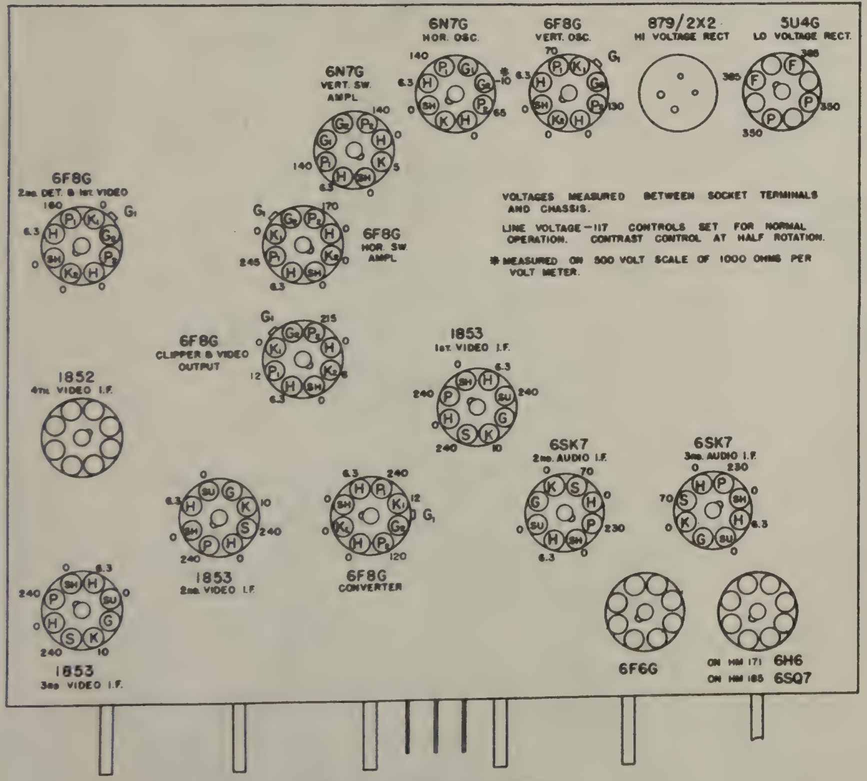
High Voltage Rectifier

The anode voltage of the picture tube is obtained from a single half-wave rectifier with a protective resistor in series with the transformer plate lead.

Loudspeaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

NOTE—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.

LINE VOLTAGE—117 CONTROLS SET FOR NORMAL OPERATION. CONTRAST CONTROL AT HALF ROTATION.

* MEASURED ON 500 VOLT SCALE OF 1000 OHMS PER VOLT METER.

Fig. 9. Socket Voltages
Models HM-171 and HM-185

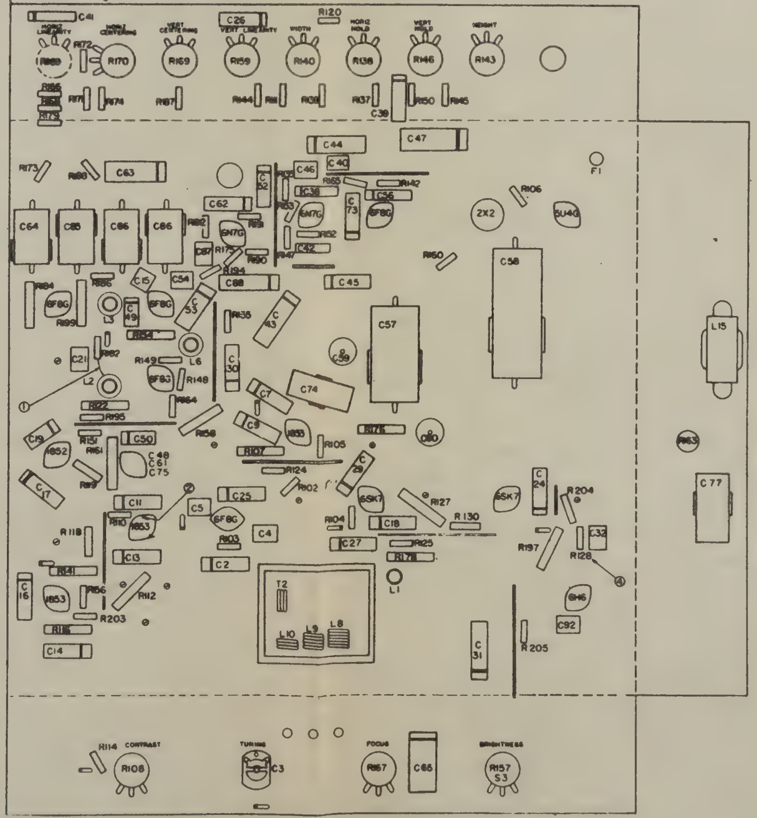


Fig. 1. Chassis Parts Layout
Model HM-171

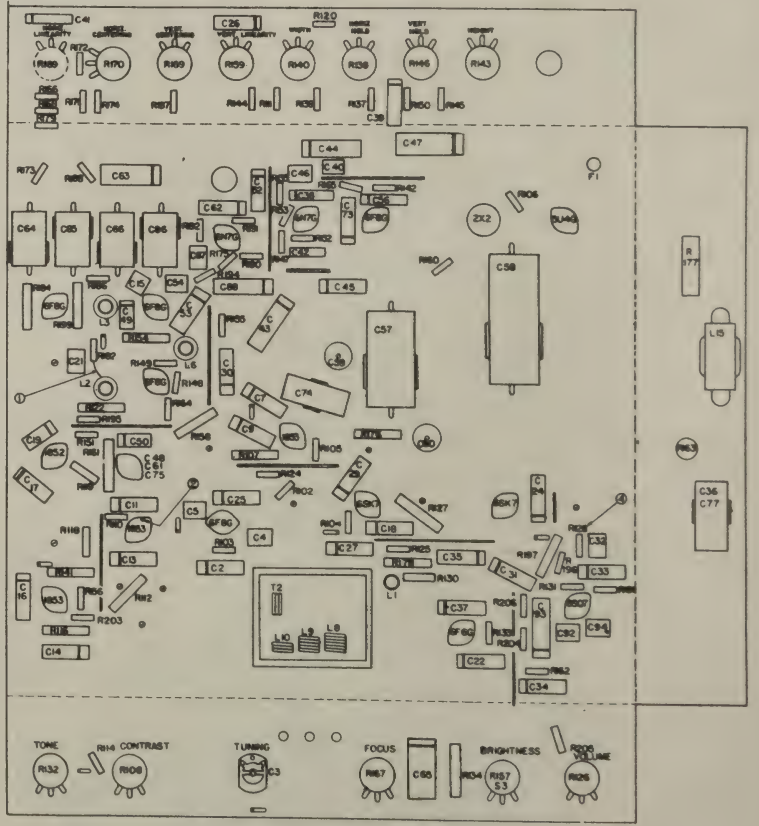


Fig. 4. Chassis Parts Layout
Model HM-185

GENERAL ELECTRIC CO.

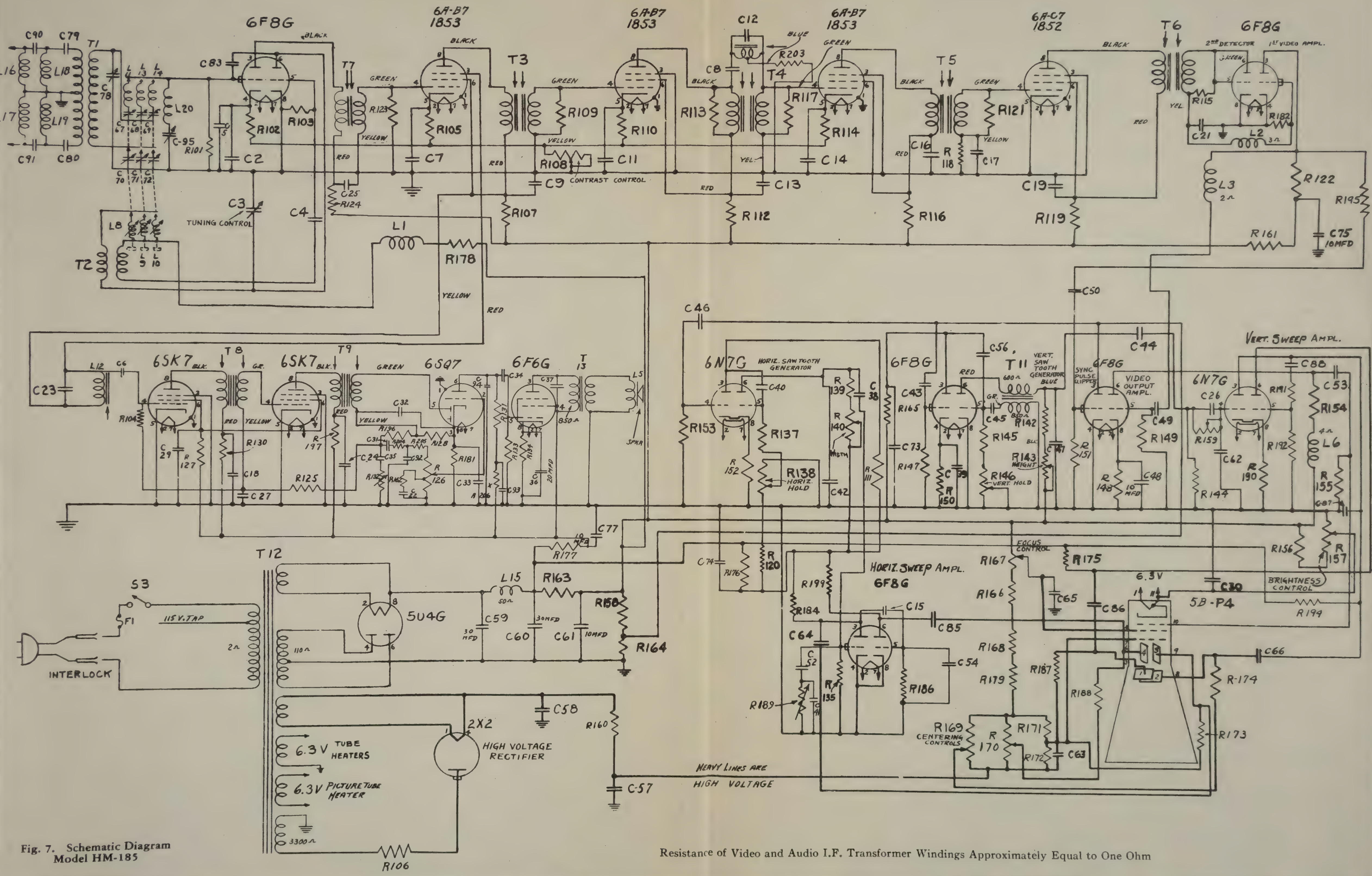


Fig. 7. Schematic Diagram
Model HM-185

Resistance of Video and Audio I.F. Transformer Windings Approximately Equal to One Ohm

Maximum Electrical Output

Model HM-171. (Dependent upon radio receiver output)	
Model HM-185	5 watts

Loudspeaker—"Alnico" Magnetic Dynamic

Model	HM-185
Cone Diameter	12 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

Picture Size

Height	3¼ inches
Width	4¼ inches

Tubes

Converter-Oscillator	GE-6F8G
Audio & Video I.F. Amplifier	GE-1853/6AB7
2nd and 3rd Audio I.F. Amplifiers	(2)GE-6SK7
Det., Audio, AVC (HM-185)	GE-6SQ7
Det. and AVC (HM-171)	GE-6H6
Audio Output (HM-185)	GE-6F6G
2nd and 3rd Video I.F. Amplifiers	(2)GE-1853/6AB7
4th Video I.F. Amplifier	GE-1852/6AC7
Video Det. and 1st Video Amplifier	GE-6F8G
Video Output and Sync. Clipper	GE-6F8G
Vertical Oscillator	GE-6F8G
Vertical Output	GE-6N7G
Horizontal Oscillator	GE-6N7G
Horizontal Output	GE-6F8G
High Voltage Rectifier	GE-879/2X2
Low Voltage Rectifier	GE-5U4G
Picture Tube	GE-5BP4

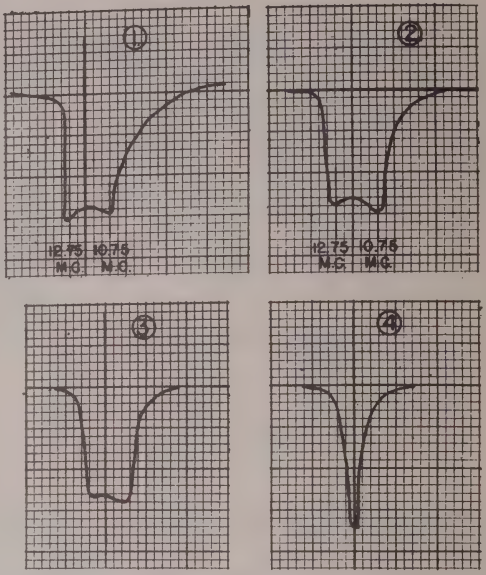


Fig. 6. Television Alignment Curves

R.F. ALIGNMENT

Signal Input	Point of Input	Adjustments	Comments
1.		Band width adjustment coupling condenser	Turn (C-78) in until tight, then open approximately 1/16 of a turn.
2. 44 to 50 MC Sweep	Antenna terminals	(L-8), (C-70), (C-67)	Depress band No. 1 push button. Set tuning control to mid-rotation. Adjust L-8 until curve is centered between maximum horizontal sweep points. Adjust C-70 and C-67 for maximum amplitude. See Fig. 6, curve 3.
3. 50 to 56 MC Sweep	Antenna terminals	(L-9), (C-71), (C-68)	Depress band No. 2 push button. Leave tuning control at mid-rotation point. Adjust L-9 for centering; C-71 and C-68 for maximum amplitude. See Fig. 6, curve 3.
4. 66 to 72 MC Sweep	Antenna terminals	(L-10), (C-72), (C-69)	Depress band No. 3 push button. Adjust L-10 for centering; C-72, C-69 for maximum amplitude. See Fig. 6, curve 3.

WAVE TRAP ALIGNMENT

1. 11.75 MC with 400 cycle modulation	Antenna terminals	Wave trap trimmer, C-95	Adjust for minimum signal response as seen on oscilloscope.

AUDIO I.F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope across R-128. See Fig. 1 or 4 arrow (4).
2. 7.75 to 8.75 MC Sweep	Converter grid, 6F8G	Iron cores of 4th audio I.F. transformer T-9	Align for maximum amplitude. See Fig. 6, curve 4.
3. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 3rd audio I.F. transformer T-8	Align for maximum amplitude. See Fig. 6, curve 4.
4. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 2nd audio I.F. transformer L-12	Align for maximum amplitude. See Fig. 6, curve 4.

MODELS HM225,HM226-7A
Voltage,Trimmers,Socket,Chassis
Controls, Notes

ANTENNA

In general, the television antenna should be of the dipole type located as high as is practical and in an area where the horizon in the direction of the television transmitter is not obstructed by buildings or structures. A noticeable gain in signal strength will be obtained as antenna height is increased. Since television radiation reacts similarly to light waves, reflection problems arise which often modify otherwise ideal installation locations. Consideration must also be given noise sources within buildings, or ignition noises from vehicles on adjacent streets. It is usually best to locate the dipole antenna on the side of the building away from the street thus allowing the building to shield the antenna from ignition noises.

The dipole should be erected with arms parallel to the ground and at right angles to the direction of the television station. If noise or reflection interference exist it may be better to point the dipole arms in the direction of the interference.

Noise interference and poor signal strength may dictate the use of a reflector. A reflector will increase the signal strength appreciably as well as increase the horizontal directivity.

General Electric Television Receiver, Model HM-225, is a console type, 22-tube, superheterodyne receiver equipped with a full magnetic, short, 9-inch picture tube. The rectifier-power supply is on a separate chassis mounted in the lower cabinet compartment with the speaker.

General Electric Television and Radio Receiver, Model HM-226-7A, is a console type instrument using the same television receiver as the Model HM-225 with minor alterations for use in conjunction with a 7-tube radio receiver. Model HM-226-7A is equipped with a full magnetic, short, 12-inch picture tube.

Additional design features include iron-core I.F. tuning, automatic contrast control, automatic brightness control, automatic tone compensation, automatic volume control and a constant high-gain antenna coupling circuit.

SERVICE DATA

Electrical Specifications

Model	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
HM-225	115–125	60	300
HM-226-7A	115–125	60	300 (Television) 75 (Radio)

Tuning Frequency Range

Television Receiver (us
Band No. 1. . . . .
Band No. 2. . . . .
Band No. 3. . . . .
Band No. 4. . . . .
Band No. 5. . . . .

Tone Control

Televison Audio. . . . .
Radio Audio. . . . .

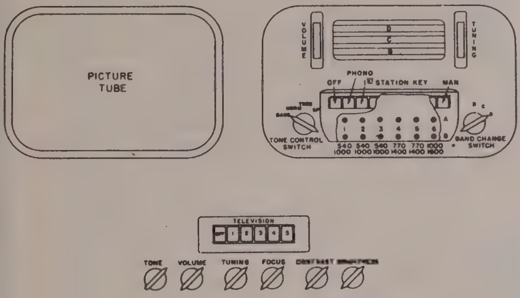


Fig. 2. Front Control Location
Model HM-226-7A

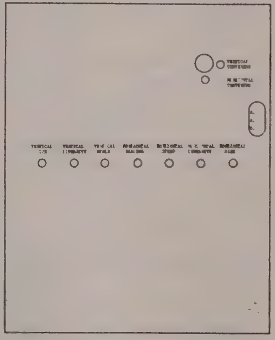


Fig. 4. Rear Control Location
Model HM-226-7A

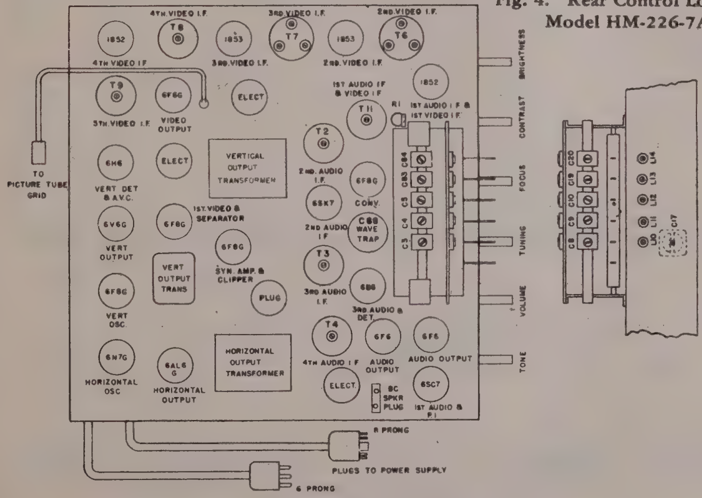
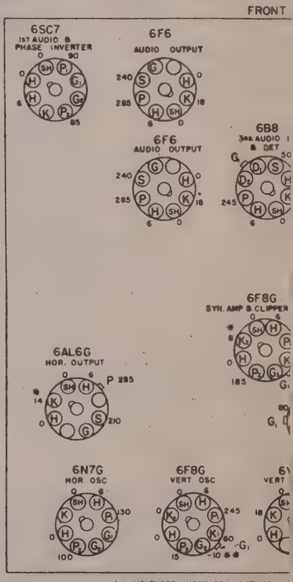


Fig. 7. Television Chassis Trimmer Location
Models HM-225 and HM-226-7A



ALL VOLTAGES MEASURED BETWEEN
ALL FRONT PANEL CONTROLS TURNED
CONTROL WHICH IS ROTATED TO
LINE VOLTAGE – 115
✱ MEASURED ON 100 VOLT SCALE OF
✱✱ MEASURED ON 250 VOLT SCALE OF

BOTTOM V

Fig. 9. Televisi

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GENERAL ELECTRIC CO.

Maximum Electrical Output

Model HM-171	(Dependent upon radio receiver output)
Model HM-185	5 watts

Loudspeaker—"Alnico" Magnetic Dynamic

Model	HM-185
Cone Diameter	12 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

Picture Size

Height	3¼ inches
Width	4¼ inches

Tubes

Converter-Oscillator	GE-6F8G
Audio & Video I.F. Amplifier	GE-1853/6AB7
2nd and 3rd Audio I.F. Amplifiers	(2)GE-6SK7
Det., Audio, AVC (HM-185)	GE-6SQ7
Det. and AVC (HM-171)	GE-6H6
Audio Output (HM-185)	GE-6F6G
2nd and 3rd Video I.F. Amplifiers	(2)GE-1853/6AB7
4th Video I.F. Amplifier	GE-1852/6AC7
Video Det. and 1st Video Amplifier	GE-6F8G
Video Output and Sync. Clipper	GE-6F8G
Vertical Oscillator	GE-6F8G
Vertical Output	GE-6N7G
Horizontal Oscillator	GE-6N7G
Horizontal Output	GE-6F8G
High Voltage Rectifier	GE-879/2X2
Low Voltage Rectifier	GE-5U4G
Picture Tube	GE-5BP4

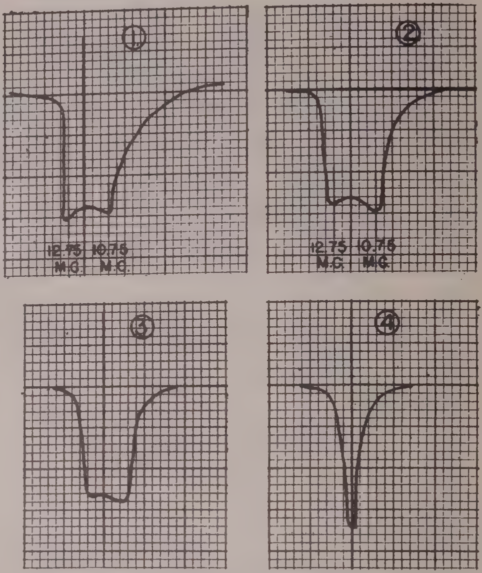


Fig. 6. Television Alignment Curves

R.F. ALIGNMENT

Signal Input	Point of Input	Adjustments	Comments
1.		Band width adjustment coupling condenser	Turn (C-78) in until tight, then open approximately 1/16 of a turn.
2. 44 to 50 MC Sweep	Antenna terminals	(L-8), (C-70), (C-67)	Depress band No. 1 push button. Set tuning control to mid-rotation. Adjust L-8 until curve is centered between maximum horizontal sweep points. Adjust C-70 and C-67 for maximum amplitude. See Fig. 6, curve 3.
3. 50 to 56 MC Sweep	Antenna terminals	(L-9), (C-71), (C-68)	Depress band No. 2 push button. Leave tuning control at mid-rotation point. Adjust L-9 for centering; C-71 and C-68 for maximum amplitude. See Fig. 6, curve 3.
4. 66 to 72 MC Sweep	Antenna terminals	(L-10), (C-72), (C-69)	Depress band No. 3 push button. Adjust L-10 for centering; C-72, C-69 for maximum amplitude. See Fig. 6, curve 3.

WAVE TRAP ALIGNMENT

1. 11.75 MC with 400 cycle modulation	Antenna terminals	Wave trap trimmer, C-95	Adjust for minimum signal response as seen on oscilloscope.

AUDIO I.F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope across R-128. See Fig. 1 or 4 arrow (4).
2. 7.75 to 8.75 MC Sweep	Converter grid, 6F8G	Iron cores of 4th audio I.F. transformer T-9	Align for maximum amplitude. See Fig. 6, curve 4.
3. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 3rd audio I.F. transformer T-8	Align for maximum amplitude. See Fig. 6, curve 4.
4. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 2nd audio I.F. transformer L-12	Align for maximum amplitude. See Fig. 6, curve 4.

GENERAL ELECTRIC CO.

GENERAL INFORMATION

General Electric Picture Receiver and Sound Converter Model HM-171, is a table type, 17-tube, superheterodyne receiver equipped with a 5-inch, electrostatic-deflected, picture tube. The receiver works in conjunction with any radio receiver, which is designed for phonograph reproduction, to reproduce the sound portion of the television broadcast.

General Electric Television Receiver, Model HM-185 is a console type, 18-tube, superheterodyne receiver with a complete sound channel and using a 5-inch, electrostatic-deflected picture tube.

Additional design features include iron-core I.F. tuning, automatic tone compensation, automatic volume control and constant high-gain antenna coupling circuit.

TELEVISION ALIGNMENT PROCEDURE

The problem of aligning the several circuits in a television receiver is much more involved and requires more specialized equipment than the alignment of conventional radio receivers. Fortunately, the use of stable components in carefully engineered circuits of wide-band characteristic reduces to a minimum the necessity for alignment under normal operating conditions. Should alignment become necessary the following equipment will be needed:

(A) For Video I.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide band sweep oscillator capable of sweeping from 7.5 to 15 MC.
  (3) Marker system either provided in sweep oscillator or from separate signal generator for locating 12.75 and 10.75 MC points.

(B) Sound I.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide band sweep oscillator capable of sweeping from 7.75 to 8.75 MC.

(C) R.F. Alignment
  (1) Cathode ray oscilloscope
  (2) Wide-band sweep oscillator capable of sweeping the following bands.
    (a) 44 to 50
    (b) 50 to 56
    (c) 66 to 72

Electrical Specifications

Model	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
HM-171	115–125	60	170
HM-185	115–125	60	170

Tuning Frequency Range

Band No. 1	44–50 MC.
Band No. 2	50–56 MC.
Band No. 3	66–72 MC.

Intermediate Frequencies

Television Video (Picture)	12.75 MC.
Television Audio	8.25 MC.

VIDEO I.F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope across resistor R-182 of 6F8G video detector. See Fig. 1 or 4, arrow (1).
2. 7.5–15 MC Sweep	Control grid of 1853 (2nd video I.F.)		Connect output tap of video I.F. Sweep oscillator to control grid of 1853 (2nd video I.F.) See Fig. 1 or 4, arrow (2). Connect ground lead to chassis. Turn contrast control (R-108) to about half of maximum or to a point which gives satisfactory vertical deflection without overloading. Set horizontal centering and gain controls on oscilloscope to give suitable horizontal deflection. Adjust sweep phase to give curve similar to Fig. 6, curve 1.
NOTE: If sweep oscillator has marker points internally supplied, steps 3 and 4 may be omitted.			
3. Same as in No. 2 plus 12.75 MC	Same as in No. 2		Superimpose an accurately calibrated 12.75 MC signal in parallel with sweep signal. Signal will appear on sweep curve in oscilloscope as a wiggle, the center of which is a thin black line. With a pen or crayon mark this point on the screen of the oscilloscope. (NOTE: Hereafter the horizontal controls on the oscilloscope must not be touched.)
4. Same as in No. 2 plus 10.75 MC	Same as in No. 2		Superimpose an accurately calibrated 10.75 MC signal in parallel with sweep signal. Mark screen at point where signal appears on curve as in No. 3 above.
5. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of detector transformer T-6	(Do not touch horizontal controls of oscilloscope. Adjust iron cores of T-6 until curve appears similar to Fig. 6, curve 1, with relatively flat top, 12.75 MC mark at corner of one side and 10.75 MC mark at corner of other side. These conditions plus maximum amplitude insure correct alignment.
6. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of 4th video transformer T-5	Adjust iron cores for maximum gain, flatness and proper centering between markers as described in step No. 5 and illustrated in Fig. 6, curve 1.
7. 7.5–15 MC Sweep	Same as in No. 2	Iron cores of 3rd video transformer T-4	Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 1.
8. 7.5–15 MC Sweep	Converter grid, 6F8G	Iron cores of 2nd video transformer T-3	Connect low tap to grid (On top of tube). Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 2.
9. 7.5–15 MC Sweep	Converter grid, 6F8G	Iron cores of 1st video transformer T-7	Connect low tap to grid. Adjust iron cores for maximum gain flatness and proper centering.
10. 14.25 MC	Converter grid, 6F8G	Series iron core of 3rd video transformer T-4	Connect low tap to grid. Reduce horizontal gain to minimum. Adjust iron core for minimum line length.

GENERAL ELECTRIC CO.

Maximum Electrical Output

Model HM-171	(Dependent upon radio receiver output)
Model HM-185	5 watts

Loudspeaker—"Alnico" Magnetic Dynamic

Model	HM-185
Cone Diameter	12 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

Picture Size

Height	3¼ inches
Width	4¼ inches

Tubes

Converter-Oscillator	GE-6F8G
Audio & Video I.F. Amplifier	GE-1853/6AB7
2nd and 3rd Audio I.F. Amplifiers	(2)GE-6SK7
Det., Audio, AVC (HM-185)	GE-6SQ7
Det. and AVC (HM-171)	GE-6H6
Audio Output (HM-185)	GE-6F6G
2nd and 3rd Video I.F. Amplifiers	(2)GE-1853/6AB7
4th Video I.F. Amplifier	GE-1852/6AC7
Video Det. and 1st Video Amplifier	GE-6F8G
Video Output and Sync. Clipper	GE-6F8G
Vertical Oscillator	GE-6F8G
Vertical Output	GE-6N7G
Horizontal Oscillator	GE-6N7G
Horizontal Output	GE-6F8G
High Voltage Rectifier	GE-879/2X2
Low Voltage Rectifier	GE-5U4G
Picture Tube	GE-5BP4

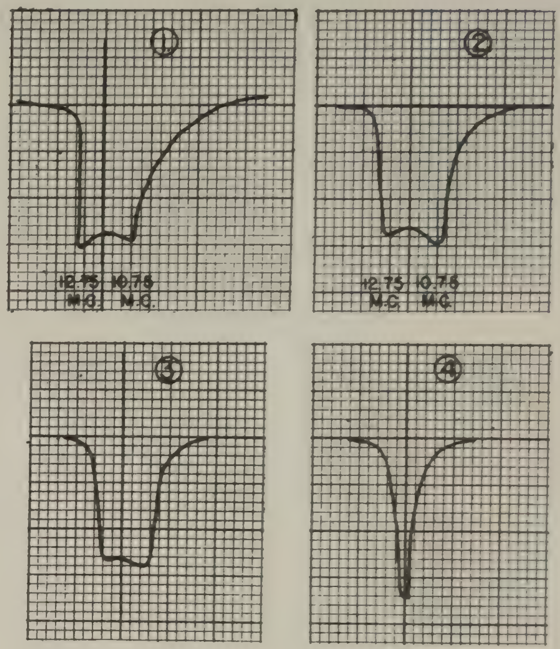


Fig. 6. Television Alignment Curves

R.F. ALIGNMENT

Signal Input	Point of Input	Adjustments	Comments
1.		Band width adjustment coupling condenser	Turn (C-78) in until tight, then open approximately 1/16 of a turn.
2. 44 to 50 MC Sweep	Antenna terminals	(L-8), (C-70), (C-67)	Depress band No. 1 push button. Set tuning control to mid-rotation. Adjust L-8 until curve is centered between maximum horizontal sweep points. Adjust C-70 and C-67 for maximum amplitude. See Fig. 6, curve 3.
3. 50 to 56 MC Sweep	Antenna terminals	(L-9), (C-71), (C-68)	Depress band No. 2 push button. Leave tuning control at mid-rotation point. Adjust L-9 for centering; C-71 and C-68 for maximum amplitude. See Fig. 6, curve 3.
4. 66 to 72 MC Sweep	Antenna terminals	(L-10), (C-72), (C-69)	Depress band No. 3 push button. Adjust L-10 for centering; C-72, C-69 for maximum amplitude. See Fig. 6, curve 3.

WAVE TRAP ALIGNMENT

1. 11.75 MC with 400 cycle modulation	Antenna terminals	Wave trap trimmer, C-95	Adjust for minimum signal response as seen on oscilloscope.

AUDIO I.F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope across R-128. See Fig. 1 or 4 arrow (4).
2. 7.75 to 8.75 MC Sweep	Converter grid, 6F8G	Iron cores of 4th audio I.F. transformer T-9	Align for maximum amplitude. See Fig. 6, curve 4.
3. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 3rd audio I.F. transformer T-8	Align for maximum amplitude. See Fig. 6, curve 4.
4. 7.75 to 8.75	Converter grid, 6F8G	Iron cores of 2nd audio I.F. transformer L-12	Align for maximum amplitude. See Fig. 6, curve 4.

GENERAL ELECTRIC CO.

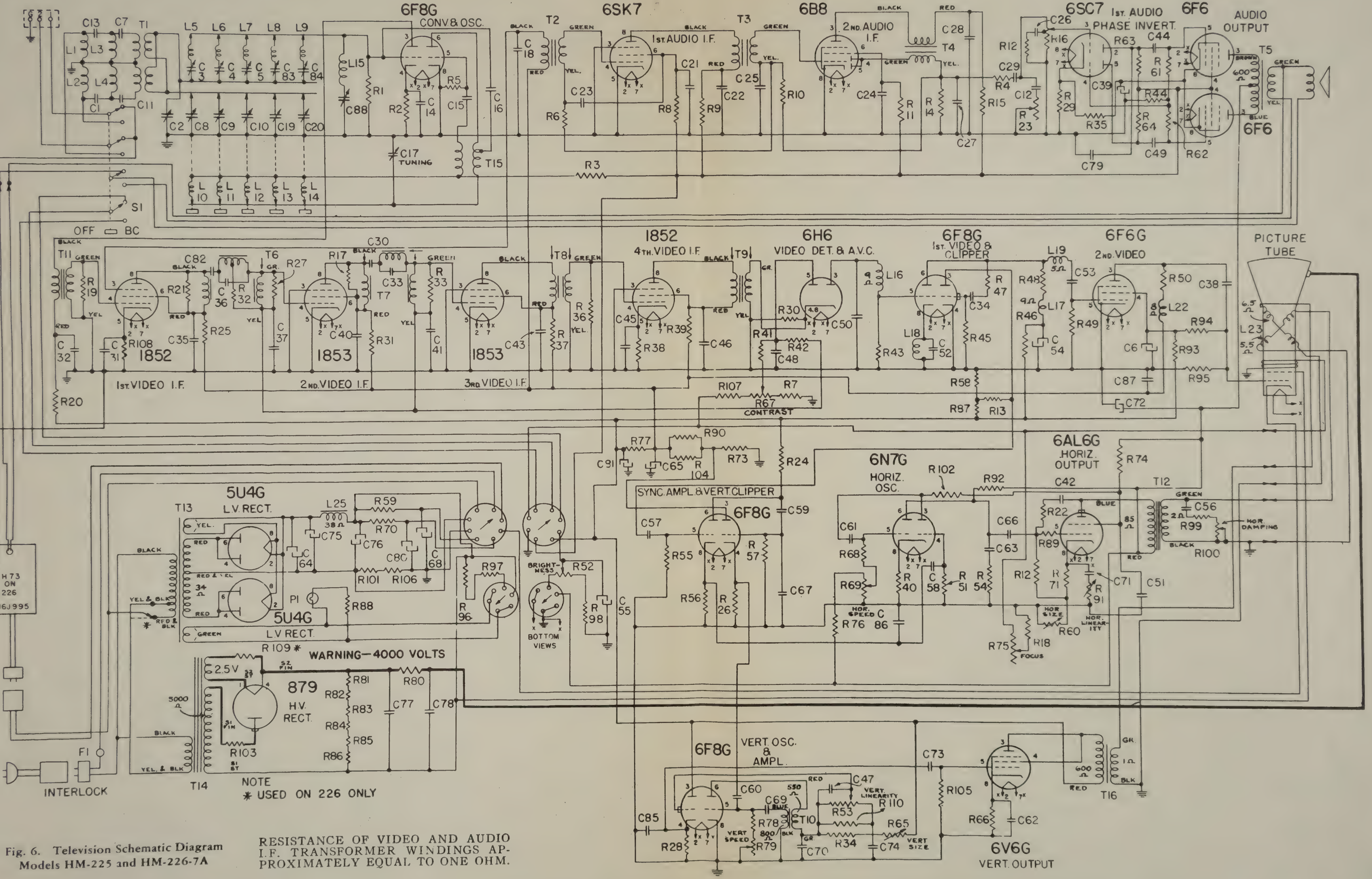


Fig. 6. Television Schematic Diagram
Models HM-225 and HM-226-7A

RESISTANCE OF VIDEO AND AUDIO I.F. TRANSFORMER WINDINGS APPROXIMATELY EQUAL TO ONE OHM.

Tubes

Television	
Converter-Oscillator	GE-6F8G
1st Audio I.F. Amplifier	GE-6SK7
2nd Audio I.F. Amplifier	GE-6B8
Audio Amplifier and Phase Inverter	GE-6SC7
Audio Output	(2)GE-6F6
1st and 4th Video I.F. Amplifier	(2)GE-1852/6AC7
2nd and 3rd Video I.F. Amplifier	(2)GE-1853/6AB7
Video Détector and AVC	GE-6H6
1st Video Amplifier and Sync. Clipper	GE-6F8G
2nd Video Amplifier	GE-6F6G
Sync. Amplifier and Vertical Clipper	GE-6F8G
Vertical Oscillator and Amplifier	GE-6F8G
Horizontal Oscillator	GE-6N7G
Vertical Output	GE-6V6G
Horizontal Output	GE-6AL6G
Low Voltage Rectifier	(2)GE-5U4G
High Voltage Rectifier	GE-879/2X2
Picture Tube (HM-225)	GE-MW-22-2
Picture Tube (HM-226-7A)	GE-MW-31-3

Intermediate Frequencies

Television Video (Picture)	12.75 M.C.
Television Audio	8.25 M.C.
Radio	455 K.C.

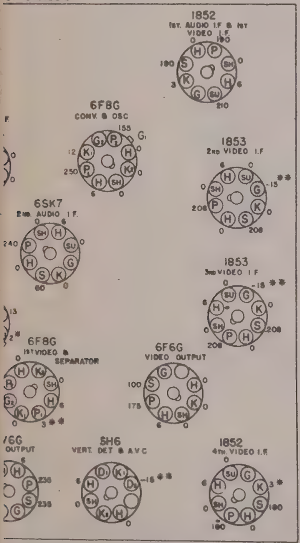
Maximum Electrical Output

Television Audio	10 Watts
Radio Audio	5 Watts

ed in both models)
........44–50 M.C.
........50–56 M.C.
........66–72 M.C.
........78–84 M.C.
........84–90 M.C.

........Continuously variable
........4-position

OF CHASSIS



SOCKET TERMINAL AND CHASSIS
MAXIMUM COUNTERCLOCKWISE EXCEPT VOLUME
AXIMUM VOLUME

000 OHMS PER. VOLT METER
00 OHMS PER VOLT METER

IEW OF CHASSIS

on Socket Voltages

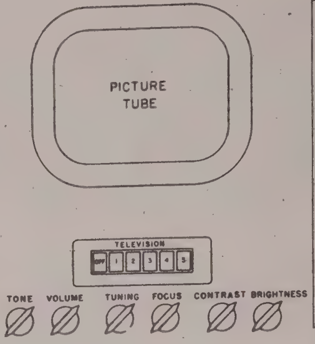


Fig. 1. Front Control Location
Model HM-225

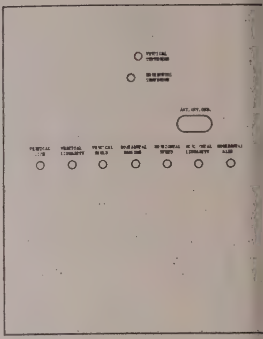


Fig. 3. Rear Control Location
Model HM-225

Picture Size

Model	HM-225	HM-226-7A
Height	5¾ inches	7½ inches
Width	7¾ inches	10 inches

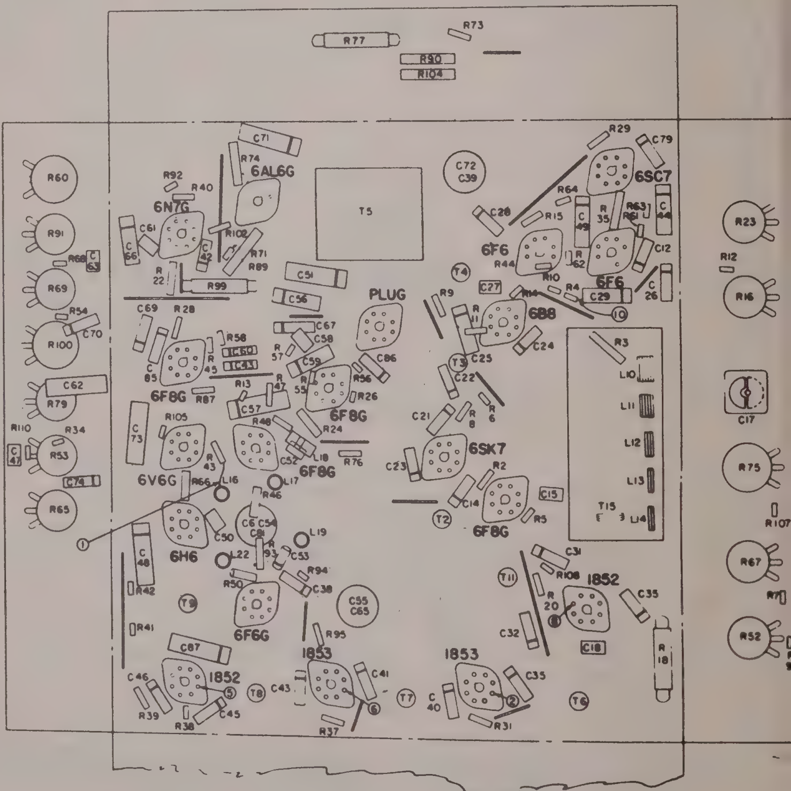


Fig. 5. Television Chassis Parts Layout
Models HM-225 and HM-226-7A

MODEL HJ1205
Chassis Wiring, Gain

GENERAL ELECTRIC CO.
SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains ‡
  (a) Antenna Post to Converter Grid
    Band "B" (Beam-a-Scope connected)*—3 at 1000 KC
    Band "C" (Beam-a-Scope disconnected)**—3 at 4 MC
    Band "D" (Beam-a-Scope disconnected)**—3 at 18 MC
  (b) Converter Grid to 1st 6SK7 Grid . . 30 at 455 KC
  (c) 1st 6SK7 Grid to 2nd 6SK7 Grid . . . 6 at 455 KC
  (d) 2nd 6SK7 Grid to 6H6 Det. Plate . . 70 at 455 KC

‡ Variations of +10%, −20% permissible.
* Use I.R.E. dummy antenna.
**Use 70 mmf. capacitor between signal generator and antenna post.

(2) A 400-cycle signal of .04 volts across volume control will give ½-watt speaker output.‡ (Volume Control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.
Band "B" 6.5 volt
Band "C" 7 volts
Band "D" 2.8 volt

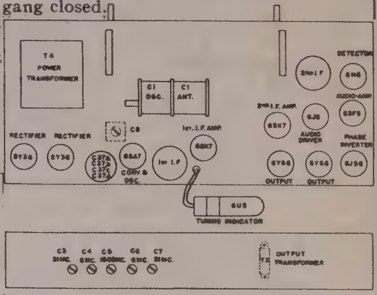


Fig. 1. Trimmer Location

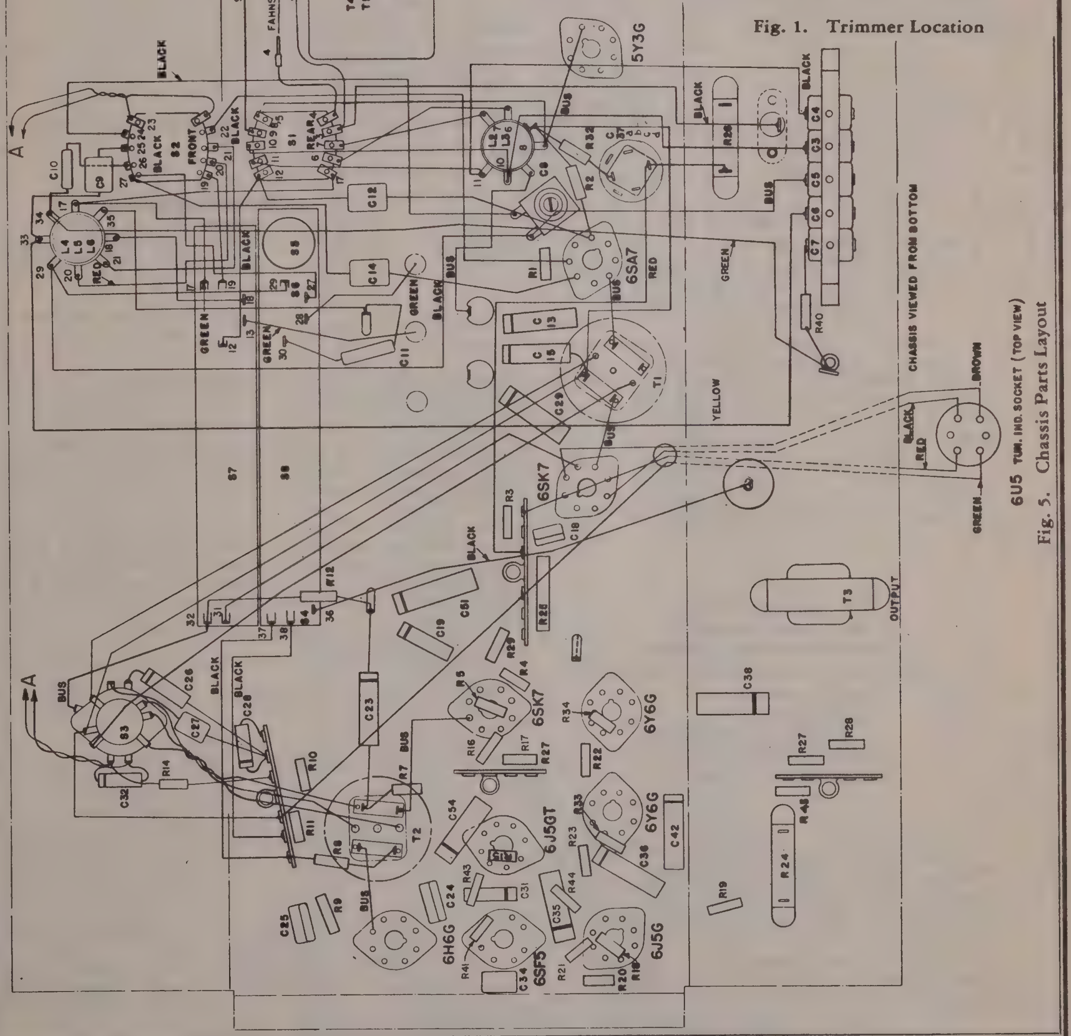


Fig. 5. Chassis Parts Layout

MODELS HM225,HM226-7A
Voltage,Trimmers,Socket,Chassis
Controls, Notes

GENERAL ELECTRIC CO.

ANTENNA

In general, the television antenna should be of the dipole type located as high as is practical and in an area where the horizon in the direction of the television transmitter is not obstructed by buildings or structures. A noticeable gain in signal strength will be obtained as antenna height is increased. Since television radiation reacts similarly to light waves, reflection problems arise which often modify otherwise ideal installation locations. Consideration must also be given noise sources within buildings, or ignition noises from vehicles on adjacent streets. It is usually best to locate the dipole antenna on the side of the building away from the street thus allowing the building to shield the antenna from ignition noises.

The dipole should be erected with arms parallel to the ground and at right angles to the direction of the television station. If noise or reflection interference exist it may be better to point the dipole arms in the direction of the interference.

Noise interference and poor signal strength may dictate the use of a reflector. A reflector will increase the signal strength appreciably as well as increase the horizontal directivity.

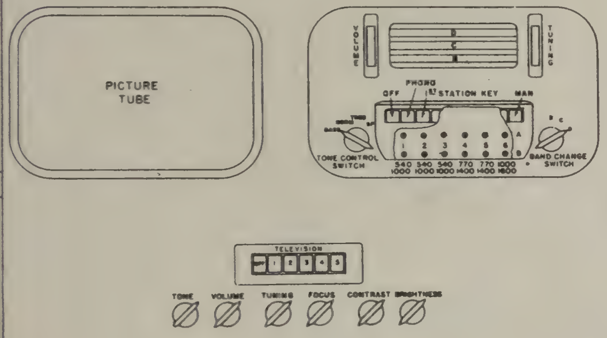


Fig. 2. Front Control Location
Model HM-226-7A

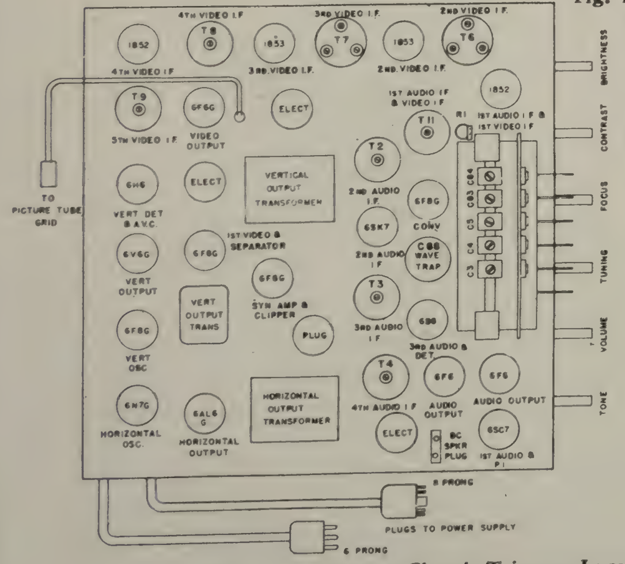


Fig. 7. Television Chassis Trimmer Location
Models HM-225 and HM-226-7A

General Electric Television Receiver, Model HM-225, is a console type, 22-tube, superheterodyne receiver equipped with a full magnetic, short, 9-inch picture tube. The rectifier-power supply is on a separate chassis mounted in the lower cabinet compartment with the speaker.

General Electric Television and Radio Receiver, Model HM-226-7A, is a console type instrument using the same television receiver as the Model HM-225 with minor alterations for use in conjunction with a 7-tube radio receiver. Model HM-226-7A is equipped with a full magnetic, short, 12-inch picture tube.

Additional design features include iron-core I.F. tuning, automatic contrast control, automatic brightness control, automatic tone compensation, automatic volume control and a constant high-gain antenna coupling circuit.

SERVICE DATA

Electrical Specifications

Model	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
HM-225	115–125	60	300
HM-226-7A	115–125	60	300 (Television) 75 (Radio)

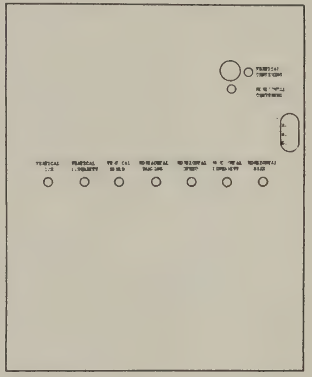
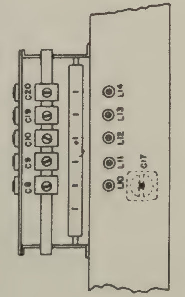


Fig. 4. Rear Control Location
Model HM-226-7A



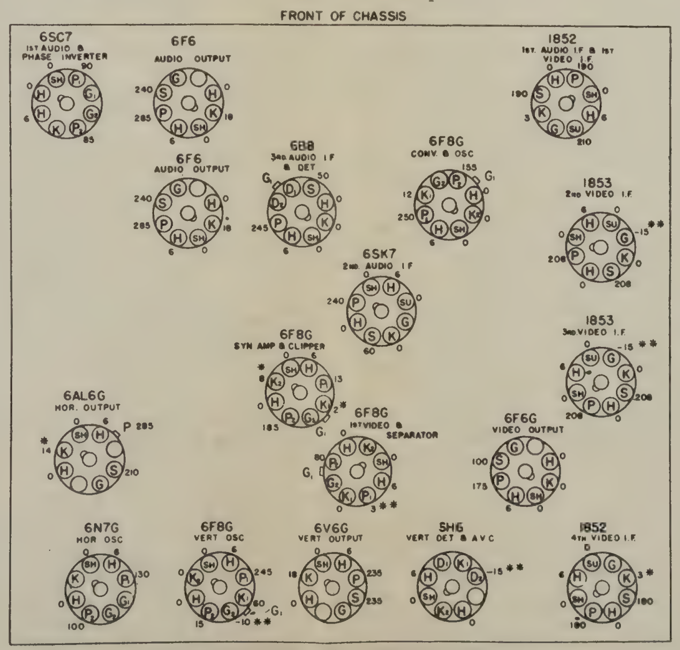
Tuning Frequency Range

Television Receiver (used in both models)

Band No. 1	44–50 M.C.
Band No. 2	50–56 M.C.
Band No. 3	66–72 M.C.
Band No. 4	78–84 M.C.
Band No. 5	84–90 M.C.

Tone Control

Televison Audio	Continuously variable
Radio Audio	4-position



ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS.
ALL FRONT PANEL CONTROLS TURNED MAXIMUM COUNTERCLOCKWISE EXCEPT VOLUME CONTROL WHICH IS ROTATED TO MAXIMUM VOLUME.
LINE VOLTAGE – 115
* MEASURED ON 100 VOLT SCALE OF 1000 OHMS PER VOLT METER
** MEASURED ON 250 VOLT SCALE OF 1000 OHMS PER VOLT METER

BOTTOM VIEW OF CHASSIS

Fig. 9. Television Socket Voltages

Tubes

Television

Converter-Oscillator	GE-6F8G
1st Audio I.F. Amplifier	GE-6SK7
2nd Audio I.F. Amplifier	GE-6B8
Audio Amplifier and Phase Inverter	GE-6SC7
Audio Output	(2)GE-6F6
1st and 4th Video I.F. Amplifier	(2)GE-1852/6AC7
2nd and 3rd Video I.F. Amplifier	(2)GE-1853/6AB7
Video Detector and AVC	GE-6H6
1st Video Amplifier and Sync. Clipper	GE-6F8G
2nd Video Amplifier	GE-6F6G
Sync. Amplifier and Vertical Clipper	GE-6F8G
Vertical Oscillator and Amplifier	GE-6F8G
Horizontal Oscillator	GE-6N7G
Vertical Output	GE-6V6G
Horizontal Output	GE-6AL6G
Low Voltage Rectifier	(2)GE-5U4G
High Voltage Rectifier	GE-879/2X2
Picture Tube (HM-225)	GE-MW-22-2
Picture Tube (HM-226-7A)	GE-MW-31-3

Intermediate Frequencies

Television Video (Picture)	12.75 M.C.
Television Audio	8.25 M.C.
Radio	455 K.C.

Maximum Electrical Output

Television Audio	10 Watts
Radio Audio	5 Watts

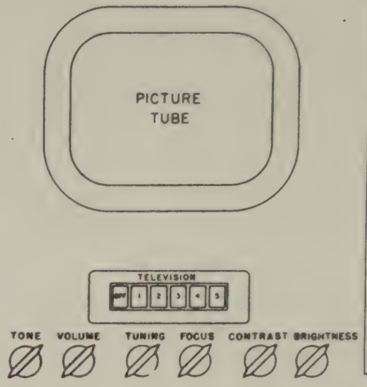


Fig. 1. Front Control Location
Model HM-225

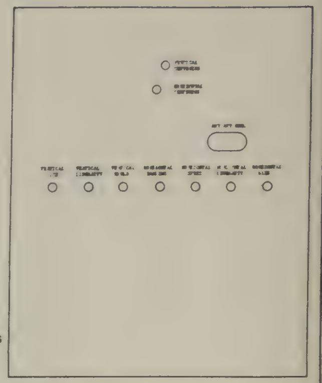


Fig. 3. Rear Control Location
Model HM-225

Picture Size

Model	HM-225	HM-226-7A
Height	5¾ inches	7½ inches
Width	7¾ inches	10 inches

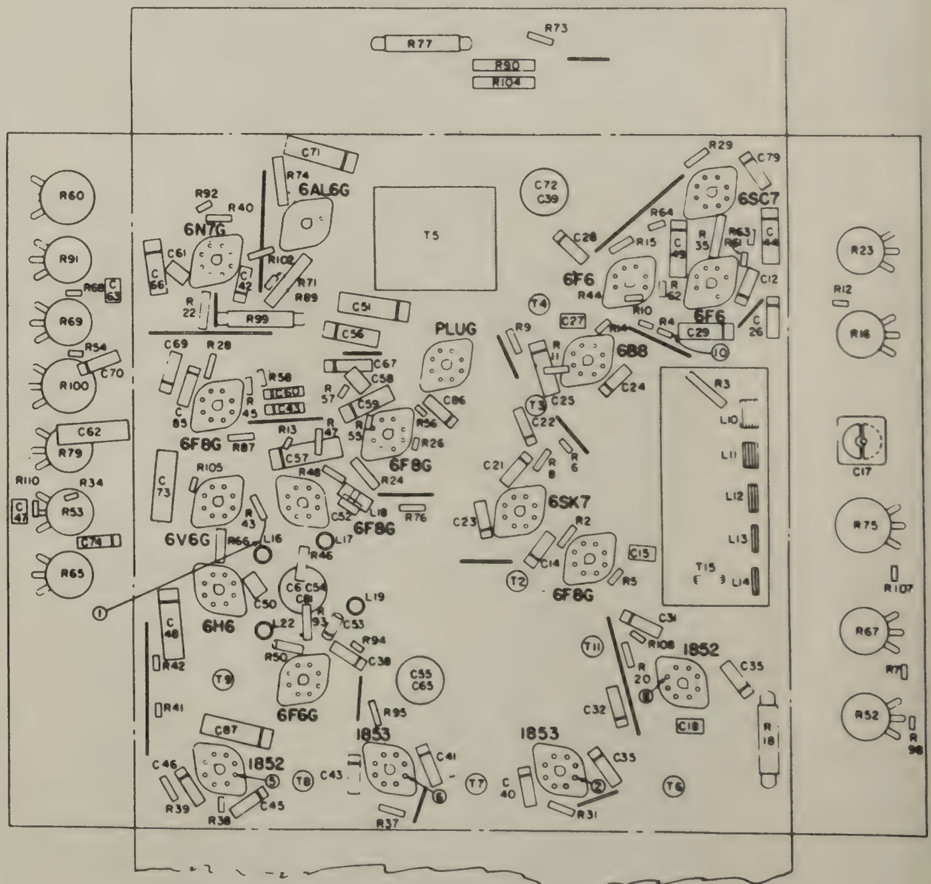
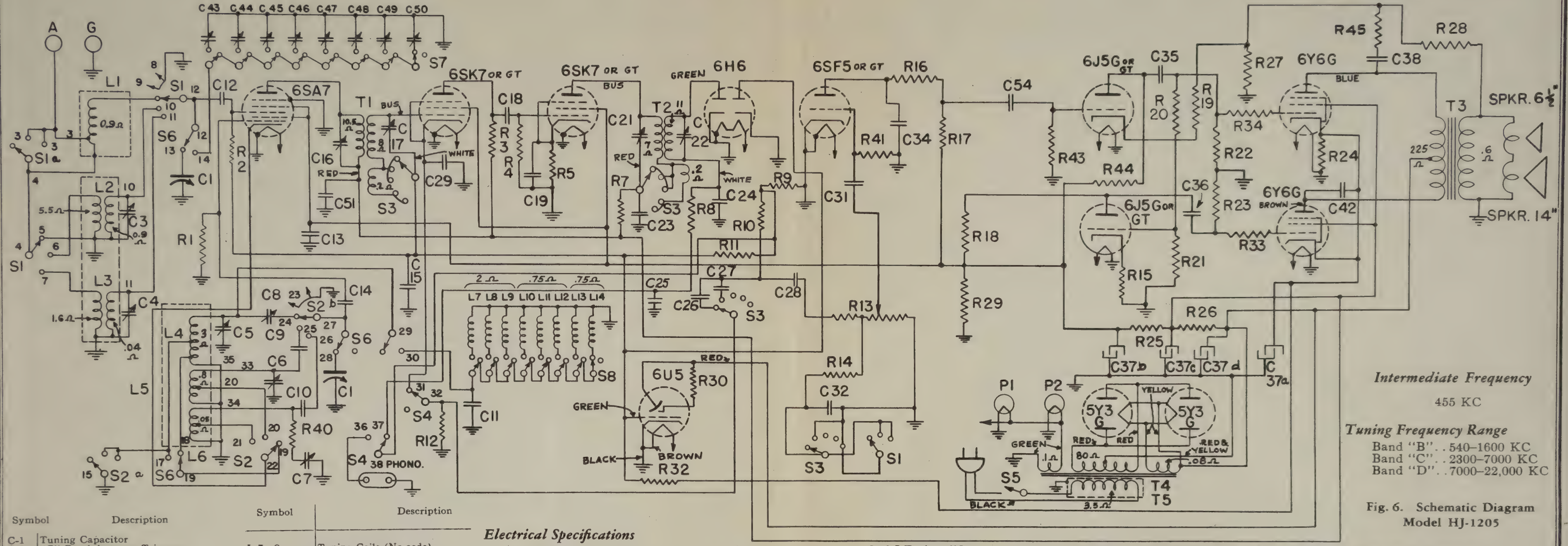


Fig. 5. Television Chassis Parts Layout
Models HM-225 and HM-226-7A

GENERAL ELECTRIC CO.

MODEL HJ1205
Schematic,Voltage,Socket,Coils



Intermediate Frequency

455 KC

Tuning Frequency Range

Band "B" . . 540–1600 KC
Band "C" . . 2300–7000 KC
Band "D" . . 7000–22,000 KC

Fig. 6. Schematic Diagram
Model HJ-1205

Symbol	Description
C-1	Tuning Capacitor
C-3	"C" Band Antenna Trimmer
C-4	"D" Band Antenna Trimmer
C-5	"B" Band Oscillator Trimmer
C-6	"C" Band Oscillator Trimmer
C-7	"D" Band Oscillator Trimmer
C-8	"B" Band Padder
C-9	1600 mmf. Mica Capacitor ±5%
C-10	4300 mmf. Mica Capacitor ±5%
C-11	750 mmf. Silvered Mica Capacitor ±5%
C-12	150 mmf. Mica Capacitor
C-13	0.1 mfd. Paper Capacitor
C-14	47 mmf. Mica Capacitor
C-15	0.1 mfd. Paper Capacitor
C-18	47 mmf. Mica Capacitor
C-19	.05 mfd. Paper Capacitor
C-23	.05 mfd. Paper Capacitor
C-24	100 mmf. Mica Capacitor
C-25	47 mmf. Mica Capacitor
C-26	.001 mfd. Paper Capacitor
C-27	470 mmf. Mica Capacitor
C-28	.01 mfd. Paper Capacitor
C-29	.05 mfd. Paper Capacitor
C-31	.01 mfd. Paper Capacitor
C-32	.003 mfd. Paper Capacitor
C-34	47 mmf. Mica Capacitor
C-35	.05 mfd. Paper Capacitor
C-36	.05 mfd. Paper Capacitor
C-37a	20 mfd. 25 V. Dry Electrolytic
C-37b	20 mfd. 300 V. Dry Electrolytic
C-37c	20 mfd. 300 V. Dry Electrolytic
C-37c	40 mfd. 350 V. Dry Electrolytic
C-38	.01 mfd. 1000 V. Paper Capacitor
C-42	.01 mfd. 1000 V. Paper Capacitor
C-43	7-65 mmf. Antenna Trimmer
C-44	7-65 mmf. Antenna Trimmer
C-45	20-180 mmf. Antenna Trimmer
C-46	20-180 mmf. Antenna Trimmer
C-47	20-180 mmf. Antenna Trimmer
C-48	100-490 mmf. Antenna Trimmer
C-49	100-490 mmf. Antenna Trimmer
C-50	100-490 mmf. Antenna Trimmer
C-51	0.1 mfd. Paper Capacitor
C-54	.05 mfd. Paper Capacitor
L-1	Beam-a-Scope
L-2	"C" Band Antenna Coil
L-3	"D" Band Antenna Coil
L-4	"B" Band Oscillator Coil
L-5	"C" Band Oscillator Coil
L-6	"D" Band Oscillator Coil

Symbol	Description
L-7, -8	Tuning Coils (No code)
L-9, -10, -11	Tuning Coils (Code—Red)
L-12, -13, -14	Tuning Coils (Code—Blue)
R-1	22,000 ohms, Carbon Resistor
R-2	1.0 megohm, Carbon Resistor
R-3	6800 ohms, Carbon Resistor
R-4	47,000 ohms, Carbon Resistor
R-5	330 ohms, Carbon Resistor
R-7	1000 ohms, Carbon Resistor
R-8	47,000 ohms, Carbon Resistor
R-9	220,000 ohms, Carbon Resistor
R-10	47,000 ohms, Carbon Resistor
R-11	2.2 megohms, Carbon Resistor
R-12	470 ohms, Carbon Resistor
R-13	2 megohm Volume Control
R-14	150,000 ohms, Carbon Resistor
R-15	3300 ohms, Carbon Resistor
R-16	47,000 ohms, Carbon Resistor
R-17	150,000 ohms, Carbon Resistor
R-18	47,000 ohms, Carbon Resistor
R-19	3300 ohms, Carbon Resistor
R-20	1.5 megohms, Carbon Resistor
R-21	270,000 ohms, Carbon Resistor
R-22	220,000 ohms, Carbon Resistor
R-23	220,000 ohms, Carbon Resistor
R-24	100 ohms, 3.4 W. Wire Wound
R-25	2400 ohms, or 3300 ohms 2 W. Resistor Carbon
R-26	2200 ohms, 2.6 W. Wire Wound
R-27	56 ohms, Carbon Resistor
R-28	100 ohms, Carbon Resistor
R-29	47,000 ohms, Carbon Resistor
R-30	1.0 megohm, Carbon Resistor
R-32	5.6 megohms, Carbon Resistor
R-33	1000 ohms, Carbon Resistor
R-34	1000 ohms, Carbon Resistor
R-40	33 ohms, Carbon Resistor
R-41	4.7 megohms, Carbon Resistor
R-43	220,000 ohms, Carbon Resistor
R-44	150,000 ohms, Carbon Resistor
R-45	2200 ohms Carbon Resistor
P-1, -2	Pilot Lights, Mazda No. 44
S-1	Antenna Band Switch
S-2	Oscillator Band Switch
S-3	Tone Switch
S-4	Phono Switch
S-5	Power Switch
S-6	Manual Switch
S-7	Antenna Section Touch Tuning Switch
S-8	Oscillator Section Touch Tuning Switch

Electrical Specifications

Rating "A"—110–125 volts, 50–60 cycles, 130 watts
Rating "C"—110–125 volts, 25–60 cycles, 130 watts

Electrical Power Output

Undistorted	8.5 watts
Maximum	10 watts

Tubes

Converter and Oscillator	GE-6SA7
1st I.F. Amplifier	GE-6SK7/6SK7GT
2nd I.F. Amplifier	GE-6SK7/6SK7GT
Detector and A.V.C.	GE-6H6
Audio Amplifier	GE-6SF5/6SF5GT
Audio Driver	GE-6J5G/6J5GT
Audio Inverter	GE-6J5G/6J5GT
Audio Power Amplifier	(2)GE-6Y6G
Tuning Indicator	GE-6U5
Rectifier	(2)GE-5Y3G
Dial Lamp	(4)Mazda No. 44

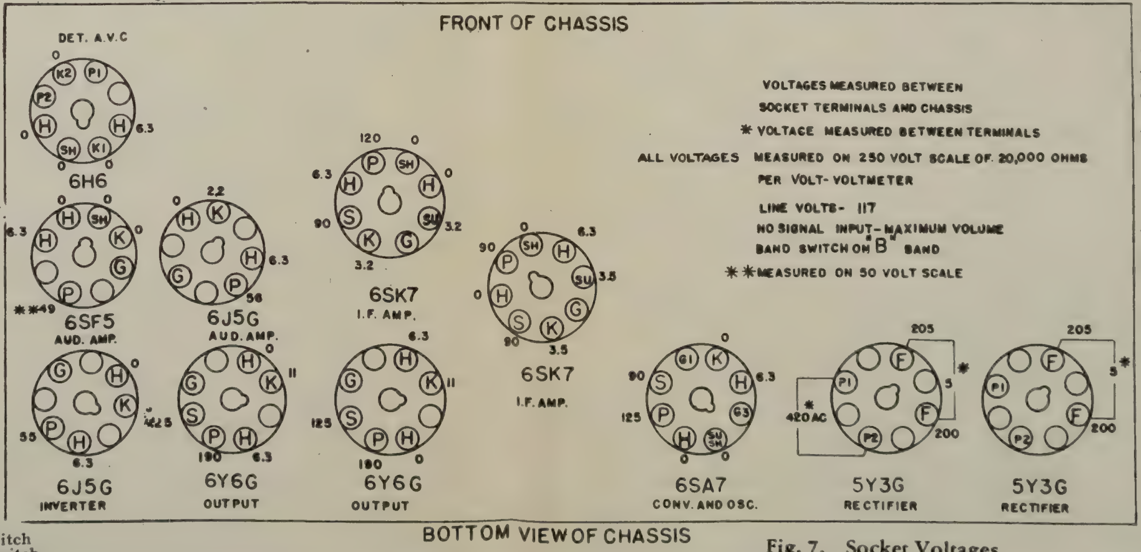


Fig. 7. Socket Voltages

Loud-speakers—"Alnico" Magnetic Dynamic

Outside Cone Diameters	12 in. and 6½ in.
Voice Coil Impedances	3.5 ohms

The voice coils are accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

Coil System

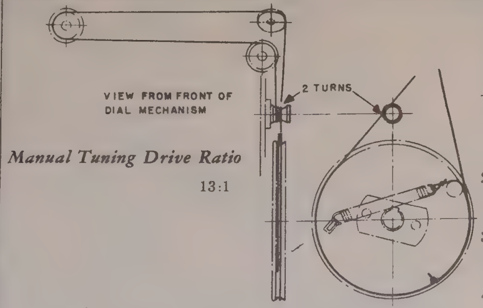
The "C" and "D" band antenna coils, L-2 and L-3 are wound on a single coil form as shown in Fig. 6. L-4, L-5 and L-6 compose the oscillator transformer for the "B" "C" and "D" bands. All switch points are numbered in Fig. 6 to facilitate in locating these switch points on the pictorial wiring diagram, Fig. 5.

The table opposite gives the coils in use for the various positions of the band switch.

Band-switch Position	Antenna Primary	Antenna Secondary	Oscillator Primary	Oscillator Secondary
Band "B"	Lower portion of L1	Upper portion of L1	Lower portion of L4	Upper portion of L4
Band "C"	L2 Primary (L1 Primary shorted)	L2 Secondary (Grid end of L1 to ground)	Lower portion of L5	Upper portion of L5 (High side of L4 to ground through R15. Mid tap of L4 to ground)
Band "D"	L3 Primary (L1 Primary shorted)	L3 Secondary (Grid end of L1 to ground. L2 secondary to ground)	Lower portion of L6	Upper portion of L6 (High side of L4 and L5 to groundthrough R15. Mid tap of L4 to ground)

MODEL HJ1205
Alignment,Drive Cord

GENERAL ELECTRIC CO.



Manual Tuning Drive Ratio

13:1

Fig. 3. Dial Drive Stringing Diagram

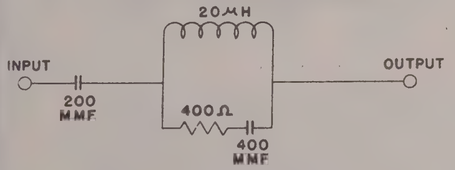
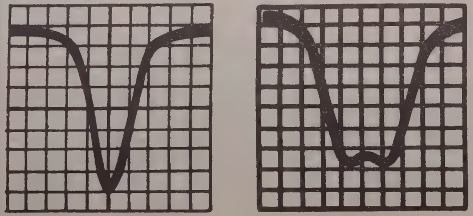


Fig. 4. I.R.E. Dummy Antenna

Alignment Procedure

The alignment procedure is given in table form on this and opposite pages. Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of input. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.



(a) Sharp Position (b) Expanded Position

Fig. 2. I.F. Curves Taken on G-E Oscilloscope OFM-1

I.F. ALIGNMENT WITH OSCILLOSCOPE*

	Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1.	Band B	455 KC and 30 KC Sweep	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—vertical input to ground and junction at R-8, R-9, and R-10. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "Bass" position is shown in Fig. 2a.
2.	Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3.	Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
4.	Band B	455 KC and 30 KC Sweep	Treble I	Converter 6SA7 Grid		The expanded curve taken with tone control at "Treble I" is shown in Fig. 2b. Excess sensitivity over "Bass" tone position indicates regeneration.

I.F. ALIGNMENT WITH OUTPUT METER *

	Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1.	Band B	455 KC Modulated	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. NOTE—Do not attempt alignment in the expanded position.
2.	Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3.	Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	All I.F. Trimmers	

* Use "dummy" antenna consisting of .05-mfd. capacitor between signal generator and point of input.

R.F. ALIGNMENT

1.	Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil.
2.	Band C	6 MC Modulated	Bass	Antenna Post**	Osc. (C-6) Ant. (C-3)	Set pointer to 6 MC mark and align (C-6). Peak (C-3) for maximum output.
3.	Band D	21 MC Modulated	Bass	Antenna Post**	Osc. (C-7) Ant. (C-4)	Set pointer to 21 MC mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the "D" band should be 910 KC below input signal. Example: 15 MC image 14.09 MC.
4.	Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Set dial pointer to 580 MC mark and tune in. signal with (C-8).
5.	Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Adjust (C-5) for maximum output in vicinity of 1500 KC while rocking gang condenser.
6.	Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Retrim (C-8).
7.	Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Repeak (C-5).

** Use a "dummy" antenna consisting of 70-mmf. capacitor between signal generator and point of input with "Beam-a-Scope" disconnected.

*** Use an I.R.E. "dummy" antenna as shown in Fig. 7 between signal generator and the point of input.

HAMMARLUND MFG. CO., INC.

CIRCUIT ARRANGEMENT

TWO-STAGE T.R.F. AMPLIFIER: For maximum sensitivity, high image ratio, and low noise level, the "SP-200" has two stages of tuned radio frequency amplification ahead of the mixer stage. The antenna input circuit is electrostatically shielded from the grid circuit of the first tube. This permits the use of low impedance transmission lines between the antenna and the receiver with a minimum of noise pick-up. When lines or lead-ins of the two wire type having an impedance of approximately 100 ohms are employed, no matching transformer is necessary. The input impedance of the receiver is approximately 112 ohms. The two tuned R.F. stages are employed on all bands covered by the receiver. Both inductive and capacitive trimming are employed in all signal frequency circuits.

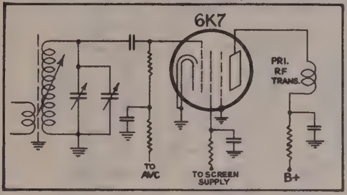


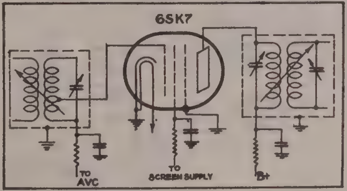
FIG. 2—Circuit diagram of first T.R.F. amplifier showing the electrostatic shield which reduces noise pickup.

OSCILLATOR AND MIXER: Two separate tubes are employed in the oscillator and mixer stages to improve stability and prevent pulling. There is a very respectable gain in the mixer stage which tends to minimize any noise that may be generated in the rest of the receiver. In fact, the gain in this stage is so great that the noise contributed by the following stages is negligible.

BAND SPREAD: In order to maintain relatively uniform band spread in the various tuning ranges of the receiver, every gang of the band spread condenser is subdivided into three sections. This allows the use of a proper sized condenser for maximum spread regardless of the position of the wave change switch. There are approximately 85 degrees spread for each of the important amateur bands, and there is also a corresponding spread over the other frequencies outside the amateur band.

CRYSTAL FILTER UNIT: The crystal filter used in the "Super-Pro" is an exclusive HAMMARLUND development and will be found only in HAMMARLUND receivers. This new filter has five ranges of selectivity varying from broad for phone reception, to knife-edge selectivity for single signal code reception. There are three positions for voice reception, and two for C.W. telegraph. The output of the filter is relatively constant over the entire selectivity range and has, therefore, little effect on "S" meter readings. Selectivity in the crystal filter circuit is not varied by detuning the load circuit. All circuits remain exactly in tune and selectivity is varied by changing the "Q" of the load circuit. This, together with the balanced phasing condenser, eliminates interlocking of controls and changes in filter gain when the selectivity is varied. Every precaution has been taken to effectively shield all circuits so that there is no feed-back or instability to impair the performance on even the highest frequencies. Stability is further insured by employing isolating resistor networks in every circuit that offers the slightest path for feed-back.

FIG. 3—Typical I.F. amplifier circuit with variable selectivity characteristics. Each circuit has isolating resistor and condenser to assure stability.



I.F. AMPLIFIER: There are three I.F. amplifier stages in the "SP-200." This elaborate amplifier is required in order to obtain a very high degree of selectivity. Special transformers are employed to hold down the gain per stage in order to maintain a high degree of selectivity and maximum stability. The band width of the I.F. amplifier is controlled by a cam arrangement which varies the coupling in two of the I.F. transformers. The I.F. channel is variable from 16 kc. down to 3 kc. with the crystal filter out of the circuit. The crystal filter, when in the circuit, is variable down to better than 100 cycles. Thus, full range selectivity is available. This wide degree of variable selectivity permits the operator to select the band width providing highest quality reproduction with a minimum of interference. In the "SP-200," the band width can be adjusted to suit operating conditions.

AVC SYSTEM: The automatic volume control system in the "SP-200" is extremely efficient. Both R.F. stages and the first two I.F. stages are automatically controlled by the incoming signal in order to compensate for variation in signal strength due to fading. This system is very fast in operation and will hold a rapidly fading signal to a relatively constant output. Special amplifier and rectifier stages are employed in order to obtain maximum efficiency.

BEAT FREQUENCY OSCILLATOR: The beat frequency oscillator circuit is designed to effectively heterodyne signals of various magnitudes. This oscillator is of the electron coupled type and is thoroughly isolated from the rest of the receiver. Careful selection of circuit values has resulted in excellent stability.

SECOND DETECTOR: A 6H6 connected in a half-wave rectifier circuit is employed for the second detector. The proper selection of circuit values in this circuit has resulted in a minimum of distortion. This circuit is more or less conventional and complete technical details are available by referring to the diagram.

NOISE LIMITER: The noise limiter in the "SP-200" is the latest development in audio peak limiting devices. It is designed to work with or without the AVC system and will follow variations in incoming signal strength. It is automatic and needs no adjustment. The limiter is designed to cut off interference of the automobile ignition nature at a point equal to approximately 100% modulation of the carrier of the signal being received. This provides for reception of 100% modulated signals without seriously affecting the quality of the voice or music. It must be remembered that this limiter will only limit interference of very short pulse duration. Such interference, as caused by auto ignition systems and similar disturbances will be reduced to a negligible quantity.

A.F. AMPLIFIER: The audio frequency channel of the series 200 "Super-Pro," is designed for high quality reproduction. The first stage is a 6C5 triode voltage amplifier. The second stage is a single 6F6 triode connected and used as a driver for the output amplifier which is a pair of 6F6's operated in push-pull, class AB. The rated output of this amplifier is approximately 14 watts. The fine quality of the A.F. amplifier in the "Super Pro" is particularly apparent when the band width control is set in the wide position. There is no tone control in this amplifier and none is needed. The A.F. portion of the "Super-Pro" will respond equally well to both low and high frequencies. Attenuation of the higher frequencies is accomplished by narrowing the I.F. band width. In this manner, the band width control serves to control tone.

POWER SUPPLY: The power supply for the "SP-200" is an extra heavy duty unit designed to furnish filament plate and grid bias voltages. The power supply is a separate unit connected to the receiver by a flexible cable. Being a separate unit, the power supply introduces a minimum of hum in the receiver and also reduces the overall temperature rise of the receiver, and thus permits better stability. The high voltage rectifier in the power supply is a 5Z3 connected in a full wave circuit with a two-section filter consisting of 32 mf. capacity and a 15 henry filter choke. The field of the speaker serves as a second filter choke in standard model receivers. In special models, a choke is mounted in the power supply to take the place of the speaker field. Grid bias for the entire receiver is supplied by an 80 rectifier tube operating from a tap on the high voltage secondary. The C-Bias supply also has a multi-section filter consisting of three 8 mf. condensers, and three resistors. The primary of the standard power supply has three taps for operation on 105, 115, and 125 volt power lines. A fuse is also provided to guard against damage in cases of overload.

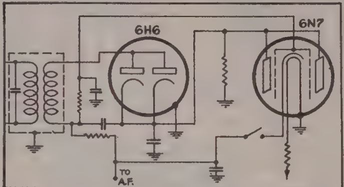


FIG. 4—"Super-Pro" noise limiter designed to reduce automobile ignition interference and other disturbances having similar characteristics.

CALIBRATION: The main tuning dial of the "Super-Pro" is calibrated for all frequencies covered by the receiver. In the process of manufacture, every effort is made to maintain accuracy and, as a result, the accuracy of the calibration is guaranteed to be within ½ of 1% of the highest frequency of the band in use. When using the calibrated dial, it should be remembered that the figures are intended as a tuning guide and not for frequency measuring purposes.

"S" METER": The "S" meter in the "Super-Pro" was designed to provide greatest satisfaction to the operator. It is, in no way, limited by fixed, factory-made adjustments. A variable control on the rear of the chassis allows the operator to set the maximum reading of the meter to conform with his particular system of reporting signal strength in "S" numbers. The meter can be adjusted to read "S-9" on any signal from 10 to 10,000 microvolts. It is adjusted at the factory to indicate "S-9" on a 25 microvolt signal, but as pointed out above, this can readily be changed. Another feature is the centrally located scale. This is much more convenient than a scale that starts at the extreme left of the meter dial, and brings the indicating pointer well out in the clear. Special meter design has also eliminated the possibility of damage due to an extremely strong signal.

SELECTIVITY

The selectivity curves shown are representative curves made on a sample receiver and will hold reasonably true for all models. These curves were taken with the signal generator operating at the intermediate frequency and these curves will maintain throughout the entire range of the receiver, except at the very low frequency end of the broadcast band where the R.F. selectivity has a very slight narrowing effect. The selectivity of the "Super-Pro" is divided into two distinct ranges. In Fig. 5, appear the wide band curves. These curves were made at 4 different positions of the band width control. However, the actual selectivity obtainable is continuously variable between curves 3 and 16. Particular attention should be paid to the steepness of the sides of these curves. They are relatively straight and do not have the usual flare at the outer limits. This means that there will be less background interference from stations operating either higher or lower in frequency than the station being received. The advantage of having continuously variable selectivity over relatively wide limits in a receiver is readily apparent when one considers that the operator has absolute control and can adjust the receiver to compensate for almost any degree of interference that may be present. For example, when interference is not serious, the band width control can be set to the widest position and permit high quality reproduction of either voice or music. In other cases where interference is present, the band width control can be adjusted to the point where selectivity is just sufficient to eliminate interference. This adjustment provides maximum fidelity with a minimum of interference. It also permits the operator to utilize the extreme sensitivity of the "Super-Pro." Even in crowded bands, the selectivity can be adjusted to a point where interference is not bothersome and the sensitivity can be turned up to provide reception of extremely weak signals with marked clarity.

In Fig. 6, the variable selectivity crystal filter curves are illustrated. It will be noticed that the crystal filter fills in the gap very nicely between position "3" of the band width control and what would normally be maximum crystal selectivity for code reception. This variable selectivity crystal filter is an exclusive HAMMARLUND development and will be found only in a HAMMARLUND receiver. The crystal filter has five ranges of selectivity. The first three are intended for phone reception. The widest position of these, however, will permit good quality reception under conditions where interference would, in most cases, make reception impossible. Positions four and five are for CW code reception and provide the usual single signal response.

SENSITIVITY

The sensitivity of the "Super-Pro" is exceptional and, in the majority of cases, limited only by noise picked up by the antenna system. Internal receiver noise has been held down to an extremely low value so that the limiting factors in the receiver itself are the noises originating in the first tube and its associated tuned circuit. The gain in the R.F. amplifier is adjusted so as to reduce the effective noise originating in the following tubes and tuned circuits. The result of this proper circuit design is a very

GENERAL ELECTRIC CO.

SPECIAL SERVICE INFORMATION

MODEL HJ1205
Chassis Wiring, Gain

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains ‡

(a) Antenna Post to Converter Grid
Band "B" (Beam-a-Scope connected)*—3 at 1000 KC
Band "C" (Beam-a-Scope disconnected)**—3 at 4 MC
Band "D" (Beam-a-Scope disconnected)**—3 at 18 MC

(b) Converter Grid to 1st 6SK7 Grid . . 30 at 455 KC
(c) 1st 6SK7 Grid to 2nd 6SK7 Grid . . . 6 at 455 KC
(d) 2nd 6SK7 Grid to 6H6 Det. Plate . . 70 at 455 KC

(2) A 400-cycle signal of .04 volts across volume control will give ½-watt speaker output.‡ (Volume Control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.
Band "B" 6.5 volt
Band "C" 7 volts
Band "D" 2.8 volt

‡ Variations of +10%, −20% permissible.
* Use I.R.E. dummy antenna.
**Use 70 mmf. capacitor between signal generator and antenna post.

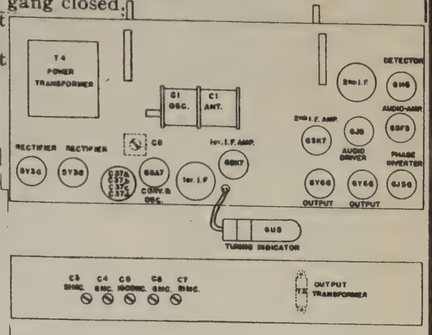


Fig. 1. Trimmer Location

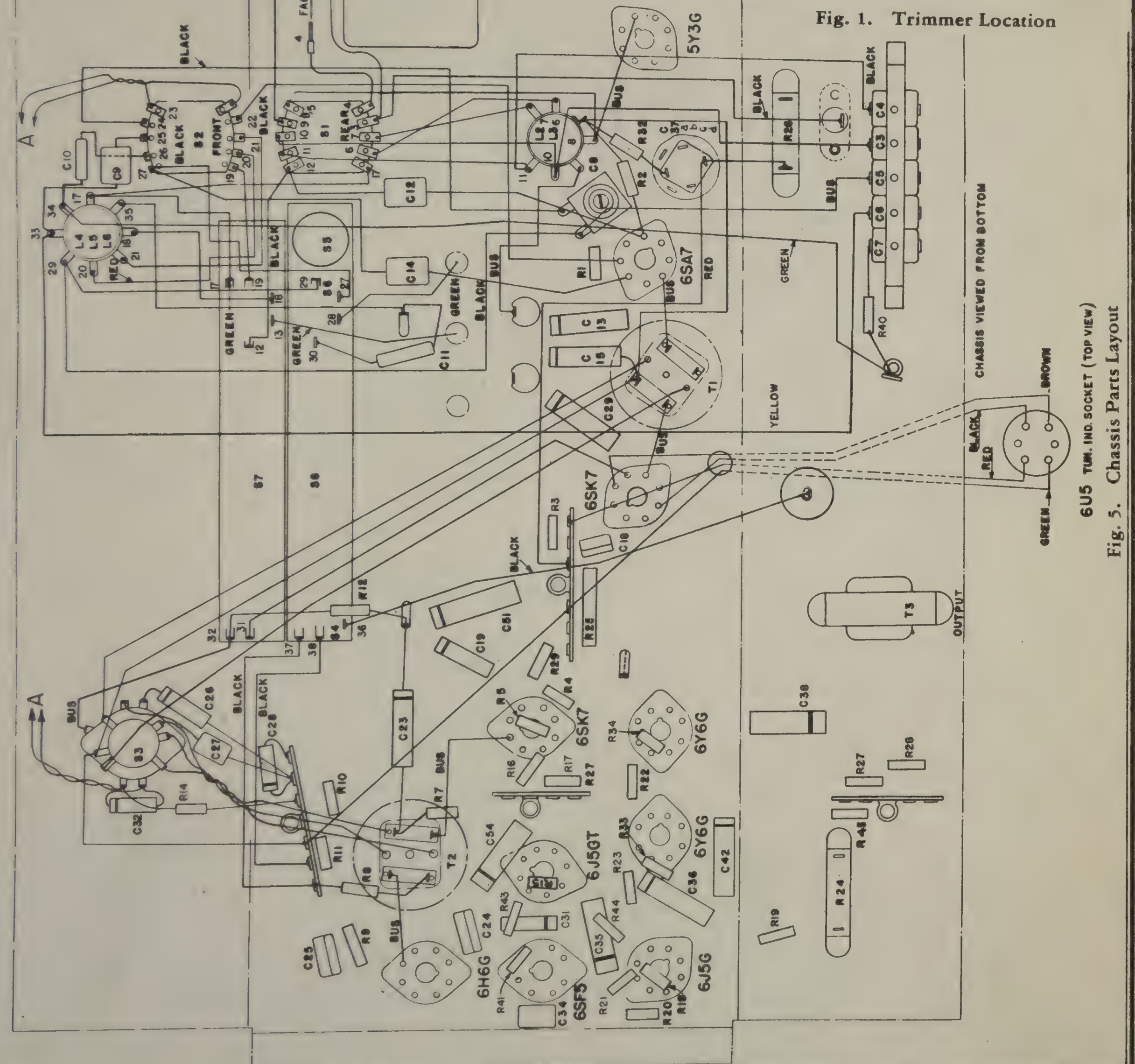


Fig. 5. Chassis Parts Layout

MODEL HJ1205
Alignment, Drive Cord

GENERAL ELECTRIC CO.

I.F. ALIGNMENT WITH OSCILLOSCOPE*

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B	455 KC and 30 KC Sweep	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—vertical input to ground and junction at R-8, R-9, and R-10. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "Bass" position is shown in Fig. 2a.
2. Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3. Band B	455 KC and 30 KC Sweep	Bass	Converter 6SA7 Grid	All I.F. Trimmers	
4. Band B	455 KC and 30 KC Sweep	Treble I	Converter 6SA7 Grid		The expanded curve taken with tone control at "Treble I" is shown in Fig. 2b. Excess sensitivity over "Bass" tone position indicates regeneration.

I.F. ALIGNMENT WITH OUTPUT METER *

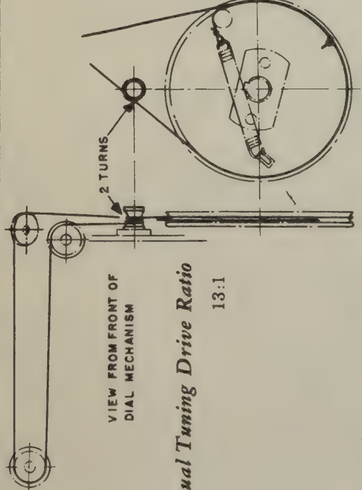
Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B	455 KC Modulated	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. NOTE—Do not attempt alignment in the expanded position.
2. Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3. Band B	455 KC Modulated	Bass	Converter 6SA7 Grid	All I.F. Trimmers	

* Use "dummy" antenna consisting of .05-mfd. capacitor between signal generator and point of input.

R.F. ALIGNMENT

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil.
2. Band C	6 MC Modulated	Bass	Antenna Post**	Osc. (C-6) Ant. (C-3)	Set pointer to 6 MC mark and align (C-6). Peak (C-3) for maximum output.
3. Band D	21 MC Modulated	Bass	Antenna Post**	Osc. (C-7) Ant. (C-4)	Set pointer to 21 MC mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the "D" band should be 910 KC below input signal. Example: 15 MC image 14.09 MC.
4. Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Set dial pointer to 580 MC mark and tune in signal with (C-8).
5. Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Adjust (C-5) for maximum output in vicinity of 1500 KC while rocking gang condenser.
6. Band B	580 KC Modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Retrim (C-8).
7. Band B	1500 KC Modulated	Bass	Antenna Post***	Osc. (C-5)	Repeak (C-5).

** Use a "dummy" antenna consisting of 70-mmf. capacitor between signal generator and point of input with "Beam-a-Scope" disconnected.
*** Use an I.R.E. "dummy" antenna as shown in Fig. 7 between signal generator and the point of input.



Manual Tuning Drive Ratio
13:1

Fig. 3. Dial Drive Stringing Diagram

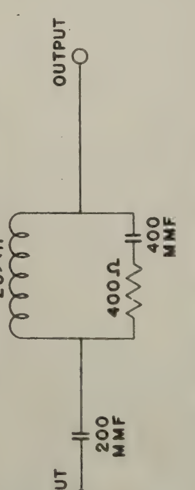
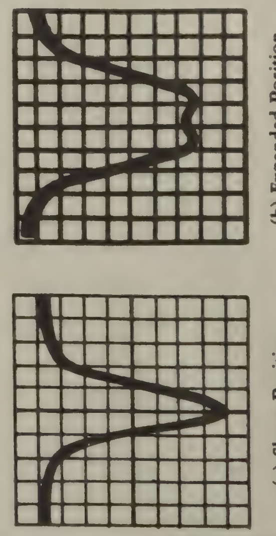


Fig. 4. I.R.E. Dummy Antenna

Alignment Procedure

The alignment procedure is given in table form on this and opposite pages. Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of input. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.

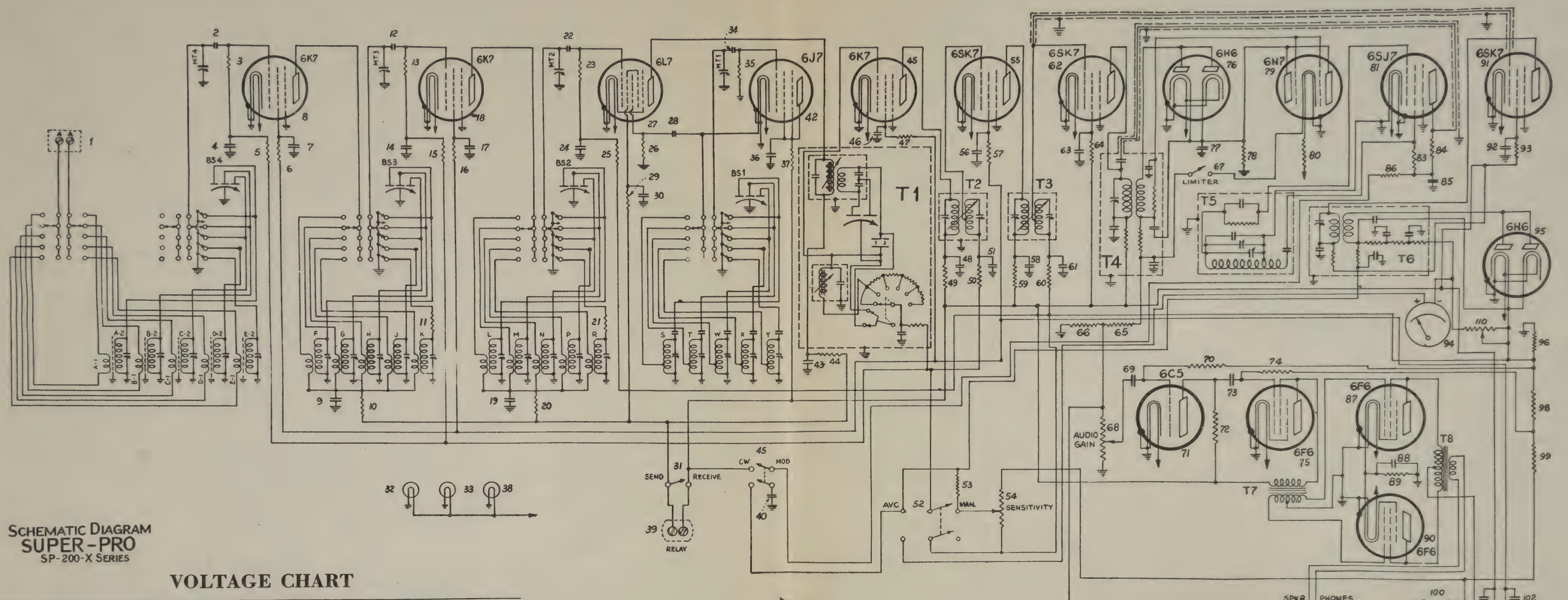


(a) Sharp Position (b) Expanded Position

Fig. 2. I.F. Curves Taken on G-E Oscilloscope OFM-1

HAMMARLUND MFG. CO., INC.

MODELS SP210X,SPR210X,SP220X,SPR220X
SP210SX,SPR210SX,SP220SX,SPR220SX
SP210LX,SPR210LX,SP220LX,SPR220LX
Schematic,Voltage,Socket,Chassis
S.P.U. Schematic



SCHEMATIC DIAGRAM
SUPER-PRO
SP-200-X SERIES

VOLTAGE CHART

TUBE	FUNCTION IN RECEIVER	VOLTS AT SOCKET TERMINAL No.							
		1	2	3	4	5	6	7	8
6K7	1st Radio Freq.	0	0	250	135	...	135	6.3 AC	0
6K7	2nd Radio Freq.	0	0	250	135	...	135	6.3 AC	0
6L7	1st Detector	0	0	250	115	...	...	6.3 AC	0
6J7	High Freq. Oscillator	0	0	160	160	160	...	6.3 AC	...
6K7	1st I.F. Amplifier	0	0	250	135	0	...	6.3 AC	0
6SK7	2nd I.F. Amplifier	0	0	0	—43.	0	135	6.3 AC	25.
6SK7	3rd I.F. Amplifier	0	0	0	—2.	0	100	6.3 AC	240
6N7	Noise Limiter	0	0	+.4	—.2	—.2	+.4	4.0 AC	—.2
6H6	2nd Detector	0	0	—.2	+.4	—.2	...	6.3 AC	+.4
6SK7	AVC Amplifier	0	0	0	—2.	0	110	6.3 AC	240
6H6	AVC	0	0	—3.2	—3.4	—3.2	...	6.3 AC	—3.4
6SJ7	Beat Oscillator	0	0	0	—.1	0	40.	6.3 AC	155.
6C5	1st A.F. Amplifier	0	0	110	...	...	—3.3	6.3 AC	0
6F6	A.F. Driver	0	0	240	240	...	—20.	6.3 AC	0
6F6	P.P. A.F. Output	0	0	380	380	0	...	6.3 AC	38.
6F6	P.P. A.F. Output	0	0	380	380	0	...	6.3 AC	38.

Measurements were made on 115 volt AC line, with line voltage adjustment set at 115 volt tap. Set sensitivity and audio gain controls at minimum. A.V.C. Manual Switch should be in manual position. CW-MOD Switch in C.W. position, Limiter Switch in "On" position, and "Send-Receive" switch in receive position. D.C. readings were obtained with voltmeter having a resistance of 1000 ohms per volt. Use chassis as a common terminal. Voltages within ± 10% are satisfactory. The 6.3 volt A.C. filament reading is obtained between chassis and terminal No. 2 on strip. Terminal No. 10 on strip is blank except when used for battery operation.

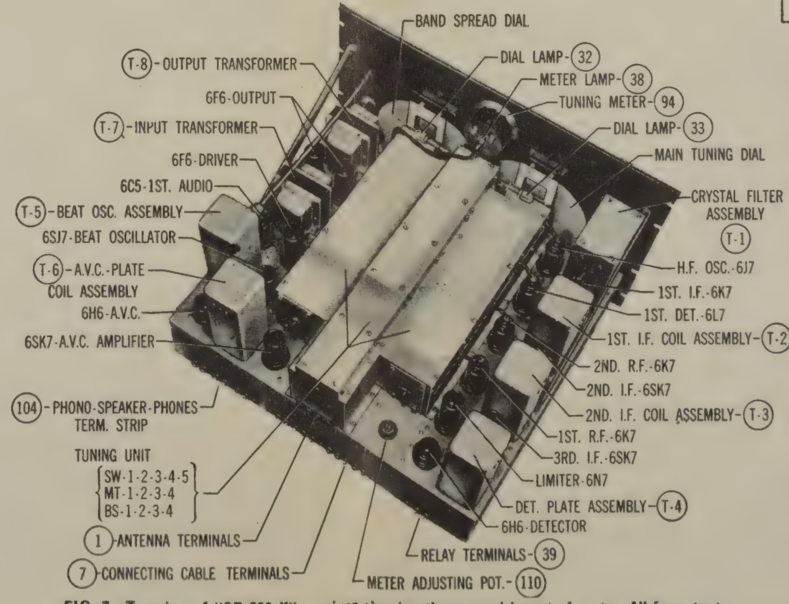


FIG. 7—Top view of "SP-200-X" receiver showing the general layout of parts. All important parts are labeled. Encircled numbers correspond to numbers appearing in the circuit diagram,

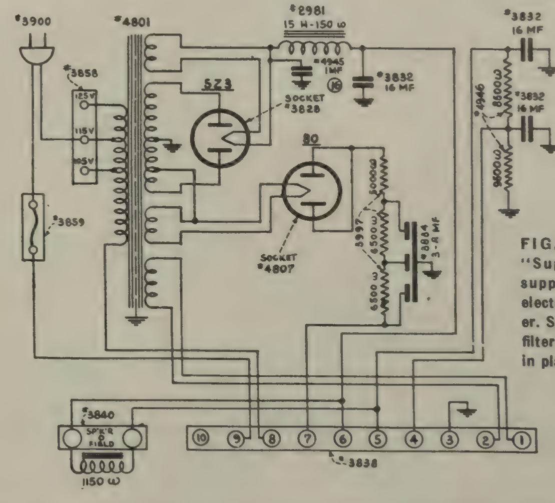


FIG. 12—Standard "Super-Pro" power supply for use with electro-dynamic speaker. Special models have filter choke connected in place of the speaker field.

favorable signal-to-noise ratio on even very weak signals. Since sensitivity depends, to a great extent, upon overall noise level, the variable selectivity characteristics of the "Super-Pro" becomes doubly important, for, by narrowing the band width, noise can be reduced and thus better sensitivity is available.

PERFORMANCE

.The "Super-Pro" is available to cover several frequency ranges. Such information as is given in this book will pertain to all models. The two standard models have the following tuning ranges:

SP-200	SP-200-S
540 – 1160 kc.	1250 – 2500 kc.
1160 – 2500 kc.	2.5 – 5 mc.
2.5 – 5 mc.	5 – 10 mc.
5 – 10 mc.	10 – 20 mc.
10 – 20 mc.	20 – 40 mc.

Other models are available to cover low frequencies in the neighborhood of 150 to 400 kc. as well as certain higher frequencies. In the two standard models, there is a convenient overlap of bands. The main tuning dial is calibrated in megacycles for the three high frequency bands, and in kilocycles for the two low frequency bands. Every effort is made to maintain a high degree of accuracy in calibrating the receiver and it is guaranteed to be at least ½ of 1% of the highest frequency of the band in use.

The sensitivity of the new "Super-Pro" is truly remarkable. By careful circuit design, the overall set noise has been held down to a minimum, thus making it possible to receive extremely weak signals with favorable signal-to-noise ratio. The variable selectivity feature of the "Super-Pro" permits the operator to make full use of the extreme sensitivity even under most severe conditions of interference. Selectivity can be adjusted to cut down interference within very close limits. The advantages of variable selectivity are tremendous when one considers that conditions of interference are not always the same. Under certain conditions, it may be possible to use quite a wide band width and thus enjoy improved tone, as well as easier tuning. Under other conditions, where interference is quite bad, the band width can be narrowed just enough to eliminate interference and in that case, the best possible fidelity that can be obtained without too much interference, is available. In a case where there is practically no interference from other stations, the band width can be adjusted to its widest point and high fidelity reception can be enjoyed.

AVC action in the "Super-Pro" is very efficient. Actual measurements on a sample receiver prove that a very great change in input is required to produce a 2 to 1 change in output. This means that rapidly fading signals can be held to a relatively constant output.

Images (two-spot tuning) on the "Super-Pro" have been eliminated, except in extremely rare cases. The average image ratio will be found to be in the neighborhood of 175,000 to 1 at 1 mc.; 65,000 to 1 at 2 mc.; 34,000 to 1 at 3.5 mc.; 10,000 to 1 at 7 mc.; 1,900 to 1 at 14 mc.; and 150 to 1 at 28 mc.

The audio frequency amplifier in the "Super-Pro" has a rated output of approximately 14 watts. It is capable of excellent quality reproduction. It will be found that the available output power is greatly in excess of that required when the receiver is used for communication purposes. Greatest intelligibility will be obtained on weak signals when the audio gain is kept down, not because of any amplifier limitation, but because the overall noise level will be too great a shock to the ear and make it difficult to follow the desired signal.

OPERATION

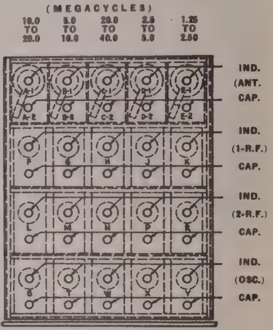
Although the "Super-Pro" is a highly technical piece of apparatus, with quite a large number of controls, it is relatively easy to operate. There are 15 controls on the panel. However, they are not all used at the same time. The number of controls necessary for operation will depend on the type of service for which the receiver is being used. The major controls are the band switch, main tuning, band spread, and audio gain. The remaining controls are brought into play as conditions demand their use. Assuming that the speaker, power supply and antenna have been connected according to instructions, the various controls should be set in the following positions: crystal selectivity, off; "phasing" on zero; "band width" on 6; "limiter," off; switch under the limiter control in "AVC" position; "sensitivity," maximum (10); band spread dial on 100; "signal" switch, on "modulation"; the toggle switch just beneath, should be set on "Speaker"; "audio gain" on 6; send-receive switch on "Rec."; beat oscillator on zero. Then, turn the main switch in the center of the panel marked "On-and-Off" to the on position. This puts the entire receiver in operation. The band switch should be adjusted to either the broadcast band or the next highest frequency band. This should permit reception of local stations and allow the operator to familiarize himself with various adjustments. The band width control should be adjusted to provide the most pleasing tone when there is no serious interference. Otherwise, it should be adjusted to the point providing best tone quality with a minimum of interference. The beat oscillator is turned on when the "signal" switch is in the "CW" position. The beat oscillator control varies the pitch of the heterodyne. This feature is used for code reception and for locating weak signals. The "limiter" control turns the noise limiter on and off. The noise limiter is most valuable on the shorter waves where automobile ignition interference is more serious. So far, we have considered the receiver adjustments necessary for phone reception. For code reception, the "AVC-Man." control should be set in the "Man." position and the sensitivity control turned down to provide proper sensitivity. On strong signals, this control should not be turned all the way on because there will be a tendency to overload the receiver. Volume is controlled with the "audio gain" control and not with the "sensitivity" control. The crystal filter is very effective and easy to operate because of its excellent stability. The first three positions are generally used for phone reception and will serve for code reception where interference is not severe. The last two positions are for code reception exclusively. When the crystal selectivity control is adjusted for optimum selectivity, the phasing control should be used to reject heterodyne interference or "whistle." The receiver can be temporarily silenced by turning the "Send-Receive" switch in the "Send" position. This allows the receiver to be ready for instant service and is more commonly called the "stand by switch" when the receiver is used for communication purposes. All tuning can be done with the main tuning control. In this case, the band spread dial is left at 100. The band spread dial operates so as to spread out a narrow band of frequencies in the neighborhood of the frequency at which the main dial is set. The band spread dial works continuously throughout the entire range of the receiver except on the lowest frequency bands. In this manner, many short wave broadcast or amateur bands can be spread out over the band spread dial for easy tuning. The wave ranges of the receiver are so arranged that when the band spread and main dial are set for 80 meter amateur band reception the 40-meter band as well as the other amateur bands will appear on the band spread dial merely by turning the wave change switch. This is a great convenience and eliminates the necessity for searching each time for the amateur band which is to be covered by the band spread dial. For ear-phone operation, ear-phones are plugged into the terminal strip so marked on the rear of the chassis, and a switch on the front panel changes the receiver from ear-phone to loud speaker operation

The next feature for consideration is the "S" Meter. This is used to judge relative signal levels and also as a tuning indicator. Maximum reading of the meter always indicates that the receiver is in exact tune with the station. The meter is calibrated in "S" units from 1 to 9, and the relative reading on any particular signal can be changed by re-setting the meter control adjustment which is located toward the rear of the chassis. The chassis drawing shows the position of this adjustment. A suggested method of adjusting the meter would be to tune in a signal of moderate strength. If you are accustomed to calling this signal, "S-8" or "S-9," then adjust the meter control so that it indicates that value. This adjustable meter arrangement allows the operator to provide reports consistent with his usual system of reporting. No amount of explaining will teach the operator exactly how to control a receiver. Experience is absolutely necessary in order to obtain best results.

H.F. OSCILLATOR AND R.F. ALIGNMENT

Connect the output of the test oscillator to the "A.A." terminal strip. Connect the output meter to the speaker voice coil terminals. The controls on the front panel should be set as follows:

(1) Band Change Switch on 540–1160 K.C. (2) Main Tuning Dial on 1100 K.C. (3) Band Spread Dial on 100. (4) Sensitivity Control "To Produce appropriate output meter reading." (5) Audio Gain Control "Full On." (6) C.W.-MOD switch on "MOD." (7) A.V.C.-MANUAL Switch on "MANUAL." (8) SEND-RECEIVE Switch on "RECEIVE." (9) "Phones-Speaker" Switch on "PHONES."



Turn the receiver over, bottom side up, placing a small block of wood under the rear of the switch section to protect the shield cans and tubes. The main tuning unit bottom plate should remain in place while H.F. oscillator and R.F. adjustments are being made. In order to facilitate the alignment of these stages, we have indicated in dotted lines, the coil positions beneath the bottom cover plate, together with all capacity and inductance adjusters. Capacity adjusting condensers are located on the coil bases and inductance adjusters extend through the top of each coil. The coil markings correspond to the designations on the schematic wiring diagram. Set the test oscillator to produce a 2.5 MC. signal. Adjust the trimmer capacitor "Y" until a peak reading is obtained in the output meter. Now set the main tuning condenser dial to 1.26 MC. and adjust the test oscillator for a 1.26 MC. signal. Turn the inductance adjustment on coil "Y" for a peak reading on the output meter. As these two adjustments react on each other it will be necessary to repeat them until no further change in either capacity or inductance is necessary. This realignment should only be done after making sure that the calibration of main dial is incorrect.

Turn the main tuning dial to 2.5 MC. and set the test oscillator for 2.5 MC. signal. Adjust each capacitor on coil "R"-"K"-"E2" in the order named, for peak reading on the output meter. The Sensitivity control should be adjusted so that no overloading occurs and an appropriate reading on the output meter is maintained. Now set the main tuning dial at 1.26 MC. and the test oscillator on the same frequency and turn the "inductance adjustments" on coil "R"-"K"-"E1" for peak reading on the output meter. These adjustments are also interlocking and should be repeated until no further improvement can be noticed. This completes the H.F. Oscillator and R.F. coil alignment for the frequency range of 1.25 to 2.50 MC.

The alignment procedure of the H.F. Oscillator and R.F. coils in the remaining frequency ranges is exactly the same as outlined for the 1.25–2.50 MC. band. Test oscillator frequencies and main tuning dial settings vary as follows:

Range	*Capacity Frequency*	*Condensers*	*Inductance Frequency*	*Coils*
1.25 to 2.50 MC.	2.5 MC.	Y-R-K-E2	1.26 MC.	Y-R-K-E1
2.5 to 5.0 MC	5.0 MC.	X-P-J-D2	2.5 MC.	X-P-J-D1
20.0 to 40.0 MC.	40 MC.	W-N-H-C2	20 MC.	W-N-H-C1
5.0 to 10.0 MC.	10.0 M.C.	T-M-G-B2	5.0 M.C.	T-M-G-B1
10.0 to 20.0 MC.	20.0 M.C.	S-L-F-A2	10.0 M.C.	S-L-F-A1

I. F. ALIGNMENT

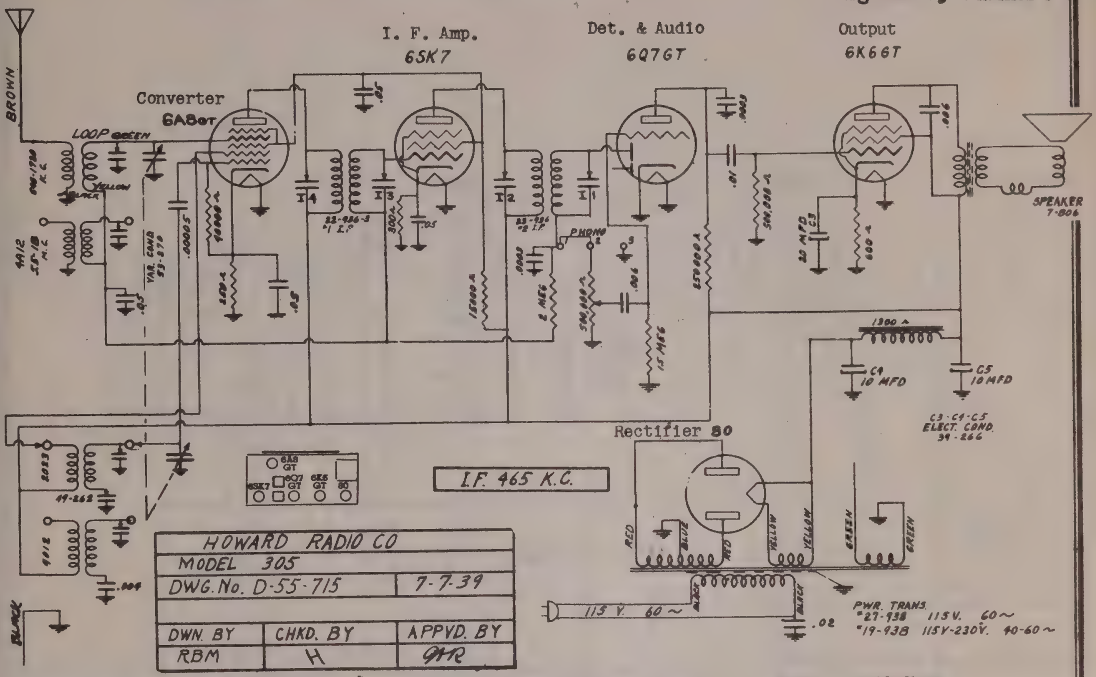
The following adjustments should only be attempted after making *certain* that the I.F. channel of the receiver is out of alignment.

The alignment of the I.F. amplifier may be checked as follows: Connect a low reading (1 volt) output meter across the voice coil terminals. Connect a test oscillator (modulated at 400 cycles or less) to the antenna terminals of the receiver. Set the crystal selectivity switch on Number 1, the phasing control on the arrow, and the band-width control at 3. With the AVC-MANUAL switch on "manual" and the A.F. gain at 10, adjust the sensitivity control for an output meter reading of approximately 1 volt, with the test signal tuned accurately. Now, check the settings of the I.F. tuning condenser on T-2, T-3, and T-4 (*DO NOT DISTURB* the screw tuning adjustments of the Crystal Filter T-1). Then reduce the A.F. gain to protect the output meter and throw the AVC-MANUAL to "AVC" and turn the sensitivity control to 10. Then adjust T-6 for maximum "S" meter reading. This can be done most satisfactorily by adjusting the input from the test oscillator to produce an "S" reading of approximately 8.

To check the alignment of the Crystal Filter T-1, an oscillograph and sweep frequency oscillator are required. First adjust the sweep frequency oscillator to exact agreement with the crystal resonant frequency with the Crystal Selectivity switch on Number 5, and the phasing control on the arrow. Then, set the switch on Number 1 and adjust the lower screw on T-1 for maximum height, and the upper screw for symmetry of oscillograph image.

HOWARD RADIO CO.

MODEL 305
Schematic,Voltage
Alignment,Trimmers



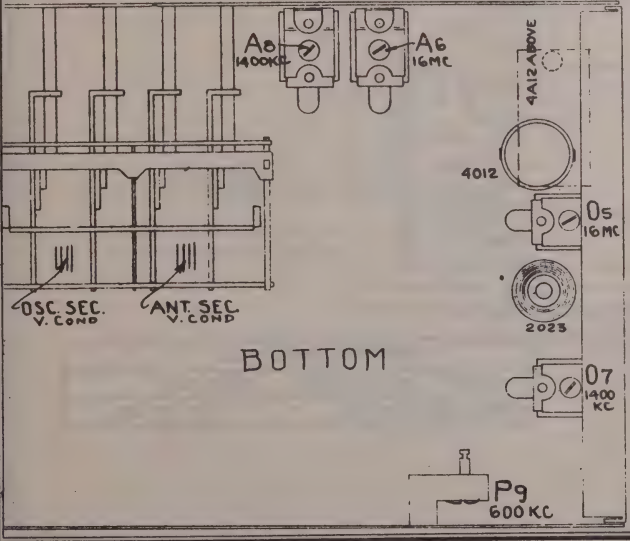
HOWARD RADIO CO	
MODEL 305	
DWG. No. D-55-715	7-7-39

DWN. BY	CHKD. BY	APPVD. BY
RBM	H	GHR

SPEAKER = Electro-dynamic SIZE = 6" V.C.IMP.(400CPS) = 4 Ohms FIELD = 1300 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 2.7 W. upo 1.5W

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_7 A_8	Osc. Ant.
BC	-600 KC	600 KC	Brown lead	C	P_9	Osc. Pad.



NOTES

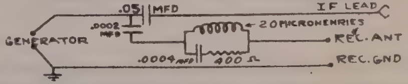
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 GT	Mixer	4.5	105	195 OB195
6SK7	IF	4.5	105	195
6Q7 gt	Det.			60
6K6 gt	Output	16	195	185

CIRCUIT ARRANGEMENT

TWO-STAGE T.R.F. AMPLIFIER: For maximum sensitivity, high image ratio, and low noise level, the "SP-200" has two stages of tuned radio frequency amplification ahead of the mixer stage. The antenna input circuit is electrostatically shielded from the grid circuit of the first tube. This permits the use of low impedance transmission lines between the antenna and the receiver with a minimum of noise pick-up. When lines or lead-ins of the two wire type having an impedance of approximately 100 ohms are employed, no matching transformer is necessary. The input impedance of the receiver is approximately 112 ohms. The two tuned R.F. stages are employed on all bands covered by the receiver. Both inductive and capacitive trimming are employed in all signal frequency circuits.

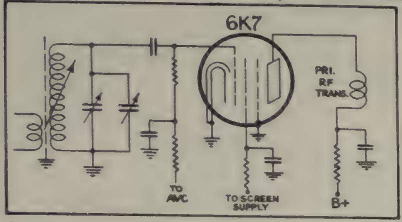


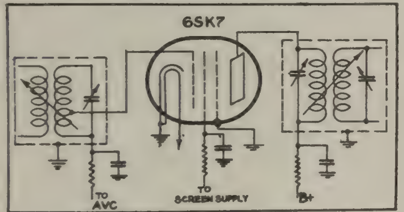
FIG. 2—Circuit diagram of first T.R.F. amplifier showing the electrostatic shield which reduces noise pickup.

OSCILLATOR AND MIXER: Two separate tubes are employed in the oscillator and mixer stages to improve stability and prevent pulling. There is a very respectable gain in the mixer stage which tends to minimize any noise that may be generated in the rest of the receiver. In fact, the gain in this stage is so great that the noise contributed by the following stages is negligible.

BAND SPREAD: In order to maintain relatively uniform band spread in the various tuning ranges of the receiver, every gang of the band spread condenser is subdivided into three sections. This allows the use of a proper sized condenser for maximum spread regardless of the position of the wave change switch. There are approximately 85 degrees spread for each of the important amateur bands, and there is also a corresponding spread over the other frequencies outside the amateur band.

CRYSTAL FILTER UNIT: The crystal filter used in the "Super-Pro" is an exclusive HAMMARLUND development and will be found only in HAMMARLUND receivers. This new filter has five ranges of selectivity varying from broad for phone reception, to knife-edge selectivity for single signal code reception. There are three positions for voice reception, and two for C.W. telegraph. The output of the filter is relatively constant over the entire selectivity range and has, therefore, little effect on "S" meter readings. Selectivity in the crystal filter circuit is not varied by detuning the load circuit. All circuits remain exactly in tune and selectivity is varied by changing the "Q" of the load circuit. This, together with the balanced phasing condenser, eliminates interlocking of controls and changes in filter gain when the selectivity is varied. Every precaution has been taken to effectively shield all circuits so that there is no feed-back or instability to impair the performance on even the highest frequencies. Stability is further insured by employing isolating resistor networks in every circuit that offers the slightest path for feed-back.

FIG. 3—Typical I.F. amplifier circuit with variable selectivity characteristics. Each circuit has isolating resistor and condenser to assure stability.



I.F. AMPLIFIER: There are three I.F. amplifier stages in the "SP-200." This elaborate amplifier is required in order to obtain a very high degree of selectivity. Special transformers are employed to hold down the gain per stage in order to maintain a high degree of selectivity and maximum stability. The band width of the I.F. amplifier is controlled by a cam arrangement which varies the coupling in two of the I.F. transformers. The I.F. channel is variable from 16 kc. down to 3 kc. with the crystal filter out of the circuit. The crystal filter, when in the circuit, is variable down to better than 100 cycles. Thus, full range selectivity is available. This wide degree of variable selectivity permits the operator to select the band width providing highest quality reproduction with a minimum of interference. In the "SP-200," the band width can be adjusted to suit operating conditions.

AVC SYSTEM: The automatic volume control system in the "SP-200" is extremely efficient. Both R.F. stages and the first two I.F. stages are automatically controlled by the incoming signal in order to compensate for variation in signal strength due to fading. This system is very fast in operation and will hold a rapidly fading signal to a relatively constant output. Special amplifier and rectifier stages are employed in order to obtain maximum efficiency.

BEAT FREQUENCY OSCILLATOR: The beat frequency oscillator circuit is designed to effectively heterodyne signals of various magnitudes. This oscillator is of the electron coupled type and is thoroughly isolated from the rest of the receiver. Careful selection of circuit values has resulted in excellent stability.

SECOND DETECTOR: A 6H6 connected in a half-wave rectifier circuit is employed for the second detector. The proper selection of circuit values in this circuit has resulted in a minimum of distortion. This circuit is more or less conventional and complete technical details are available by referring to the diagram.

NOISE LIMITER: The noise limiter in the "SP-200" is the latest development in audio peak limiting devices. It is designed to work with or without the AVC system and will follow variations in incoming signal strength. It is automatic and needs no adjustment. The limiter is designed to cut off interference of the automobile ignition nature at a point equal to approximately 100% modulation of the carrier of the signal being received. This provides for reception of 100% modulated signals without seriously affecting the quality of the voice or music. It must be remembered that this limiter will only limit interference of very short pulse duration. Such interference, as caused by auto ignition systems and similar disturbances will be reduced to a negligible quantity.

A.F. AMPLIFIER: The audio frequency channel of the series 200 "Super-Pro," is designed for high quality reproduction. The first stage is a 6C5 triode voltage amplifier. The second stage is a single 6F6 triode connected and used as a driver for the output amplifier which is a pair of 6F6's operated in push-pull, class AB. The rated output of this amplifier is approximately 14 watts. The fine quality of the A.F. amplifier in the "Super Pro" is particularly apparent when the band width control is set in the wide position. There is no tone control in this amplifier and none is needed. The A.F. portion of the "Super-Pro" will respond equally well to both low and high frequencies. Attenuation of the higher frequencies is accomplished by narrowing the I.F. band width. In this manner, the band width control serves to control tone.

POWER SUPPLY: The power supply for the "SP-200" is an extra heavy duty unit designed to furnish filament plate and grid bias voltages. The power supply is a separate unit connected to the receiver by a flexible cable. Being a separate unit, the power supply introduces a minimum of hum in the receiver and also reduces the overall temperature rise of the receiver, and thus permits better stability. The high voltage rectifier in the power supply is a 5Z3 connected in a full wave circuit with a two-section filter consisting of 32 mf. capacity and a 15 henry filter choke. The field of the speaker serves as a second filter choke in standard model receivers. In special models, a choke is mounted in the power supply to take the place of the speaker field. Grid bias for the entire receiver is supplied by an 80 rectifier tube operating from a tap on the high voltage secondary. The C-Bias supply also has a multi-section filter consisting of three 8 mf. condensers, and three resistors. The primary of the standard power supply has three taps for operation on 105, 115, and 125 volt power lines. A fuse is also provided to guard against damage in cases of overload.

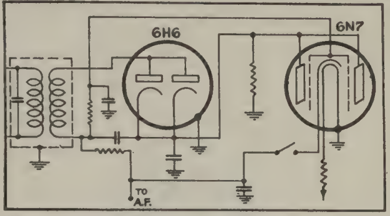


FIG. 4—"Super-Pro" noise limiter designed to reduce automobile ignition interference and other disturbances having similar characteristics.

CALIBRATION: The main tuning dial of the "Super-Pro" is calibrated for all frequencies covered by the receiver. In the process of manufacture, every effort is made to maintain accuracy and, as a result, the accuracy of the calibration is guaranteed to be within ½ of 1% of the highest frequency of the band in use. When using the calibrated dial, it should be remembered that the figures are intended as a tuning guide and not for frequency measuring purposes.

"S" METER": The "S" meter in the "Super-Pro" was designed to provide greatest satisfaction to the operator. It is, in no way, limited by fixed, factory-made adjustments. A variable control on the rear of the chassis allows the operator to set the maximum reading of the meter to conform with his particular system of reporting signal strength in "S" numbers. The meter can be adjusted to read "S-9" on any signal from 10 to 10,000 microvolts. It is adjusted at the factory to indicate "S-9" on a 25 microvolt signal, but as pointed out above, this can readily be changed. Another feature is the centrally located scale. This is much more convenient than a scale that starts at the extreme left of the meter dial, and brings the indicating pointer well out in the clear. Special meter design has also eliminated the possibility of damage due to an extremely strong signal.

SELECTIVITY

The selectivity curves shown are representative curves made on a sample receiver and will hold reasonably true for all models. These curves were taken with the signal generator operating at the intermediate frequency and these curves will maintain throughout the entire range of the receiver, except at the very low frequency end of the broadcast band where the R.F. selectivity has a very slight narrowing effect. The selectivity of the "Super-Pro" is divided into two distinct ranges. In Fig. 5, appear the wide band curves. These curves were made at 4 different positions of the band width control. However, the actual selectivity obtainable is continuously variable between curves 3 and 16. Particular attention should be paid to the steepness of the sides of these curves. They are relatively straight and do not have the usual flare at the outer limits. This means that there will be less background interference from stations operating either higher or lower in frequency than the station being received. The advantage of having continuously variable selectivity over relatively wide limits in a receiver is readily apparent when one considers that the operator has absolute control and can adjust the receiver to compensate for almost any degree of interference that may be present. For example, when interference is not serious, the band width control can be set to the widest position and permit high quality reproduction of either voice or music. In other cases where interference is present, the band width control can be adjusted to the point where selectivity is just sufficient to eliminate interference. This adjustment provides maximum fidelity with a minimum of interference. It also permits the operator to utilize the extreme sensitivity of the "Super-Pro." Even in crowded bands, the selectivity can be adjusted to a point where interference is not bothersome and the sensitivity can be turned up to provide reception of extremely weak signals with marked clarity.

In Fig. 6, the variable selectivity crystal filter curves are illustrated. It will be noticed that the crystal filter fills in the gap very nicely between position "3" of the band width control and what would normally be maximum crystal selectivity for code reception. This variable selectivity crystal filter is an exclusive HAMMARLUND development and will be found only in a HAMMARLUND receiver. The crystal filter has five ranges of selectivity. The first three are intended for phone reception. The widest position of these, however, will permit good quality music under conditions where interference would, in most cases, make reception impossible. Positions four and five are for CW code reception and provide the usual single signal response.

SENSITIVITY

The sensitivity of the "Super-Pro" is exceptional and, in the majority of cases, limited only by noise picked up by the antenna system. Internal receiver noise has been held down to an extremely low value so that the limiting factors in the receiver itself are the noises originating in the first tube and its associated tuned circuit. The gain in the R.F. amplifier is adjusted so as to reduce the effective noise originating in the following tubes and tuned circuits. The result of this proper circuit design is a very

favorable signal-to-noise ratio on even very weak signals. Since sensitivity depends, to a great extent, upon overall noise level, the variable selectivity characteristics of the "Super-Pro" becomes doubly important, for, by narrowing the band width, noise can be reduced and thus better sensitivity is available.

PERFORMANCE

The "Super-Pro" is available to cover several frequency ranges. Such information as is given in this book will pertain to all models. The two standard models have the following tuning ranges:

SP-200	SP-200-S
540 – 1160 kc.	1250 – 2500 kc.
1160 – 2500 kc.	2.5 – 5 mc.
2.5 – 5 mc.	5 – 10 mc.
5 – 10 mc.	10 – 20 mc.
10 – 20 mc.	20 – 40 mc.

Other models are available to cover low frequencies in the neighborhood of 150 to 400 kc. as well as certain higher frequencies. In the two standard models, there is a convenient overlap of bands. The main tuning dial is calibrated in megacycles for the three high frequency bands, and in kilocycles for the two low frequency bands. Every effort is made to maintain a high degree of accuracy in calibrating the receiver and it is guaranteed to be at least ½ of 1% of the highest frequency of the band in use.

The sensitivity of the new "Super-Pro" is truly remarkable. By careful circuit design, the overall set noise has been held down to a minimum, thus making it possible to receive extremely weak signals with favorable signal-to-noise ratio. The variable selectivity feature of the "Super-Pro" permits the operator to make full use of the extreme sensitivity even under most severe conditions of interference. Selectivity can be adjusted to cut down interference within very close limits. The advantages of variable selectivity are tremendous when one considers that conditions of interference are not always the same. Under certain conditions, it may be possible to use quite a wide band width and thus enjoy improved tone, as well as easier tuning. Under other conditions, where interference is quite bad, the band width can be narrowed just enough to eliminate interference and in that case, the best possible fidelity that can be obtained without too much interference, is available. In a case where there is practically no interference from other stations, the band width can be adjusted to its widest point and high fidelity reception can be enjoyed.

AVC action in the "Super-Pro" is very efficient. Actual measurements on a sample receiver prove that a very great change in input is required to produce a 2 to 1 change in output. This means that rapidly fading signals can be held to a relatively constant output.

Images (two-spot tuning) on the "Super-Pro" have been eliminated, except in extremely rare cases. The average image ratio will be found to be in the neighborhood of 175,000 to 1 at 1 mc.; 65,000 to 1 at 2 mc.; 34,000 to 1 at 3.5 mc.; 10,000 to 1 at 7 mc.; 1,900 to 1 at 14 mc.; and 150 to 1 at 28 mc.

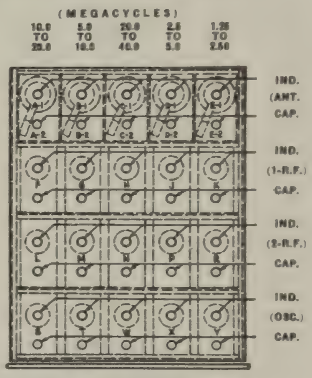
The audio frequency amplifier in the "Super-Pro" has a rated output of approximately 14 watts. It is capable of excellent quality reproduction. It will be found that the available output power is greatly in excess of that required when the receiver is used for communication purposes. Greatest intelligibility will be obtained on weak signals when the audio gain is kept down, not because of any amplifier limitation, but because the overall noise level will be too great a shock to the ear and make it difficult to follow the desired signal.

OPERATION

Although the "Super-Pro" is a highly technical piece of apparatus, with quite a large number of controls, it is relatively easy to operate. There are 15 controls on the panel. However, they are not all used at the same time. The number of controls necessary for operation will depend on the type of service for which the receiver is being used. The major controls are the band switch, main tuning, band spread, and audio gain. The remaining controls are brought into play as conditions demand their use. Assuming that the speaker, power supply and antenna have been connected according to instructions, the various controls should be set in the following positions: crystal selectivity, off; "phasing" on zero; "band width" on 6; "limiter," off; switch under the limiter control in "AVC" position; "sensitivity," maximum (10); band spread dial on 100; "signal" switch, on "modulation"; the toggle switch just beneath, should be set on "Speaker"; "audio gain" on 6; send-receive switch on "Rec."; beat oscillator on zero. Then, turn the main switch in the center of the panel marked "On-and-Off" to the on position. This puts the entire receiver in operation. The band switch should be adjusted to either the broadcast band or the next highest frequency band. This should permit reception of local stations and allow the operator to familiarize himself with various adjustments. The band width control should be adjusted to provide the most pleasing tone when there is no serious interference. Otherwise, it should be adjusted to the point providing best tone quality with a minimum of interference. The beat oscillator is turned on when the "signal" switch is in the "CW" position. The beat oscillator control varies the pitch of the heterodyne. This feature is used for code reception and for locating weak signals. The "limiter" control turns the noise limiter on and off. The noise limiter is most valuable on the shorter waves where automobile ignition interference is more serious. So far, we have considered the receiver adjustments necessary for phone reception. For code reception, the "AVC-Man." control should be set in the "Man." position and the sensitivity control turned down to provide proper sensitivity. On strong signals, this control should not be turned all the way on because there will be a tendency to overload the receiver. Volume is controlled with the "audio gain" control and not with the "sensitivity" control. The crystal filter is very effective and easy to operate because of its excellent stability. The first three positions are generally used for phone reception and will serve for code reception where interference is not severe. The last two positions are for code reception exclusively. When the crystal selectivity control is adjusted for optimum selectivity, the phasing control should be used to reject heterodyne interference or "whistle." The receiver can be temporarily silenced by turning the "Send-Receive" switch in the "Send" position. This allows the receiver to be ready for instant service and is more commonly called the "stand by switch" when the receiver is used for communication purposes. All tuning can be done with the main tuning control. In this case, the band spread dial is left at 100. The band spread dial operates so as to spread out a narrow band of frequencies in the neighborhood of the frequency at which the main dial is set. The band spread dial works continuously throughout the entire range of the receiver except on the lowest frequency bands. In this manner, many short wave broadcast or amateur bands can be spread out over the band spread dial for easy tuning. The wave ranges of the receiver are so arranged that when the band spread and main dial are set for 80 meter amateur band reception the 40-meter band as well as the other amateur bands will appear on the band spread dial merely by turning the wave change switch. This is a great convenience and eliminates the necessity for searching each time for the amateur band which is to be covered by the band spread dial. For ear-phone operation, ear-phones are plugged into the terminal strip so marked on the rear of the chassis, and a switch on the front panel changes the receiver from ear-phone to loud speaker operation

The next feature for consideration is the "S" Meter. This is used to judge relative signal levels and also as a tuning indicator. Maximum reading of the meter always indicates that the receiver is in exact tune with the station. The meter is calibrated in "S" units from 1 to 9, and the relative reading on any particular signal can be changed by re-setting the meter control adjustment which is located toward the rear of the chassis. The chassis drawing shows the position of this adjustment. A suggested method of adjusting the meter would be to tune in a signal of moderate strength. If you are accustomed to calling this signal, "S-8" or "S-9," then adjust the meter control so that it indicates that value. This adjustable meter arrangement allows the operator to provide reports consistent with his usual system of reporting. No amount of explaining will teach the operator exactly how to control a receiver. Experience is absolutely necessary in order to obtain best results.

H.F. OSCILLATOR AND R.F. ALIGNMENT



Connect the output of the test oscillator to the "A.A." terminal strip. Connect the output meter to the speaker voice coil terminals. The controls on the front panel should be set as follows:

(1) Band Change Switch on 540–1160 K.C. (2) Main Tuning Dial on 1100 K.C. (3) Band Spread Dial on 100. (4) Sensitivity Control "To Produce appropriate output meter reading." (5) Audio Gain Control "Full On." (6) C.W.-MOD switch on "MOD." (7) A.V.C.-MANUAL Switch on "MANUAL." (8) SEND-RECEIVE Switch on "RECEIVE." (9) "Phones-Speaker" Switch on "PHONES."

Turn the receiver over, bottom side up, placing a small block of wood under the rear of the switch section to protect the shield cans and tubes. The main tuning unit bottom plate should remain in place while H.F. oscillator and R.F. adjustments are being made. In order to facilitate the alignment of these stages, we have indicated in dotted lines, the coil positions beneath the bottom cover plate, together with all capacity and inductance adjusters. Capacity adjusting condensers are located on the coil bases and inductance adjusters extend through the top of each coil. The coil markings correspond to the designations on the schematic wiring diagram. Set the test oscillator to produce a 2.5 MC. signal. Adjust the trimmer capacitor "Y" until a peak reading is obtained in the output meter. Now set the main tuning condenser dial to 1.26 MC. and adjust the test oscillator for a 1.26 MC. signal. Turn the inductance adjustment on coil "Y" for a peak reading on the output meter. As these two adjustments react on each other it will be necessary to repeat them until no further change in either capacity or inductance is necessary. This realignment should only be done after making sure that the calibration of main dial is incorrect.

Turn the main tuning dial to 2.5 MC. and set the test oscillator for 2.5 MC. signal. Adjust each capacitor on coil "R"-"K"-"E2" in the order named, for peak reading on the output meter. The Sensitivity control should be adjusted so that no overloading occurs and an appropriate reading on the output meter is maintained. Now set the main tuning dial at 1.26 MC. and the test oscillator on the same frequency and turn the "inductance adjustments" on coil "R"-"K"-"E1" for peak reading on the output meter. These adjustments are also interlocking and should be repeated until no further improvement can be noticed. This completes the H.F. Oscillator and R.F. coil alignment for the frequency range of 1.25 to 2.50 MC.

The alignment procedure of the H.F. Oscillator and R.F. coils in the remaining frequency ranges is exactly the same as outlined for the 1.25–2.50 MC. band. Test oscillator frequencies and main tuning dial settings vary as follows:

Range	*Capacity Frequency*	*Condensers*	*Inductance Frequency*	*Coils*
1.25 to 2.50 MC.	2.5 MC.	Y-R-K-E2	1.26 MC.	Y-R-K-E1
2.5 to 5.0 MC	5.0 MC.	X-P-J-D2	2.5 MC.	X-P-J-D1
20.0 to 40.0 MC.	40 MC.	W-N-H-C2	20 MC.	W-N-H-C1
5.0 to 10.0 MC.	10.9 M.C.	T-M-G-B2	5.0 M.C.	T-M-G-B1
10.0 to 20.0 MC.	20.0 M.C.	S-L-F-A2	10.0 M.C.	S-L-F-A1

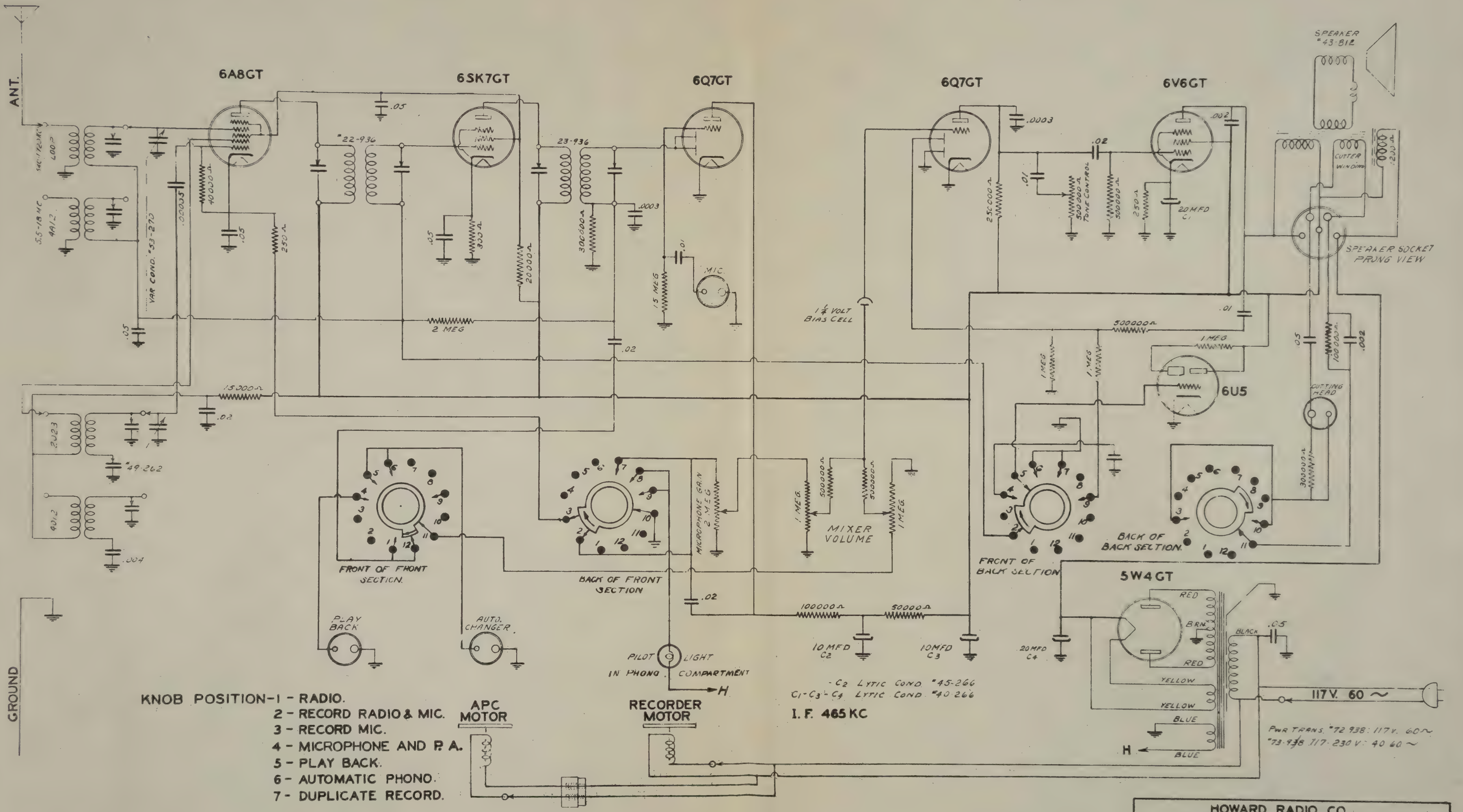
I. F. ALIGNMENT

The following adjustments should only be attempted after making *certain* that the I.F. channel of the receiver is out of alignment.

The alignment of the I.F. amplifier may be checked as follows: Connect a low reading (1 volt) output meter across the voice coil terminals. Connect a test oscillator (modulated at 400 cycles or less) to the antenna terminals of the receiver. Set the crystal selectivity switch on Number 1, the phasing control on the arrow, and the band-width control at 3. With the AVC-MANUAL switch on "manual" and the A.F. gain at 10, adjust the sensitivity control for an output meter reading of approximately 1 volt, with the test signal tuned accurately. Now, check the settings of the I.F. tuning condenser on T-2, T-3, and T-4 (*DO NOT DISTURB* the screw tuning adjustments of the Crystal Filter T-1). Then reduce the A.F. gain to protect the output meter and throw the AVC-MANUAL to "AVC" and turn the sensitivity control to 10. Then adjust T-6 for maximum "S" meter reading. This can be done most satisfactorily by adjusting the input from the test oscillator to produce an "S" reading of approximately 8.

To check the alignment of the Crystal Filter T-1, an oscillograph and sweep frequency oscillator are required. First adjust the sweep frequency oscillator to exact agreement with the crystal resonant frequency with the Crystal Selectivity switch on Number 5, and the phasing control on the arrow. Then, set the switch on Number 1 and adjust the lower screw on T-1 for maximum height, and the upper screw for symmetry of oscillograph image.

HOWARD RADIO CO.



- C2 LYTIC COND #45-266
C1-C3-C4 LYTIC COND #40-266

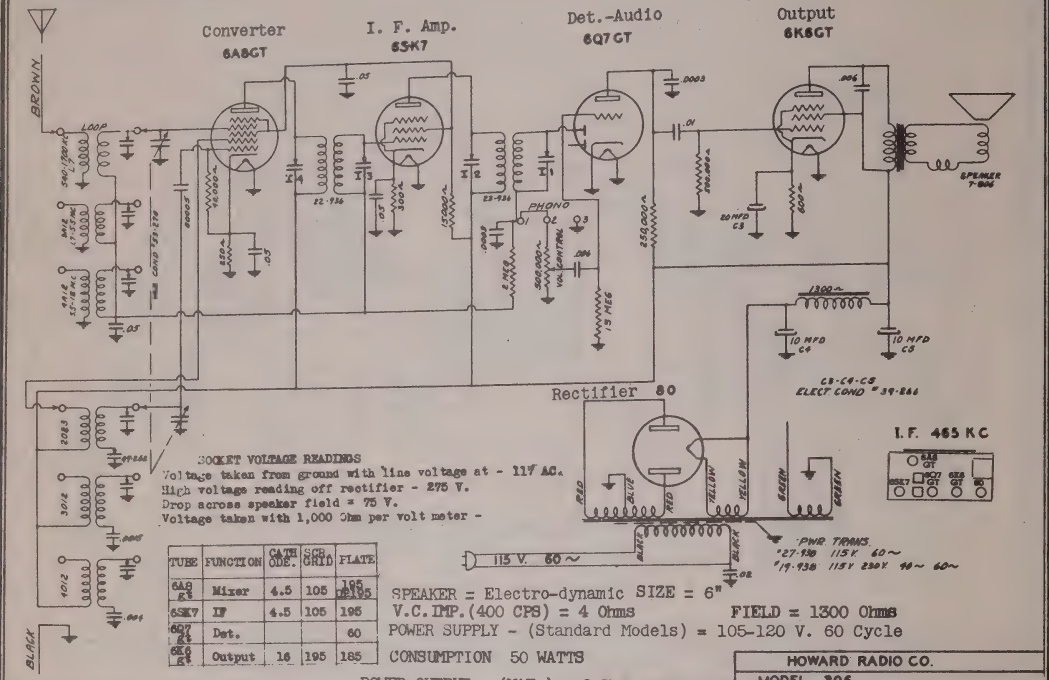
I. F. 465 KC

KNOB POSITION-1 - RADIO.
2 - RECORD RADIO & MIC.
3 - RECORD MIC.
4 - MICROPHONE AND P. A.
5 - PLAY BACK.
6 - AUTOMATIC PHONO.
7 - DUPLICATE RECORD.

HOWARD RADIO CO.
MODELS 302 R (RA), 302 RT
DWG. NO. C71-715 2-21-40

MODEL 306
Schematic, Voltage
Alignment, Trimmers

HOWARD RADIO CO.

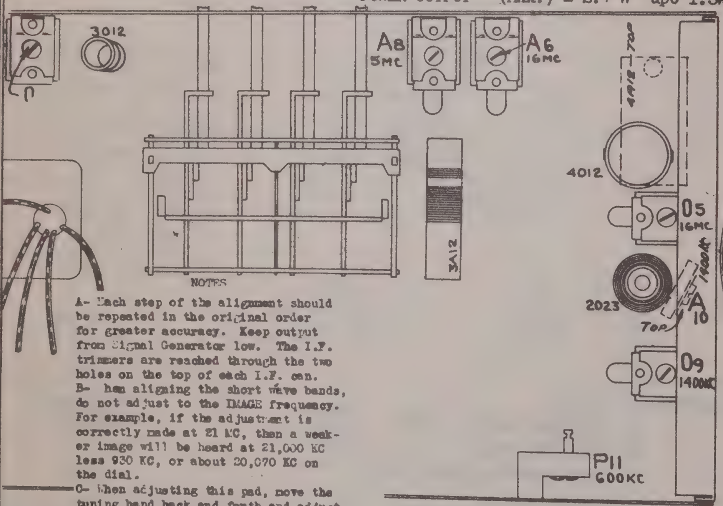


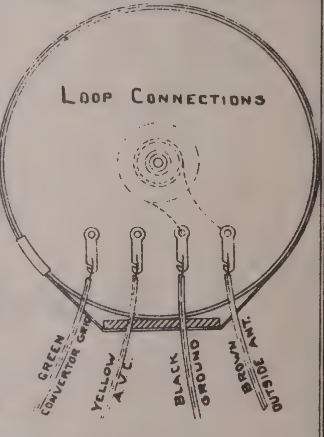
SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6A8 gt	Mixer	4.5	105	195 or 195
6SK7	IF	4.5	105	195
6Q7 gt	Det.			60
6K6 gt	Output	16	195	185

SPEAKER = Electro-dynamic SIZE = 6"
V.C. IMP. (400 CPS) = 4 Ohms FIELD = 1300 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle
CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 2.7 w upo 1.5w

HOWARD RADIO CO.		
MODEL 306		
DWG. NO. D62-715		10-13-39
DWN. BY	CHKD. BY.	APPVD. BY
RBM		WR





NOTES

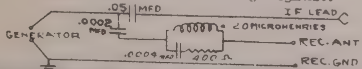
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
PB	5 MC	5 MC	Brown lead		O_7 A_8	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc. Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc. Pad.

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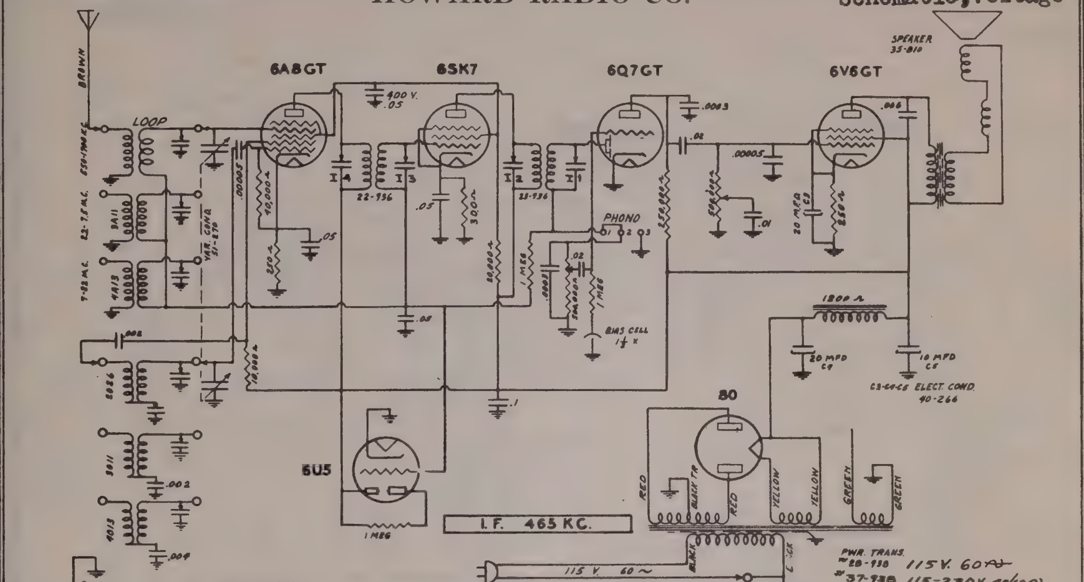
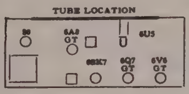
Alignment,Trimmers

HOWARD RADIO CO.

MODEL 575
Schematic,Voltage





SPEAKER = Electro-dynamic

SIZE = 6½" V.C.IMP. (400CPS) = 4 Ohms FIELD = 1200 Ohms

POWER SUPPLY - (Standard Models) = 105-120V. 60 Cycle
CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 6W. upo 4W.

MODEL 575		
DWG. NO. D-59-715		7-25-39
DWN. BY	CHKD BY	APPVD BY
RM	H	

Tubes:

6A8GT Converter	6V6GT Output
6SK7 I. F. Amp.	6U5 Tuning Eye
6Q7GT Det.-Audio	80 Rectifier

ALIGMMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5,A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc., Pad.

NOTES

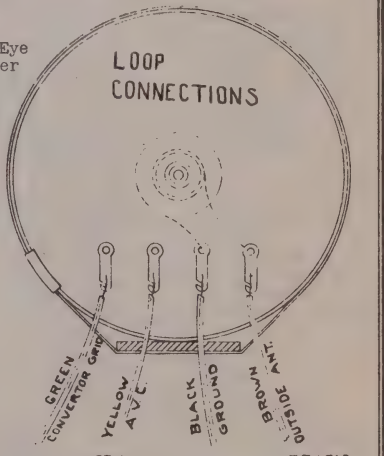
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

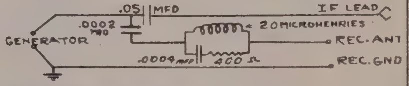
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

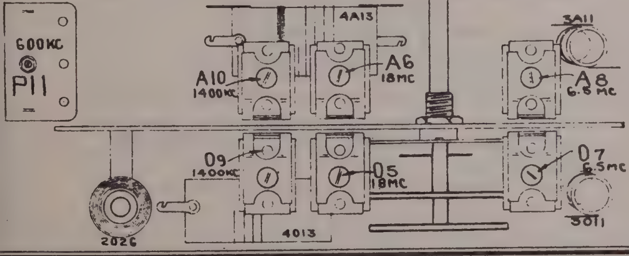
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.







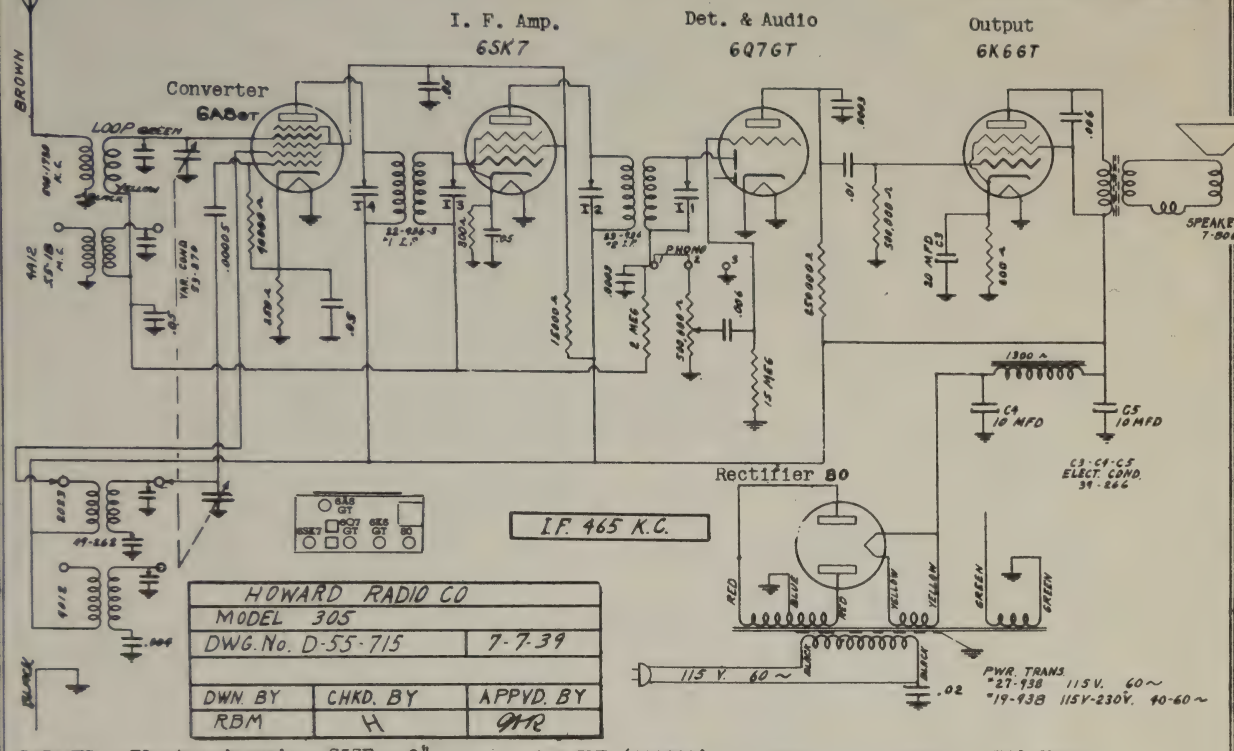
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier - 320 V.
Drop across speaker field - 80 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Mixer	3½	107	255 OR180
6SK7	IF	4	107	235
6Q7 gt	Det.	x	x	70
6V6 gt	Output	11	240	225

MODEL 305
Schematic,Voltage
Alignment,Trimmers

HOWARD RADIO CO.

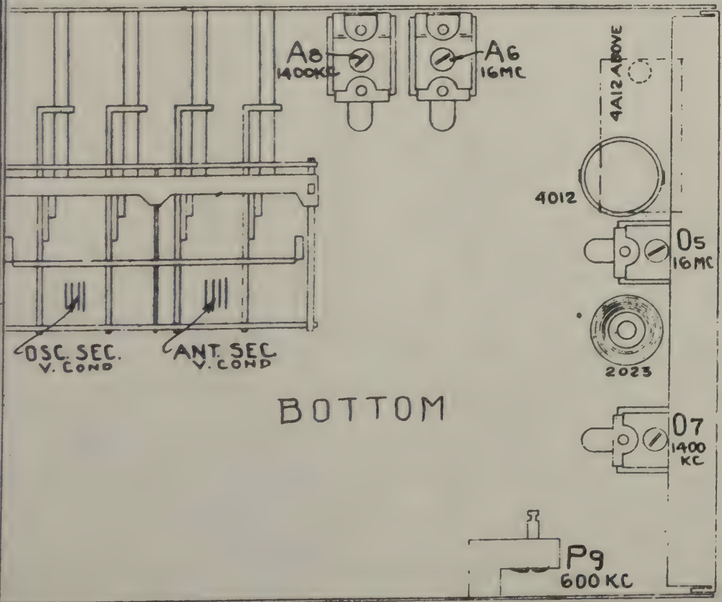


HOWARD RADIO CO		
MODEL 305		
DWG. No. D-55-715		7-7-39
DWN. BY	CHKD. BY	APPVD. BY
RBM	H	

SPEAKER - Electro-dynamic SIZE - 6" V.C.IMP.(400CPS) = 4 Ohms FIELD = 1300 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 2.7 W. upo 1.5W

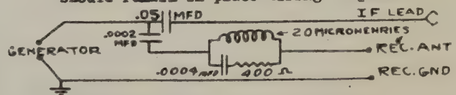
ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_7 A_8	Osc. Ant.
BC	-600 KC	600 KC	Brown lead	C	P_9	Osc. Pad.



NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

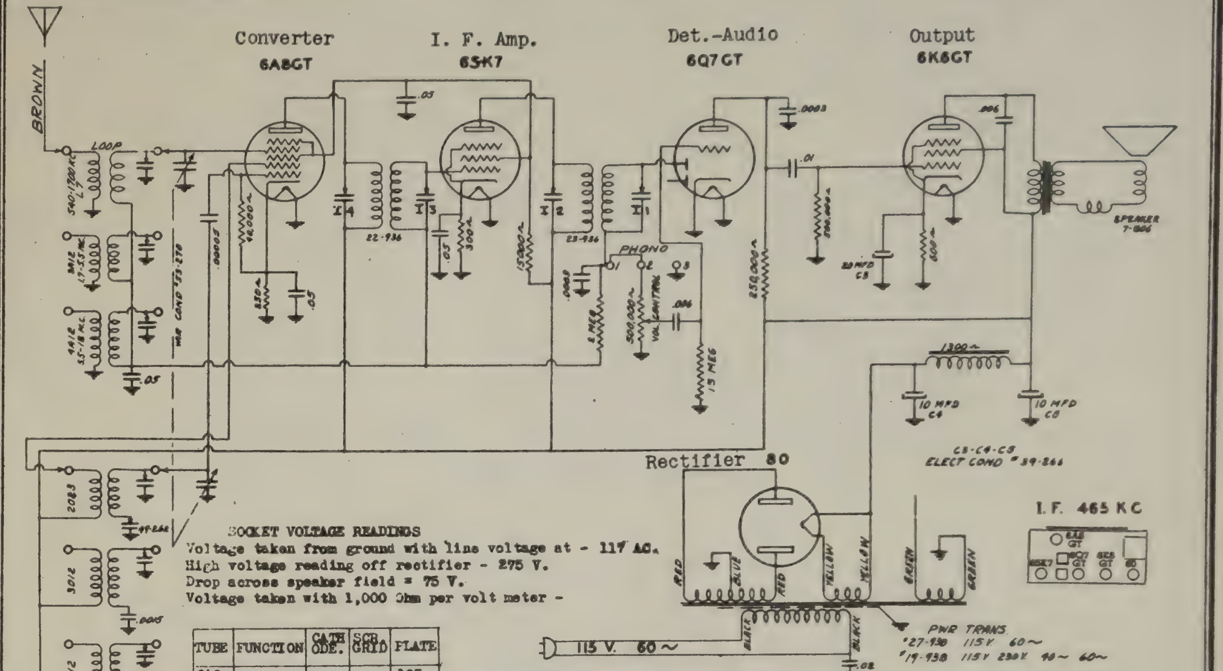


SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1.000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6A8 GT	Mixer	4.5	105	195 OB195
6SK7	IF	4.5	105	195
6Q7 gt	Det.			60
6K6 gt	Output	16	195	185

MODEL 306
Schematic,Voltage
Alignment,Trimmers

HOWARD RADIO CO.

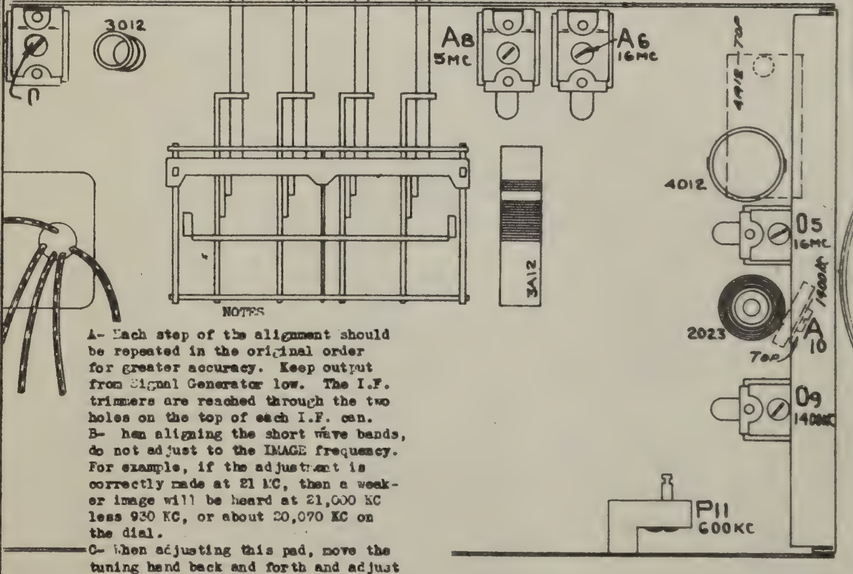


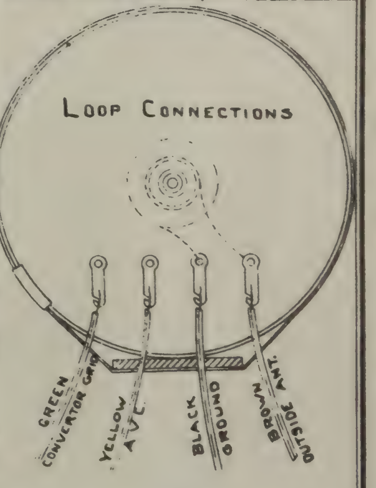
SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6A8 gt	Mixer	4.5	105	195 OB195
6SK7	IF	4.5	105	195
6Q7 gt	Det.			60
6K6 gt	Output	16	195	185

SPEAKER = Electro-dynamic SIZE = 6"
V.C.IMP.(400 CPS) = 4 Ohms FIELD = 1300 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle
CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 2.7 w upo 1.5w

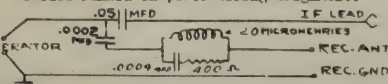
HOWARD RADIO CO.		
MODEL 306		
DWG.NO. D62-715		10-13-39
DWN. BY	CHKD. BY.	APPVD. BY
RBM		





NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 KC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

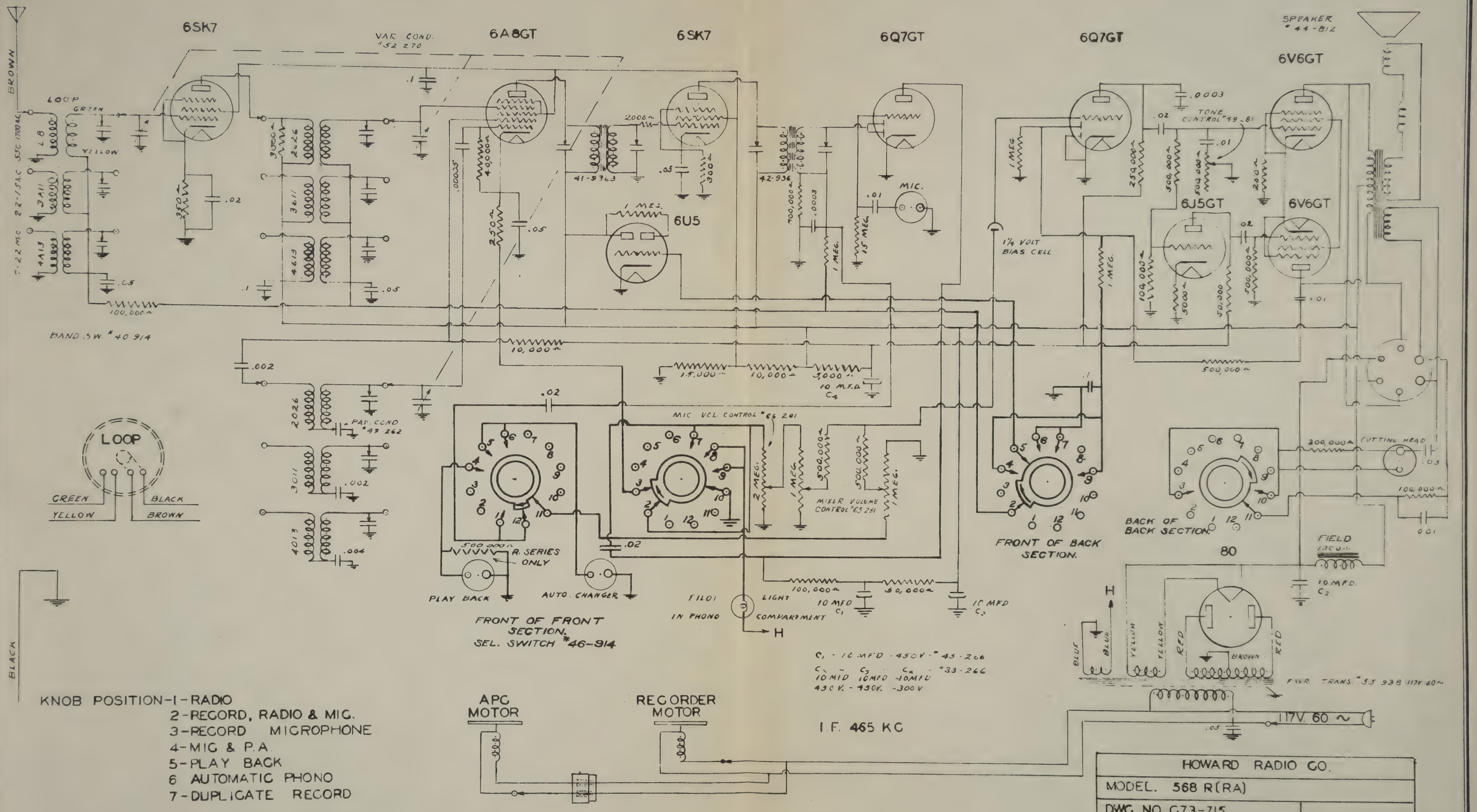


ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
PB	5 MC	5 MC	Brown lead		O_7 A_8	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc. Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc. Pad.

MODEL 568R(RA)
Schematic

HOWARD RADIO CO.



C1 - 10 MFD - 450V - #45-266
C2 - C3 - C4 - #33-266
10 MFD 10 MFD - 10 MFD
450 V. - 450V. - 300 V

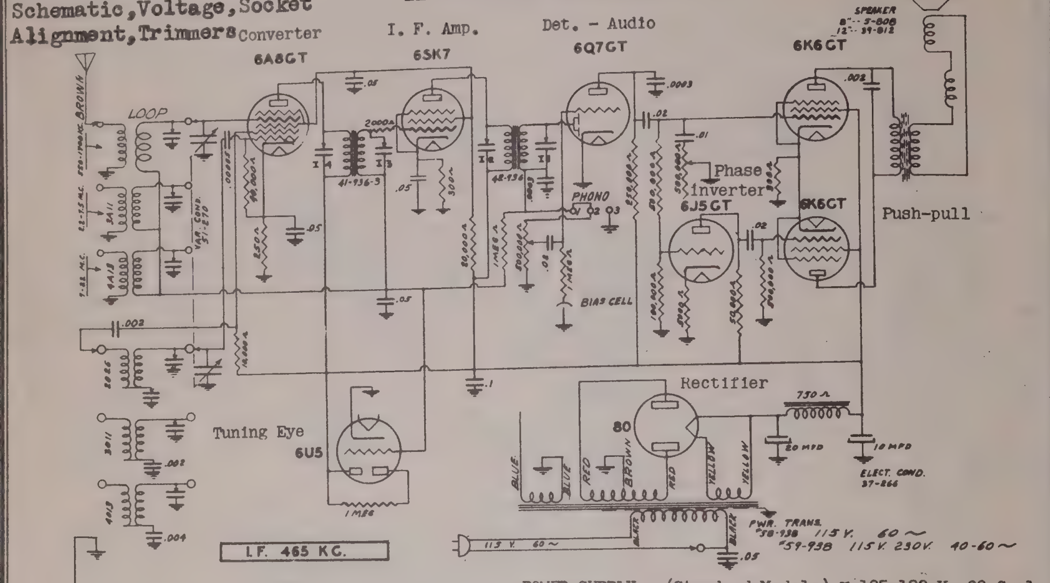
I.F. 465 KC

KNOB POSITION-1-RADIO
2-RECORD, RADIO & MIC.
3-RECORD MICROPHONE
4-MIC & P.A.
5-PLAY BACK
6 AUTOMATIC PHONO
7-DUPLICATE RECORD

HOWARD RADIO CO.		
MODEL. 568 R(RA)		
DWG. NO. C73-715		
DWN. BY.	CHCKD. BY.	APPVD. BY
E.E. S.		

MODELS 580,580C,580APC
Schematic,Voltage,Socket
Alignment,Trimmers

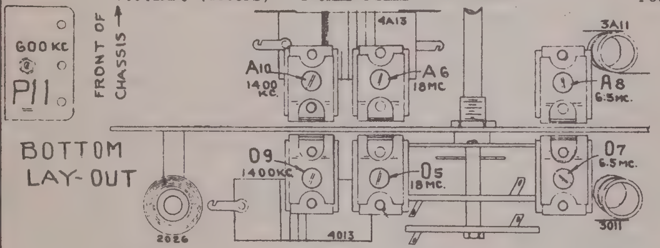
HOWARD RADIO CO.



POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle

SPEAKER = Electro-dynamic SIZE = 8" & 12"
V.C.IMP. (400CPS) = 4 Ohms FIELD = 750 Ohms

CONSUMPTION 75 WATTS APC + 30
POWER OUTPUT - (MAX.) = 7.5W upo 5



NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

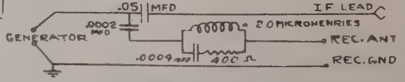
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

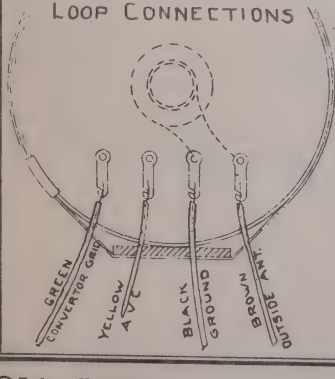
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5, A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc., Pad.



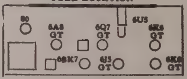
LOOP CONNECTIONS



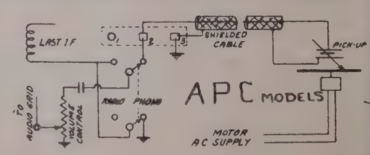
SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at -117 AC.
High voltage reading off rectifier =305 V.
Drop across speaker field = 70 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Converter	4	110	235 OR 175
6SK7	IF	3½	110	235
6Q7 gt	Det.	x	x	70
6J5 gt	Invert	8	x	140
6K6 gt	Output	18	235	225
6K6 gt	"	18	235	225

TUBE LOCATION

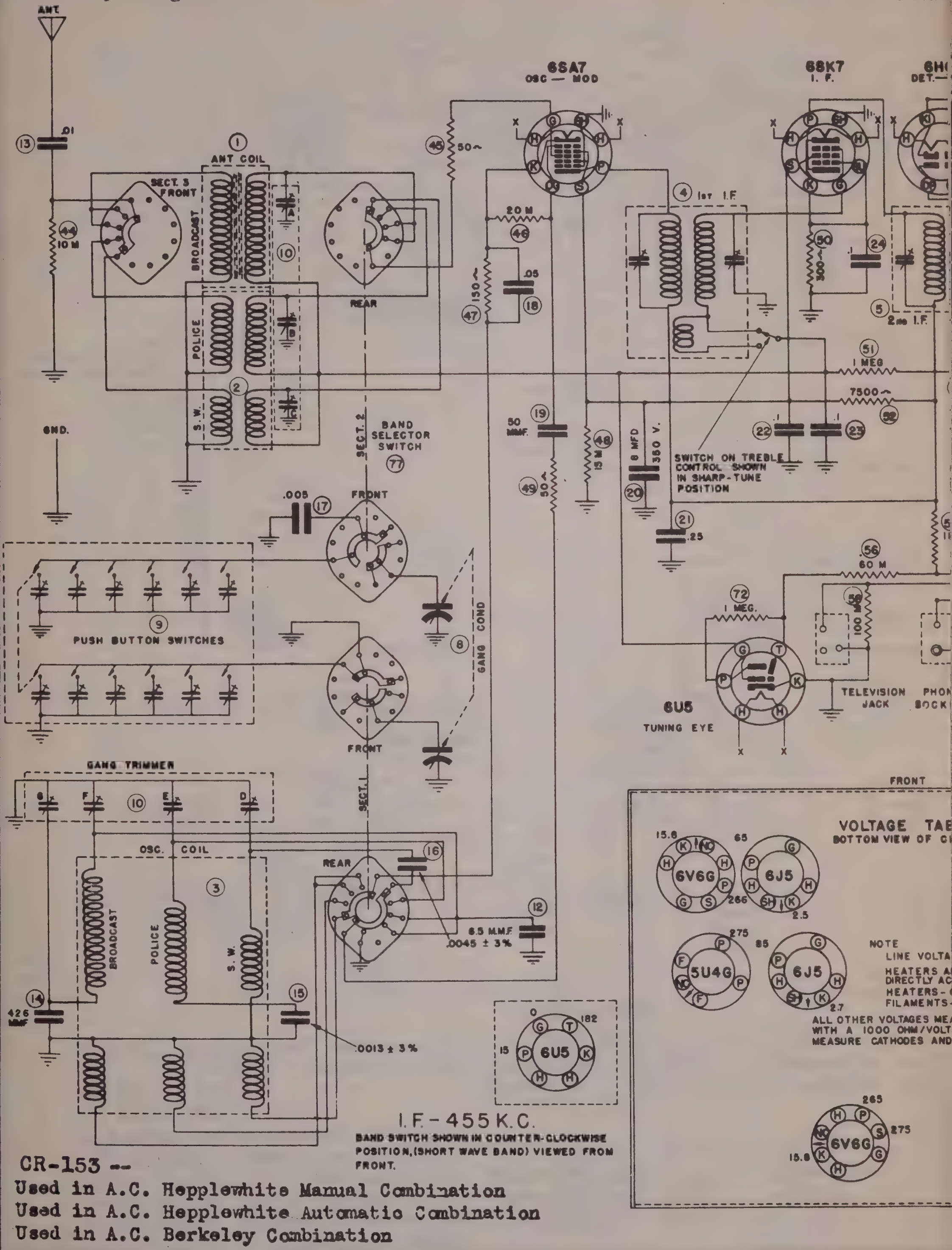


THE ADAPTION OF THE SET FOR USE WITH PHONOGRAPH



CHASSIS CR153
Schematic,Voltage

THE MAGNA



I.F. - 455 K.C.

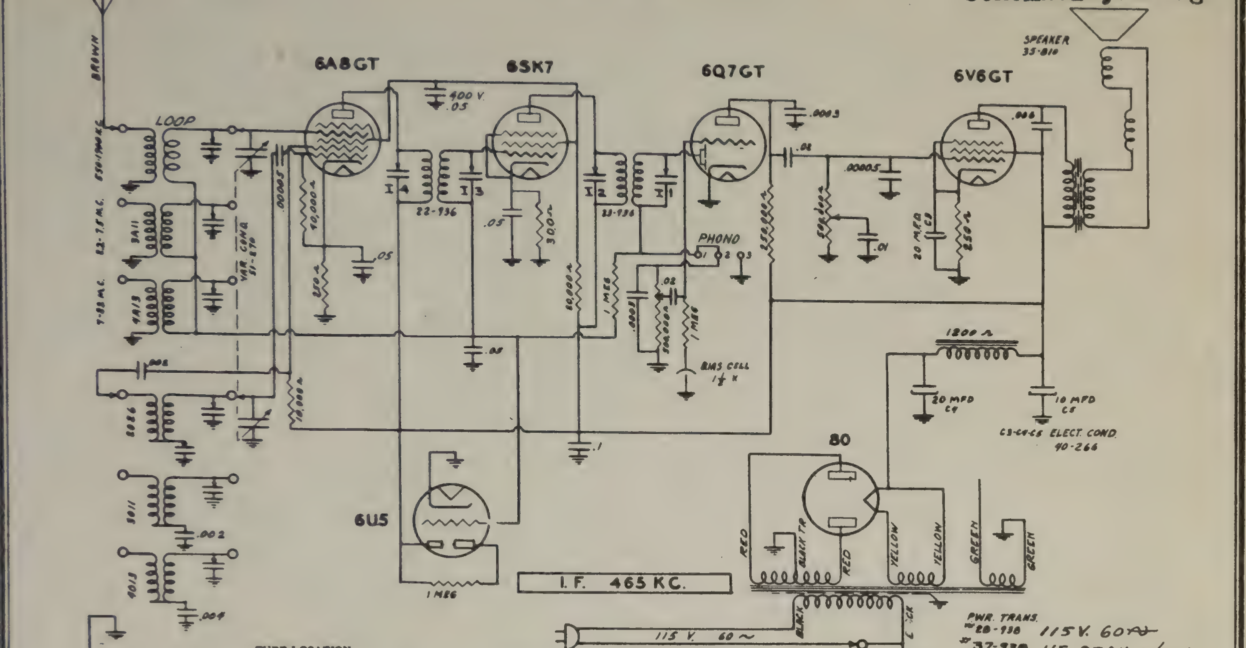
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION,(SHORT WAVE BAND) VIEWED FROM FRONT.

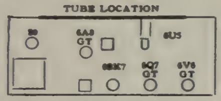
CR-153 --
Used in A.C. Hepplewhite Manual Combination
Used in A.C. Hepplewhite Automatic Combination
Used in A.C. Berkeley Combination

Alignment,Trimmers

HOWARD RADIO CO.

MODEL 575
Schematic,Voltage





MODEL 575		
DWG. NO. D-59-715		7-25-39
DWN. BY	CHKD. BY	APPVD. BY
RM	H	JKR

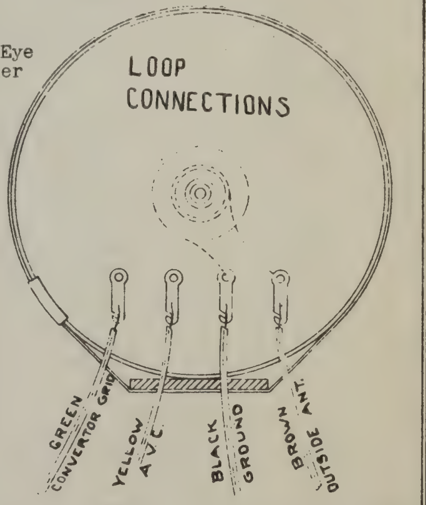
SPEAKER = Electro-dynamic

SIZE = 6½" V.C.IMP. (400CPS) = 4 Ohms FIELD = 1200 Ohms

POWER SUPPLY - (Standard Models) = 105-120V. 60 Cycle
CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 6W. upo 4W.

Tubes:

6A8GT	Converter	6V6GT	Output
6SK7	I. F. Amp.	6U5	Tuning Eye
6Q7GT	Det.-Audio	80	Rectifier



ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5,A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc., Pad.

NOTES

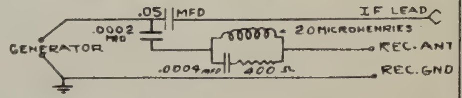
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

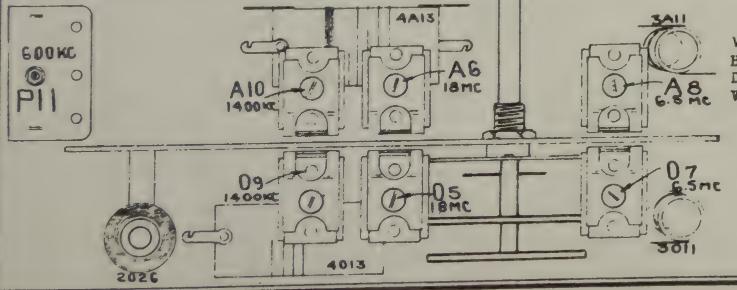
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.





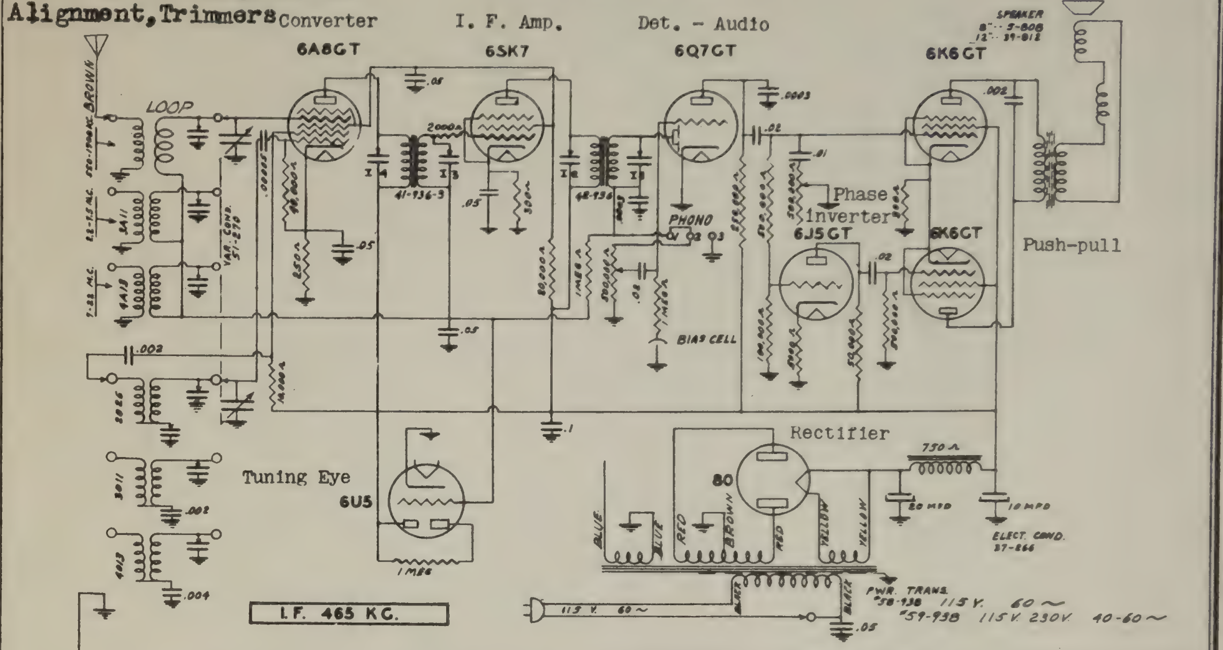
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier - 320 V.
Drop across speaker field - 80 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Mixer	3½	107	235 OR180
6SK7	IF	4	107	235
6Q7 gt	Det.	x	x	70
6V6 gt	Output	11	240	225

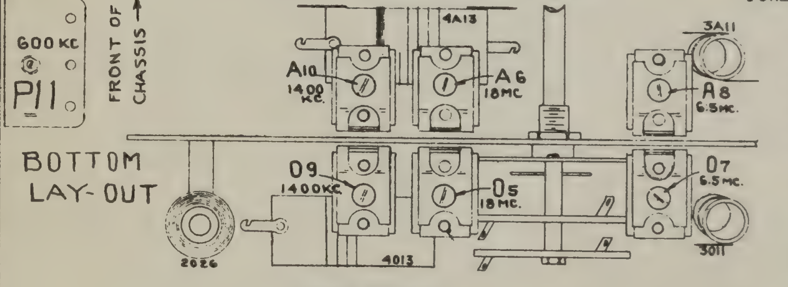
MODELS 580,580C,580APC
Schematic,Voltage,Socket
Alignment,Trimmers

HOWARD RADIO CO.



SPEAKER = Electro-dynamic SIZE = 8" & 12"
V.C.IMP. (400CPS) = 4 Ohms FIELD = 750 Ohms

POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle
CONSUMPTION 75 WATTS APC + 30
POWER OUTPUT - (MAX.) = 7.5W upo 5



NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

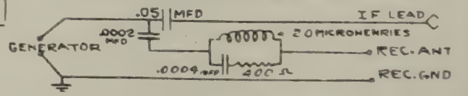
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

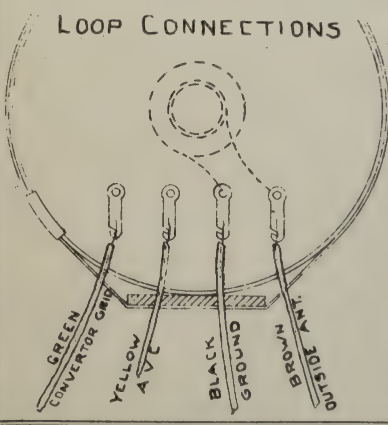
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5,A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc., Pad.

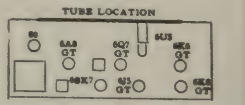




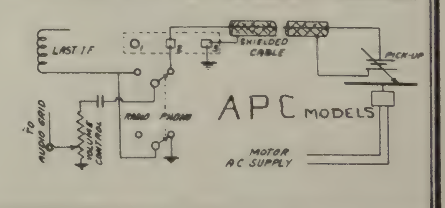
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at -117 AC.
High voltage reading off rectifier =305 V.
Drop across speaker field = 70 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Converter	4	110	235 OR175
6SK7	IF	3½	110	235
6Q7 gt	Det.	x	x	70
6J5 gt	Invert	8	x	140
6K6 gt	Output	18	235	225
6K6 gt	"	18	235	225

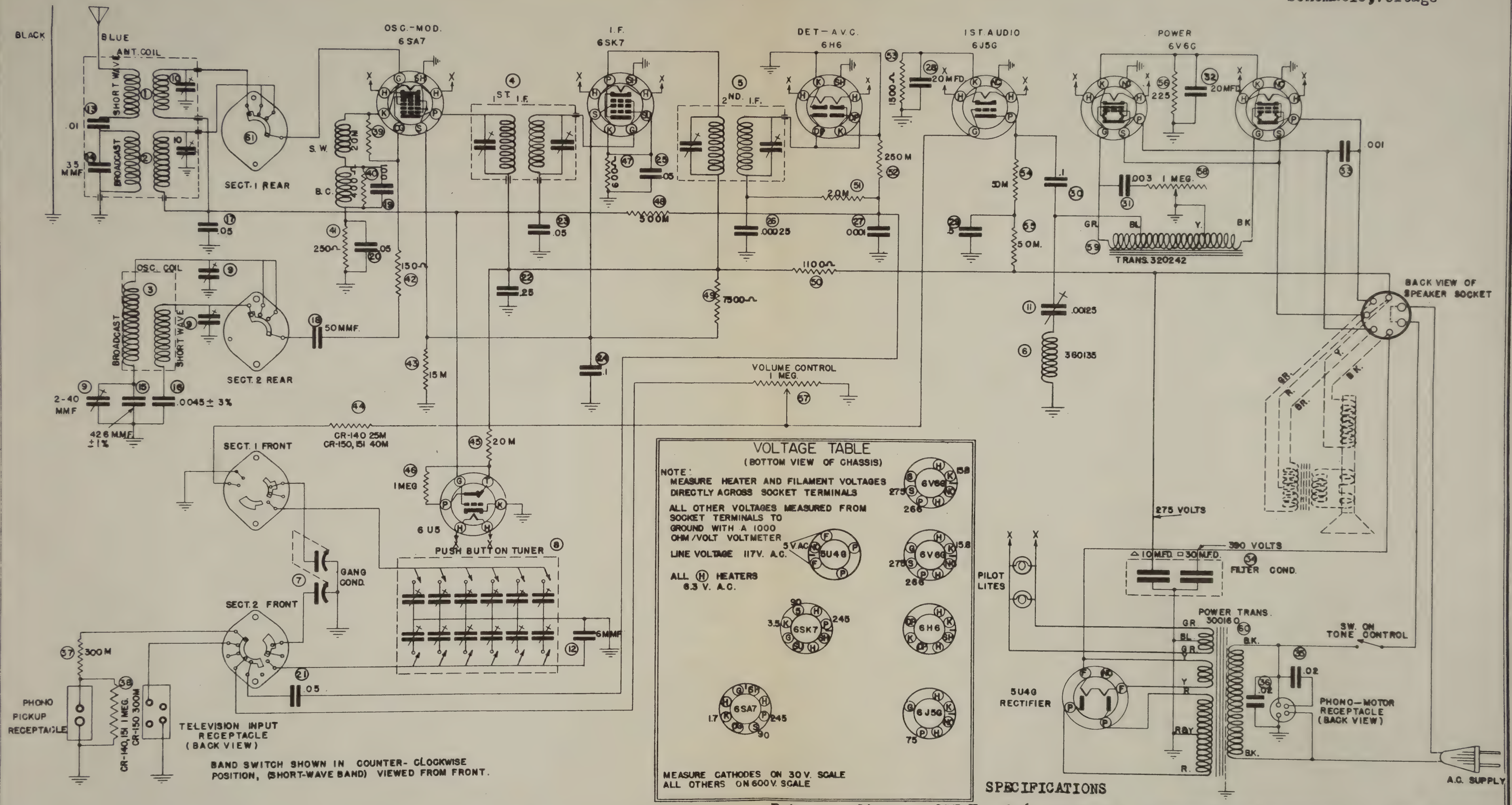


THE ADAPTION OF THE SET FOR USE WITH PHONOGRAPH



CHASSIS CR140,CR150,CR151
Schematic,Voltage

THE MAGNAVOX CO., INC.



VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS

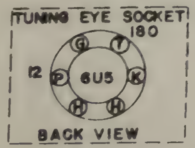
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER

LINE VOLTAGE 117V. A.C.

ALL (H) HEATERS 6.3 V. A.C.

MEASURE CATHODES ON 30V. SCALE
ALL OTHERS ON 600V. SCALE

I.F. 455 K.C.



CR-140
CR-150-595184-CR-151

CR-140	Used in American Modern Combination Used in Chairside Combination Used in Sheraton Combination
CR-150	Used in Grinnell Model 60 Combination Used in Chippendale Combination
CR-151	Used in Sheraton Combination

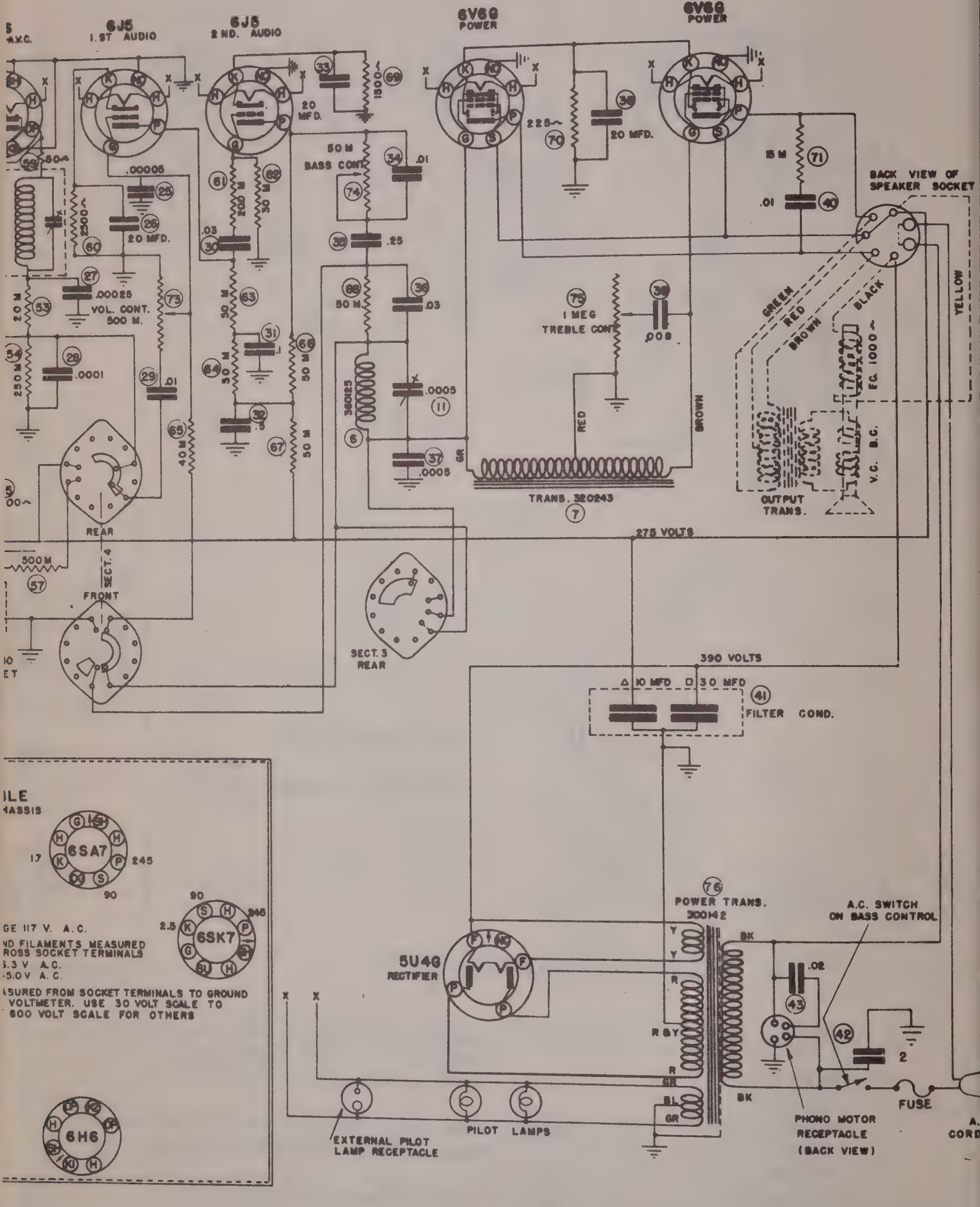
SPECIFICATIONS

Primary voltage....117 V. 50-60 cycle AC;
Power consumption............ 100 watts;
Power output................. 12 watts;

Speaker:

Field coil.............. 1000 ohms;
Transformer............. 8000 ohms;

Intermediate frequency......455 KC;
Tuning frequency range:
539 - 1677 KC;
5.7 - 18.1 MC;
Circuit: Superheterodyne with two tuning ranges, treble control, AVC, bass compensation in volume control for phonograph pickup, push-button condenser-type tuner, television input receptacle.



LE
HASSIS

GE 117 V. A.C.
ND FILAMENTS MEASURED
ROSS SOCKET TERMINALS
5.3 V A.C.
5.0V A.C.
ASURED FROM SOCKET TERMINALS TO GROUND
VOLTMETER. USE 30 VOLT SCALE TO
600 VOLT SCALE FOR OTHERS

3-15-40

13 TUBE • 3 BAND • ALL WAVE A. C. POWER SUPPLY

ALIGNMENT PROCEDURE

Local-Distance Switch — Distance Position.
Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator With a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR		TRIMMERS ADJUSTED See Illustration	PROCEDURE	
			FREQUENCY SETTING	CONNECTION AT RADIO		INITIAL STEPS	ADJUSTMENT
I.F.							
3rd I.F.	Range B	.1 mf.	456 KC	Grid of 2nd I.F. Tube	3rd I.F. (C39)	Turn Rotor to Full Open	Adjust to Maximum Output
2nd I.F.	Range B	.1 mf.	456 KC	Grid of 1st I.F. Tube	2nd I.F. (C29) & (C30)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C22) & (C23)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B							
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C15)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st & 2nd Ant. Range B (C5) & (C3)—Int. Range B (C9)	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C16)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE C							
6350 KC	Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C12)	Turn Rotor to Full Open	Adjust to Maximum Output
6000 KC	Range C	400 Ohm	6000 KC	Antenna Lead	Ant. Range C (C2) Int. Range C (C8)	Turn Rotor to Max. Output	Adjust to Maximum Output
2000 KC	Range C	400 Ohm	2000 KC	Antenna Lead	2000 KC (C13)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE D							
22,000 KC	Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output
20,000 KC	Range D	400 Ohm	20,000 KC	Antenna Lead	Ant. Range D (C1) Int. Range D (C7)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
7000 KC	Range D	400 Ohm	7000 KC	Antenna Lead	7000 KC (C17)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the telephone dial tuning, there will be seen inside the telephone dial button ring an escutcheon plate held in place by four screws. Loosen the 2 screws nearest the pointer. An extension of the pointer will be seen protruding over the edge of this escutcheon plate. Move the pointer to the 1500 KC mark on the dial and then tighten the 2 escutcheon screws. (Do not tighten these screws too much.)

On the electric drive models, the pointer is held to the shaft by a friction clip arrangement. With the electric-manual lever in the manual position, hold the tuning knob and move the pointer to the 1500 KC mark on the dial.

In sets using any other type of dial mechanism, it will be necessary to adjust the position of the indicator until it is at the 1500 KC mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

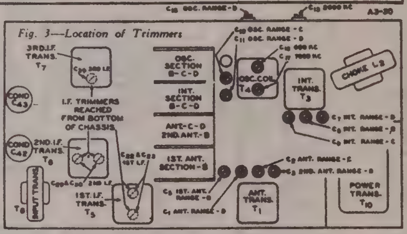


Fig. 3—Location of Trimmers

117-234 Volt Power Transformer

Some models are equipped with a 117-234 volt universal power transformer. Connections as shown in Fig. 2 are completed to a special octal socket mounted on the back panel of the chassis. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

Models without the electric drive, which are equipped with this transformer, may be used on a power supply of 40 to 60 cycles. If an electric drive motor is used, however, it is important that the set be operated on a 60 cycle power supply only. The reason for this is that the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycle. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model, is used for this purpose.

If one of these transformers is to be installed in a chassis equipped with a regular transformer, there is a 1⅛ inch round knockout on the back panel which may be removed to permit installation of the octal socket mentioned above.

Twenty-Five Cycle Models

Twenty-five cycle receivers not equipped with an electric motor drive, differ from sixty cycle receivers only in the fact that a different power transformer is used. The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true—a sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

Phonograph Connections

Phonograph connections are made as shown in the schematic circuit diagram Fig. 2. On the front panel of the chassis base is a round knockout 1⅛ inches in diameter. An octal base socket is mounted in this knockout opening and wired as shown in the schematic.

A phono cable assembly may then be purchased On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack

Some models are shipped from the factory equipped with the phono socket. A jumper is inserted in this socket which must be removed if the phonograph installation is made—See Fig. 2.

Dial and Drive Assembly

Complete information regarding the dial and drive assemblies will be found in the Dial and Drive Service NOTES issued for this chassis. (see index)

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control Maximum
Local-Distance Switch in Distance Position
Readings taken with 1000 Ohm-per-volt meter

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7—6U7G	R.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6J7—6J7G	1st Det.	0	6.1(1)	250	115	0		6.1(1)	6.0
6C5—6C5G	Osc.	0	6.1(1)	115				6.1(1)	0
6K7—6U7G	1st I.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6K7—6U7G	2nd I.F.	0	6.1(1)	240	130	5.0		6.1(1)	5.0
6H6	2nd Det.	0	6.1(1)					6.1(1)	0
6C5—6C5G	A.V.C.	0	6.1(1)	5(3)				6.1(1)	.5
6C5—6C5G	1st A.F.	0	6.1(1)	145				6.1(1)	6.0
6L6—6L6G	Output	0	6.1(1)	330	250	21(4)		6.1(1)	0
5Y3G	Rectifier	0	4.7(5)		1100(6)		1100(6)		4.7(5)
6G5	Tuning Indicator	Plate to Ground 20(3)		Target to Ground 250		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with a 1000 Ohm-per-volt meter (500 volt scale).
(4) Bias as read across L4 or R32, depending on speaker arrangement. See Schematic Diagram.
(5) A.C. voltage as read across filament terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.

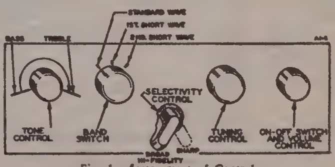
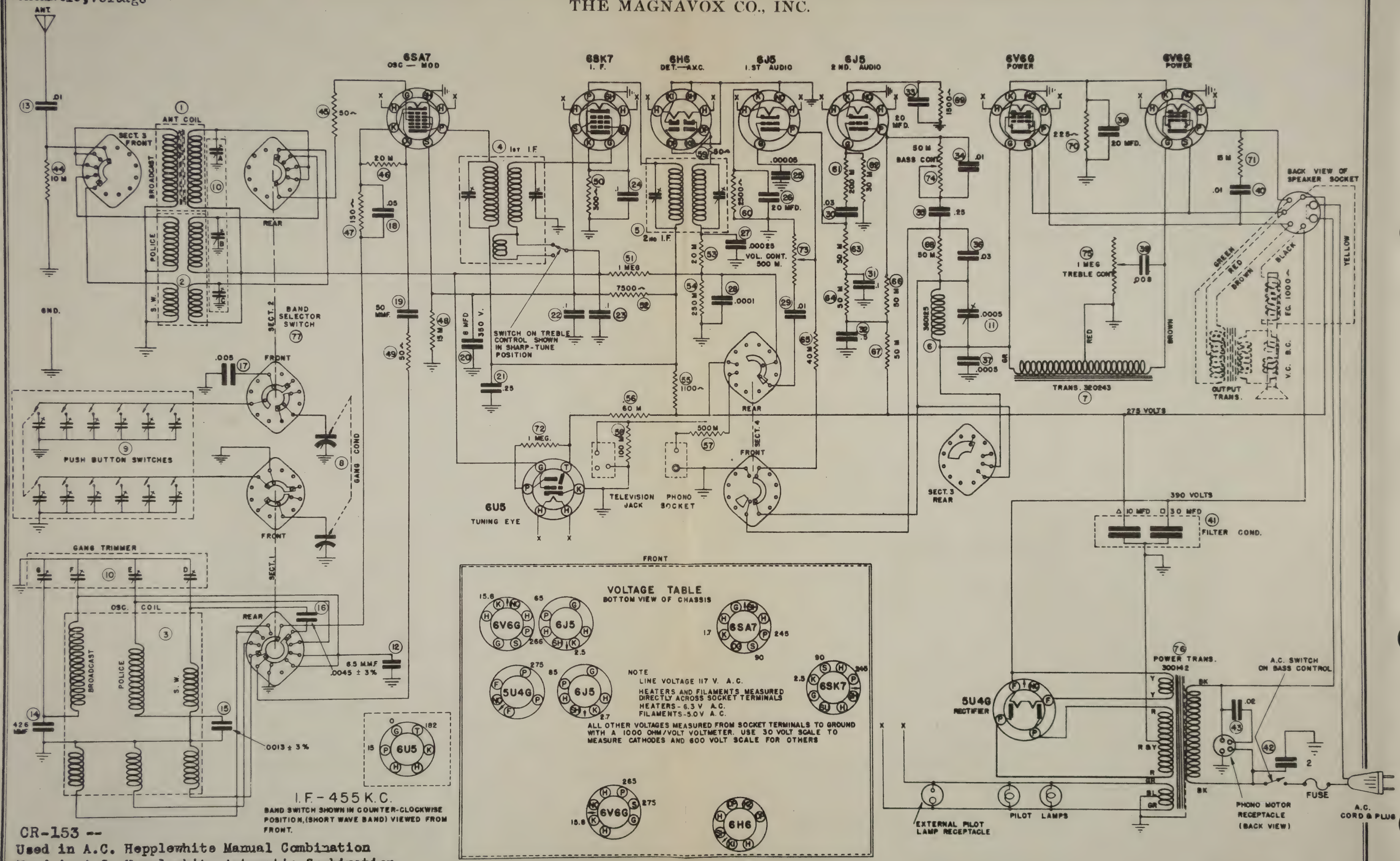


Fig. 1—Arrangement of Controls

CHASSIS CR153
Schematic,Voltage

THE MAGNAVOX CO., INC.



NOTE
LINE VOLTAGE 117 V. A.C.
HEATERS AND FILAMENTS MEASURED DIRECTLY ACROSS SOCKET TERMINALS
HEATERS - 6.3 V A.C.
FILAMENTS - 5.0 V A.C.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER. USE 30 VOLT SCALE TO MEASURE CATHODES AND 600 VOLT SCALE FOR OTHERS

I.F. - 455 K.C.
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION, (SHORT WAVE BAND) VIEWED FROM FRONT.

CR-153 --
Used in A.C. Hepplewhite Manual Combination
Used in A.C. Hepplewhite Automatic Combination
Used in A.C. Berkeley Combination

3-15-40

MODELS 62-303,62-433
Schematic,Socket,Coils
Transformer,Phono.Conn.

MONTGOMERY WARD & CO.

POWER CONSUMPTION---160 WATTS AT 117 V. 60 CYCLES.
190 WATTS (MOTOR OPERATING).
POWER OUTPUT---------20 WATTS UNDISTORTED.
30 WATTS MAXIMUM.

SPEAKER:-
12" DYNAMIC.

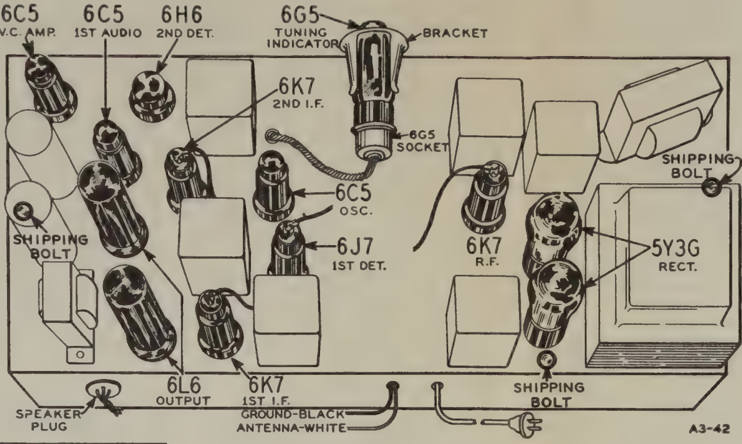
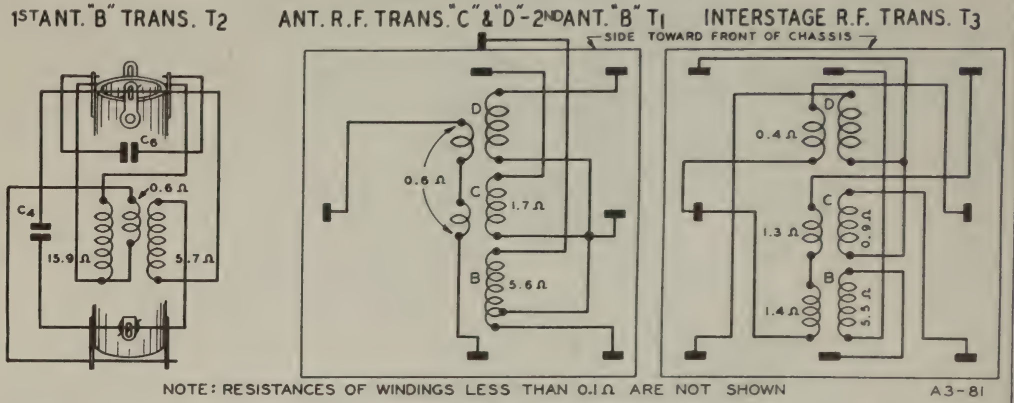


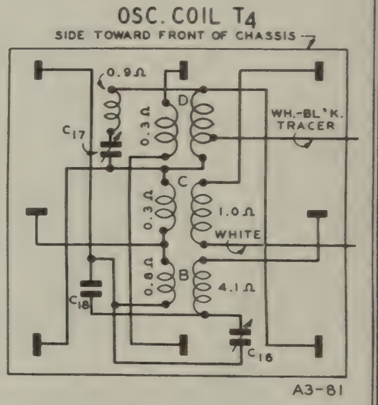
Fig. 6—Location of Tubes

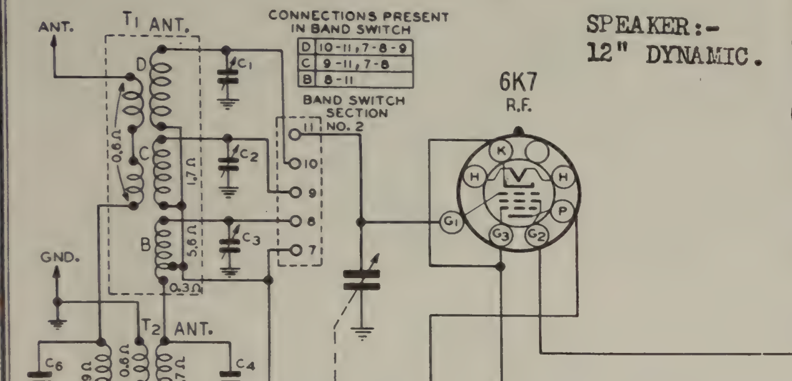
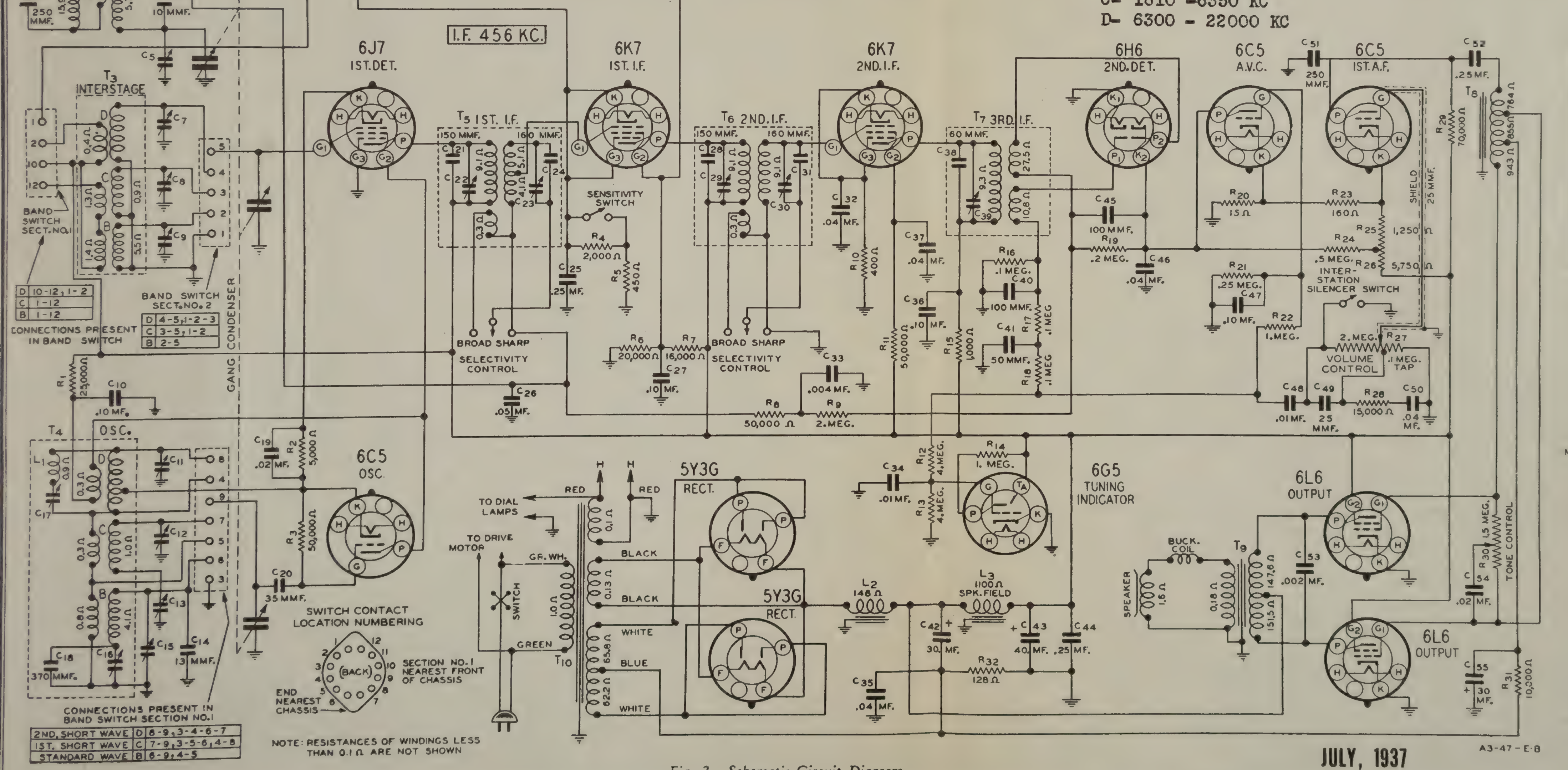

1ST ANT. "B" TRANS. T2
ANT. R.F. TRANS. "C" & "D"-2ND ANT. "B" T1
INTERSTAGE R.F. TRANS. T3
SIDE TOWARD FRONT OF CHASSIS
C6
C4
15.9 Ω
0.6 Ω
5.7 Ω
D
C
B
1.7 Ω
5.6 Ω
0.4 Ω
1.3 Ω
0.9 Ω
1.4 Ω
5.5 Ω
A3-81

NOTE: RESISTANCES OF WINDINGS LESS THAN 0.1Ω ARE NOT SHOWN

Fig. 5—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

RANGES:-
B- 528 - 1830 KC
C- 1810 -6350 KC
D- 6300 - 22000 KC



CONNECTIONS PRESENT IN BAND SWITCH

D	10-11,7-8-9
C	9-11,7-8
B	8-11

BAND SWITCH SECT. NO. 1

D	10-12, 1-2
C	1-12
B	1-12

CONNECTIONS PRESENT IN BAND SWITCH

BAND SWITCH SECT. NO. 2

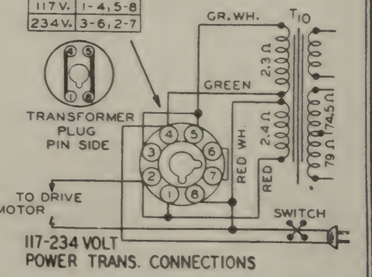
D	4-5, 1-2-3
C	3-5, 1-2
B	2-5

CONNECTIONS PRESENT IN BAND SWITCH SECTION NO. 1

2ND. SHORT WAVE	D	8-9, 3-4-6-7
1ST. SHORT WAVE	C	7-9, 3-5-6, 4-8
STANDARD WAVE	B	6-9, 4-5

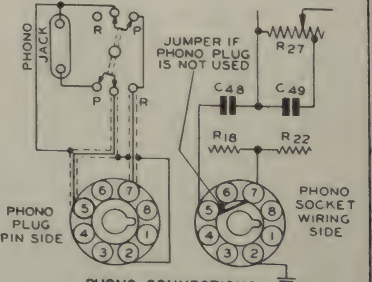
NOTE: RESISTANCES OF WINDINGS LESS THAN 0.1Ω ARE NOT SHOWN

Fig. 2—Schematic Circuit Diagram



117 V.	1-4, 5-8
234 V.	3-6, 2-7

117-234 VOLT POWER TRANS. CONNECTIONS



PHONO CONNECTIONS

JULY, 1937

MODEL 62-303
" 62-309
" 62-321
" 62-347
" 62-417

ELECTRIC DRIVE PANEL ASSEMBLY

SEPTEMBER,1937

MODEL 62-433
" 62-447
" 62-449
" 62-451

General Information

The electric drive panel assembly is the same for all touch tuning radios, and may be removed from the chassis as described in the article on that subject.

All sets since August 23, 1937, incorporate several changes in the electric drive unit. These later sets are identified by the number 2 (or higher) stamped on the bracket over the motor On-Off switch located at the upper right of the drive assembly (from the back).

The principal changes made in these later models are the following:

(1) Originally a friction drive was used from the motor to the gear train. This friction drive has been replaced with a fibre gear drive.

(2) A new method of stringing the main drive cable has been used. The new drive cable is not interchangeable with the old.

Instructions for replacing the original friction drive with the new gear drive and for replacing the original drive cable with the new drive cable are not included, since these replacements should not be made in the field.

If major trouble develops in the early models (these do not have a number on the motor On-Off switch bracket), a replacement electric drive panel assembly should be ordered.
The defective panel may then be returned for credit. There is one exception to this and that is in the case of the early 7-tube sets. Instructions for handling repairs on the electric drive panel in these models will be found further on in this manual.

Replacing Electric Drive Panel on Chassis

Remove the chassis from the cabinet using extreme care not to damage the setting button shafts. To do this, it is necessary to remove the touch tuning buttons by pushing down the lower end of the small hairpin spring at the back of the button and, at the same time, pulling the button off the shaft. It is not necessary to remove the setting buttons.

Remove the speaker plug from the socket at the back of the chassis and also the tuning eye tube from its clamp bracket. Loosen the screw holding the bottom shield connection to the back of the chassis. Unscrew and remove the twc L bolts (located under the chassis shelf) which are secured to the two rear chassis mounting feet. The screws in the wooden support behind the electric drive panel must be unscrewed and the support removed from the cabinet.

To remove the panel from the chassis, turn the electric-manual lever to the electric position. Unsolder the wire on the silencer switch on the front panel and also the motor connections under the chassis.

Take off the collars from the volume and tone control shafts.

Remove the glass screen from the panel by taking the screw out of the bracket in the upper right corner and loosening the screw in the lower left corner.

Early 7-tube models have four RED SCREWS (two located at bottom of panel and one on each side of the shaft extending through the center of the panel). Unscrew these four red screws.

THE PANEL USED FOR REPLACEMENT PURPOSES CANNOT BE MOUNTED ON THE EARLY 7-TUBE RADIOS (See article on Early 7 Tube Models).

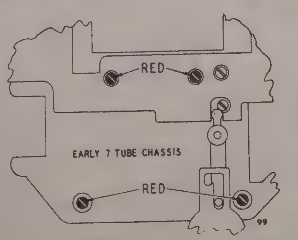


Fig.1 - Location of 4 Red Mounting Bolts in Early Models

Later models have four RED SCREWS (two located at bottom of panel and two behind glass screen). Unscrew these four red screws. DO NOT remove the screws on each side of the shaft extending through center of panel.

The following procedure for removing the panel from early models is given only in case minor repairs are necessary. If trouble serious enough to require replacement of the panel develops, the entire chassis or complete radio must be sent to the factory. A replacement panel cannot be mounted on the early type chassis.

On early models, pull the panel away from the chassis about ½", being careful not to damage the steel cable. Then tilt the upper part of the panel toward the chassis. Lower the panel about ½" and slide it to the left so the steel cable will pass under the bracket at the bottom of the projector compartment. After the cable clears this bracket, the panel may be removed.

On later models, the panel can be pulled straight out from the chassis.

To replace the assembly, reverse the above procedure. Before mounting the panel, caution must be taken that the driver arm on the drive gear and the spring clip on the gang condenser drive pulley line up properly. When they line up, the arm fits into the spring clip as the panel is pushed in toward the chassis.

When installing a new replacement panel on a late model 7 tube chassis, or any 9, 11, or 13 tube chassis, the following points must be observed carefully.

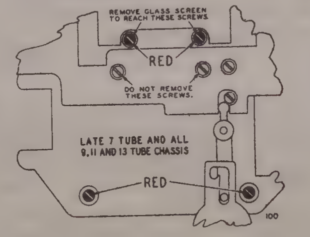

REMOVE GLASS SCREEN TO REACH THESE SCREWS
RED
DO NOT REMOVE THESE SCREWS.
LATE 7 TUBE AND ALL 9,11 AND 13 TUBE CHASSIS
RED
100

Fig.2 - Location of 4 Red Mounting Bolts in Late Models

MOUNTING BOLTS

Two bolts with heads painted red are furnished with the new panel. These bolts are longer than those used in the old panel and must be used in the TOP mounting holes only. (Holes behind glass screen.) The bolts used on the old panel may be used in the two lower mounting holes of the new panel.

MOTOR CONNECTIONS

The motor cable assembly in the new panel has only two lead wires extending from it, while the old motor cable assembly has three. The third lead on the old cable assembly was connected to a condenser which is not necessary when the new drive assembly is used.

The two leads from this condenser (metal shell, tubular type) to the terminal strips should be disconnected. The condenser can be left in the chassis, or it can be removed.

One motor lead is soldered to the terminal strip lug to which is connected one wire of the power cord and one power transformer primary lead. The other motor lead is soldered to the terminal strip lug to which is also connected the lead from the On-Off switch and the other power transformer primary lead.

CAUTION

When the electric drive panel is removed from the chassis, lay it face down and not back down. The reason for this is that there is a possibility that the motor On-Off switch on the back of the unit will be damaged or thrown out of adjustment.

In handling the electric drive panel, do not carry it by the switch operating lever (See Fig. 6) which actuates the motor On-Off switch. This bar may be bent and damaged by such handling.

A NEW ELECTRIC DRIVE PANEL CANNOT BE MOUNTED ON THE EARLY 7-TUBE MODELS

These models may be identified by the fact that when the chassis is removed from the cabinet and the electric-manual lever is in the electric position all four red mounting screws can be seen - See Fig. 1. On late models, the two top red screws are behind the glass screen and cannot be seen unless this screen is removed - See Fig. 2.

If trouble serious enough to require replacement of the electric drive panel develops in the early model radio, it will be necessary to send the entire chassis or the complete radio to the factory to have this done. A replacement panel should not be ordered as it cannot be mounted on the early type 7-tube chassis.

If Dial Figures Go Back and Forth Without Stopping

THE BUTTON MAY BE SET TOO CLOSE TO THE END OF THE DIAL

It is not advisable to set a station close to the end of the dial travel, at the point where the reversing switch operates. If, when a setting button is depressed, you should turn the tuning knob too far, a click will be heard near the end of the dial travel. Then, whenever THIS touch tuning button is depressed, the dial figures will continue to move back and forth without stopping.

This condition is easily corrected as follows: Remember which tuning button it is, on which the above condition takes place.

Turn the electric-manual lever to the manual position. Turn the manual tuning knob until the 550 KC figure is at the line on the screen.

Turn the manual tuning knob to the left 2½ complete revolutions (5 half turns).

Turn the radio off.
At the back of the assembly are 8 circular discs which correspond to the 8 buttons in front. The first disc corresponds to the first button, etc. Now, refer to the disc which corresponds to the button mentioned above (the dial figures continue to move back and forth when this button is depressed).
The disc of this button will be approximately in the position shown in Fig. 3. With the flat end of a long pencil or a thin piece of wood, carefully depress lever "A" and rotate disc "B" about one inch in the direction shown by the arrow. Do not use a metal rod or the pointed end of the pencil. Disc "B" will turn readily after lever "A" has been depressed.

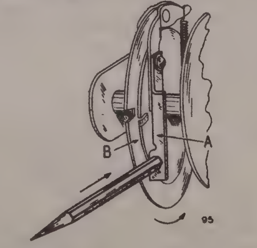


Fig.3 - Adjusting Position of Setting Disc

This will correct the condition, the stations may be set, and the radio operated in the usual manner.

Of course, when tuning in a station manually, as explained in the article "Tuning in a Station with the Manual Tuning Knob" in the instruction book, you can tune to the extreme end of the dial travel without the above condition taking place.

THE PAWL ON THE SETTING DISC MAY NOT ENGAGE THE STOPPING LEVER

The outer edge of pawl "A" (Fig. 4) should extend beyond the outside diameter of setting disc "B". As the setting disc rotates, pawl "A" will pass over stop lever "C" in one direction. When the setting disc is rotating in the other direction, stop lever "C" will engage the tip end of pawl "A" and cause pawl "A" to slide over and permit stop lever arm "C" to fall into notch in the setting disc.
If the tip end of pawl "A" does not extend a sufficient amount beyond the outer edge of the setting disc, the above mentioned action will not take place and the setting disc will rotate beyond stop lever "C" in either direction of rotation.
Should this faulty condition exist on one of the setting discs, whenever the touch tuning button corresponding to this disc is depressed, the dial figures will continue to move back and forth without stopping.
This condition is easily corrected as follows: Using a pair of side cutters, grip the tip of the pawl as shown in Fig. 4 about 1/32 inch from the edge. Pinch firmly and push outward (away from the center of setting disc). Do this until the tip of the pawl is a little more than 1/64 inch beyond the outer edge of the setting disc.
After this procedure has been followed, depress the setting button corresponding to this setting disc and see whether the stop lever edge engages the pawl properly.

IF THIS OCCURS WHEN NO TOUCH TUNING BUTTON IS DEPRESSED

Adjust the motor On-Off switch. See the article on this subject.

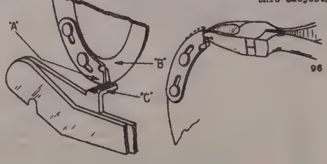


Fig.4 - Pinching Pawl of Setting Disc

Chassis, Trimmers
Stepper Unit, Dial

PHILCO RADIO & TELEV. CORP.

MODEL 40-216
MODEL 40-516

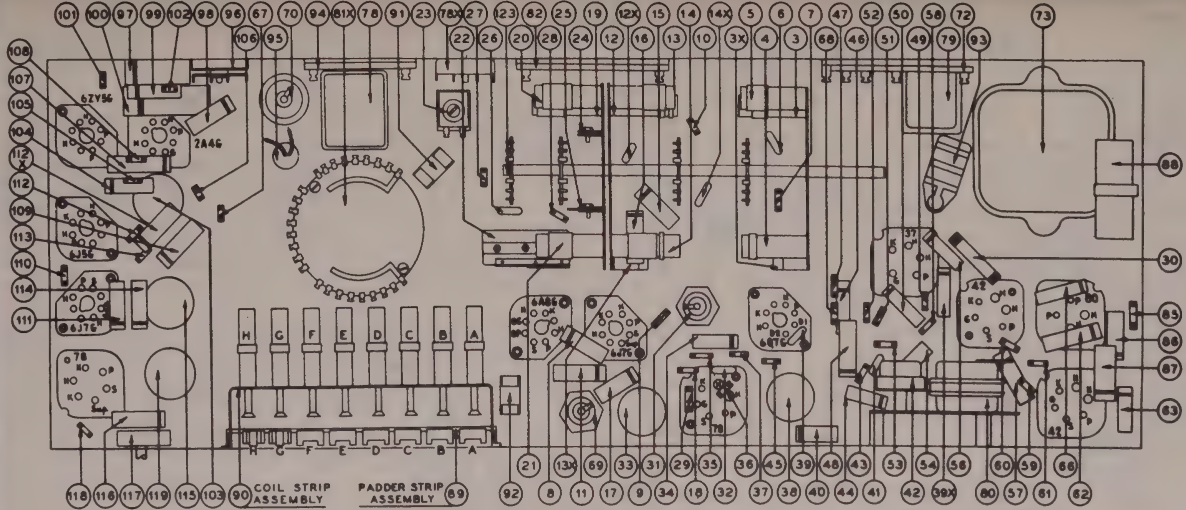
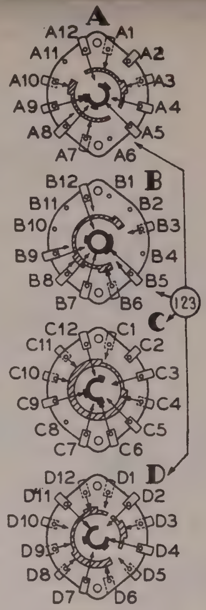


FIG. 1. MODEL 40-216 PART LOCATIONS, UNDERSIDE OF CHASSIS.



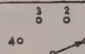
=NOTE=

SWITCHES SHOWN IN POSITION No.1 (REMOTE), FROM REAR OF CHASSIS, BOTTOM VIEW.

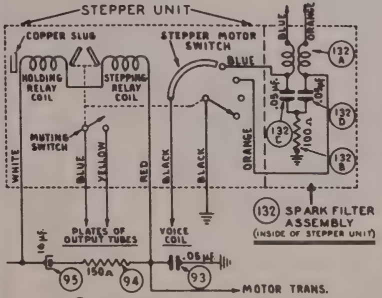
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.

SOLID AREA INDICATES REAR OF SWITCH WAFER.

SHADED AREA INDICATES FRONT OF SWITCH WAFER.



DIRECTION OF ROTATION FROM REAR OF SWITCH



(81) STEPPER UNIT COMPLETE

FIG. 2. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC.

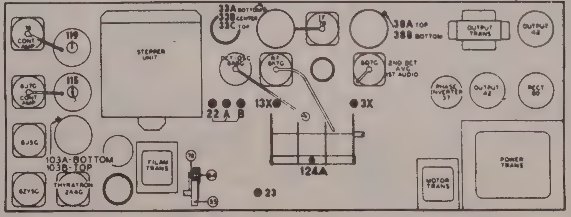


FIG. 7. LOCATIONS OF COMPENSATORS, MODEL 40-216.

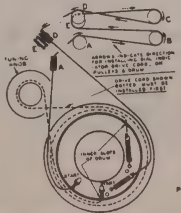
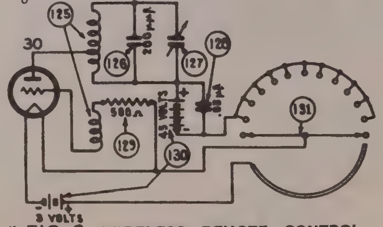

TUNING KNOB
A
B
C
D
E
ARROWS INDICATE DIRECTION FOR INSTALLING DIAL INDICATOR DRIVE CORD, ON PULLEYS & DRUM
DRIVE CORD SHOWN DOTTED MUST BE INSTALLED FIRST
INNER SLOTS OF DRUM
START

FIG. 5. DIAL POINTER AND CABLE ARRANGEMENT.

MODELS 40-205, 40-216.

INSTALLATION OF DRIVE CORDS
POINTER AT LOW FREQUENCY END OF DIAL
GANG CLOSED



* FIG. 3. WIRELESS REMOTE CONTROL UNIT SCHEMATIC DIAGRAM.

***In model 40-516** No. 8 position is used for phonograph. This position is already connected and will not need adjustment.

MONTGOMERY WARD & CO

MODELS 62-303,62-433
Alignment,Trimmers
Voltage,Notes

A. C. POWER SUPPLY

13 TUBE • 3 BAND • ALL WAVE

ALIGNMENT PROCEDURE

Local-Distance Switch — Distance Position.
Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator With a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR		TRIMMERS ADJUSTED See Illustration	PROCEDURE	
			FREQUENCY SETTING	CONNECTION AT RADIO		INITIAL STEPS	ADJUSTMENT
I.F.							
3rd I.F.	Range B	.1 mf.	456 KC	Grid of 2nd I.F. Tube	3rd I.F. (C39)	Turn Rotor to Full Open	Adjust to Maximum Output
2nd I.F.	Range B	.1 mf.	456 KC	Grid of 1st I.F. Tube	2nd I.F. (C29) & (C30)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C22) & (C23)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B							
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C15)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st & 2nd Ant. Range B (C5) & (C3)—Int. Range B (C9)	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C16)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE C							
6350 KC	Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C12)	Turn Rotor to Full Open	Adjust to Maximum Output
6000 KC	Range C	400 Ohm	6000 KC	Antenna Lead	Ant. Range C; (C2) Int. Range C (C8)	Turn Rotor to Max. Output	Adjust to Maximum Output
2000 KC	Range C	400 Ohm	2000 KC	Antenna Lead	2000 KC (C13)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE D							
22,000 KC	Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output
20,000 KC	Range D	400 Ohm	20,000 KC	Antenna Lead	Ant. Range D (C1) Int. Range D (C7)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
7000 KC	Range D	400 Ohm	7000 KC	Antenna Lead	7000 KC (C17)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the telephone dial tuning, there will be seen inside the telephone dial button ring an escutcheon plate held in place by four screws. Loosen the 2 screws nearest the pointer. An extension of the pointer will be seen protruding over the edge of this escutcheon plate. Move the pointer to the 1500 KC mark on the dial and then tighten the 2 escutcheon screws. (Do not tighten these screws too much.)

On the electric drive models, the pointer is held to the shaft by a friction clip arrangement. With the electric-manual lever in the manual position, hold the tuning knob and move the pointer to the 1500 KC mark on the dial.

In sets using any other type of dial mechanism, it will be necessary to adjust the position of the indicator until it is at the 1500 KC mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

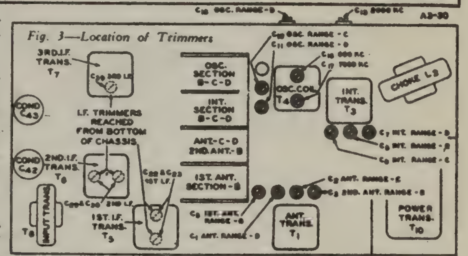


Fig. 3—Location of Trimmers

117-234 Volt Power Transformer

Some models are equipped with a 117-234 volt universal power transformer. Connections as shown in Fig. 2 are completed to a special octal socket mounted on the back panel of the chassis. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

Models without the electric drive, which are equipped with this transformer, may be used on a power supply of 40 to 60 cycles. If an electric drive motor is used, however, it is important that the set be operated on a 60 cycle power supply only. The reason for this is that the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycle. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model, is used for this purpose.

If one of these transformers is to be installed in a chassis equipped with a regular transformer, there is a 1⅛ inch round knockout on the back panel which may be removed to permit installation of the octal socket mentioned above.

Twenty-Five Cycle Models

Twenty-five cycle receivers not equipped with an electric motor drive, differ from sixty cycle receivers only in the fact that a different power transformer is used. The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true—a sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

Phonograph Connections

Phonograph connections are made as shown in the schematic circuit diagram Fig. 2. On the front panel of the chassis base is a round knockout 1⅛ inches in diameter. An octal base socket is mounted in this knockout opening and wired as shown in the schematic.

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control Maximum
Local-Distance Switch in Distance Position
Readings taken with 1000 Ohm-per-volt meter

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7—6U7G	R.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6J7—6J7G	1st Det.	0	6.1(1)	250	115	0		6.1(1)	6.0
6C5—6C5G	Osc.	0	6.1(1)	115				6.1(1)	0
6K7—6U7G	1st I.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6K7—6U7G	2nd I.F.	0	6.1(1)	240	130	5.0		6.1(1)	5.0
6H6	2nd Det.	0	6.1(1)					6.1(1)	0
6C5—6C5G	A.V.C.	0	6.1(1)	5(3)				6.1(1)	.5
6C5—6C5G	1st A.F.	0	6.1(1)	145				6.1(1)	6.0
6L6—6L6G	Output	0	6.1(1)	330	250	21(4)		6.1(1)	0
5Y3G	Rectifier	0	4.7(5)		1100(6)		1100(6)		4.7(5)
6G5	Tuning Indicator	Plate to Ground 20(3)		Target to Ground 250		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with a 1000 Ohm-per-volt meter (500 volt scale).
(4) Bias as read across L4 or R32, depending on speaker arrangement. See Schematic Diagram.
(5) A.C. voltage as read across filament terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.

A phono cable assembly may then be purchased On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack

Some models are shipped from the factory equipped with the phono socket. A jumper is inserted in this socket which must be removed if the phonograph installation is made—See Fig. 2.

Dial and Drive Assembly

Complete information regarding the dial and drive assemblies will be found in the Dial and Drive Service NOTES issued for this chassis. (see index)

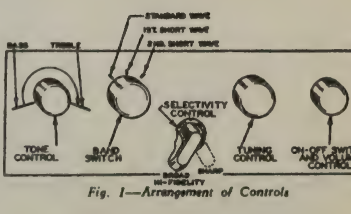


Fig. 1—Arrangement of Controls

MODELS 62-303,62-309,62-321
62-347,62-417,62-433,62-447
62-449,62-451
Elec.Drive Panel Assembly

MONTGOMERY WARD & CO.

Replacement Instructions
Notes

MODEL 62-303
" 62-309
" 62-321
" 62-347
" 62-417

ELECTRIC DRIVE PANEL ASSEMBLY

SEPTEMBER,1937

MODEL 62-433
" 62-447
" 62-449
" 62-451

General Information

The electric drive panel assembly is the same for all touch tuning radios, and may be removed from the chassis as described in the article on that subject.

All sets since August 23, 1937, incorporate several changes in the electric drive unit. These later sets are identified by the number 2 (or higher) stamped on the bracket over the motor On-Off switch located at the upper right of the drive assembly (from the back).

The principal changes made in these later models are the following:

(1) Originally a friction drive was used from the motor to the gear train. This friction drive has been replaced with a fibre gear drive.

(2) A new method of stringing the main drive cable has been used. The new drive cable is not interchangeable with the old.

Instructions for replacing the original friction drive with the new gear drive and for replacing the original drive cable with the new drive cable are not included, since these replacements should not be made in the field.

If major trouble develops in the early models (these do not have a number on the motor On-Off switch bracket), a replacement electric drive panel assembly should be ordered.
The defective panel may then be returned for credit. There is one exception to this and that is in the case of the early 7-tube sets. Instructions for handling repairs on the electric drive panel in these models will be found further on in this manual.

Replacing Electric Drive Panel on Chassis

Remove the chassis from the cabinet using extreme care not to damage the setting button shafts. To do this, it is necessary to remove the touch tuning buttons by pushing down the lower end of the small hairpin spring at the back of the button and, at the same time, pulling the button off the shaft. It is not necessary to remove the setting buttons.

Remove the speaker plug from the socket at the back of the chassis and also the tuning eye tube from its clamp bracket. Loosen the screw holding the bottom shield connection to the back of the chassis. Unscrew and remove the two L bolts (located under the chassis shelf) which are secured to the two rear chassis mounting feet. The screws in the wooden support behind the electric drive panel must be unscrewed and the support removed from the cabinet.

To remove the panel from the chassis, turn the electric-manual lever to the electric position. Unsolder the wire on the silencer switch on the front panel and also the motor connections under the chassis.

Take off the collars from the volume and tone control shafts.

Remove the glass screen from the panel by taking the screw out of the bracket in the upper right corner and loosening the screw in the lower left corner.

Early 7-tube models have four RED SCREWS (two located at bottom of panel and one on each side of the shaft extending through the center of the panel). Unscrew these four red screws.

THE PANEL USED FOR REPLACEMENT PURPOSES CANNOT BE MOUNTED ON THE EARLY 7-TUBE RADIOS (See article on Early 7 Tube Models).

Later models have four RED SCREWS (two located at bottom of panel and two behind glass screen). Unscrew these four red screws. DO NOT remove the screws on each side of the shaft extending through center of panel.

The following procedure for removing the panel from early models is given only in case minor repairs are necessary. If trouble serious enough to require replacement of the panel develops, the entire chassis or complete radio must be sent to the factory. A replacement panel cannot be mounted on the early type chassis.

On early models, pull the panel away from the chassis about ½", being careful not to damage the steel cable. Then tilt the upper part of the panel toward the chassis. Lower the panel about ½" and slide it to the left so the steel cable will pass under the bracket at the bottom of the projector compartment. After the cable clears this bracket, the panel may be removed.

On later models, the panel can be pulled straight out from the chassis.

To replace the assembly, reverse the above procedure. Before mounting the panel, caution must be taken that the driver arm on the drive gear and the spring clip on the gang condenser drive pulley line up properly. When they line up, the arm fits into the spring clip as the panel is pushed in toward the chassis.

When installing a new replacement panel on a late model 7 tube chassis, or any 9, 11, or 13 tube chassis, the following points must be observed carefully.

MOUNTING BOLTS

Two bolts with heads painted red are furnished with the new panel. These bolts are longer than those used in the old panel and must be used in the TOP mounting holes only. (Holes behind glass screen.) The bolts used on the old panel may be used in the two lower mounting holes of the new panel.

MOTOR CONNECTIONS

The motor cable assembly in the new panel has only two lead wires extending from it, while the old motor cable assembly has three. The third lead on the old cable assembly was connected to a condenser which is not necessary when the new drive assembly is used.

The two leads from this condenser (metal shell, tubular type) to the terminal strips should be disconnected. The condenser can be left in the chassis, or it can be removed.

One motor lead is soldered to the terminal strip lug to which is connected one wire of the power cord and one power transformer primary lead. The other motor lead is soldered to the terminal strip lug to which is also connected the lead from the On-Off switch and the other power transformer primary lead.

CAUTION

When the electric drive panel is removed from the chassis, lay it face down and not back down. The reason for this is that there is a possibility that the motor On-Off switch on the back of the unit will be damaged or thrown out of adjustment.

In handling the electric drive panel, do not carry it by the switch operating lever (See Fig. 6) which actuates the motor On-Off switch. This bar may be bent and damaged by such handling.

A NEW ELECTRIC DRIVE PANEL CANNOT BE MOUNTED ON THE EARLY 7-TUBE MODELS

These models may be identified by the fact that when the chassis is removed from the cabinet and the electric-manual lever is in the electric position all four red mounting screws can be seen - See Fig. 1. On late models, the two top red screws are behind the glass screen and cannot be seen unless this screen is removed - See Fig. 2.

If trouble serious enough to require replacement of the electric drive panel develops in the early model radio, it will be necessary to send the entire chassis or the complete radio to the factory to have this done. A replacement panel should not be ordered as it cannot be mounted on the early type 7-tube chassis.

If Dial Figures Go Back and Forth Without Stopping

THE BUTTON MAY BE SET TOO CLOSE TO THE END OF THE DIAL

It is not advisable to set a station close to the end of the dial travel, at the point where the reversing switch operates. If, when a setting button is depressed, you should turn the tuning knob too far, a click will be heard near the end of the dial travel. Then, whenever THIS touch tuning button is depressed, the dial figures will continue to move back and forth without stopping.

This condition is easily corrected as follows: Remember which tuning button it is, on which the above condition takes place.

Turn the electric-manual lever to the manual position. Turn the manual tuning knob until the 550 KC figure is at the line on the screen.

Turn the manual tuning knob to the left 2½ complete revolutions (5 half turns).

Turn the radio off.

At the back of the assembly are 8 circular discs which correspond to the 8 buttons in front. The first disc corresponds to the first button, etc. Now, refer to the disc which corresponds to the button mentioned above (the dial figures continue to move back and forth when this button is depressed).

The disc of this button will be approximately in the position shown in Fig. 3. With the flat end of a long pencil or a thin piece of wood, carefully depress lever "A" and rotate disc "B" about one inch in the direction shown by the arrow. Do not use a metal rod or the pointed end of the pencil. Disc "B" will turn readily after lever "A" has been depressed.

This will correct the condition, the stations may be set, and the radio operated in the usual manner.

Of course, when tuning in a station manually, as explained in the article "Tuning in a Station with the Manual Tuning Knob" in the instruction book, you can tune to the extreme end of the dial travel without the above condition taking place.

THE PAWL ON THE SETTING DISC MAY NOT ENGAGE THE STOPPING LEVER

The outer edge of pawl "A" (Fig. 4) should extend beyond the outside diameter of setting disc "B". As the setting disc rotates, pawl "A" will pass over stop lever "C" in one direction. When the setting disc is rotating in the other direction, stop lever "C" will engage the tip end of pawl "A" and cause pawl "A" to slide over and permit stop lever arm "C" to fall into notch in the setting disc.

If the tip end of pawl "A" does not extend a sufficient amount beyond the outer edge of the setting disc, the above mentioned action will not take place and the setting disc will rotate beyond stop lever "C" in either direction of rotation.

Should this faulty condition exist on one of the setting discs, whenever the touch tuning button corresponding to this disc is depressed, the dial figures will continue to move back and forth without stopping.

This condition is easily corrected as follows: Using a pair of side cutters, grip the tip of the pawl as shown in Fig. 4 about 1/32 inch from the edge. Pinch firmly and push outward (away from the center of setting disc). Do this until the tip of the pawl is a little more than 1/64 inch beyond the outer edge of the setting disc.

After this procedure has been followed, depress the setting button corresponding to this setting disc and see whether the stop lever edge engages the pawl properly.

IF THIS OCCURS WHEN NO TOUCH TUNING BUTTON IS DEPRESSED

Adjust the motor On-Off switch. See the article on this subject.

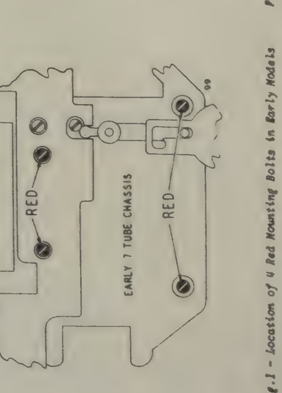


Fig.1 - Location of 4 Red Mounting Bolts in Early Models

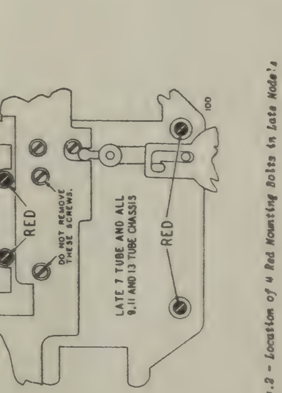


Fig.2 - Location of 4 Red Mounting Bolts in Late Models

REMOVE GLASS SCREEN TO REACH THESE SCREWS
RED
DO NOT REMOVE THESE SCREWS.
LATE 7 TUBE AND ALL 9, 11 AND 13 TUBE CHASSIS
RED
100

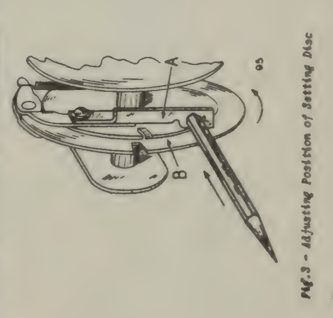


Fig.3 - Adjusting Position of Setting Disc

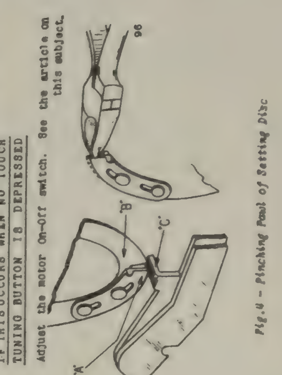
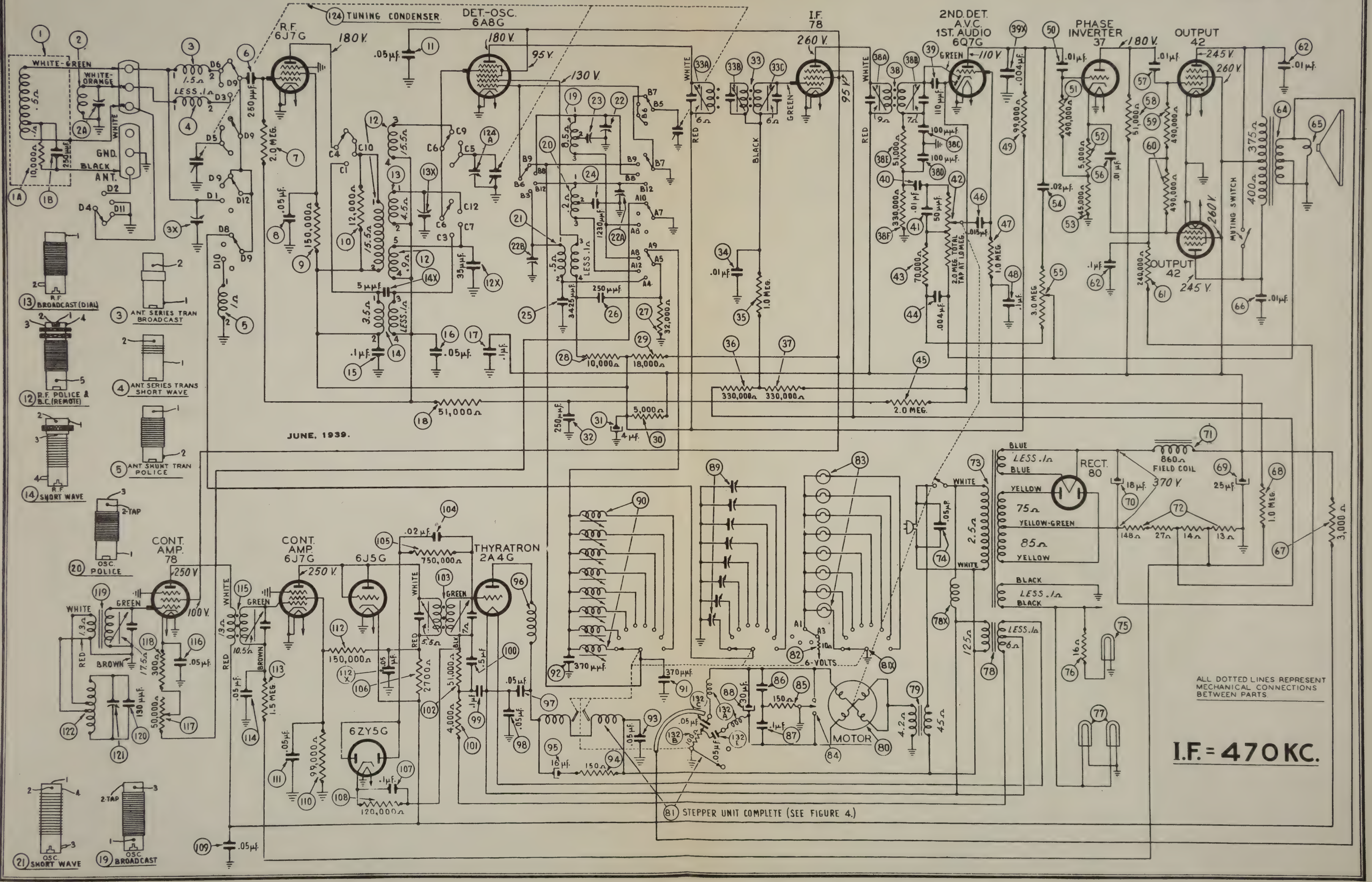


Fig.4 - Pinching Pawl of Setting Disc

PHILCO RADIO & TELEV. CORP.

MODEL 40-216
Schematic, Voltage



Replacement Parts

Model 40-205

SCHE. No.	DESCRIPTION	PART No.
1	Resistor (1.0 meg., ½ watt)	33-510339
1X	Tubular Cond. (.05 mfd.)	30-4519
1Y	Resistor (330,000 ohms, ½ watt)	33-433339
2	Mica Cond. (200 mmfd.)	30-1078
2X	Tubular Cond. (.05 mfd.)	30-4123
3	R. F. Trans.	32-3282
3A	Resistor (12,000 ohms, ½ watt)	33-312339
4	Mica Cond. (250 mmfd.)	30-1032
5	Resistor (32,000 ohms, ½ watt)	33-332339
6	Oscillator Trans.	32-3278
7	Compensator	31-6230
7X	Mica Cond. (15 mmfd.)	30-1139
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	Resistor (5,000 ohms, 2 watts)	33-250539
10	Resistor (13,000 ohms, 1 watt)	33-313439
11	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
12	Tubular Cond. (.05 mfd.)	30-4123
13	1st I. F. Trans. Assy.	32-3089
14	2nd I. F. Trans. Assy.	32-2045
15	Mica Cond. (110 mmfd.)	30-1031
16	Resistor (2.0 meg., ½ watt)	33-520339
17	Resistor (1.0 meg., ½ watt)	33-510339
18	Tubular Cond. (.01 mfd.)	30-4479
19	Mica Cond. (50 mmfd.)	30-1029
20	Resistor (70,000 ohms, ½ watt)	33-370339
21	Volume Control (2.0 meg.)	33-5300
22	Tubular Cond. (.004 mfd.)	30-4334
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Cond. (.015 mfd.)	30-4358
25	Tone Control (3.0 meg.)	33-5287
26	Tubular Cond. (.02 mfd.)	30-4481
27	Resistor (99,000 ohms, ½ watt)	33-399339
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Resistor (490,000 ohms, ½ watt)	33-449339
30	Tubular Cond. (.03 mfd.)	30-4517
30X	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Cond. (.01 mfd.)	30-4501
32	Resistor (3500 ohms, ½ watt)	33-235339
33	Tubular Cond. (.01 mfd.)	30-4501
34	Output Trans.	32-7997
35	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
36	Tubular Cond. (.01 mfd.)	30-4501
37	Resistor (3000 ohms, ½ watt)	33-230339
38	Tubular Cond. (.1 mfd.)	30-4499
39	Resistor (1.0 meg., ½ watt)	33-510339
40	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
41	Bias Resistor (Wirewound)	33-3361
42	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
43	Field Coil (Replace Spkr. Part No. 36-1450)	
44	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
45	Condenser (.05 mfd., 115 V. Plug)	30-4576
46	Pilot Lamp (Bullseye)	34-2210
47	Pilot Lamp Resistor (16 ohms, 1 watt)	33-016431
48	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
48X	Choke Coil	32-1281
49	Pilot Lamps (Dial)	34-2064
50	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
51	Volume Control Motor Assy.	35-1151
52	Rotary Switch	42-1468
53	Bias Resistor (Wirewound, 10 ohms)	33-3363
54	Pilot Lamps (Station Indicator)	34-2064
55	Resistor (150 ohms, ½ watt)	33-115339
56	Volume Control Switch (Motor Control)	42-1469
57	Tubular Cond. (.1 mfd.)	30-4499
58	Tubular Cond. (.1 mfd.)	30-4499
58X	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
59	Stepper Unit Complete	38-9689
60	Compensator Strip (Pushbutton)	31-6264
60A	Compensator No. 1	
60B	Compensator No. 2	
	540-1030 K.C., Part of 60	
60C	Compensator No. 3	
60D	Compensator No. 4	
	670-1160 K.C., Part of 60	
60E	Compensator No. 5	
60F	Compensator No. 6	
	900-1470 K.C., Part of 60	
60G	Compensator No. 7	
60H	Compensator No. 8	
	1170-1600 K.C., Part of 60	
61	Coil Assy. (Pushbuttons)	
61A	Oscillator Coil No. 1	
61B	Oscillator Coil No. 2	
	540-1030 K.C.	32-3042
61C	Oscillator Coil No. 3	
61D	Oscillator Coil No. 4	
	670-1160 K.C.	32-3042
61E	Oscillator Coil No. 5	
61F	Oscillator Coil No. 6	
	900-1470 K.C.	32-3041
61G	Oscillator Coil No. 7	
61H	Oscillator Coil No. 8	
	1170-1600 K.C.	32-3041
62	Silver Mica Cond. (370 mmfd.)	30-1110
62X	Silver Mica Cond. (370 mmfd.)	30-1110
63	Spark Filter Assy.	
63A	Spark Filter Choke	32-3276
63B	Resistor (100 ohms, ½ watt)	33-110339
63C	Tubular Cond. (.05 mfd.)	30-4444
63D	Tubular Cond. (.05 mfd.)	30-4444
64	Bakelite Cond. (.05 mfd.)	3615-SG
65	Resistor (150 ohms, Wirewound)	33-3362
66	Electrolytic Cond. (16 mfd., 150 V.)	30-2367
67	Choke Coil	32-1281
68	Tubular Cond. (.05 mfd.)	30-4123
69	Tubular Cond. (.05 mfd.)	30-4123
70	Tubular Cond. (.1 mfd.)	30-4499
71	Tubular Cond. (.5 mfd.)	30-4551
72	Resistor (51,000 ohms, ½ watt)	33-351339
73	Resistor (4,000 ohms, ½ watt)	33-240339
74	No. 3 Control Amp. Coil	32-3275
75	Resistor (750,000 ohms, ½ watt)	33-475339
76	Tubular Cond. (.02 mfd.)	30-4516
77	Resistor (120,000 ohms, ½ watt)	33-412339
78	Tubular Cond. (.1 mfd.)	30-4455
79	Resistor (150,000 ohms, ½ watt)	33-415339
80	Tubular Cond. (.05 mfd.)	30-4123
80X	Resistor (2700 ohms, ½ watt)	33-227339
81	Resistor (99,000 ohms, ½ watt)	33-399339
82	Tubular Cond. (.05 mfd.)	30-4123
83	Resistor (1.5 meg., ½ watt)	33-515339
84	Tubular Cond. (.05 mfd.)	30-4519
85	No. 2 Control Amp. Coil	32-3087
86	Tubular Cond. (.05 mfd.)	30-4123
87	Tubular Cond. (.05 mfd.)	30-4444
88	Resistor (300 ohms, ½ watt)	33-130339
89	Sensitivity Control (50,000 ohms)	33-5295
90	No. 1 Control Amp. Coil	32-3086
91	Silver Mica Cond. (155 mfd.)	30-1121
92	Air Padder (Secondary Inductor)	31-6268
93	Secondary Inductor	40-6414
94	Wave Switch	42-1454
95	Tuning Cond.	31-2311
96	Loop Assembly	38-9882
96A	Mica Cond. (250 mmfd.)	61-0033
96B	Resistor (10,000 ohms, ½ watt)	33-310339
97	Ant. Series Trans.	32-3226

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	38-9931
Bezel Gasket and Staple Assy.	38-9734
Bezel Screws	W-1834
Cable and Plug (Power Supply)	L-3176
Cabinet	10402A
Drive Cord (Tuning Cond.)	31-2350
Drive Cord (Pointer)	31-2320
Dial	27-5537
Disc (Tuning)	27-4766
Disc (Tone Control)	27-4764
Disc (Volume Control)	27-4765
Disc (Wave Switch)	27-4767
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Lamp Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (6 prong, Octal, 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (7 prong, Octal, 6J7G tubes)	27-6057
Socket (7 prong, Octal, 6A8G tube)	27-6099
Speaker	36-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer, Tuning Disc)	56-1029
Washer (Spring Washer, Tuning Disc)	6717

Model 40-216

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1509
Bezel Gasket and Staple Assy.	38-9734
Cabinet	10403A
Cable (Power Supply)	L-3176
Dial	27-5535
Drive Cord (Tuning Cond.)	31-2315
Drive Cord (Pointer)	31-2320
Disc (Tuning)	27-4766
Disc (Volume)	27-4765
Disc (Wave Switch)	27-4767
Disc (Tone Control)	27-4764
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Light Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (5 prong, type 37 tube)	27-6035
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (Octal, type 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (Octal, type 6J7G tube)	27-6057
Socket (Octal, type 6A8G tubes)	27-6099
Speaker	36-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer Tuning Disc)	56-1029
Washer (Spring Washer Tuning Disc)	6717

Replacement Parts

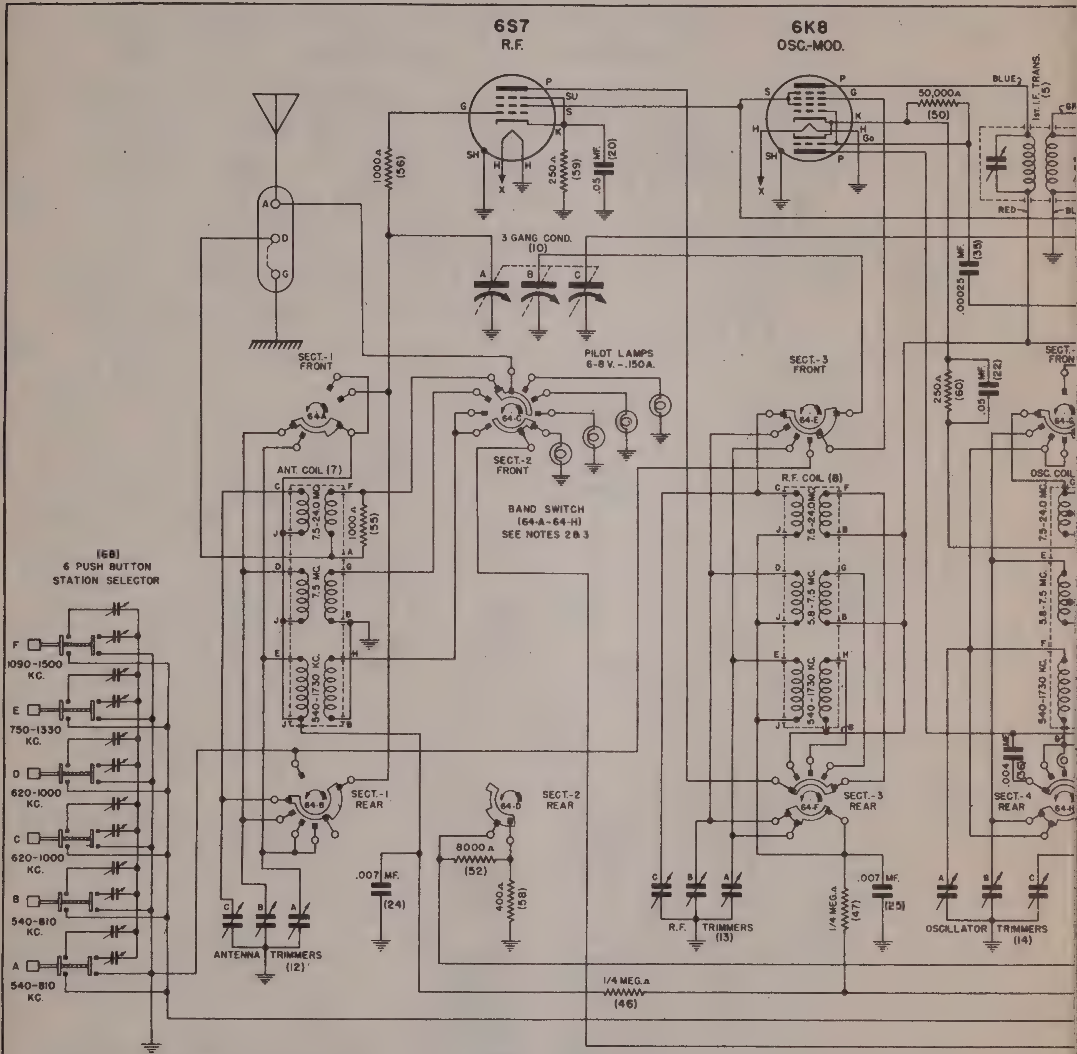
Model 40-216

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9882
1A	Resistor (10,000 ohms, ½ watt)	33-310339
1B	Mica Cond. (250 mmfd.)	61-0033
2	Loop Assy. (Short Wave)	38-9933
2A	Compensator	31-6326
3	Ant. Series Trans. (Broadcast)	32-3291
3X	Compensator	31-6212
4	Ant. Series Trans. (Short Wave)	32-3293
5	Ant. Trans. (Police Shunt)	32-3292
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (2.0 meg., ½ watt)	33-520339
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (150,000 ohms, ½ watt)	33-415339
10	Resistor (12,000 ohms, ½ watt)	33-312339
11	Tubular Cond. (.05 mfd.)	30-4123
12	R. F. Trans. (Broadcast, Pushbutton and Police)	32-3230
12X	Mica Condenser (35 mmfd.)	30-1141
13	R. F. Trans. (Broadcast Manual)	32-3227
13X	Compensator	31-6212
14	R. F. Trans. (Short Wave)	32-3046
14X	Mica Cond. (5 mmfd.)	30-1097
15	Tubular Cond. (.1 mfd.)	30-4455
16	Tubular Cond. (.05 mfd.)	30-4519
17	Tubular Cond. (.1 mfd.)	30-4455
18	Resistor (51,000 ohms, ½ watt)	33-351339
19	Oscillator Trans. (Broadcast)	32-3231
20	Oscillator Trans. (Police)	32-3294
21	Oscillator Trans. (Short Wave)	32-3051
22	Compensator (3 section, oscillator)	31-6266
23	Compensator (Broadcast, Low Frequency)	31-6230
24	Tracking Cond. (1230 mmfd.)	31-6262
25	Tracking Cond. (3425 mmfd.)	31-6263
26	Mica Cond. (250 mmfd.)	61-0033
27	Resistor (32,000 ohms, ½ watt)	33-332339
28	Resistor (10,000 ohms, ½ watt)	33-310339
29	Resistor (18,000 ohms, ½ watt)	33-318339
30	Resistor (5,000 ohms, 2 watt)	33-250539
31	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
32	Mica Cond. (250 mmfd.)	61-0033
33	1st I. F. Trans. Assy.	32-3089
34	Tubular Cond. (.01 mfd.)	30-4572
35	Resistor (1.0 meg., ½ watt)	33-510339
36	Resistor (330,000 ohms, ½ watt)	33-433339
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	2nd I. F. Trans. Assy.	32-2645
39	Mira Cond. (110 mmfd.)	30-1031
39X	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.01 mfd.)	30-4479
41	Mica Cond. (50 mmfd.)	30-1029
42	Volume Control	33-5300
43	Resistor (70,000 ohms, ½ watt)	33-370339
44	Tubular Cond. (.004 mfd.)	30-4334
45	Resistor (2.0 meg., ½ watt)	33-520339
46	Tubular Cond. (.015 mfd.)	30-4529
47	Resistor (1.0 meg., ½ watt)	33-510339
48	Tubular Cond. (.1 mfd.)	30-4527
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Tubular Cond. (.01 mfd.)	30-4169
51	Resistor (490.000 ohms, ½ watt)	33-449339
52	Resistor (5.000 ohms, ½ watt)	33-250339
53	Resistor (45,000 ohms, ½ watt)	33-345339
54	Tubular Cond. (.02 mfd.)	30-4481
55	Tone Control (3.0 meg.)	33-5287
56	Tubular Cond. (.01 mfd.)	30-4572
57	Tubular Cond. (.01 mfd.)	30-4572
58	Resistor (51,000 ohms, ½ watt)	33-351339
59	Resistor (490,000 ohms, ½ watt)	33-449339
60	Resistor (490,000 ohms, ½ watt)	33-449339
61	Resistor (240,000 ohms, ½ watt)	33-424339
62	Tubular Cond. (.1 mfd.)	30-4499
63	Tubular Cond. (.01 mfd.)	30-4501
64	Output Trans.	32-7996
65	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
66	Tubular Cond. (.01 mfd.)	30-4501
67	Resistor (3,000 ohms, ½ watt)	33-230339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
70	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Resistor (Wirewound, Bias)	33-3364
73	Power Trans. (115 V., 50-60 cycles)	32-8001
	Power Trans. (115 V., 25-40 cycles)	32-8017
74	Bypass Cond. (.05 mfd., 110 V. Plug)	30-4576
75	Pilot Lamp (Bullseye)	34-2210
76	Pilot Lamp Resistor (16 ohms)	33-016331
77	Pilot Lamps (Dial)	34-2064
78	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
78X	Choke Coil	32-1281
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assy. (Volume Control)	35-1151
81	Stepper Unit (Complete)	38-9689
81X	Rotary Switch (Stepper Unit)	42-1468
82	B. C. Resistor (Wirewound, 10 ohms)	33-3363
83	Pilot Lamp Assy. (Station Indicator)	34-2064
84	Switch (Volume Control-Motor)	42-1469
85	Resistor (150 ohms, ½ watt)	33-115339
86	Tubular Cond. (.1 mfd.)	30-4499
87	Tubular Cond. (.1 mfd.)	30-4499
88	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
89	Padder Strip (Pushbuttons)	31-6264
89A	Compensator No. 1	
89B	Compensator No. 2	
	540-1030 K.C., Part of 89	
89C	Compensator No. 3	
89D	Compensator No. 4	
	670-1160 K.C., Part of 89	
89E	Compensator No. 5	
89F	Compensator No. 6	
	900-1470 K.C., Part of 89	
89G	Compensator No. 7	
89H	Compensator No. 8	
	1100-1600 K.C., Part of 89	
90	Elec. Pushbutton Trans. Assy. (8 Trans.)	32-3091
90A	Osc. Trans. No. 1	
90B	Osc. Trans. No. 2	
	540-1030 K.C.	32-3042
90C	Osc. Trans. No. 3	
90D	Osc. Trans. No. 4	
	670-1160 K.C.	32-3042
90E	Osc. Trans. No. 5	
90F	Osc. Trans. No. 6	
	900-1470 K.C.	32-3041
90G	Osc. Trans. No. 7	
90H	Osc. Trans. No. 8	
	1100-1600 K.C.	32-3041
91	Silver Mica Cond. (370 mmfd.)	30-1110
92	Silver Mica Cond. (370 mmfd.)	30-1110
93	Bakelite Cond. (.05 mfd.)	3615SG
94	Resistor (150 ohms)	33-3362
95	Electrolytic Cond. (16 mfd., 200	30-2356
96	Choke Coil	32-1281
97	Tubular Cond. (.05 mfd.)	30-4123
98	Tubular Cond. (.05 mfd.)	30-4123
99	Tubular Cond. (.1 mfd.)	30-4499
100	Tubular Cond. (.5 mfd.)	30-4551
101	Resistor (4000 ohms, ½ watt)	33-240339
102	Resistor (51,000 ohms, ½ watt)	33-351339
103	No. 3 Control Amp. Trans.	32-3275
104	Tubular Cond. (.02 mfd.)	30-4516
105	Resistor (750,000 ohms, ½ watt)	33-475339
106	Resistor (2700 ohms, ½ watt)	33-227339
107	Tubular Cond. (.1 mfd.)	30-4455
108	Resistor (120,000 ohms, ½ watt)	33-412339
109	Tubular Cond. (.05 mfd.)	30-4123
110	Resistor (99,000 ohms, ½ watt)	33-399339
111	Tubular Cond. (.05 mfd.)	30-4123
112	Resistor (150,000 ohms, ½ watt)	33-415339
112X	Tubular Cond. (.05 mfd.)	30-4123
113	Resistor (1.5 meg., ½ watt)	33-515339
114	Tubular Cond. (.05 mfd.)	30-4519
115	No. 2 Control Amp. Trans.	32-3087
116	Tubular Cond. (.05 mfd.)	30-4444
117	Sensitivity Control	33-5295
118	Resistor (300 ohms, ½ watt)	33-130339
119	No. 1 Control Amp. Trans.	32-3086
120	Silver Mica Cond. (130 mmfd.)	30-1122
121	Compensator (Secondary Inductor)	31-6268
122	Secondary Inductor (Mystery Tuni	40-6415
123	Wave Switch	42-1537
124	Tuning Cond.	31-2417

WIRELESS REMOTE CONTROL UNIT

SCHE. No.	DESCRIPTION	PART No.
125	Primary Inductor	32-3097
126	Silver Mica Cond. (200 mmfd.)	30-1115
127	Tubular Cond. (.05 mfd.)	30-4519
128	Air Padder	31-6268
129	Resistor (500 ohms, ½ watt)	33-150339
130	Mystery Pack (Battery)	41-8023
131	Dial Unit (Pulser)	38-9704
132	Spark Filter Assy. (Inside of Sepper Unit)	38-9898
132A	Spark Filter Choke	32-3276
132B	Resistor (100 ohms, ½ watt)	33-110339
132C	Tubular Cond. (.05 mfd.)	30-4444
132D	Tubular Cond. (.05 mfd.)	30-4444

MODELS 191B,191BE
Schematic,Voltage

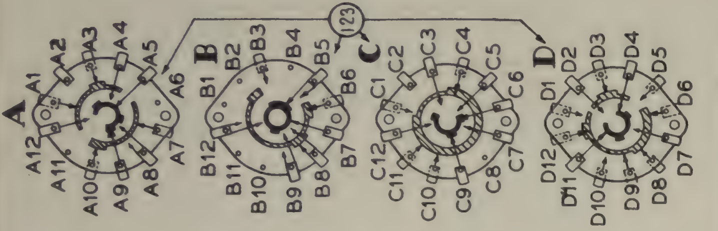


I.F. - 455 KC.

NOTES:-

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH VIEWED FROM REAR SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION.
3. SECTIONS OF BAND SWITCH (64-A TO 64-H) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION No-1 WHICH IS AT KNOB END OF SHAFT.
4. SOME MODELS OF THIS SERIES ARE EQUIPPED WITH A 6AB5 TUNING INDICATOR (EYE). CONNECTIONS ARE SHOWN DOTTED.

PART NO.-191-B(E)



=NOTE=
SWITCHES SHOWN IN POSITION No.1 (REMOTE) FROM REAR OF CHASSIS, BOTTOM VIEW.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.
SOLID AREA INDICATES REAR OF SWITCH WAFER
SHADED AREA INDICATES FRONT OF SWITCH WAFER.

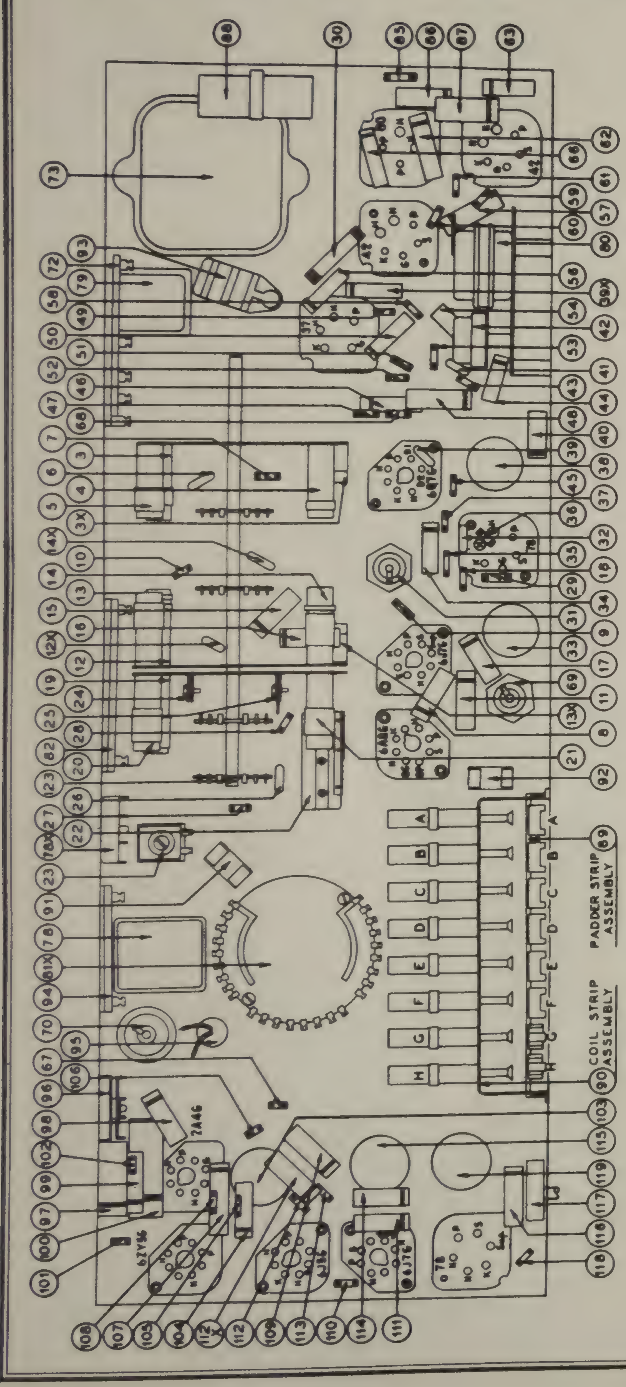


FIG. 1. MODEL 40-216 PART LOCATIONS, UNDERSIDE OF CHASSIS.

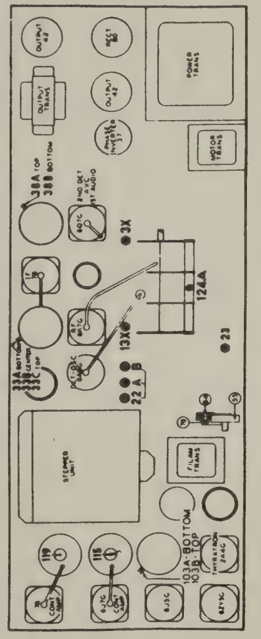
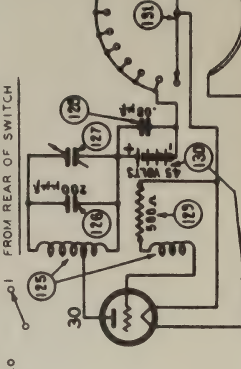


FIG. 7. LOCATIONS OF COMPENSATORS, MODEL 40-216.



* FIG. 3. WIRELESS REMOTE CONTROL UNIT SCHEMATIC DIAGRAM.

* In model 40-516 No. 8 position is used for phonograph. This position is already connected and will not need adjustment.

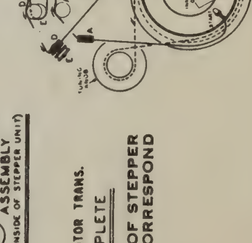
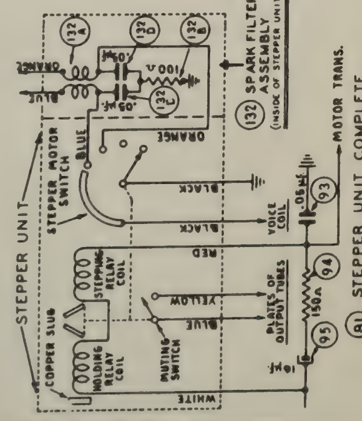


FIG. 5. DIAL POINTER AND CABLE ARRANGEMENT. MODELS 40-205, 40-216.

INSTALLATION OF DRIVE CORDS POINTER AT LOW FREQUENCY END OF DIAL GANG CLOSED



(81) STEPPER UNIT COMPLETE

FIG. 2. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC.

Replacement Parts

Model 40-205

SCHE. No.	DESCRIPTION	PART No.
1	Resistor (1.0 meg., ½ watt)	33-510339
1X	Tubular Cond. (.05 mfd.)	30-4519
1Y	Resistor (330,000 ohms, ½ watt)	33-433339
2	Mica Cond. (200 mmfd.)	30-1078
2X	Tubular Cond. (.05 mfd.)	30-4123
3	R. F. Trans.	32-3282
3A	Resistor (12,000 ohms, ½ watt)	33-312339
4	Mica Cond. (250 mmfd.)	30-1032
5	Resistor (32,000 ohms, ½ watt)	33-332339
6	Oscillator Trans.	32-3278
7	Compensator	31-6230
7X	Mica Cond. (15 mmfd.)	30-1139
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	Resistor (5,000 ohms, 2 watts)	33-250539
10	Resistor (13,000 ohms, 1 watt)	33-313439
11	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
12	Tubular Cond. (.05 mfd.)	30-4123
13	1st I. F. Trans. Assy.	32-3089
14	2nd I. F. Trans. Assy.	32-2645
15	Mica Cond. (110 mmfd.)	30-1031
16	Resistor (2.0 meg., ½ watt)	33-520339
17	Resistor (1.0 meg., ½ watt)	33-510339
18	Tubular Cond. (.01 mfd.)	30-4479
19	Mica Cond. (50 mmfd.)	30-1029
20	Resistor (70,000 ohms, ½ watt)	33-370339
21	Volume Control (2.0 meg.)	33-5300
22	Tubular Cond. (.004 mfd.)	30-4334
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Cond. (.015 mfd.)	30-4358
25	Tone Control (3.0 meg.)	33-5287
26	Tubular Cond. (.02 mfd.)	30-4481
27	Resistor (99,000 ohms, ½ watt)	33-399339
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Resistor (490,000 ohms, ½ watt)	33-449339
30	Tubular Cond. (.03 mfd.)	30-4517
30X	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Cond. (.01 mfd.)	30-4501
32	Resistor (3500 ohms, ½ watt)	33-235339
33	Tubular Cond. (.01 mfd.)	30-4501
34	Output Trans.	32-7997
35	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
36	Tubular Cond. (.01 mfd.)	30-4501
37	Resistor (3000 ohms, ½ watt)	33-230339
38	Tubular Cond. (.1 mfd.)	30-4499
39	Resistor (1.0 meg., ½ watt)	33-510339
40	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
41	Bias Resistor (Wirewound)	33-3361
42	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
43	Field Coil (Replace Spkr. Part No. 36-1450)	
44	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
45	Condenser (.05 mfd., 115 V. Plug)	30-4576
46	Pilot Lamp (Bullseye)	34-2210
47	Pilot Lamp Resistor (16 ohms, 1 watt)	33-016431
48	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
48X	Choke Coil	32-1281
49	Pilot Lamps (Dial)	34-2064
50	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
51	Volume Control Motor Assy.	35-1151
52	Rotary Switch	42-1468
53	Bias Resistor (Wirewound, 10 ohms)	33-3363
54	Pilot Lamps (Station Indicator)	34-2064
55	Resistor (150 ohms, ½ watt)	33-115339
56	Volume Control Switch (Motor Control)	42-1469
57	Tubular Cond. (.1 mfd.)	30-4499
58	Tubular Cond. (.1 mfd.)	30-4499
58X	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
59	Stepper Unit Complete	38-9689
60	Compensator Strip (Pushbutton)	31-6264
60A	Compensator No. 1	
60B	Compensator No. 2	
	540-1030 K.C., Part of 60	
60C	Compensator No. 3	
60D	Compensator No. 4	
	670-1160 K.C., Part of 60	
60E	Compensator No. 5	
60F	Compensator No. 6	
	900-1470 K.C., Part of 60	
60G	Compensator No. 7	
60H	Compensator No. 8	
	1170-1600 K.C., Part of 60	
61	Coil Assy. (Pushbuttons)	
61A	Oscillator Coil No. 1	
61B	Oscillator Coil No. 2	
	540-1030 K.C.	32-3042
61C	Oscillator Coil No. 3	
61D	Oscillator Coil No. 4	
	670-1160 K.C.	32-3042
61E	Oscillator Coil No. 5	
61F	Oscillator Coil No. 6	
	900-1470 K.C.	32-3041
61G	Oscillator Coil No. 7	
61H	Oscillator Coil No. 8	
	1170-1600 K.C.	32-3041
62	Silver Mica Cond. (370 mmfd.)	30-1110
62X	Silver Mica Cond. (370 mmfd.)	30-1110
63	Spark Filter Assy.	
63A	Spark Filter Choke	32-3276
63B	Resistor (100 ohms, ½ watt)	33-110339
63C	Tubular Cond. (.05 mfd.)	30-4444
63D	Tubular Cond. (.05 mfd.)	30-4444
64	Bakelite Cond. (.05 mfd.)	3615-SG
65	Resistor (150 ohms, Wirewound)	33-3362
66	Electrolytic Cond. (16 mfd., 150 V.)	30-2387
67	Choke Coil	32-1281
68	Tubular Cond. (.05 mfd.)	30-4123
69	Tubular Cond. (.05 mfd.)	30-4123
70	Tubular Cond. (.1 mfd.)	30-4499
71	Tubular Cond. (.5 mfd.)	30-4551
72	Resistor (51,000 ohms, ½ watt)	33-351339
73	Resistor (4,000 ohms, ½ watt)	33-240339
74	No. 3 Control Amp. Coil	32-3275
75	Resistor (750,000 ohms, ½ watt)	33-475339
76	Tubular Cond. (.02 mfd.)	30-4516
77	Resistor (120,000 ohms, ½ watt)	33-412339
78	Tubular Cond. (.1 mfd.)	30-4455
79	Resistor (150,000 ohms, ½ watt)	33-415339
80	Tubular Cond. (.05 mfd.)	30-4123
80X	Resistor (2700 ohms, ½ watt)	33-227339
81	Resistor (99,000 ohms, ½ watt)	33-399339
82	Tubular Cond. (.05 mfd.)	30-4123
83	Resistor (1.5 meg., ½ watt)	33-515339
84	Tubular Cond. (.05 mfd.)	30-4519
85	No. 2 Control Amp. Coil	32-3087
86	Tubular Cond. (.05 mfd.)	30-4123
87	Tubular Cond. (.05 mfd.)	30-4444
88	Resistor (300 ohms, ½ watt)	33-130339
89	Sensitivity Control (50,000 ohms)	33-5295
90	No. 1 Control Amp. Coil	32-3086
91	Silver Mica Cond. (155 mfd.)	30-1121
92	Air Padder (Secondary Inductor)	31-6268
93	Secondary Inductor	40-6414
94	Wave Switch	42-1454
95	Tuning Cond.	31-2311
96	Loop Assembly	38-9882
96A	Mica Cond. (250 mmfd.)	61-0033
96B	Resistor (10,000 ohms, ½ watt)	33-310339
97	Ant. Series Trans.	32-3226

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	38-9931
Bezel Gasket and Staple Assy.	38-9734
Bezel Screws	W-1834
Cable and Plug (Power Supply)	L-3176
Cabinet	10402A
Drive Cord (Tuning Cond.)	31-2350
Drive Cord (Pointer)	31-2320
Dial	27-5537
Disc (Tuning)	27-4766
Disc (Tone Control)	27-4764
Disc (Volume Control)	27-4765
Disc (Wave Switch)	27-4767
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Lamp Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (8 prong, Octal, 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (7 prong, Octal, 6J7G tubes)	27-6057
Socket (7 prong, Octal, 6A8G tube)	27-6099
Speaker	36-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer, Tuning Disc)	56-1029
Washer (Spring Washer, Tuning Disc)	6717

Model 40-216

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1509
Bezel Gasket and Staple Assy.	38-9734
Cabinet	10403A
Cable (Power Supply)	L-3176
Dial	27-5535
Drive Cord (Tuning Cond.)	31-2315
Drive Cord (Pointer)	31-2320
Disc (Tuning)	27-4766
Disc (Volume)	27-4765
Disc (Wave Switch)	27-4767
Disc (Tone Control)	27-4764
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Light Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (5 prong, type 37 tube)	27-6035
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (Octal, type 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (Octal, type 6J7G tube)	27-6057
Socket (Octal, type 6A8G tubes)	27-6099
Speaker	36-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer Tuning Disc)	56-1029
Washer (Spring Washer Tuning Disc)	6717

Replacement Parts

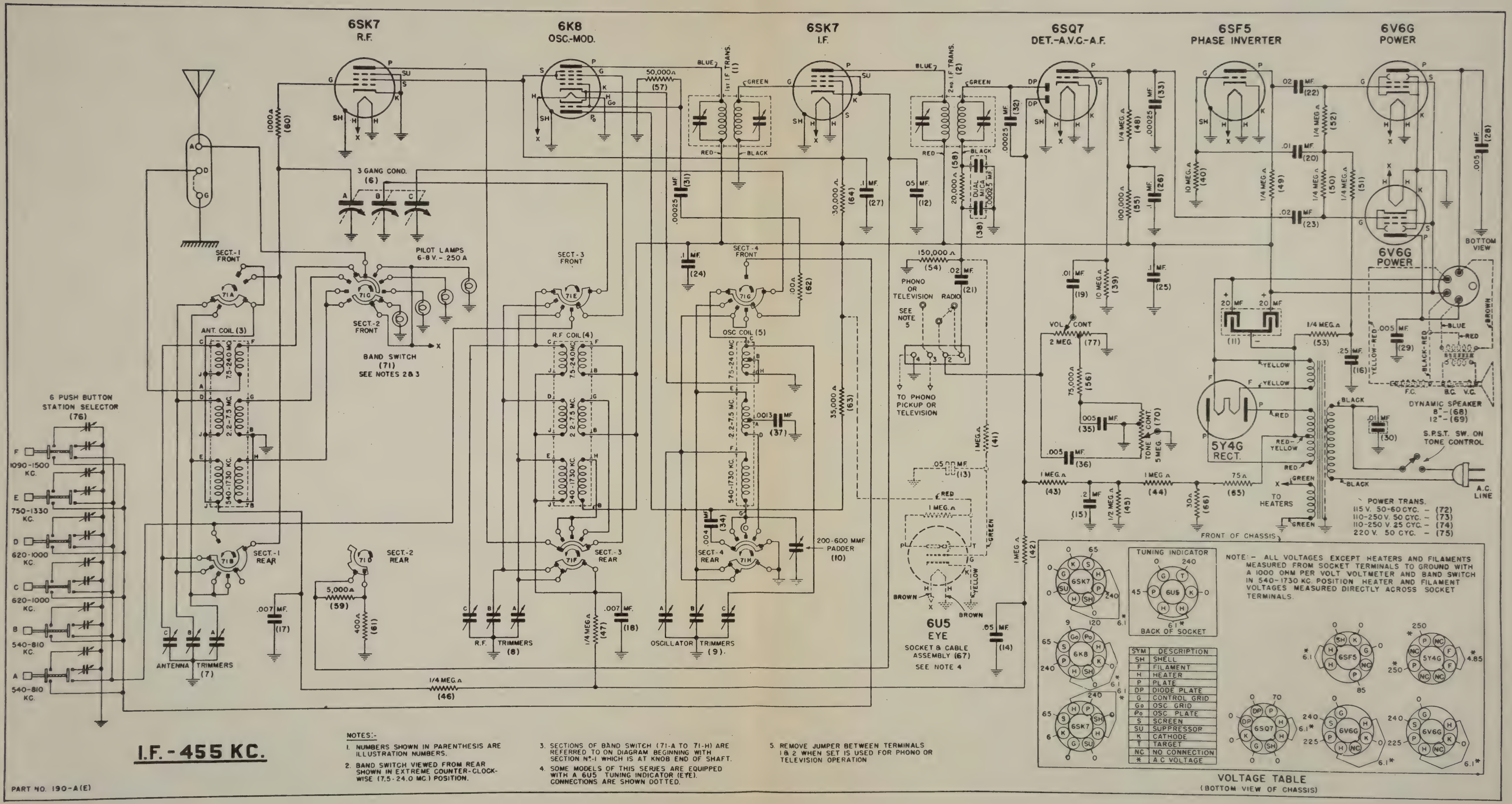
Model 40-216

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9882
1A	Resistor (10,000 ohms, ½ watt)	33-310339
1B	Mica Cond. (250 mmfd.)	61-0033
2	Loop Assy. (Short Wave)	38-9933
2A	Compensator	31-6326
3	Ant. Series Trans. (Broadcast)	32-3291
3X	Compensator	31-6212
4	Ant. Series Trans. (Short Wave)	32-3293
5	Ant. Trans. (Police Shunt)	32-3292
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (2.0 meg., ½ watt)	33-520339
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (150,000 ohms, ½ watt)	33-415339
10	Resistor (12,000 ohms, ½ watt)	33-312339
11	Tubular Cond. (.05 mfd.)	30-4123
12	R. F. Trans. (Broadcast, Pushbutton and Police)	32-3230
12X	Mica Condenser (35 mmfd.)	30-1141
13	R. F. Trans. (Broadcast Manual)	32-3227
13X	Compensator	31-6212
14	R. F. Trans. (Short Wave)	32-3046
14X	Mica Cond. (5 mmfd.)	30-1097
15	Tubular Cond. (.1 mfd.)	30-4455
16	Tubular Cond. (.05 mfd.)	30-4519
17	Tubular Cond. (.1 mfd.)	30-4455
18	Resistor (51,000 ohms, ½ watt)	33-351339
19	Oscillator Trans. (Broadcast)	32-3231
20	Oscillator Trans. (Police)	32-3294
21	Oscillator Trans. (Short Wave)	32-3051
22	Compensator (3 section, oscillator)	31-6266
23	Compensator (Broadcast, Low Frequency)	31-6230
24	Tracking Cond. (1230 mmfd.)	31-6262
25	Tracking Cond. (3425 mmfd.)	31-6263
26	Mica Cond. (250 mmfd.)	61-0033
27	Resistor (32,000 ohms, ½ watt)	33-332339
28	Resistor (10,000 ohms, ½ watt)	33-310339
29	Resistor (18,000 ohms, ½ watt)	33-318339
30	Resistor (5,000 ohms, 2 watt)	33-250539
31	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
32	Mica Cond. (250 mmfd.)	61-0033
33	1st I. F. Trans. Assy.	32-3089
34	Tubular Cond. (.01 mfd.)	30-4572
35	Resistor (1.0 meg., ½ watt)	33-510339
36	Resistor (330,000 ohms, ½ watt)	33-433339
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	2nd I. F. Trans. Assy.	32-2645
39	Mira Cond. (110 mmfd.)	30-1031
39X	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.01 mfd.)	30-4479
41	Mica Cond. (50 mmfd.)	30-1029
42	Volume Control	33-5300
43	Resistor (70,000 ohms, ½ watt)	33-370339
44	Tubular Cond. (.004 mfd.)	30-4334
45	Resistor (2.0 meg., ½ watt)	33-520339
46	Tubular Cond. (.015 mfd.)	30-4529
47	Resistor (1.0 meg., ½ watt)	33-510339
48	Tubular Cond. (.1 mfd.)	30-4527
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Tubular Cond. (.01 mfd.)	30-4169
51	Resistor (490,000 ohms, ½ watt)	33-449339
52	Resistor (5,000 ohms, ½ watt)	33-250339
53	Resistor (45,000 ohms, ½ watt)	33-345339
54	Tubular Cond. (.02 mfd.)	30-4481
55	Tone Control (3.0 meg.)	33-5287
56	Tubular Cond. (.01 mfd.)	30-4572
57	Tubular Cond. (.01 mfd.)	30-4572
58	Resistor (51,000 ohms, ½ watt)	33-351339
59	Resistor (490,000 ohms, ½ watt)	33-449339
60	Resistor (490,000 ohms, ½ watt)	33-449339
61	Resistor (240,000 ohms, ½ watt)	33-424339
62	Tubular Cond. (.1 mfd.)	30-4499
63	Tubular Cond. (.01 mfd.)	30-4501
64	Output Trans.	32-7996
65	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
66	Tubular Cond. (.01 mfd.)	30-4501
67	Resistor (3,000 ohms, ½ watt)	33-230339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
70	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Resistor (Wirewound, Bias)	33-3364
73	Power Trans. (115 V., 50-60 cycles)	32-8001
	Power Trans. (115 V., 25-40 cycles)	32-8017
74	Bypass Cond. (.05 mfd., 110 V. Plug)	30-4576
75	Pilot Lamp (Bullseye)	34-2210
76	Pilot Lamp Resistor (16 ohms)	33-016331
77	Pilot Lamps (Dial)	34-2064
78	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
78X	Choke Coil	32-1281
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assy. (Volume Control)	35-1151
81	Stepper Unit (Complete)	38-9689
81X	Rotary Switch (Stepper Unit)	42-1468
82	B. C. Resistor (Wirewound, 10 ohms)	33-3363
83	Pilot Lamp Assy. (Station Indicator)	34-2064
84	Switch (Volume Control-Motor)	42-1469
85	Resistor (150 ohms, ½ watt)	33-115339
86	Tubular Cond. (.1 mfd.)	30-4499
87	Tubular Cond. (.1 mfd.)	30-4499
88	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
89	Padder Strip (Pushbuttons)	31-6264
89A	Compensator No. 1	
89B	Compensator No. 2	
	540-1030 K.C., Part of 89	
89C	Compensator No. 3	
89D	Compensator No. 4	
	670-1160 K.C., Part of 89	
89E	Compensator No. 5	
89F	Compensator No. 6	
	900-1470 K.C., Part of 89	
89G	Compensator No. 7	
89H	Compensator No. 8	
	1100-1600 K.C., Part of 89	
90	Elec. Pushbutton Trans. Assy. (8 Trans.)	32-3081
90A	Osc. Trans. No. 1	
90B	Osc. Trans. No. 2	
	540-1030 K.C.	32-3042
90C	Osc. Trans. No. 3	
90D	Osc. Trans. No. 4	
	670-1160 K.C.	32-3042
90E	Osc. Trans. No. 5	
90F	Osc. Trans. No. 6	
	300-1470 K.C.	32-3041
90G	Osc. Trans. No. 7	
90H	Osc. Trans. No. 8	
	1100-1600 K.C.	32-3041
91	Silver Mica Cond. (370 mmfd.)	30-1110
92	Silver Mica Cond. (370 mmfd.)	30-1110
93	Bakelite Cond. (.05 mfd.)	3615SG
94	Resistor (150 ohms)	33-3362
95	Electrolytic Cond. (16 mfd., 200	30-2356
96	Choke Coil	32-1281
97	Tubular Cond. (.05 mfd.)	30-4123
98	Tubular Cond. (.05 mfd.)	30-4123
99	Tubular Cond. (.1 mfd.)	30-4499
100	Tubular Cond. (.5 mfd.)	30-4551
101	Resistor (4000 ohms, ½ watt)	33-240339
102	Resistor (51,000 ohms, ½ watt)	33-351339
103	No. 3 Control Amp. Trans.	32-3275
104	Tubular Cond. (.02 mfd.)	30-4516
105	Resistor (750,000 ohms, ½ watt)	33-475339
106	Resistor (2700 ohms, ½ watt)	33-227339
107	Tubular Cond. (.1 mfd.)	30-4455
108	Resistor (120,000 ohms, ½ watt)	33-412339
109	Tubular Cond. (.05 mfd.)	30-4123
110	Resistor (99,000 ohms, ½ watt)	33-399339
111	Tubular Cond. (.05 mfd.)	30-4123
112	Resistor (150,000 ohms, ½ watt)	33-415339
112X	Tubular Cond. (.05 mfd.)	30-4123
113	Resistor (1.5 meg., ½ watt)	33-515339
114	Tubular Cond. (.05 mfd.)	30-4519
115	No. 2 Control Amp. Trans.	32-3087
116	Tubular Cond. (.05 mfd.)	30-4444
117	Sensitivity Control	33-5295
118	Resistor (300 ohms, ½ watt)	33-130339
119	No. 1 Control Amp. Trans.	32-3086
120	Silver Mica Cond. (130 mmfd.)	30-1122
121	Compensator (Secondary Inductor)	31-6268
122	Secondary Inductor (Mystery Tuni	40-6415
123	Wave Switch	42-1537
124	Tuning Cond.	31-2417

WIRELESS REMOTE CONTROL UNIT

SCHE. No.	DESCRIPTION	PART No.
125	Primary Inductor	32-3097
126	Silver Mica Cond. (200 mmfd.)	30-1115
127	Tubular Cond. (.05 mfd.)	30-4519
128	Air Padder	31-6268
129	Resistor (500 ohms, ½ watt)	33-150339
130	Mystery Pack (Battery)	41-8023
131	Dial Unit (Pulser)	38-9704
132	Spark Filter Assy.	38-9898
	(Inside of Sepper Unit)	
132A	Spark Filter Choke	32-3276
132B	Resistor (100 ohms, ½ watt)	33-110339
132C	Tubular Cond. (.05 mfd.)	30-4444
132D	Tubular Cond. (.05 mfd.)	30-4444

SENTINEL RADIO CORP.

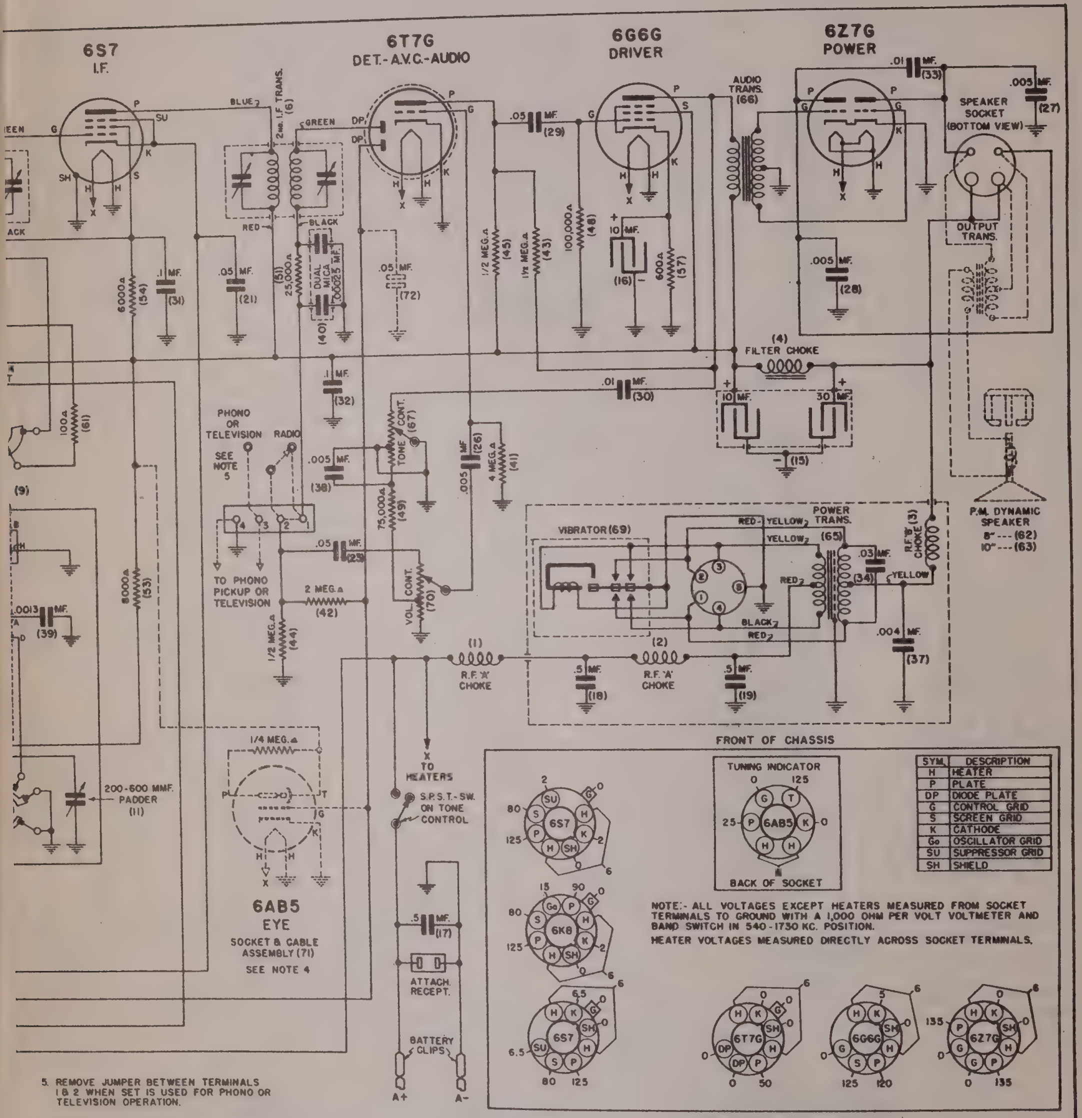


NOTE:- ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND BAND SWITCH IN 540-1730 KC. POSITION HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

SYM	DESCRIPTION
SH	SHELL
F	FILAMENT
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC GRID
Po	OSC PLATE
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
T	TARGET
NC	NO CONNECTION
*	A C VOLTAGE

NOTES:-

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH VIEWED FROM REAR SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION.
3. SECTIONS OF BAND SWITCH (71-A TO 71-H) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION N°-1 WHICH IS AT KNOB END OF SHAFT.
4. SOME MODELS OF THIS SERIES ARE EQUIPPED WITH A 6U5 TUNING INDICATOR (EYE). CONNECTIONS ARE SHOWN DOTTED.
5. REMOVE JUMPER BETWEEN TERMINALS 1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION OPERATION



SYM.	DESCRIPTION
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
S	SCREEN GRID
K	CATHODE
Go	OSCILLATOR GRID
SU	SUPPRESSOR GRID
SH	SHIELD

NOTE:- ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER AND BAND SWITCH IN 540-1730 KC. POSITION.

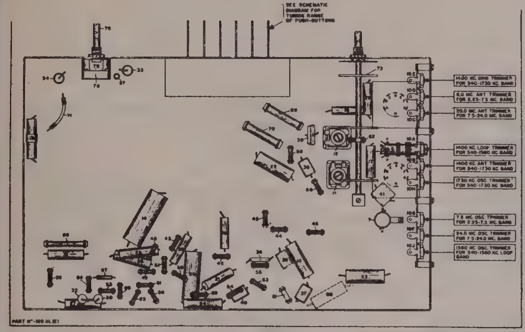
HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

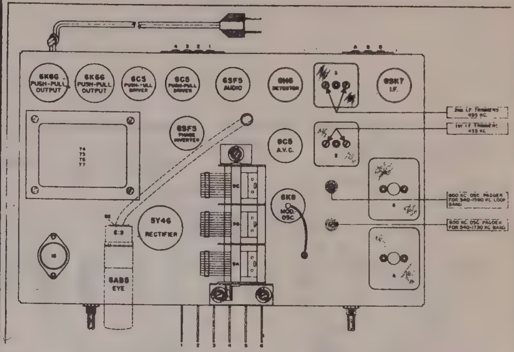
5. REMOVE JUMPER BETWEEN TERMINALS 1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION OPERATION.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

SENTINEL RADIO CORP.

MODELS 199A,199AE
Socket,Trimmers
Alignment,Chassis


SEE SCHEMATIC DIAGRAM FOR TUNING RANGE OF PUSH-BUTTONS
1400 KC. GRID TRIMMER FOR 540-1730 KC. BAND
6.0 MC. ANT TRIMMER FOR 2.25-7.5 MC. BAND
20.0 MC. ANT TRIMMER FOR 7.5-24.0 MC. BAND
1400 KC. LOOP TRIMMER FOR 540-1580 KC. BAND
1400 KC. ANT TRIMMER FOR 540-1730 KC. BAND
1730 KC. OSC. TRIMMER FOR 540-1730 KC. BAND
7.5 MC. OSC. TRIMMER FOR 2.25-7.5 MC. BAND
24.0 MC. OSC. TRIMMER FOR 7.5-24.0 MC. BAND
1580 KC. OSC. TRIMMER FOR 540-1580 KC. LOOP BAND



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 600 or 1580 kilocycle loop oscillator trimmers and 1400 kilocycle loop antenna trimmer, do not connect test oscillator to "A" post.

Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

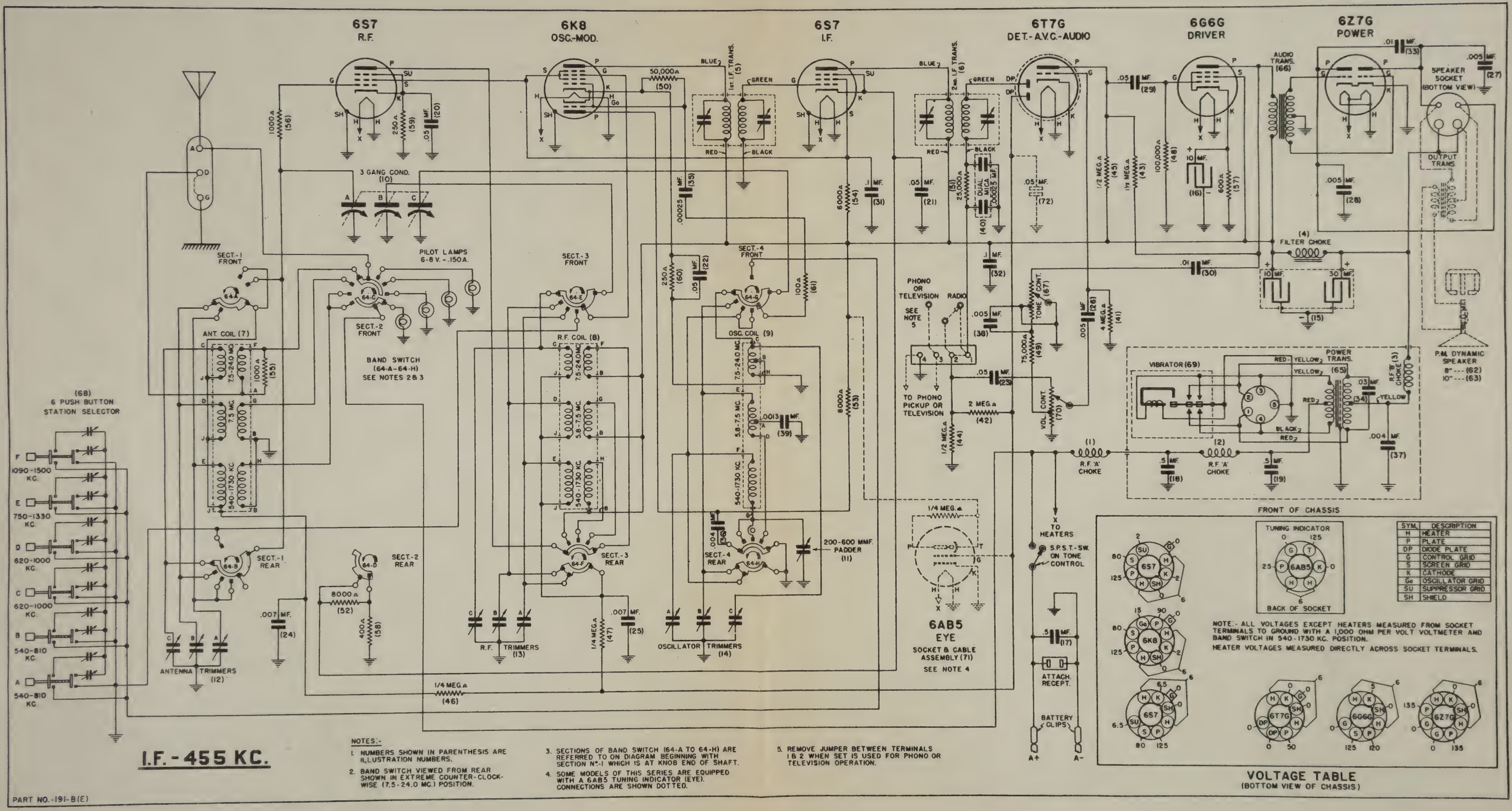
(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

(c) Place band switch in next to maximum right hand position.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR Adjust test Oscillator frequency to	 Use dummy antenna in series with output of test oscillator consisting of:	 Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1580 to 540 K.C. Band Using Loop Aerial	1 Exactly 1580 K.C.	Exactly 1580 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1580 K. C. oscillator trimmer for maximum output
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 1400 K.C. loop antenna trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 600 K.C. loop oscillator padder for maximum output.
1730 TO 540 K.C. BAND USING REGULAR AERIAL	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and grid trimmers for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.25 TO 7.5 M.C. BAND	1 Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2 Approx. 6. M.C.	Approx. 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna trimmer for maximum output.
7.5 24 M.C. BAND	1 Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna trimmer for maximum output.

MODELS 191B,191BE
Schematic,Voltage

SENTINEL RADIO CORP.



NOTES:-

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH VIEWED FROM REAR SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION.
3. SECTIONS OF BAND SWITCH (64-A TO 64-H) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION Nº-1 WHICH IS AT KNOB END OF SHAFT.
4. SOME MODELS OF THIS SERIES ARE EQUIPPED WITH A 6AB5 TUNING INDICATOR (EYE). CONNECTIONS ARE SHOWN DOTTED.
5. REMOVE JUMPER BETWEEN TERMINALS 1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION OPERATION.

SYM.	DESCRIPTION
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
S	SCREEN GRID
K	CATHODE
Go	OSCILLATOR GRID
SU	SUPPRESSOR GRID
SH	SHIELD

NOTE:- ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER AND BAND SWITCH IN 540-1730 KC. POSITION.

HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

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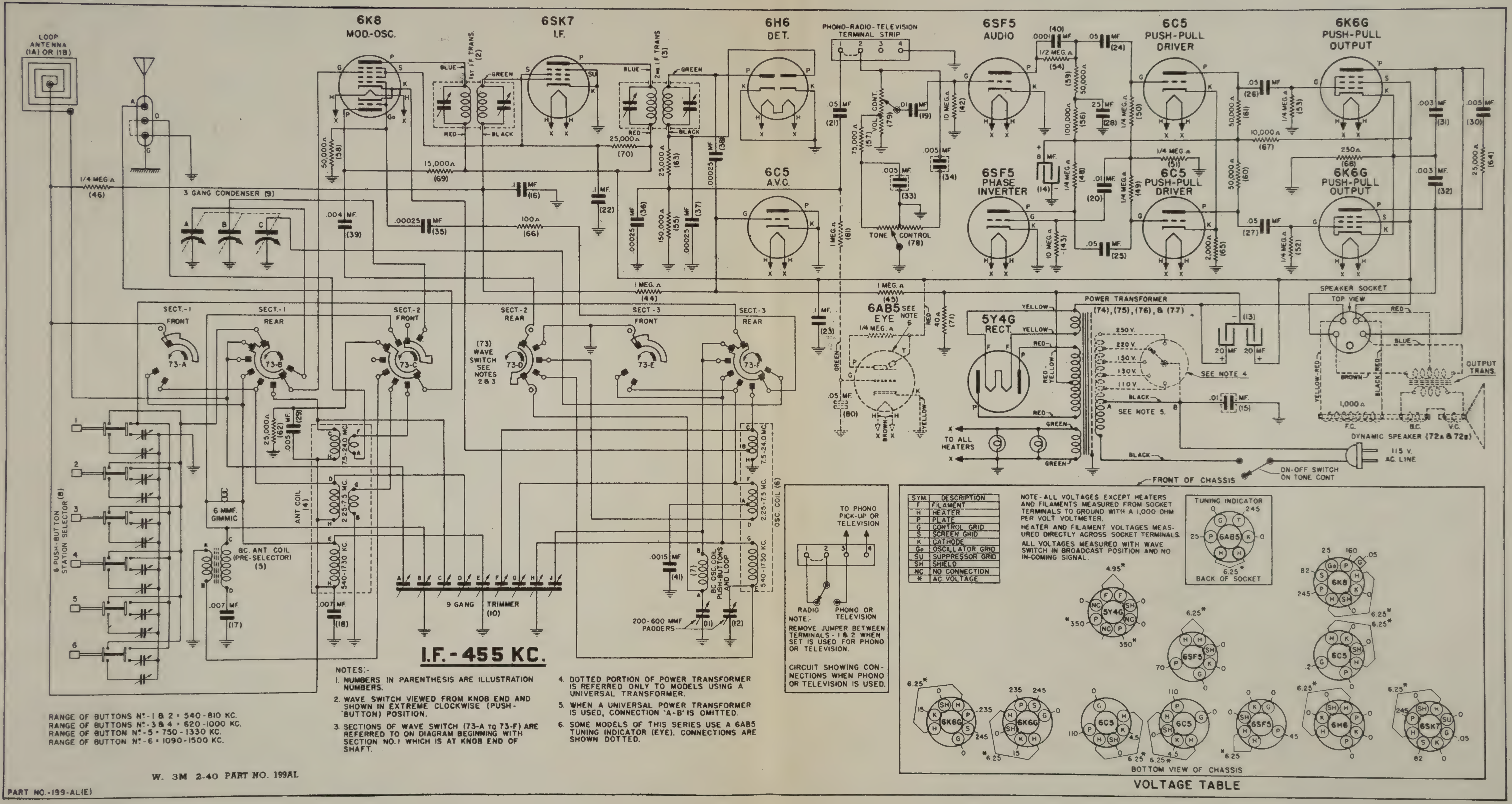
MODELS 199A,199AE
Schematic,Voltage

SENTINEL RADIO CORP.



I.F.-455 KC.

NOTES:-

1. NUMBERS IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. WAVE SWITCH VIEWED FROM KNOB END AND SHOWN IN EXTREME CLOCKWISE (PUSH-BUTTON) POSITION.
3. SECTIONS OF WAVE SWITCH (73-A TO 73-F) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION NO.1 WHICH IS AT KNOB END OF SHAFT.
4. DOTTED PORTION OF POWER TRANSFORMER IS REFERRED ONLY TO MODELS USING A UNIVERSAL TRANSFORMER.
5. WHEN A UNIVERSAL POWER TRANSFORMER IS USED, CONNECTION 'A-B' IS OMITTED.
6. SOME MODELS OF THIS SERIES USE A 6AB5 TUNING INDICATOR (EYE). CONNECTIONS ARE SHOWN DOTTED.

RANGE OF BUTTONS Nº-1 & 2 = 540-810 KC.
RANGE OF BUTTONS Nº-3 & 4 = 620-1000 KC.
RANGE OF BUTTON Nº-5 = 750-1330 KC.
RANGE OF BUTTON Nº-6 = 1090-1500 KC.

NOTE:-
REMOVE JUMPER BETWEEN TERMINALS-1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION.

CIRCUIT SHOWING CONNECTIONS WHEN PHONO OR TELEVISION IS USED.

SYM.	DESCRIPTION
F	FILAMENT
H	HEATER
P	PLATE
G	CONTROL GRID
S	SCREEN GRID
K	CATHODE
Go	OSCILLATOR GRID
SU	SUPPRESSOR GRID
SH	SHIELD
NC	NO CONNECTION
*	AC. VOLTAGE

NOTE-ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER.

HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

ALL VOLTAGES MEASURED WITH WAVE SWITCH IN BROADCAST POSITION AND NO IN-COMING SIGNAL.

VOLTAGE TABLE

W. 3M 2-40 PART NO. 199AL

PART NO.-199-AL(E)

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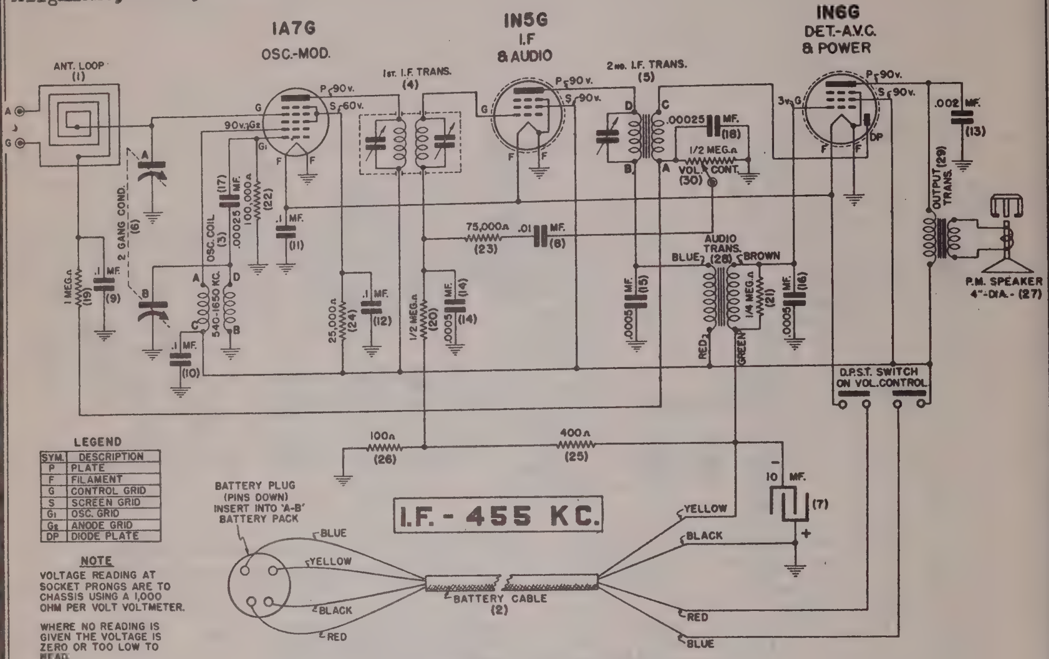
MODEL 160BL
Schematic,Voltage,Chassis
Alignment,Socket,Trimmers

SENTINEL RADIO CORP.



LEGEND

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	ANODE GRID
DP	DIODE PLATE

NOTE

VOLTAGE READING AT SOCKET PRONGS ARE TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER.

WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

1½ V. "A" BAT.-DRAIN-150 MA.
90 V. "B" BAT.-DRAIN-6.8 MA.

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERY-PACK IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1650 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

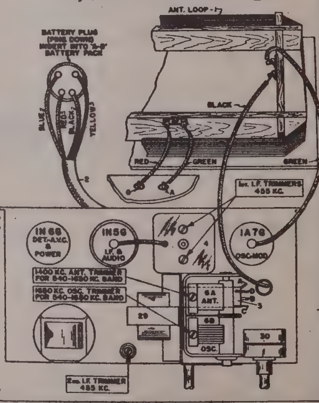
Couple test oscillator to receiver loop by:
- a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.
- b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

PART N°-160-BL

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below—and:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmer for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1650 K. C.	Exactly 1650 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1650 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output

3 TUBE PORTABLE

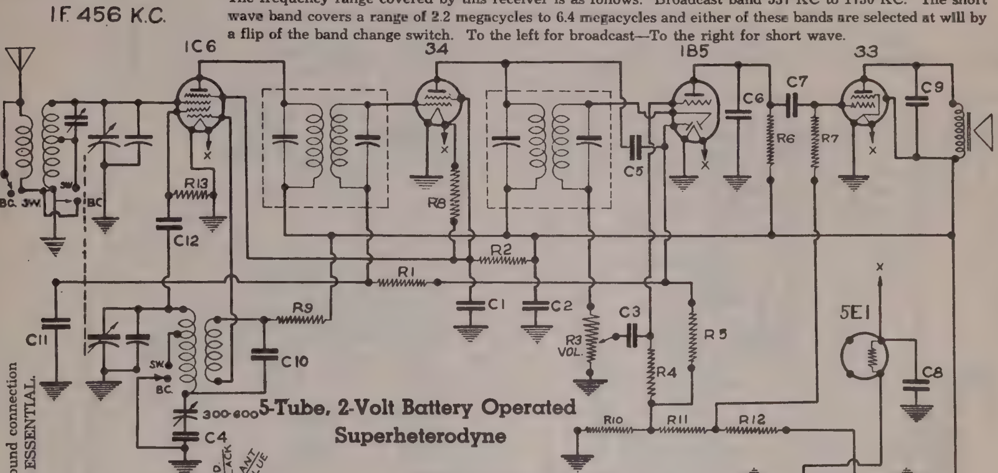
1½ Volt Battery


ANT. LOOP-1
BATTERY PLUG (PINS DOWN) INSERT INTO "A-B" BATTERY PACK
BLUE
RED
BLACK
YELLOW
BLACK
RED
GREEN
GREEN
1st. I.F. TRIMMERS 455 KC.
1N6G DET.-A.V.C. & POWER
1N5G I.F. & AUDIO
1A7G OSC-MOD
1400 KC. ANT. TRIMMER FOR 540-1650 KC. BAND
1650 KC. OSC. TRIMMER FOR 540-1650 KC. BAND
6A ANT.
6B
29
30
OSC.
2nd. I.F. TRIMMER 455 KC.

SPIEGEL INC.

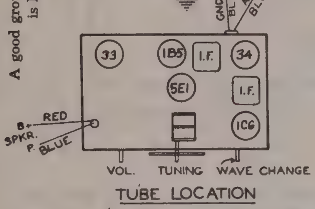
MODEL 6606,Chassis 525
Schematic,Socket,Trimmers
Alignment

The frequency range covered by this receiver is as follows: Broadcast band 537 KC to 1730 KC. The short wave band covers a range of 2.2 megacycles to 6.4 megacycles and either of these bands are selected at will by a flip of the band change switch. To the left for broadcast—To the right for short wave.

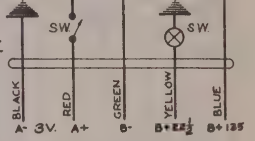


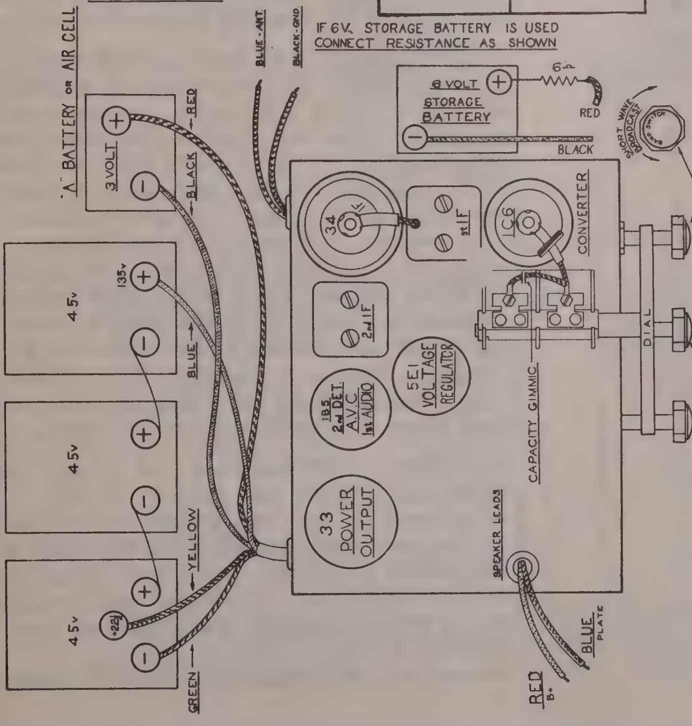
5-Tube, 2-Volt Battery Operated Superheterodyne

A good ground connection is ESSENTIAL.



R1	1MEG. OHMS	C1	.1 MFD.
R2	15 M	C2	.1
R3	500 M	C3	.05
R4	1. MEG.	C4	.002
R5	1. MEG.	C5	.00025
R6	250 M	C6	.00025
R7	500 M	C7	.05
R8	50 M	C8	.25
R9	50 M	C9	.01
R10	400	C10	.001
R11	4500	C11	.1
R12	2 M	C12	.0001
R13	50 M		





I. F. Alignment:

Connect the oscillator through a .1 condenser to the grid of the 1C6 tube and set the oscillator to 456 kilocycles. Peak each I. F. stage to resonance as indicated by maximum output on the output meter.

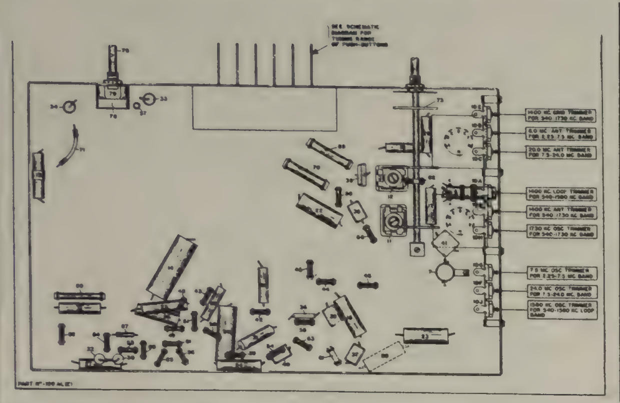
R. F. Alignment:

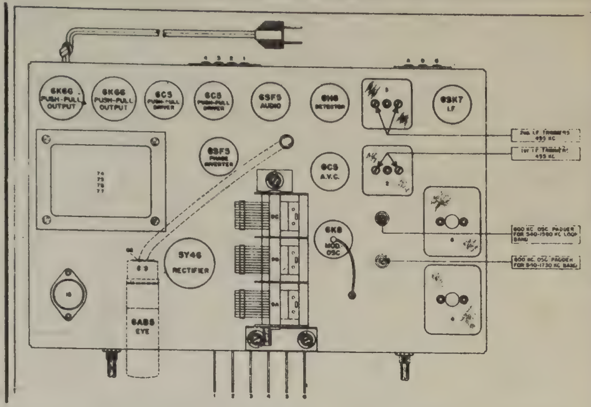
With the wave change switch in the broadcast position, set the oscillator to 1700 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1700 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. The location of oscillator trimmer is on rear section of variable condenser. Reset the test oscillator to 1400 kilocycles and adjust antenna trimmer located corner front section of variable condenser. Now set oscillator to 600 kilocycles and adjust padder located on side of chassis. Check alignment at 1000 kilocycles.

For aligning police band, set test oscillator to 6 megacycles. Turn band switch to short wave. Rotate variable condenser until signal is heard. Peak antenna trimmer (across antenna coil under chassis) to maximum. Rock variable condenser slightly backward and forward until maximum peak is reached.

SENTINEL RADIO CORP.

MODELS 199A,199AE
Socket,Trimmers
Alignment,Chassis


SEE SCHEMATIC DIAGRAM FOR TUNING RANGE OF PUSH-BUTTONS
1400 KC GRID TRIMMER FOR 540-1730 KC BAND
6.0 MC ANT TRIMMER FOR 2.25-7.5 MC BAND
20.0 MC ANT TRIMMER FOR 7.5-24.0 MC BAND
1400 KC LOOP TRIMMER FOR 540-1580 KC BAND
1400 KC ANT TRIMMER FOR 540-1730 KC BAND
1730 KC OSC TRIMMER FOR 540-1730 KC BAND
7.5 MC OSC TRIMMER FOR 2.25-7.5 MC BAND
24.0 MC OSC TRIMMER FOR 7.5-24.0 MC BAND
1580 KC OSC TRIMMER FOR 540-1580 KC LOOP BAND
73
82
12
11
23



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 600 or 1580 kilocycle loop oscillator trimmers and 1400 kilocycle loop antenna trimmer, do not connect test oscillator to "A" post.

Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

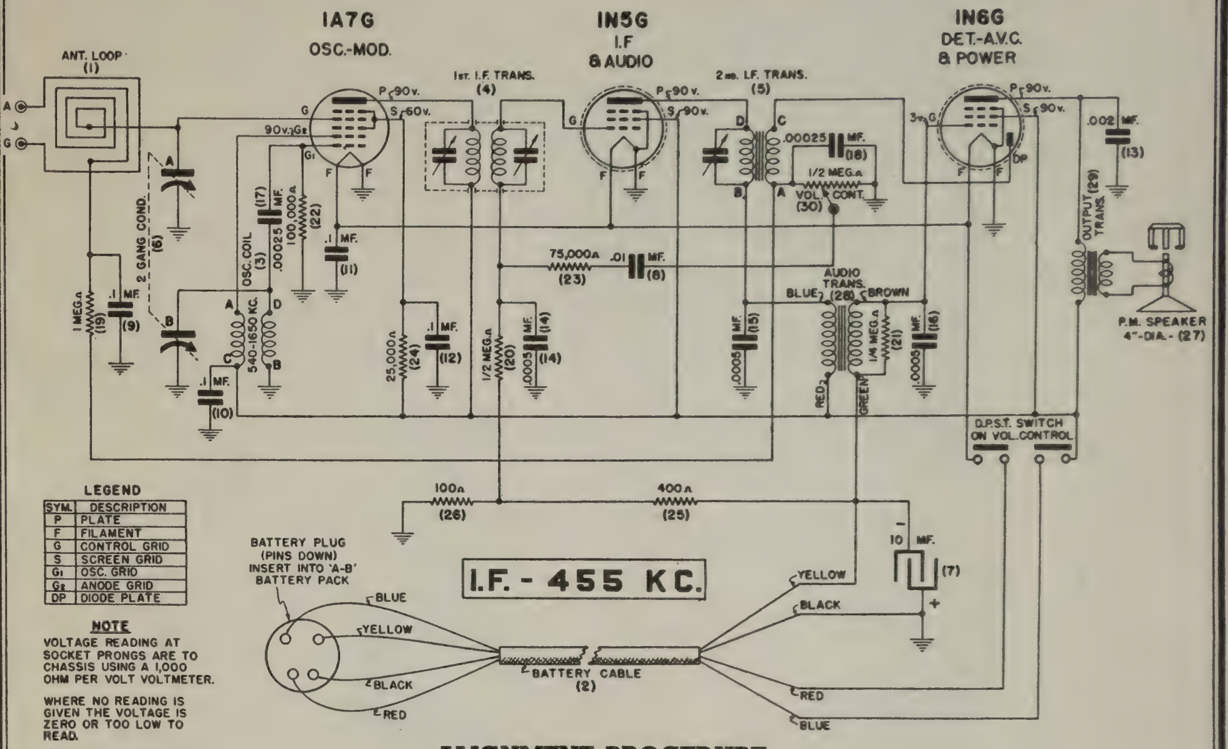
(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

(c) Place band switch in next to maximum right hand position.

		TEST OSCILLATOR			
Place band switch for operation on:	**Set receiver dial to:**	**Adjust test Oscillator frequency to**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below:**
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1580 to 540 K.C. Band Using Loop Aerial	1 Exactly 1580 K.C.	Exactly 1580 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1580 K. C. oscillator trimmer for maximum output
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 1400 K.C. loop antenna trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 600 K.C. loop oscillator padder for maximum output.
1730 TO 540 K.C. BAND USING REGULAR AERIAL	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and grid trimmers for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.25 TO 7.5 M.C. BAND	1 Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2 Approx. 6. M.C.	Approx. 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna trimmer for maximum output.
7.5 24 M.C. BAND	1 Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna trimmer for maximum output.

MODEL 160BL
Schematic,Voltage,Chassis
Alignment,Socket,Trimmers

SENTINEL RADIO CORP.



LEGEND

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G_1	OSC. GRID
G_2	ANODE GRID
DP	DIODE PLATE

NOTE

VOLTAGE READING AT SOCKET PRONGS ARE TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER.

WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

1½ V. 'A' BAT.-DRAIN-150 MA.
90 V. 'B' BAT.-DRAIN-6.8 MA.

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERY-PACK IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1650 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

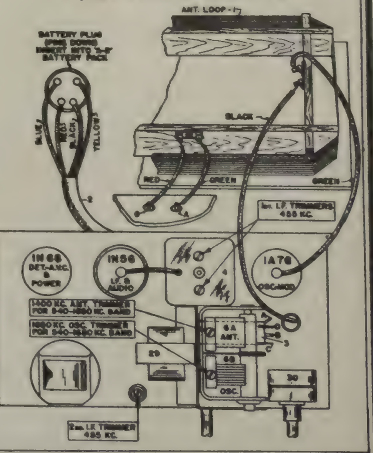
a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

PART No.-160-BL

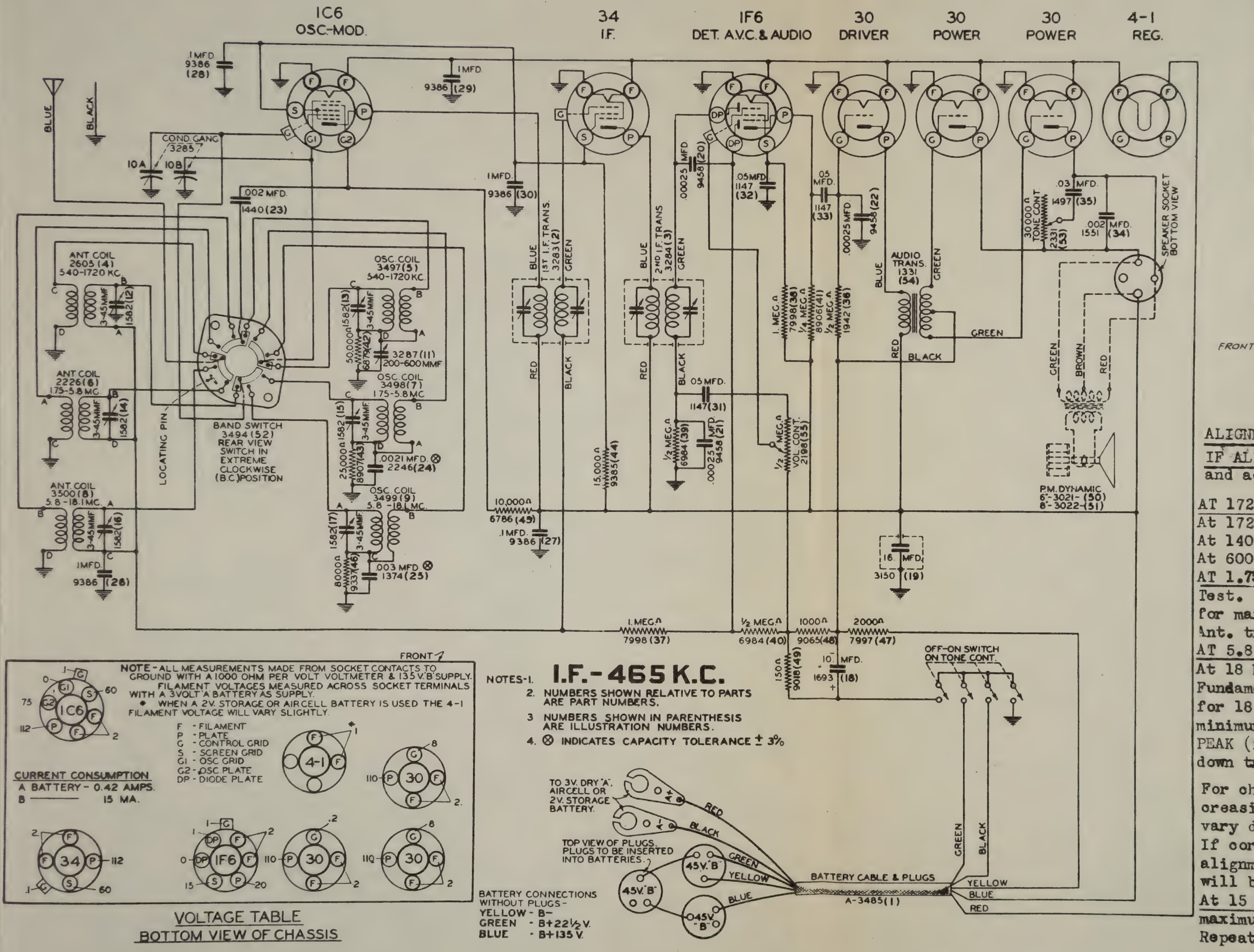
	TEST OSCILLATOR			
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmer for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1650 K. C.	Exactly 1650 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1650 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output

3 TUBE PORTABLE
1½ Volt Battery


ANT. LOOP
BATTERY PLUG (PINS DOWN) INSERT INTO 'A-B' BATTERY PACK
BLUE
RED
BLACK
YELLOW
BLACK
RED
GREEN
GREEN
1st. I.F. TRIMMERS 455 KC.
IN6G DET.-A.V.C. & POWER
IN5G I.F. & AUDIO
1A7G OSC.-MOD.
1400 KC. ANT. TRIMMER FOR 540-1650 KC. BAND
1650 KC. OSC. TRIMMER FOR 540-1650 KC. BAND
OSC.
2nd. I.F. TRIMMER 455 KC.

MODELS 5104,5152
Chassis 1075B
Schematic,Voltage,Chassis
Alignment,Socket,Trimmers

SPIEGEL INC.



NOTE-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER & 135 V.'B' SUPPLY. FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3VOLT 'A' BATTERY AS SUPPLY.
* WHEN A 2V. STORAGE OR AIRCELL BATTERY IS USED THE 4-1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.

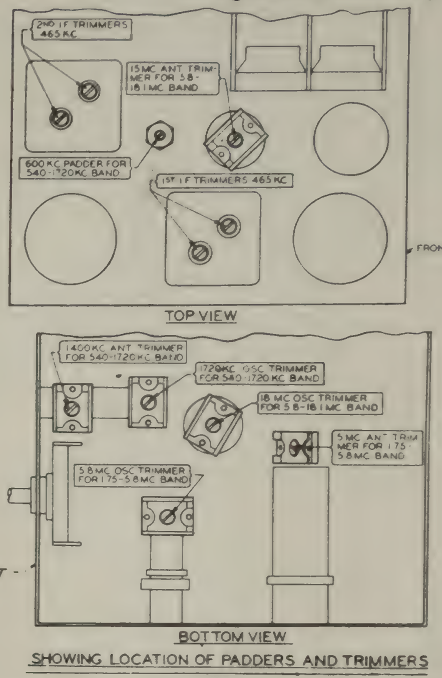
F - FILAMENT
P - PLATE
G - CONTROL GRID
S - SCREEN GRID
G1 - OSC GRID
G2 - OSC PLATE
DP - DIODE PLATE

CURRENT CONSUMPTION
A BATTERY - 0.42 AMPS.
B ——— 15 MA.

VOLTAGE TABLE
BOTTOM VIEW OF CHASSIS

NOTES-1. I.F.-465 K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%

BATTERY CONNECTIONS WITHOUT PLUGS-
YELLOW - B-
GREEN - B+22½V.
BLUE - B+135 V.


2ND I.F. TRIMMERS 465 KC
15 MC ANT. TRIMMER FOR 5.8-18.1 MC BAND
600 KC PADDER FOR 540-1720 KC BAND
1ST I.F. TRIMMERS 465 KC
FRONT
TOP VIEW
1400 KC ANT. TRIMMER FOR 540-1720 KC BAND
1720 KC OSC. TRIMMER FOR 540-1720 KC BAND
18 MC OSC. TRIMMER FOR 5.8-18.1 MC BAND
5 MC ANT. TRIMMER FOR 1.75-5.8 MC BAND
5.8 MC OSC. TRIMMER FOR 1.75-5.8 MC BAND
FRONT
BOTTOM VIEW

SHOWING LOCATION OF PADDERS AND TRIMMERS

ALIGNMENT

IF ALIGNMENT :- Set test osc. at 465 KC and adjust IF stages, thru .02 Condenser.

AT 1720-540 KC BAND thru .00025 Cond. :-
At 1720 KC adjust Osc. trim. at maximum.
At 1400 KC adj. Ant. trim. for max. sig.
At 600 KC adj. Osc. padder for max. sig.

AT 1.75 - 5.8 MC BAND:-thru 400 OHM resistor
Test. osc. at 5.8 MC, adj. osc. trimmer for maximum response. At 5 MC adjust Ant. trimmer for maximum sensitivity.

AT 5.8 - 18.1 BAND THRU 400 OHM RESISTOR.
At 18 MC adjust. Osc. trim. max. output. Fundamental and not Image peak is used for 18 MC alignment. Back off trim,to minimum, then add capacity until FIRST PEAK (fundamental) is tuned in. Screwing down trim. too much brings in IMAGE.

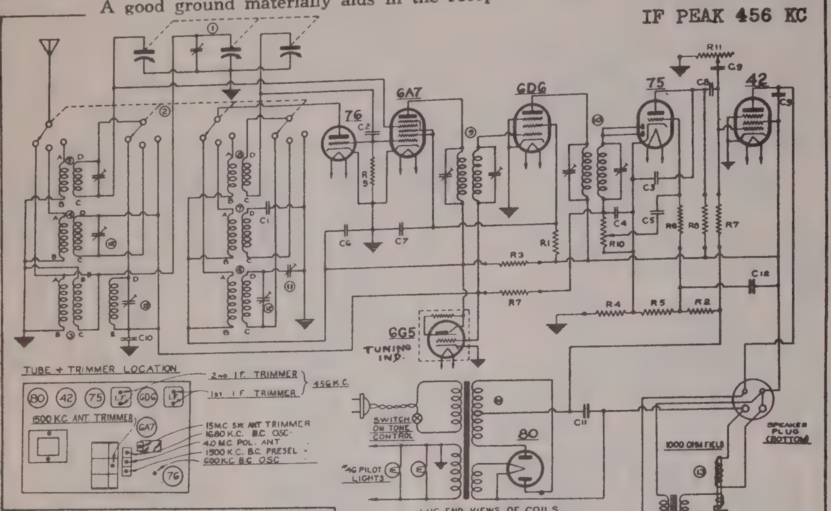
For check:- Set test osc. at 18 MC, increasing output; set dial at 17 MC; vary dial to left and right of 17 Mc. If correct fundamental peak was used in alignment at 18 MC, then test osc.signal will be heard at 17 MC. of dial setting.
At 15 MC adjustment, Ant. trimmer for maximum signal.
Repeat all adjustments for final check.

1936 - 1937

MODELS 5004,5005,5056
Chassis 701

SPIEGEL INC.

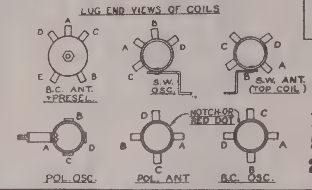
A good ground materially aids in the reception of distant stations.



CIRCUIT DATA

PART No		DESCRIPTION
C1	1500C	.0009 MFD. MICA 2%
C2	1503	.00005 " "
C3	1602	.0005 " "
C4	1604	.00025 " "
C5	1605	.02 " 400 v
C6	1602	.1 " 800 v
C7	1601	.1 " 400 v
C8	1648	.03 " 600 v
C9	1651	.004 " " v
C10	1622	.05 " 200 v
C11	18-202	10.0 ELECTROLYTIC
C12	18-201	12.0
R1	6211	15000 OHMS 1W.
R2	80-100	200 " 1W.5%
R3	6115	1000 " ½W.
R4	60-103	30 " " 5%
R5	60-104	20 " " "
R6	8020	2.0MEG - ⅓W

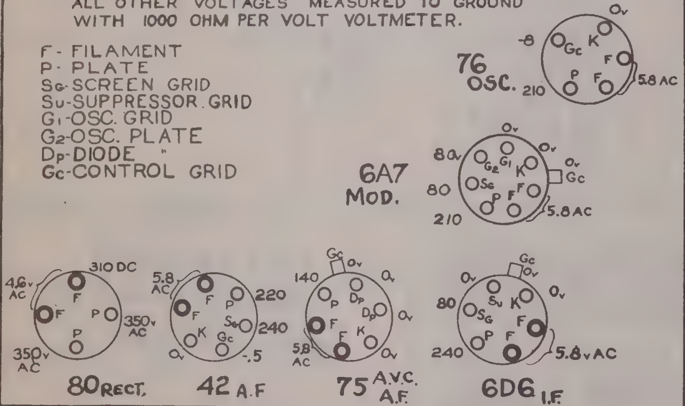
PART No.		DESCRIPTION
R7	8018	800,000 OHMS ½W
R8	6024	250 000 "
R9	6025	50000 "
R10	24-101	500 000 VOL. CONTR
R11	26-101	500 000 TONE CONTR
1	19-106	GANG
2	69-103	SWITCH
3	10-137	B.C. ANT.+PRESELECTOR COIL
4	10-135	POL. " COIL
5	10-132	S.W. " "
6	10-134	B C OSC "
7	10-136	POL. " "
8	10-133	S W. " "
9	1123	1ST I.F.
10	1124	2ND I.F.
11	20-100	B C OSC PADDER
12	20-101	TRIMMER GANG
13		SPEAKER
14	80-105	POWER TRANSF.



BANDS
1680 to 535 KC
5.6 to 1.7 MC
20 to 5.4 MC

FILAMENT VOLTAGES MEASURED ACROSS SOCKET.
ALL OTHER VOLTAGES MEASURED TO GROUND
WITH 1000 OHM PER VOLT VOLTMETER.

F- FILAMENT
P- PLATE
SG-SCREEN GRID
SU-SUPPRESSOR GRID
G1-OSC. GRID
G2-OSC. PLATE
DP-DIODE "
GC-CONTROL GRID



ALIGNMENT PROCEDURE

The equipment required for re-aligning this receiver is an output meter and a modulated source of radio frequency (a signal generator or microvolter). This source of radio frequency must be accurately calibrated in frequency and must have a method of varying the output.

All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to the two small pins of the speaker plug. The output meter remains connected during the entire alignment procedure.

1. Connect the signal generator to the grid cap of the 6A7 tube through a 1 M.F. condenser. Connect the ground of the generator to the ground post of the receiver. With the wave switch on broadcast position and the dial set to about 1000 K.C., feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. This aligns the I.F.

2. Leaving the wave switch on broadcast position turn the dial to the extreme high frequency end. Feed a 1680 K.C. signal to the receiver antenna post through a .00025 M.F. mica condenser. Adjust the 1680 K.C. broadcast oscillator trimmer for maximum output. Set the generator to 1500 K.C. and tune in this signal on the receiver. Then adjust the 1500 K.C. broadcast antenna trimmer and the 1500 K.C. broadcast preselector trimmer for maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output **while tuning the receiver back and forth across the signal** from the generator. This completes the alignment of the broadcast band.

3. The police band is aligned by feeding 4.0 M.C. signal to the receiver antenna lead through the .00025 condenser. Turn the wave switch to the center position and tune the receiver to this signal. Adjust the 4.0 M.C. police antenna trimmer for best output.

4. The short wave band is aligned in the same way using a 15 M.C. signal and adjusting the 15 M.C. short wave antenna trimmer after having turned the wave switch to the right hand position.

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CHASSIS 01-6A,010-6AX,01-6B,010-6BX,01-6D,010-6DX
Alignment,Trimmers,Phono.Notes,Drive Cord Data

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

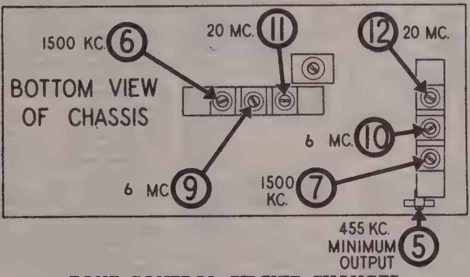
1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground in series with a .1 mfd. c denser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. move the connector from between the "A" and "X" terminals.
4. The pointer should be at the following distances with the gang condenser in full mesh:
   01-6D & 010-6DX CHASSIS: $2\frac{3}{16}$ inches from the LEFT end of the dial plate.
   01-6A, 010-6AX, 01-6B, & 010-6BX CHASSIS: 1⅜ inches from the LEFT end of the dial plate.

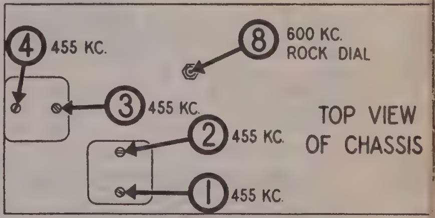
NOTE: When aligning models 01-6B9 and 010-6B9X, make the following connections at the phonograph terminal strip on the rear the chassis near the center:
Ground the right hand terminal (the one nearest the push button trimmers).

Connect the center and left hand terminals together.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Pointer Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Front Lug on Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Outp Then Repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	Antenna Terminal "A"	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Outp using a strong generator sign
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	Broadcast	*1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Detector	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal "A"	600 KC	Broadcast	Tune to 600 KC Generator Signal	8	Broadcast Oscillator (Series)	Adjust for Maximum Output. T to Increase Output by Detuni Trimmer and Retuning Receiv Dial until Maximum Output Obtained.
400 OHM Carbon Resistor	Antenna Terminal "A"	6 MC	Intermediate	*6 MC	9	Intermediate Oscillator	Adjust for Maximum Output. Che to see if Proper Peak was Obtained Tuning in Image at Approx. 5.1 M If Image does not appear, Realign 6 MC with Trimmer Screw fart Out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal "A"	6 MC	Intermediate	Tune to 6 MC Generator Signal	10	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Antenna Terminal "A"	20 MC	Foreign	*20 MC	11	Foreign Oscillator	Adjust for Maximum Output. Che to see if Proper Peak was obtained Tuning in Image at Approx. 19.1 M If Image does not appear Realign at MC with Trimmer Screw farther o Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal "A"	20 MC	Foreign	Tune to 20 MC Generator Signal	12	Foreign Antenna	Adjust for Maximum Output. T to Increase Output by Detuni Trimmer and Retuning Receiv Dial until Maximum Output obtained.

*For pointer settings at these frequencies, see "Alignment Points"





TONE CONTROL CIRCUIT CHANGES

The tone control circuit used in most receivers of this model is shown in the circuit diagram on the reverse side of this sheet. Chassis employing this type of tone control circuit are stamped with the letter "S" on the chassis.

To the right of the circuit diagram is shown a tone control circuit used in some early receivers. Note the important differences both in the set itself and in the push button circuit. A few receivers incorporate a tone control circuit differing from both circuits illustrated. In these cases, it is suggested that the serviceman revise these earlier circuits so as to convert them to the tone control circuit illustrated at the right of the receiver circuit diagram.

In some chassis, Resistor No. 31 was 22,000 ohms instead of 47,000 o If this lower value resistor is replaced by the 47,000 ohm unit, an impr ment in tone will result, especially noticeable on higher volume.

IMPORTANT: Servicemen are cautioned not to interchange radio ch indiscriminately in these receivers. The tone control circuit of an e receiver will not operate with a chassis of the later type (Stamped "S") vice versa. Should it be necessary to interchange chassis and tone co assemblies, change the connections of the switch or of the set to con to the circuit diagram.

PHONOGRAPH PICK-UP CIRCUIT CHANGES

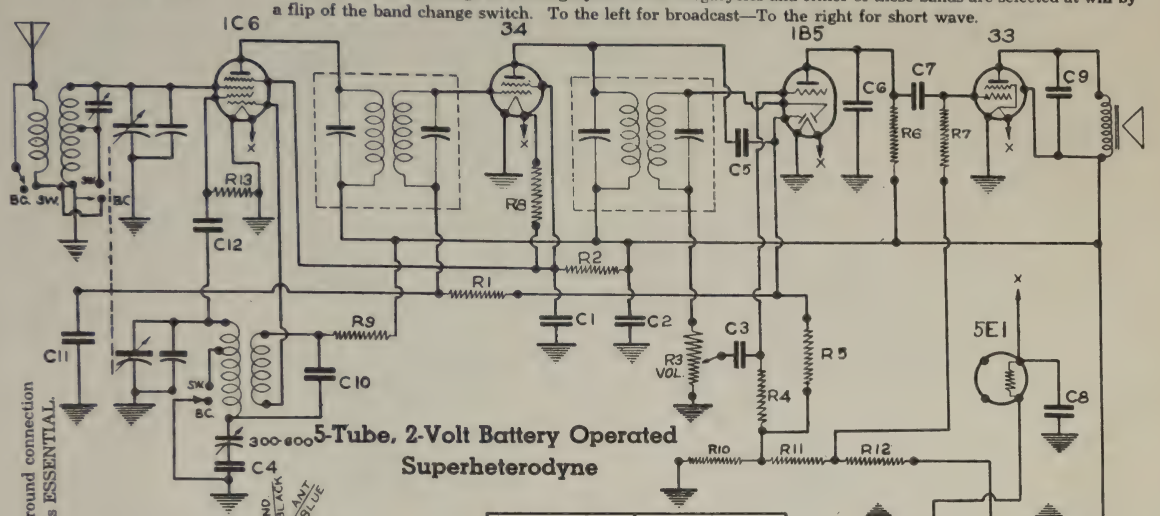
Some of the earlier chassis of this model did not include the 220,000 resistor or the 0.001 mfd. condenser, which are shown connected across pick-up. If either of these units are missing, or are of a value diffe from that specified, the insertion of the proper units will improve tone when records are being played.

SPIEGEL INC.

MODEL 6606,Chassis 525
Schematic,Socket,Trimmers
Alignment

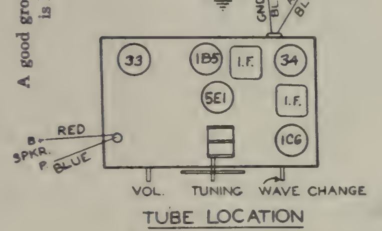
The frequency range covered by this receiver is as follows: Broadcast band 537 KC to 1730 KC. The short wave band covers a range of 2.2 megacycles to 6.4 megacycles and either of these bands are selected at will by a flip of the band change switch. To the left for broadcast—To the right for short wave.

IF 456 K.C.



5-Tube, 2-Volt Battery Operated Superheterodyne

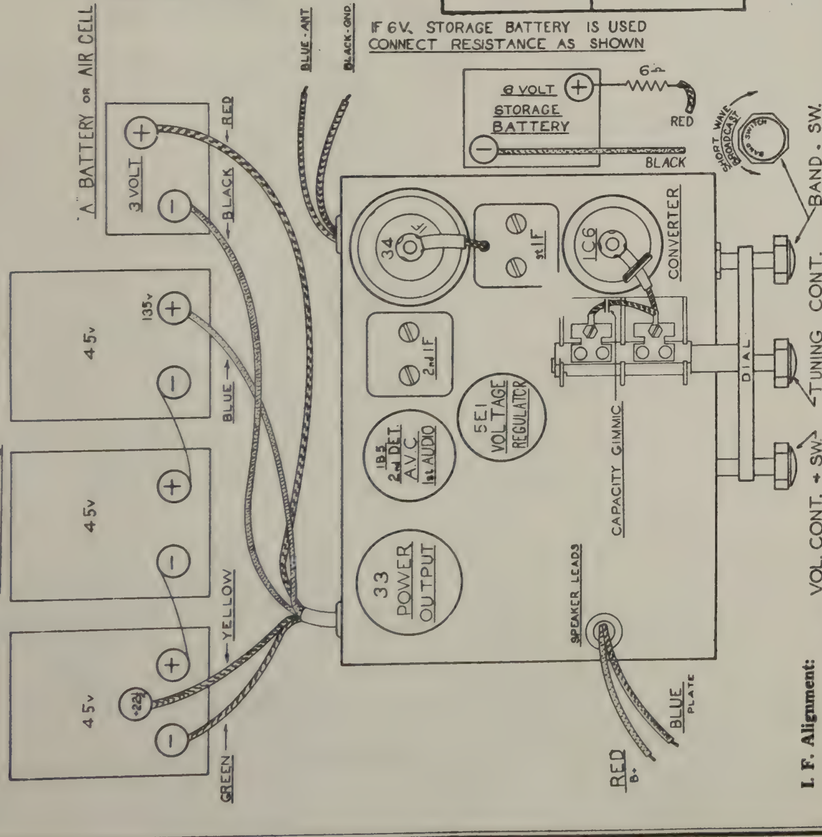
R1	1. MEG. OHMS	C1	.1	MFD.
R2	15 M	C2	.1	"
R3	500 M	C3	.05	"
R4	1. MEG.	C4	.002	"
R5	1. MEG.	C5	.00025	"
R6	250 M	C6	.00025	"
R7	500 M	C7	.05	"
R8	50 M	C8	.25	"
R9	50 M	C9	.01	"
R10	400	C10	.001	"
R11	4500	C11	.1	"
R12	2 M	C12	.0001	"
R13	50 M			



TUBE LOCATION

A good ground connection is ESSENTIAL.

IF 6V. STORAGE BATTERY IS USED CONNECT RESISTANCE AS SHOWN



I. F. Alignment:

Connect the oscillator through a .1 condenser to the grid of the 1C6 tube and set the oscillator to 456 kilocycles. Peak each I. F. stage to resonance as indicated by maximum output on the output meter.

R. F. Alignment:

With the wave change switch in the broadcast position, set the oscillator to 1700 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1700 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. The location of oscillator trimmer is on rear section of variable condenser. Reset the test oscillator to 1400 kilocycles and adjust antenna trimmer located corner front section of variable condenser. Now set oscillator to 600 kilocycles and adjust padder located on side of chassis. Check alignment at 1000 kilocycles.

For aligning police band, set test oscillator to 6 megacycles. Turn band switch to short wave. Rotate variable condenser until signal is heard. Peak antenna trimmer (across antenna coil under chassis) to maximum. Rock variable condenser slightly backward and forward until maximum peak is reached.

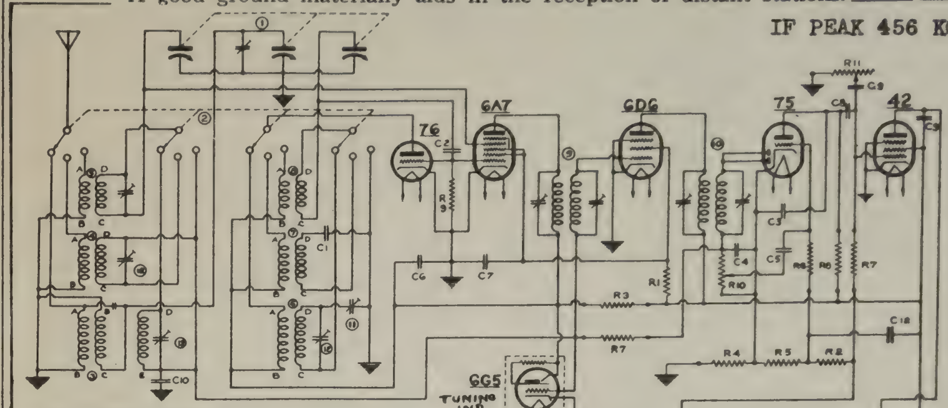
MODELS 5004,5005,5056
Chassis 701

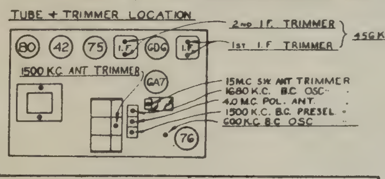
SPIEGEL INC.

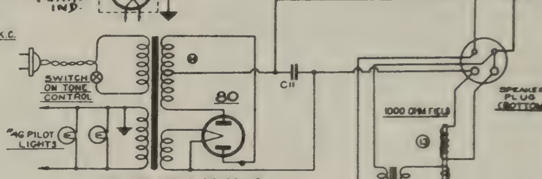
Schematic,Voltage
Alignment,Trimmers
Socket

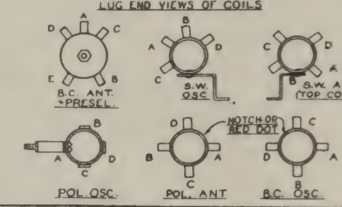
A good ground materially aids in the reception of distant stations.

IF PEAK 456 KC









BANDS

1680 to 535 KC
5.6 to 1.7 MC
20 to 5.4 MC

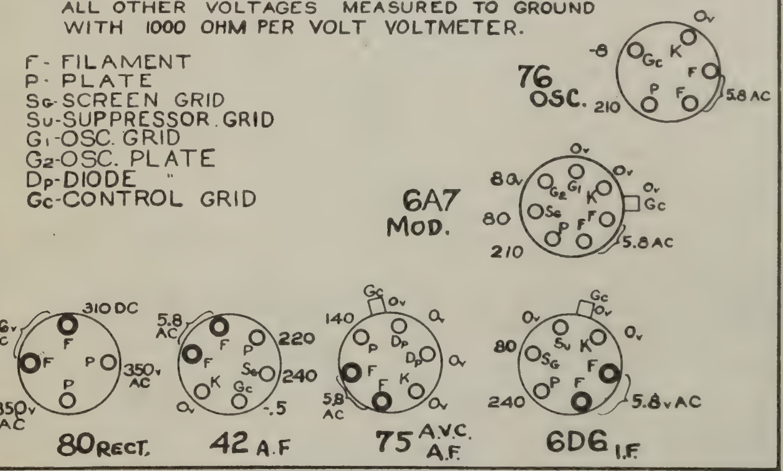
CIRCUIT DATA

PART	No.	DESCRIPTION
C1	1500C	.0009 MFD. MICA 5%
C2	1503	.00005 " "
C3	1802	.0005 " "
C4	1804	.00025 " "
C5	1605	.02 " 400 v
C6	1602	.1 " 600 v
C7	1601	.1 " 400 v
C8	1648	.03 " 600 v
C9	1651	.004 " " v
C10	1622	.05 " 200 v
C11	18-202	10.0 ELECTROLYTIC
C12	18-201	12.0
R1	6211	15000 OHMS 1W.
R2	60-100	200 " 1W.5%
R3	6115	1000 " ½W.
R4	60-103	30 " 5%
R5	60-104	20 " "
R6	6020	2.0MEG " ⅓W

PART	No.	DESCRIPTION
R7	6018	500,000 OHMS ½W
R8	6024	250 000 "
R9	6025	50000 "
R10	24-101	500000 VOL. CONTR
R11	26-101	500 000 TONE CONTR
1	19-106	GANG
2	69-103	SWITCH
3	10-137	B.C. ANT + PRESELECTOR
4	10-135	POL. " COIL
5	10-132	S.W. " "
6	10-134	B.C OSC "
7	10-136	POL. " "
8	10-133	S.W. " "
9	1123	1ST I.F.
10	1124	2ND I.F.
11	20-100	B.C. OSC. PADDER
12	20-101	TRIMMER GANG
13		SPEAKER
14	80-105	POWER TRANSF.

FILAMENT VOLTAGES MEASURED ACROSS SOCKET.
ALL OTHER VOLTAGES MEASURED TO GROUND
WITH 1000 OHM PER VOLT VOLTMETER.

F - FILAMENT
P - PLATE
Sg - SCREEN GRID
Su - SUPPRESSOR GRID
G1 - OSC. GRID
G2 - OSC. PLATE
Dp - DIODE "
Gc - CONTROL GRID



ALIGNMENT PROCEDURE

The equipment required for re-aligning this receiver is an output meter and a modulated source of radio frequency (a signal generator or microvolter). This source of radio frequency must be accurately calibrated in frequency and must have a method of varying the output.

All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to the two small pins of the speaker plug. The output meter remains connected during the entire alignment procedure.

1. Connect the signal generator to the grid cap of the 6A7 tube through a 1 M.F. condenser. Connect the ground of the generator to the ground post of the receiver. With the wave switch on broadcast position and the dial set to about 1000 K.C., feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. This aligns the I.F.

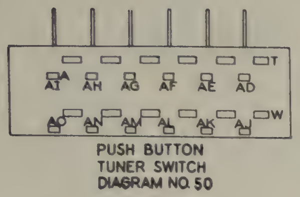
2. Leaving the wave switch on broadcast position turn the dial to the extreme high frequency end. Feed a 1680 K.C. signal to the receiver antenna post through a .00025 M.F. mica condenser. Adjust the 1680 K.C. broadcast oscillator trimmer for maximum output. Set the generator to 1500 K.C. and tune in this signal on the receiver. Then adjust the 1500 K.C. broadcast antenna trimmer and the 1500 K.C.broadcast preselector trimmer for maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output **while tuning the receiver back and forth across the signal** from the generator. This completes the alignment of the broadcast band.

3. The police band is aligned by feeding 4.0 M.C. signal to the receiver antenna lead through the .00025 condenser. Turn the wave switch to the center position and tune the receiver to this signal. Adjust the 4.0 M.C. police antenna trimmer for best output.

4. The short wave band is aligned in the same way using a 15 M.C. signal and adjusting the 15 M.C. short wave antenna trimmer after having turned the wave switch to the right hand position.

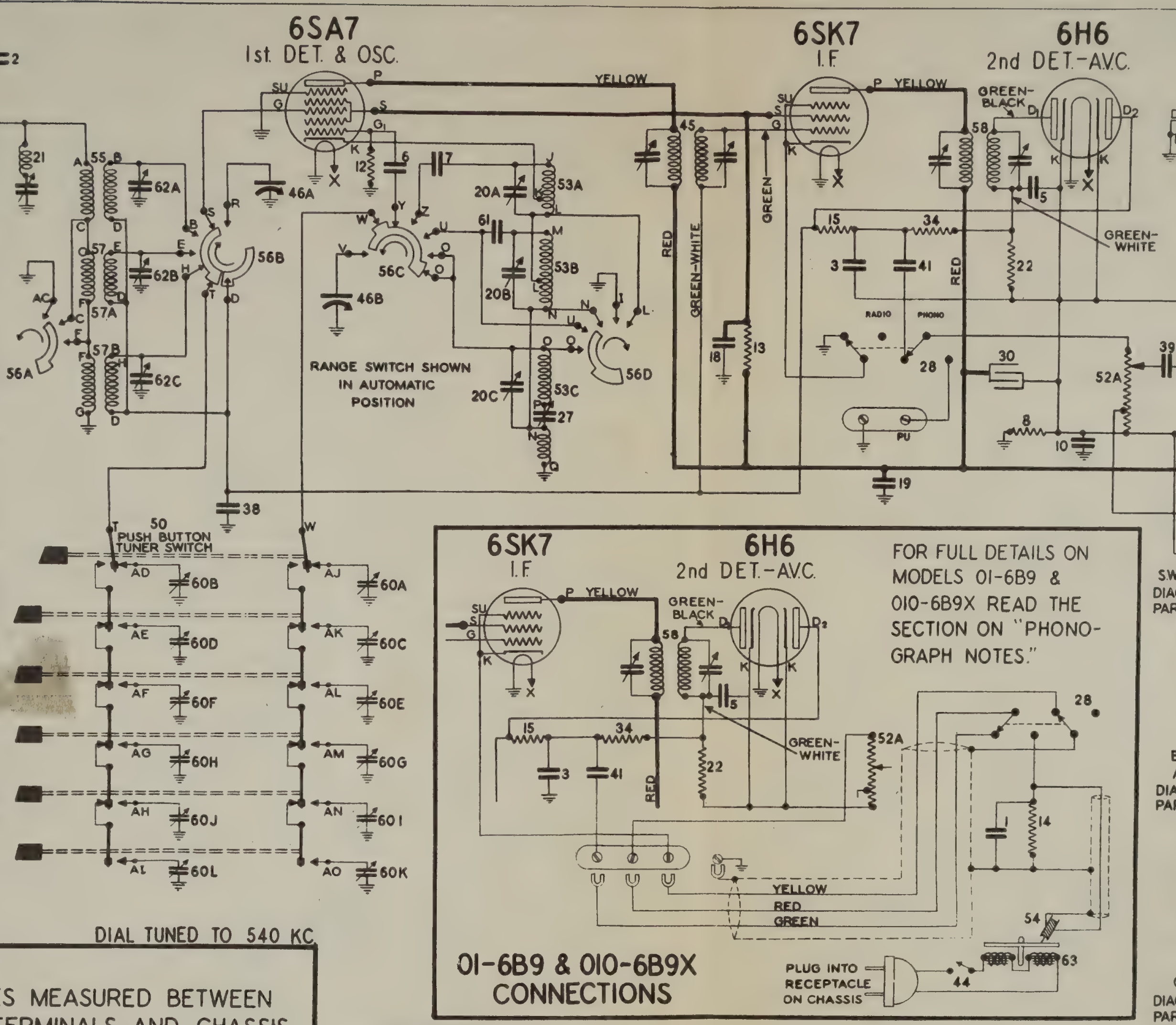
STEWART-WARNER CORP.

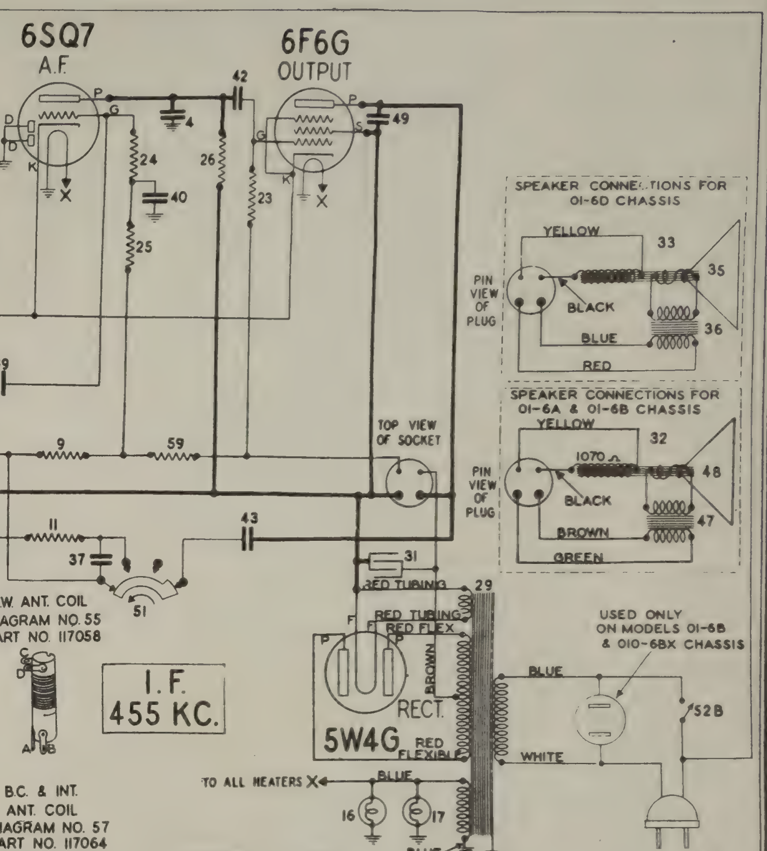
CHASSIS 01-6A, 010-6AX, 01-6B, 010-6BX, 01-6D, 010-6DX
Schematic, Voltage, Socket, Phono. Schematic

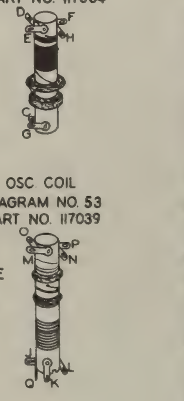


PUSH BUTTON TUNER SWITCH DIAGRAM NO. 50

Diagram Number	Part Number	Description	List Price
1	81156 111122	Condenser—mica, .001 mfd. (see "Phonograph Notes") Condenser—mica, .003 mfd. (see "Phonograph Notes")	$0.30 .22
2-3-4	83539	Condenser—mica, 260 mmfd.	.20
5	83783	Condenser—mica, 110 mmfd.	.20
6	85061	Condenser—mica, 51 mmfd.	.15
7	85440	Condenser—mica, 3510 mmfd.	.40
8	88460	Resistor—150 ohms, ½ watt, W.W.	.12
9	88465	Resistor—25 ohms, ½ watt, W.W.	.15
10	89532 117356	Condenser—paper, .25 mfd., 200 volts (01-6A, 01-6B, 010-6AX, 010-6BX) Condenser—electrolytic, 10 mfd., 25 volts (01-6D, 010-6DX only)	.32 .50
11	110552	Resistor—carbon, 47,000 ohms, ¼ watt	.12
12	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
13	110575	Resistor—carbon, 12,000 ohms, 2 watts	.30
14	110578 112971	Resistor—carbon, 68,000 ohms, ¼ watt (see "Phonograph Notes") Resistor—insulated 470,000 ohms ¼ watt (see "Phonograph Notes")	.12 .15
15	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
16-17	110629	Lamp—6.3 volts—.25 amps.	.15
18-19	111252	Condenser—paper, .05 mfd., 400 volt	.13
20A-20B-20C	112072	Condenser—trimmer—3 sections	.45
21	112796	Coil—wave trap (with trimmer)	.50
22-23	112971	Resistor—insulated, 470,000 ohms, ¼ watt	.15
24-25	112972	Resistor—insulated, 1 meg., ¼ watt	.15
26	112987	Resistor—insulated, 220,000 ohms, ¼ watt	.15
27	113346	Condenser—padding	.38
28	114141	Switch—D.P.D.T.	.44
29	114530 116352	Power transformer, 117 volt, 60 cycle (01-6A, 01-6B, 01-6D) Power transformer, 110-240 V., 40-133 C. (010-6AX, 010-6BX, 010-6DX)	3.50 7.75
30-31	114972	Condenser—electrolytic, 16 mfd., 450 volt	.78
32	U-115060 U-115061	Speaker—dynamic, 10", (01-6A7, 010-6A7X) Speaker—dynamic, 12", (01-6B9, 010-6B9X)	8.60 10.50
33	U-115063	Speaker—dynamic, 6", (01-6D4, 01-6D1, 010-6DX)	5.50
34	116058	Resistor—carbon, 47,000 ohms, ¼ watt	.12


6SA7
1st. DET. & OSC.
6SK7
I.F.
6H6
2nd DET.-A.V.C.
YELLOW
GREEN-BLACK
GREEN
RED
GREEN-WHITE
RADIO
PHONO
PU
RANGE SWITCH SHOWN IN AUTOMATIC POSITION
PUSH BUTTON TUNER SWITCH
50
56A
56B
56C
56D
46A
46B
53A
53B
53C
60A 60B 60C 60D 60E 60F 60G 60H 60I 60J 60K 60L
AD AE AF AG AH AL AJ AK AM AN AO
6SK7
I.F.
6H6
2nd DET.-A.V.C.
FOR FULL DETAILS ON MODELS 01-6B9 & 010-6B9X READ THE SECTION ON "PHONOGRAPH NOTES."
YELLOW
RED
GREEN
PLUG INTO RECEPTACLE ON CHASSIS
01-6B9 & 010-6B9X CONNECTIONS

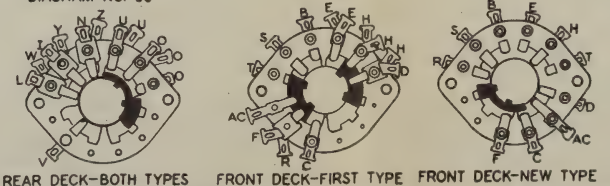



B.C. & INT. ANT. COIL DIAGRAM NO. 57 PART NO. 117064
OSC. COIL DIAGRAM NO. 53 PART NO. 117039

TERMINALS OF THE ILLUSTRATIONS ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

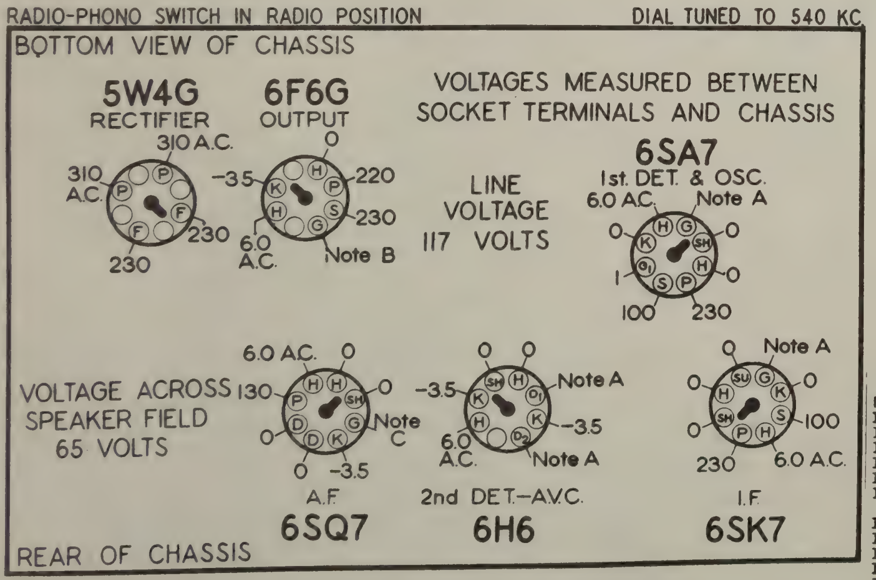
Diagram Number	Part Number	Description	List Price
35	U-116211	Cone & Voice Coil assy. for U-115063 speaker	$1.65
36	U-116212	Output transformer for U-115063 speaker	1.50
	116352	Power transformer, 100-240 volt, 40-133 cycles (010-6AX, 010-6BX, 010-6DX)	7.75
37	116640	Condenser—.01 mfd., 600 volts	.15
38-39-40	116819	Condenser—.05 mfd., 600 volts	.20
41-42-43	116893	Condenser—.02 mfd., 600 volts	.15
44	116942	On-Off Phono switch (01-6B9, 010-6B9X)	.25
45	116954 117523	Transformer—1st I.F. (01-6A, 01-6B, 01-6D) Transformer—1st I.F. (010-6AX, 010-6BX, 010-6DX)	1.20 1.35
46A-46B	116996	Condenser—variable gang	3.30
47	U-117004	Output transformer for U-115060 & U-115061 speakers	2.50
48	U-117005 U-117071	Cone & Voice coil assy. for U-115060 speaker Cone & Voice coil assy. for U-115061 speaker	2.50 2.30
49	117022	Condenser—.002 mfd., 600 volt	.15
50	117024	Switch—push button	2.80
51	117025	Tone control switch	.60
52A-52B	117035	Volume control with switch—1 meg.	1.00
53A-53B-53C	117039	Coil—oscillator (with trimmers)	2.15
54	117053	Phono pickup arm with arm rest and mtg. nut (01-6B9, 010-6B9X)	7.25
55	117058	Coil—antenna S.W.	.50
56A to 56D	117062	Range switch	1.90
57A-57B	117064	Coil—antenna, B.C. & Pol. or Int.	1.00
	117071	Coil & Voice coil assy. for U-115061 speaker	2.30
58	117072 117580	Transformer—2nd I.F. (01-6A, 01-6B, 01-6D) Transformer—2nd I.F. (010-6AX, 010-6BX, 010-6DX)	1.20 1.20
59	117075	Resistor—300 ohms 1 watt W.W.	.16
60A to 60L	117081	Push button trimmer gang condenser assy.	5.20
61	117113	Condenser—mica, 1760 mmfd.	.30
	117356	Condenser—electrolytic, 10 mfd., 25 volt (01-6D, 010-6DX only)	.50
62	117450	Condenser—trimmer—3 section	.40
	117523	Transformer—1st I.F. (010-6AX, 010-6BX, 010-6DX)	1.35
	117580	Transformer—2nd I.F. (010-6AX, 010-6BX, 010-6DX)	1.20
63		See Phonograph parts list.	

FRONT VIEWS OF RANGE SWITCH DECKS DIAGRAM NO. 56



MISCELLANEOUS PARTS

Part Number	Description	List Price
117009	Call tabs and instruction sheets for 01-6A sets	$0.45
117010	Call tabs and instruction sheets for 01-6B sets	.50
117534	Call tabs and instruction sheets for 01-6D sets	.45
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
112798	Clip—for mounting wave trap	.01
85321	Connector—for internal antenna	.01
116948	Cord—dial (6 ft. lengths)	.18
117057	Cord—drive (3 ft. lengths)	.15
111973	Cushion—rubber rest for back of chassis (01-6A7, 010-6A7X)	.06
117028	Dial plate & pulley assembly (01-6A, 01-6B)	1.00
117194	Dial plate & pulley assembly (01-6D)	.85
117042	Dial scale and escutcheon (01-6A, 01-6B)	1.50
117198	Dial scale and escutcheon (01-6D)	1.25
117029	Drive drum and bushing	.50
116998	Escutcheon for push buttons	.30
88348	Eyelet—for dial cord ... Per Doz.	.05
116773	Knob—tuning or volume	.10
116952	Pin for push buttons	.02
117036	Pointer assembly (01-6A, 01-6B)	.28
117195	Pointer assembly (01-6D)	.32
116999	Push buttons	.08
116165	Receptacle for 2 prong plug	.50
117019	Reflector—for pilot lights	.04
81145	Retaining ring—for drive shaft ... Per C	.50
114148	Rotor—for power transformer switch (010-6AX, 010-6BX, 010-6DX)	



These readings were taken, using a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The bias on the control grids of the 6SK7 and 6SA7 tubes and on the diode plates of the 6H6 tube is —2.7 volts measured across resistor No. 8.

NOTE B: The bias on the control grid of the 6F6G tube is —16 volts, measured across resistors No. 9 and 59.

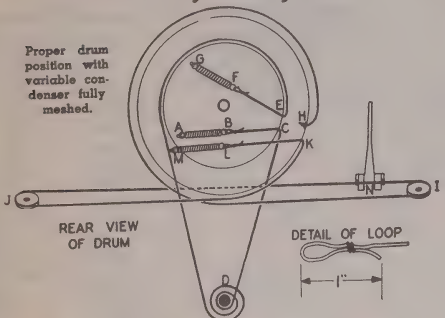
NOTE C: The bias on the control grid of the 6SQ7 tube is —1.4 volts measured across resistor No. 9.

RANGE SWITCH

Two types of range switches were used in these receivers. Both switches are electrically identical, although the contacts are arranged differently on the front decks of the two types. The rear decks of both switches are identical. Illustrations of both types of switch decks adjacent to the circuit diagram show the connections to the various lugs, as they correspond to lettered terminals on the circuit diagram. Coil and push button tuner switch drawings give the same information regarding connections.

DIAL CORD REPLACEMENT

Chassis 01-6A,010-6AX,01-6B 01-6C,010-6CX ,010-6BX



Proper drum position with variable condenser fully meshed.

TO REPLACE THE TUNING DRIVE CORD

1. 19¾ inches of dial drive cord (part No. 117057) are required. Make a one-inch loop in each end of this cord, using a dial cord clip, (part No. 114955) (See sketch above for detail of loop). A knot may be tied if a slightly smaller loop is made.
2. Fasten one end of a tension spring (part No. 113177) to the loop at point B and the other end of the spring to tab A.
3. Pass the other end of the dial cord through hole C in the inner drum and
4. Make two and a half turns of the cord about tuning shaft D.
5. Continue the cord clockwise (rear view) about the inner drum and pass it through hole E.
6. Fasten a tension spring, (part No. 113177) to the other loop of the cord at point F and fasten the spring to the tab G.

TO REPLACE THE POINTER DRIVE CORD

1. 37 inches of pointer drive cord, (part No. 116948) are required. Fasten an eyelet (part No. 88348) at a point one-half inch from one end of this cord.
2. Pass the other end of the cord outward through hole H in the larger drum.
3. Fashion a one-inch loop at outer end of the pointer cord, (See detail of loop in illustration), using a dial cord clip (part No. 114955), or tie a knot using a smaller loop.
4. Continue the cord counter-clockwise (rear view) around the larger drum and around the rear of pulley I from the rear to the front.
5. Go from pulley I around the front of pulley J and counter-clockwise (rear view) around the larger drum to hole K.
6. Pass the loop through hole K and fasten it to one end of a tension spring (part No. 113177) at point L, the other end of the spring being fastened to point M.
7. Clip the dial pointer to the cord. With the drum in the position shown, and with the gang condenser in full mesh, fasten the pointer so that it is at a point 1⅜ inches from the left end of the brown dial plate (front view).

PHONOGRAPH NOTES

On early releases of model 01-6B9, a 220,000 ohm resistor was connected across the phonograph pickup at the "PHONO-RADIO" switch.

In order to eliminate needle scratch on these sets, a 68,000 ohm resistor and a .003 mfd. condenser were substituted for the 220,000 ohm resistor. These were connected as shown in the circuit diagram and are included on the parts list under diagram numbers 1 and 14.

On all late releases a pickup with different cushioning was used, and the values of the resistor and condenser were changed to 470,000 ohms and .001 mfd. These values are also included under diagram numbers 1 and 14.

If "growling" is encountered during phonograph operation, the chassis mounting bolts should be checked to see that they are loose enough to allow the chassis to float on its rubber cushions.

If the set is of the early type using the 220,000 ohm resistor, the substitution of the 68,000 ohm resistor and .003 mfd. condenser described above may help to reduce "growling,"

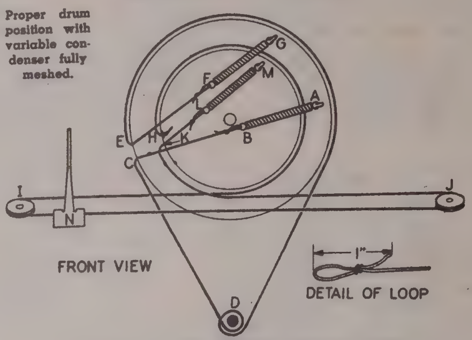
RANGE SWITCH

Two types of range switches were used in this receiver. Both switches are electrically identical, although the contacts are arranged differently on the front decks of the two types. The rear decks of both switches are identical. Illustrations of both types of switch decks adjacent to the circuit diagram show the connections to the various lugs, as they correspond to lettered terminals on the circuit diagram. Coil and push button tuner switch drawings give the same information regarding connections.

SETTING UP PUSH BUTTONS

1. Always allow set to warm up thoroughly before attempting to set up the push buttons. Fifteen minutes will suffice.
2. Set must be connected to a good antenna system, preferably the antenna on which it is to operate.
3. On the bottom of the chassis, as viewed from rear of cabinet will be seen six pairs of adjusting screws, which are used to adjust the push button trimmers to the selected stations. The larger of the two screws in each case adjusts BOTH the oscillator and antenna trimmers, while the smaller screw is a vernier adjustment on the antenna trimmer.
4. The frequency range of the trimmers is indicated on the sticker adjacent to the trimmer adjusting screws. Select six local stations whose frequencies fall within the tuning range of the individual trimmers.

MODELS 01-6D & 010-6DX



Proper drum position with variable condenser fully meshed.

TO REPLACE THE TUNING DRIVE CORD

1. 25½ inches of dial drive cord (part No. 117057) are required. Make a one-inch loop in each end of this cord, using a dial cord clip, (part No. 114955) (See sketch above for detail of loop). A knot may be tied if a slightly smaller loop is made.
2. Fasten one end of a tension spring (part No. 113177) to the loop at point B and the other end of the spring to tab A.
3. Pass the other end of the dial cord through hole C in the outer drum.
4. Make one and a half turns of the cord about tuning shaft D.
5. Continue the cord counter-clockwise about the outer drum and pass it through hole E.
6. Fasten a tension spring, (part No. 113177) to the other loop of the cord at point F and fasten the spring to the tab G.

TO REPLACE THE POINTER DRIVE CORD

1. 34⅛ inches of pointer drive cord, (part No. 116948) are required. Fasten an eyelet (part No. 88348) at a point one-half inch from one end of this cord.
2. Pass the other end of the cord outward through hole H in the smaller drum.
3. Fashion a one-inch loop at outer end of the pointer cord, (See detail of loop in illustration), using a dial cord clip (part No. 114955), or tie a knot using a smaller loop.
4. Continue the cord clockwise around the smaller drum and around pulley I from the rear to the front.
5. Go from pulley I around the front of Pulley J and clockwise around the smaller drum to hole K.
6. Pass the loop through hole K and fasten it to one end of a tension spring (part No. 113177) at point L, the other end of the spring then being fastened to point M.
7. Clip the dial pointer to the cord. With the drum in the position shown, and with the gang condenser in full mesh, fasten the pointer so that it is at a point 2$\frac{3}{16}$" from the left end of the brown dial plate.

ALIGNMENT POINTS

Frequency	Pointer Distance in inches from Right End of Brown Dial Plate	
	Models 01-6A, 010-6AX, 01-6B, 010-6BX	Models 01-6D & 010-6DX
1500 KC	2-5/16"	3"
6 MC.	2-3/8"	2-15/16"
20 MC.	2-3/16"	2-7/8"

5. Label the push buttons with the call letters of the selected stations, assigning the lowest frequency station to the extreme left hand button and the highest frequency station to the extreme right hand button.
6. Turn the range switch to "B" and manually tune in the station you wish to set up on the extreme left hand button.
7. Turn the range switch to "A" and push in the left hand button. Using a small screwdriver, adjust the large screw of the No. 1 trimmer until the station you had previously tuned in manually is again heard. Adjust this screw to the point where the program is heard with the deepest tone.
8. Insert the screwdriver in the small screw of this trimmer and turn it until the station is heard with deepest tone. Now again check the setting of the larger adjusting screw, making sure it is adjusted to the point of deepest tone.
9. The set-up for this button is now complete. Set up the remaining buttons in a similar manner.
10. In some instances it may be necessary to reset the trimmer after several months, as they may drift due to heat, humidity, etc.

Do not adjust trimmers too tightly or too loosely. Wherever possible, select stations that will fall well within the frequency ranges specified on the trimmers.

SETTING THE DIAL POINTER

Since the dial scale is printed on the escutcheon glass, the serviceman will not know whether the pointer is set correctly unless the set is in place in the cabinet. With the gang condenser in full mesh, the dial pointer should be at a point 1⅜ inches from the left end of the brown dial plate. If the pointer is not set correctly, loosen the two set screws holding the dial drum to the condenser shaft. Then hold the condenser in full mesh and move the dial drum until the pointer reaches the proper point, then tighten the set screws.

When replacing the chassis in the cabinet, be sure it is in the position giving most accurate dial calibration.

MODEL 01-6C9,Ch.01-6C
Auto.Record Changer
Adjustments,Assemblies

Servicing the Automatic Record Changer

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

Refer to photograph and illustrations for references in following text.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .055—.061 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

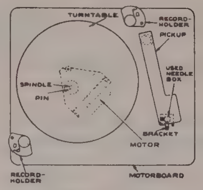
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records —Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed — Increase tension of pickup locating lever spring "34."

Leveling

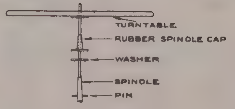
When a record has been played the pickup moves out, another record is dropped down, and the needle is fed automatically into the starting groove of this record. If the needle fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the base on that side. If the needle slides over a few grooves, raise the left-hand side of the cabinet in a similar manner.

Lubrication

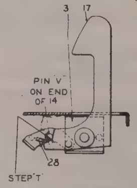
A few drops of good quality light machine oil should be applied about once every six months at the base of the spindle below the metal washer under the turntable.



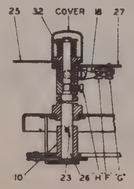
Motorboard



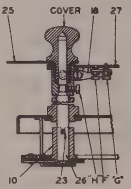
Turntable



Locating Lever



Early Type Shelf Posts.



New Type Shelf Posts

CHASSIS 01-6A,010-6AX,01-6B,010-6BX,01-6D,010-6DX
Alignment,Trimmers,Phono.Notes,Drive Cord Data

STEWART-WARNER CORP.

MODELS 01-6C9,010-6C9X
Alignmant,Trimmers,Drive Cord,Tuner,Notes

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

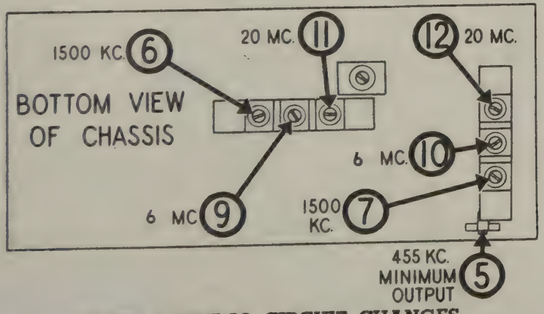
1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. Remove the connector from between the "A" and "X" terminals.
4. The pointer should be at the following distances with the gang condenser in full mesh:
   01-6D & 010-6DX CHASSIS: 2$\frac{3}{16}$ inches from the LEFT end of the dial plate.
   01-6A, 010-6AX, 01-6B, & 010-6BX CHASSIS: 1⅜ inches from the LEFT end of the dial plate.

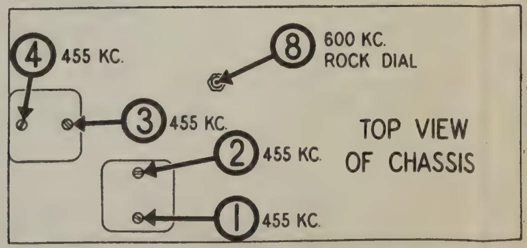
NOTE: When aligning models 01-6B9 and 010-6B9X, make the following connections at the phonograph terminal strip on the rear of the chassis near the center:
Ground the right hand terminal (the one nearest the push button trimmers).

Connect the center and left hand terminals together.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Pointer Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Front Lug on Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
200 MMFD. Mica Condenser	Antenna Terminal "A"	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, using a strong generator signal.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	Broadcast	*1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Detector	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal "A"	600 KC	Broadcast	Tune to 600 KC Generator Signal	8	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Antenna Terminal "A"	6 MC	Intermediate	*6 MC	9	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC with Trimmer Screw farther Out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal "A"	6 MC	Intermediate	Tune to 6 MC Generator Signal	10	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Antenna Terminal "A"	20 MC	Foreign	*20 MC	11	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was obtained by Tuning in Image at Approx. 19.1 MC. If Image does not appear Realign at 20 MC with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal "A"	20 MC	Foreign	Tune to 20 MC Generator Signal	12	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is obtained.

*For pointer settings at these frequencies, see "Alignment Points"





TONE CONTROL CIRCUIT CHANGES

The tone control circuit used in most receivers of this model is shown in the circuit diagram on the reverse side of this sheet. Chassis employing this type of tone control circuit are stamped with the letter "S" on the chassis.

To the right of the circuit diagram is shown a tone control circuit used in some early receivers. Note the important differences both in the set itself and in the push button circuit. A few receivers incorporate a tone control circuit differing from both circuits illustrated. In these cases, it is suggested that the serviceman revise these earlier circuits so as to convert them to the tone control circuit illustrated at the right of the receiver circuit diagram.

In some chassis, Resistor No. 31 was 22,000 ohms instead of 47,000 ohms. If this lower value resistor is replaced by the 47,000 ohm unit, an improvement in tone will result, especially noticeable on higher volume.

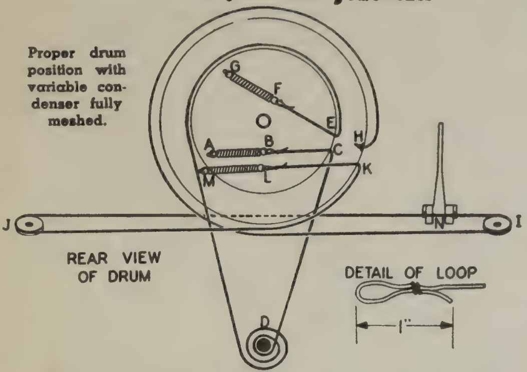
IMPORTANT: Servicemen are cautioned not to interchange radio chassis indiscriminately in these receivers. The tone control circuit of an early receiver will not operate with a chassis of the later type (Stamped "S") and vice versa. Should it be necessary to interchange chassis and tone control assemblies, change the connections of the switch or of the set to conform to the circuit diagram.

PHONOGRAPH PICK-UP CIRCUIT CHANGES

Some of the earlier chassis of this model did not include the 220,000 ohm resistor or the 0.001 mfd. condenser, which are shown connected across the pick-up. If either of these units are missing, or are of a value different from that specified, the insertion of the proper units will improve the tone when records are being played.

DIAL CORD REPLACEMENT

Chassis 01-6A,010-6AX,01-6B
01-6C,010-6CX ,010-6BX



Proper drum position with variable condenser fully meshed.

TO REPLACE THE TUNING DRIVE CORD

1. 19¾ inches of dial drive cord (part No. 117057) are required. Make a one-inch loop in each end of this cord, using a dial cord clip, (part No. 114955) (See sketch above for detail of loop). A knot may be tied if a slightly smaller loop is made.
2. Fasten one end of a tension spring (part No. 113177) to the loop at point B and the other end of the spring to tab A.
3. Pass the other end of the dial cord through hole C in the inner drum and
4. Make two and a half turns of the cord about tuning shaft D.
5. Continue the cord clockwise (rear view) about the inner drum and pass it through hole E.
6. Fasten a tension spring, (part No. 113177) to the other loop of the cord at point F and fasten the spring to the tab G.

TO REPLACE THE POINTER DRIVE CORD

1. 37 inches of pointer drive cord, (part No. 116948) are required. Fasten an eyelet (part No. 88348) at a point one-half inch from one end of this cord.
2. Pass the other end of the cord outward through hole H in the larger drum.
3. Fashion a one-inch loop at outer end of the pointer cord, (See detail of loop in illustration), using a dial cord clip (part No. 114955), or tie a knot using a smaller loop.
4. Continue the cord counter-clockwise (rear view) around the larger drum and around the rear of pulley I from the rear to the front.
5. Go from pulley I around the front of pulley J and counter-clockwise (rear view) around the larger drum to hole K.
6. Pass the loop through hole K and fasten it to one end of a tension spring (part No. 113177) at point L, the other end of the spring being fastened to point M.
7. Clip the dial pointer to the cord. With the drum in the position shown, and with the gang condenser in full mesh, fasten the pointer so that it is at a point 1⅜ inches from the left end of the brown dial plate (front view).

PHONOGRAPH NOTES

On early releases of model 01-6B9, a 220,000 ohm resistor was connected across the phonograph pickup at the "PHONO-RADIO" switch.

In order to eliminate needle scratch on these sets, a 68,000 ohm resistor and a .003 mfd. condenser were substituted for the 220,000 ohm resistor. These were connected as shown in the circuit diagram and are included on the parts list under diagram numbers 1 and 14.

On all late releases a pickup with different cushioning was used, and the values of the resistor and condenser were changed to 470,000 ohms and .001 mfd. These values are also included under diagram numbers 1 and 14.

If "growling" is encountered during phonograph operation, the chassis mounting bolts should be checked to see that they are loose enough to allow the chassis to float on its rubber cushions.

If the set is of the early type using the 220,000 ohm resistor, the substitution of the 68,000 ohm resistor and .003 mfd. condenser described above may help to reduce "growling,"

RANGE SWITCH

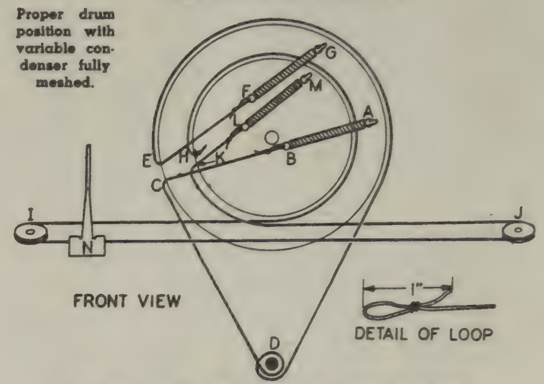
Two types of range switches were used in this receiver. Both switches are electrically identical, although the contacts are arranged differently on the front decks of the two types. The rear decks of both switches are identical. Illustrations of both types of switch decks adjacent to the circuit diagram show the connections to the various lugs, as they correspond to lettered terminals on the circuit diagram. Coil and push button tuner switch drawings give the same information regarding connections.

SETTING UP PUSH BUTTONS

1. Always allow set to warm up thoroughly before attempting to set up the push buttons. Fifteen minutes will suffice.
2. Set must be connected to a good antenna system, preferably the antenna on which it is to operate.
3. On the bottom of the chassis, as viewed from rear of cabinet will be seen six pairs of adjusting screws, which are used to adjust the push button trimmers to the selected stations. The larger of the two screws in each case adjusts BOTH the oscillator and antenna trimmers, while the smaller screw is a vernier adjustment on the antenna trimmer.
4. The frequency range of the trimmers is indicated on the sticker adjacent to the trimmer adjusting screws. Select six local stations whose frequencies fall within the tuning range of the individual trimmers.

MODELS 01-6D & 010-6DX

Proper drum position with variable condenser fully meshed.



TO REPLACE THE TUNING DRIVE CORD

1. 25½ inches of dial drive cord (part No. 117057) are required. Make a one-inch loop in each end of this cord, using a dial cord clip, (part No. 114955) (See sketch above for detail of loop). A knot may be tied if a slightly smaller loop is made.
2. Fasten one end of a tension spring (part No. 113177) to the loop at point B and the other end of the spring to tab A.
3. Pass the other end of the dial cord through hole C in the outer drum.
4. Make one and a half turns of the cord about tuning shaft D.
5. Continue the cord counter-clockwise about the outer drum and pass it through hole E.
6. Fasten a tension spring, (part No. 113177) to the other loop of the cord at point F and fasten the spring to the tab G.

TO REPLACE THE POINTER DRIVE CORD

1. 34⅛ inches of pointer drive cord, (part No. 116948) are required. Fasten an eyelet (part No. 88348) at a point one-half inch from one end of this cord.
2. Pass the other end of the cord outward through hole H in the smaller drum.
3. Fashion a one-inch loop at outer end of the pointer cord, (See detail of loop in illustration), using a dial cord clip (part No. 114955), or tie a knot using a smaller loop.
4. Continue the cord clockwise around the smaller drum and around pulley I from the rear to the front.
5. Go from pulley I around the front of Pulley J and clockwise around the smaller drum to hole K.
6. Pass the loop through hole K and fasten it to one end of a tension spring (part No. 113177) at point L, the other end of the spring then being fastened to point M.
7. Clip the dial pointer to the cord. With the drum in the position shown, and with the gang condenser in full mesh, fasten the pointer so that it is at a point 2$\frac{3}{16}$" from the left end of the brown dial plate.

ALIGNMENT POINTS

Frequency	Pointer Distance in inches from Right End of Brown Dial Plate	
	Models 01-6A, 010-6AX, 01-6B, 010-6BX	Models 01-6D & 010-6DX
1500 KC	2-5/16"	3"
6 MC.	2-3/8"	2-15/16"
20 MC.	2-3/16"	2-7/8"

5. Label the push buttons with the call letters of the selected stations, assigning the lowest frequency station to the extreme left hand button and the highest frequency station to the extreme right hand button.
6. Turn the range switch to "B" and manually tune in the station you wish to set up on the extreme left hand button.
7. Turn the range switch to "A" and push in the left hand button. Using a small screwdriver, adjust the large screw of the No. 1 trimmer until the station you had previously tuned in manually is again heard. Adjust this screw to the point where the program is heard with the deepest tone.
8. Insert the screwdriver in the small screw of this trimmer and turn it until the station is heard with deepest tone. Now again check the setting of the larger adjusting screw, making sure it is adjusted to the point of deepest tone.
9. The set-up for this button is now complete. Set up the remaining buttons in a similar manner.
10. In some instances it may be necessary to reset the trimmer after several months, as they may drift due to heat, humidity, etc.

Do not adjust trimmers too tightly or too loosely. Wherever possible, select stations that will fall well within the frequency ranges specified on the trimmers.

SETTING THE DIAL POINTER

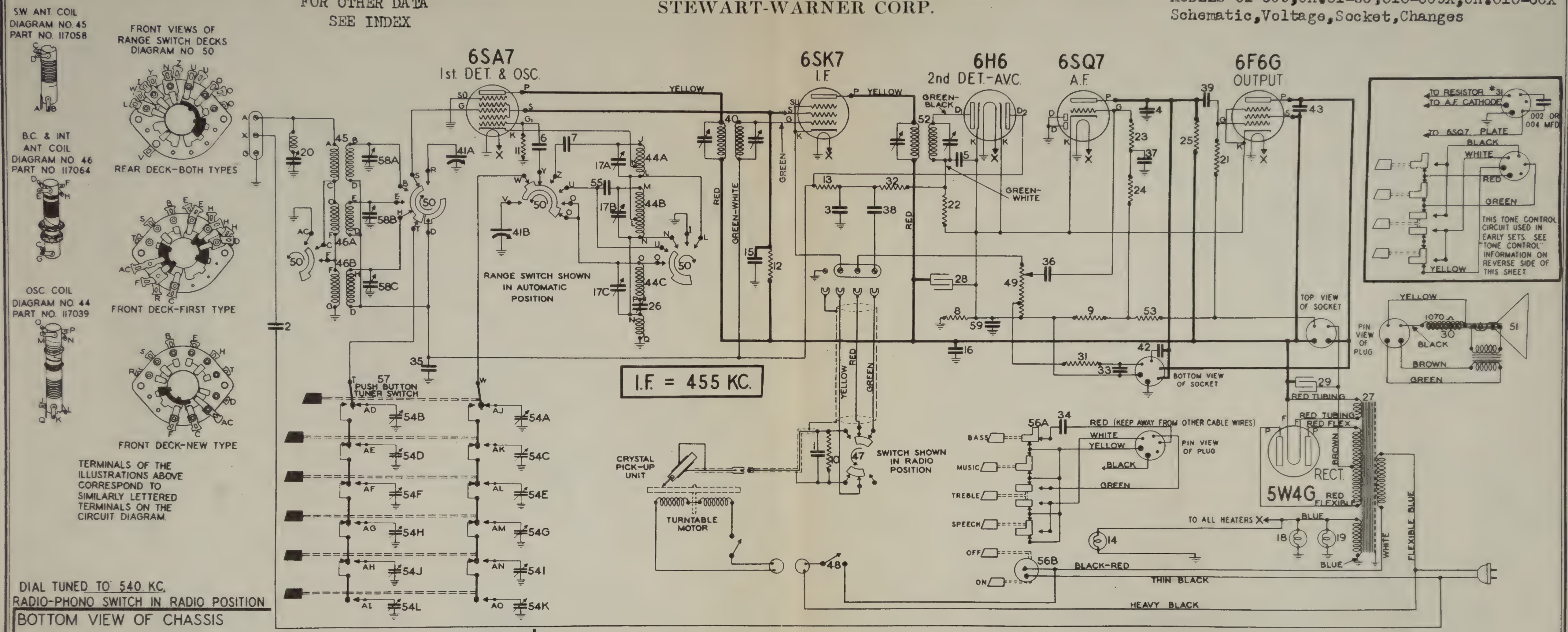
Since the dial scale is printed on the escutcheon glass, the serviceman will not know whether the pointer is set correctly unless the set is in place in the cabinet. With the gang condenser in full mesh, the dial pointer should be at a point 1⅜ inches from the left end of the brown dial plate. If the pointer is not set correctly, loosen the two set screws holding the dial drum to the condenser shaft. Then hold the condenser in full mesh and move the dial drum until the pointer reaches the proper point, then tighten the set screws.

When replacing the chassis in the cabinet, be sure it is in the position giving most accurate dial calibration.

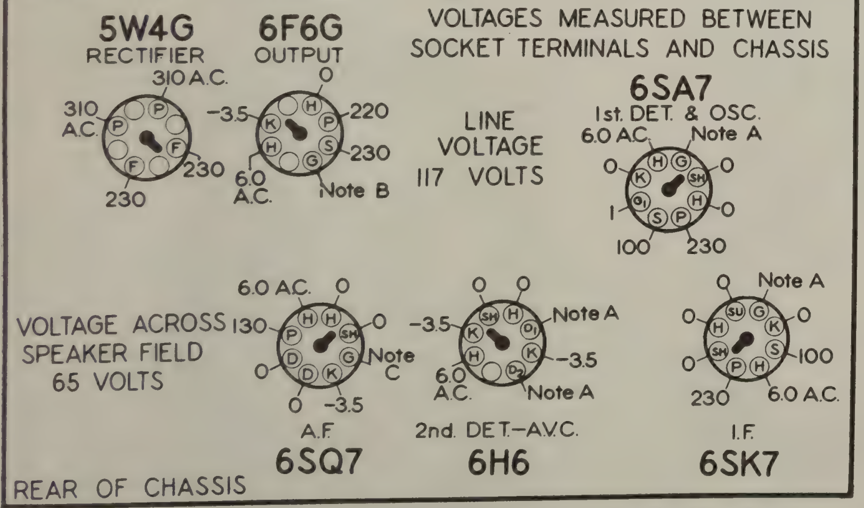
FOR OTHER DATA
SEE INDEX

STEWART-WARNER CORP.

MODELS 01-6C9,Ch.01-6C;010-6C9X,Ch.010-6CX
Schematic,Voltage,Socket,Changes



DIAL TUNED TO 540 KC.
RADIO-PHONO SWITCH IN RADIO POSITION



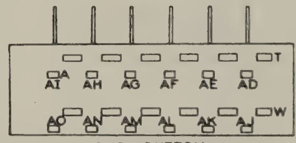
These readings were taken, using a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The bias on the control grids of the 6SK7 and 6SA7 tubes and on the diode plates of the 6H6 tube is —2.7 volts measured across resistor No. 8.

NOTE B: The bias on the control grid of the 6F6G tube is —16 volts, measured across resistors No. 9 and 53.

NOTE C: The bias on the control grid of the 6SQ7 tube is —1.4 volts measured across resistor No. 9.

Diagram Number	Part Number	Description	List Price
1	81156	Condenser—mica 1000 mmfd.	$ 0.30
2-3-4	83539	Condenser—mica 260 mmfd.	.20
5	83783	Condenser—mica 110 mmfd.	.20
6	85061	Condenser—mica 51 mmfd.	.15
7	85440	Condenser—mica .00351 mfd. 3%	.40
8	88460	Resistor—wire wound 150 ohms ½ watt	.12
9	88465	Resistor—wire wound 25 ohms ½ watt	.15
10	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
11	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
12	110575	Resistor—carbon 12,000 ohms 2 watts	.30
13	110580	Resistor—carbon 3.3 megohm ¼ watt	.12
14	110629	Lamp—6.3 volt—.25 amps	.15
15-16	111252	Condenser—paper .05 mfd. 400 volt	.13
17A-17B-17C	112072	Condenser—trimmer—3 section	.45
18-19	112636	Lamp—dial (frosted) 6-8 volt—.25 amps.	.25
20	112796	Coil—wave trap (with trimmer)	.50
21-22	112971	Resistor—insulated 470,000 ohms ¼ watt	.15
23-24	112972	Resistor—insulated 1 megohm ¼ watt	.15
25	112987	Resistor—insulated 220,000 ohms ¼ watt	.15
26	113346	Condenser—padding	.38
27	114530	Power Transformer 117 volt—60 cycle	3.50
	116352	Power Transformer 100-240 volt; 40-133 cycles	7.75
28-29	114972	Condenser—electrolytic 16 mfd. 450 volt	.78
30	U-115061	Speaker—electro-dynamic 12"	10.50
31-32	116058	Resistor—carbon 47,000 ohms ¼ watt	.12
	116352	Power Transformer 100-240 volt; 40-133 cycles	7.75
33-34	116640	Condenser—.01 mfd. 600 volt	.15
35-36-37	116819	Condenser—.05 mfd. 600 volt	.20
38-39	116893	Condenser—.02 mfd. 600 volt	.15
40	116954	Transformer—1st I.F.	1.20
	117598	Transformer—1st I.F. (010-6CX)	1.20
41A-41B	116996	Condenser—variable gang	3.30
42-43	117022	Condenser—.002 mfd. 600 volt	.15
44A-44B-44C	117039	Coil—oscillator (with trimmers)	2.15
45	117058	Coil—antenna (short wave)	.50
46A-46B	117064	Coil—antenna	1.00
47	117067	Switch (Radio Phono)	.55
48	117068	Switch for Phono motor	$ 0.60
49	117069	Volume control	.85
50	117070	Range switch	1.70
51	U-117071	Diaphragm assembly for U-115061 speaker	2.30
52	117072	Transformer—2nd I.F.	1.20
	117580	Transformer—2nd I.F. (010-6CX only)	1.20
53	117075	Resistor—300 ohms 1 watt wire wound	.16
54A to 54L	117081	Push button trimmer gang assembly	5.20
55	117113	Condenser—mica .001/6 mfd. 3%	.30
56A-56B	117115	Switch—push button for tone control and on-off switch	2.30
57	117126	Push button switch	2.40
58A-58B-58C	117450	Trimmer condenser strip—3 gang	.40
	117580	Transformer—2nd I.F. (010-6CX only)	1.20
	117598	Transformer—1st I.F. (010-6CX only)	1.20
59	118206	Condenser—.25 mfd. 600 volt	.35



PUSH BUTTON
TUNER SWITCH
DIAGRAM NO. 57

DIAL AND MISCELLANEOUS PARTS

Part Number	Description	List Price
117127	Cable (Phono Pick Up)	$0.40
84572	Cable—shielded for phono pick up (24")	.60
114955	Clamp for dial cord	.01
112745	Clip—coil mounting	.01
112798	Clip—for mtg. wave trap	.01
85321	Connector—for internal antenna	.01
116948	Cord—dial	.18
117057	Cord—drive	$0.15
117028	Dial plate & pulley assembly	1.00
117029	Drive drum & bushing	.50
117042	Escutcheon & Dial Scale	1.50
116998	Escutcheon for push buttons	.30
88348	Eyelet—for dial cord ... Dz.	.05
117131	Indicator button (bulls eye)	.12
116773	Knob—tuning or volume	.10
84571	Needle cup for phono	.10
116952	Pin for push buttons	.02
117118	Plug (female for motor cable)	.10
117114	Plug (male for motor cable)	.15
110496	Plug—speaker (4 prong)	.12
117036	Pointer Assembly	.28
116999	Push Button	.08
117019	Reflector—for pilot lights	.04
81145	Retaining ring—for drive shaft ... Per C	.50
114148	Rotor Voltage Switch	.50
113463	Rubber bushing—chassis mtg.	.03
83624	Screw—self tapping 8 x ¼	.01
85827	Screw—No. 8-32 Sq. Head Set Screw	.02
85040	Screw—No. 6 Hex. Hd. ... Per C	.35
114914	Screw—special head—for mtg. escutcheons .. Per Dz.	.15
81834	Socket—6 prong	.10
110501	Socket—4 prong (for spkr.)	.16
114117	Socket—dial lamp	.18
117123	Socket—for pilot light	.26
116690	Socket—(octal base) (small)	.12
117078	Socket—octal with special grounding lug	.12
111090	Spacer—steel, mechanism mtg. to chassis	.02
113177	Spring—dial cord tension	.09
117458	Spring—push button	.05
116981	Spring—for pointer	.02
117011	Station tabs & instruction sheets	.40
84412	Terminal strip—phono	.03
116536	Terminal strip (G.X.A.)	.15
117103	Tuning shaft	.06
117102	Tuning shaft extension	.10
111456	Washer—spring washer ... Per C	.50
116530	Washer (paper) for back of knobs	.005

Automatic Record Changer

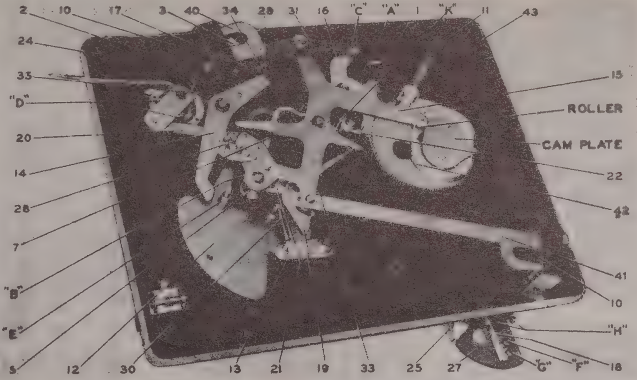
Two slightly different Record Changers are being used in the Stewart-Warner Model 01-6C9 Radio Phonograph Combination. The early type is shown in Figure 1a and the later one in Figure 1b. The two types are easily identified by the shape of the top covers of the record holder posts. The early type has plain cylindrical covers while the later type has knob shaped covers so they can be grasped easily.

The two types are practically identical in both operation and service. All the information contained in this Service Manual applies to both types unless otherwise indicated.

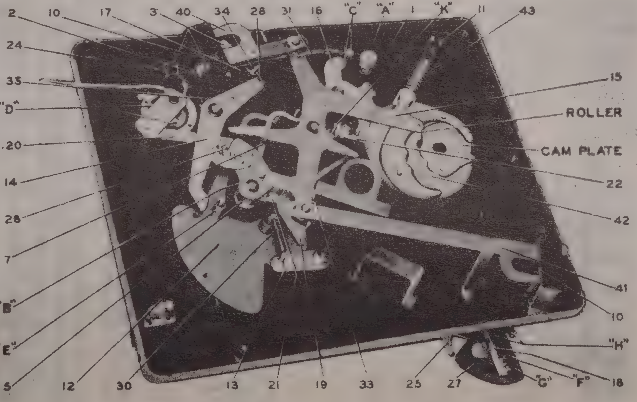
OPERATING INSTRUCTIONS

This Record Changer will automatically play a series of eight 10- or seven 12-inch records of the 78 revolutions-per-minute type or, if you so desire, you may play records, of any size up to 12 inches, manually. Records of the last few years with the standard eccentric or spiral stopping groove will operate the automatic mechanism and change your records for you. The Record Changer is for operation on 110 volts, 60 cycles.

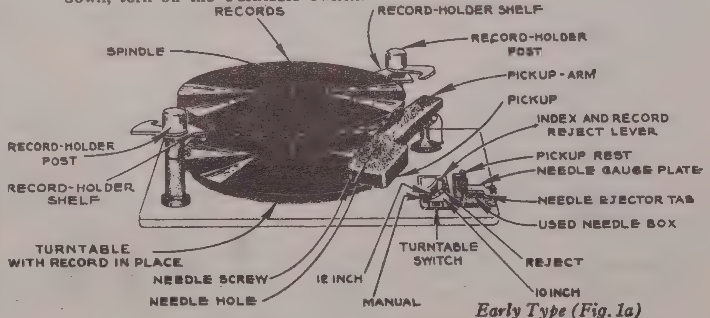
Before operating the phonograph, either automatically or manually, be sure that the pickup is down and can be moved by hand. If not, a "cycle" must be completed to bring it down. To do this, throw Motor Switch "on." The turntable will start to revolve and the cycle of motion on the pickup arm will be resumed. When the pickup arm comes down, turn off the Turntable Switch.



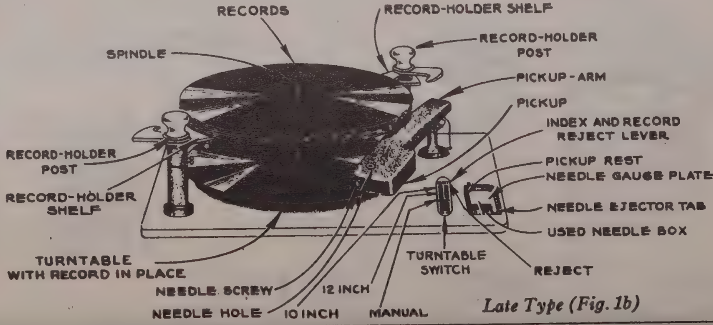
NOTE: Numbers refer to parts—letters refer to adjustments
Early Type



NOTE: Numbers refer to parts—letters refer to adjustments
Late Type



Early Type (Fig. 1a)



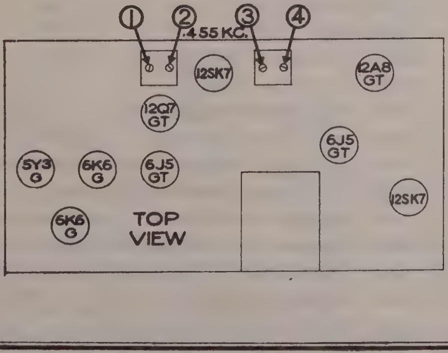
Late Type (Fig. 1b)

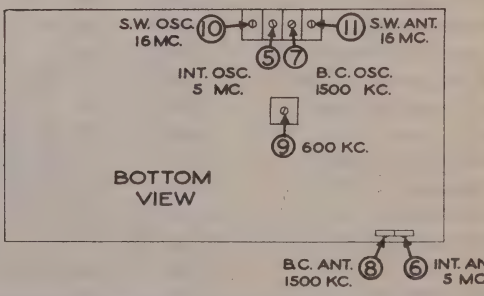
ALIGNMENT PROCEDURE FOR 01-9A & 01-9A-Z CHASSIS

1. Connect the output meter across the voice coil or from plate to plate of the 6K6G output tubes through a . mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and change the black wire from th outer to the inner clip on top of the loop drum.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignmen procedure.
4. Push in the Manual button and keep it pushed in.
5. The loop must be connected as indicated in circuit diagram at all times.
6. With some signal generators, it may be found that the signal cannot be reduced to a useable value usinc the dummy antennas recommended below. In such cases the signal generator may be disconnected entirely from the set and the R. F. lead of the signal generator placed in the vicinity of the loop. On the Shor Wave position the shield wire (black) may be disconnected from its jack and the output of the signal generator connected to the black wire through a 400 ohm resistor.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Clip on Side of Loop Drum	5 MC	Intermediate	5 MC	5	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If Image does not appear, Realign at 5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	5 MC	Intermediate	Tune to 5 MC Generator Signal	6*	Intermediate Antenna	*Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	*Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series Padder)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	16 MC	Foreign	16 MC	10	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*Realign trimmer No. 6 on 5 MC, then trimmer No. 8 on 1500 KC, after set is in cabinet.





Servicing the Automatic Record Changer

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

Refer to photograph and illustrations for references in following text.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .055—.061 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformily spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

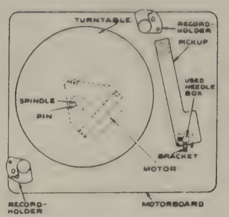
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed — Increase tension of pickup locating lever spring "34."

Leveling

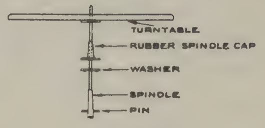
When a record has been played the pickup moves out, another record is dropped down, and the needle is fed automatically into the starting groove of this record. If the needle fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the base on that side. If the needle slides over a few grooves, raise the left-hand side of the cabinet in a similar manner.

Lubrication

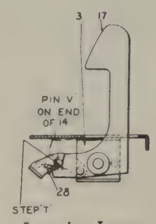
A few drops of good quality light machine oil should be applied about once every six months at the base of the spindle below the metal washer under the turntable.



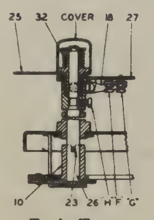
Motorboard



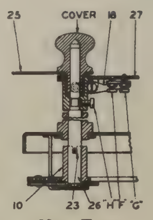
Turntable



Locating Lever



Early Type Shelf Posts

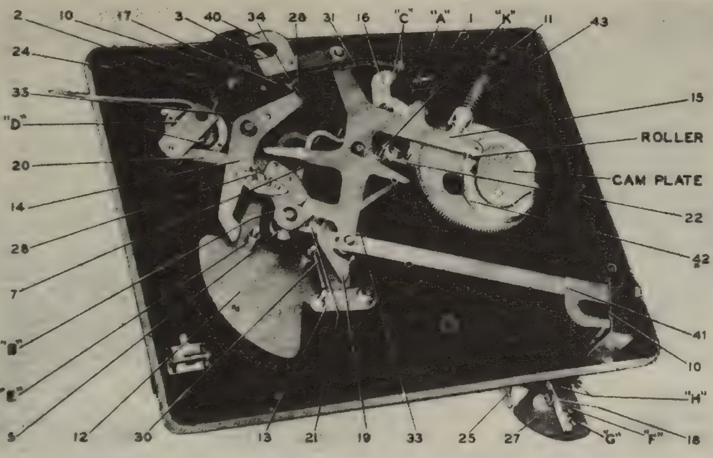


New Type Shelf Posts

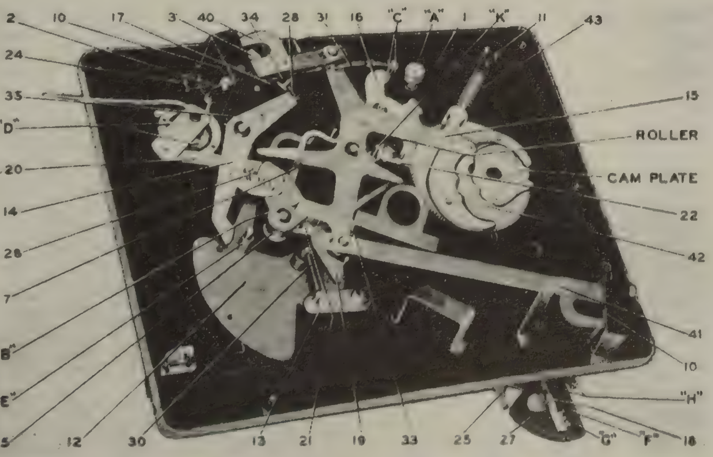
Automatic Record Changer

Two slightly different Record Changers are being used in the Stewart-Warner Model 01-6C9 Radio Phonograph Combination. The early type is shown in Figure 1a and the later one in Figure 1b. The two types are easily identified by the shape of the top covers of the record holder posts. The early type has plain cylindrical covers while the later type has knob shaped covers so they can be grasped easily.

The two types are practically identical in both operation and service. All the information contained in this Service Manual applies to both types unless otherwise indicated.



NOTE: Numbers refer to parts—letters refer to adjustments
Early Type



NOTE: Numbers refer to parts—letters refer to adjustments
Late Type

OPERATING INSTRUCTIONS

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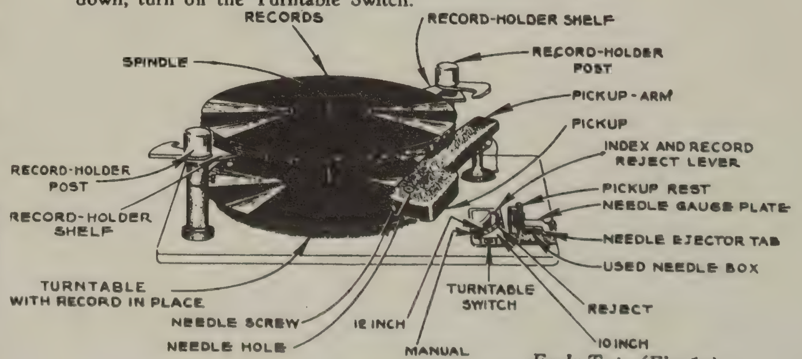
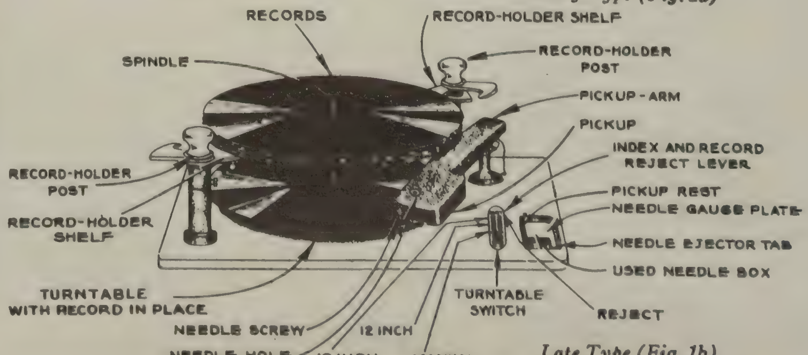


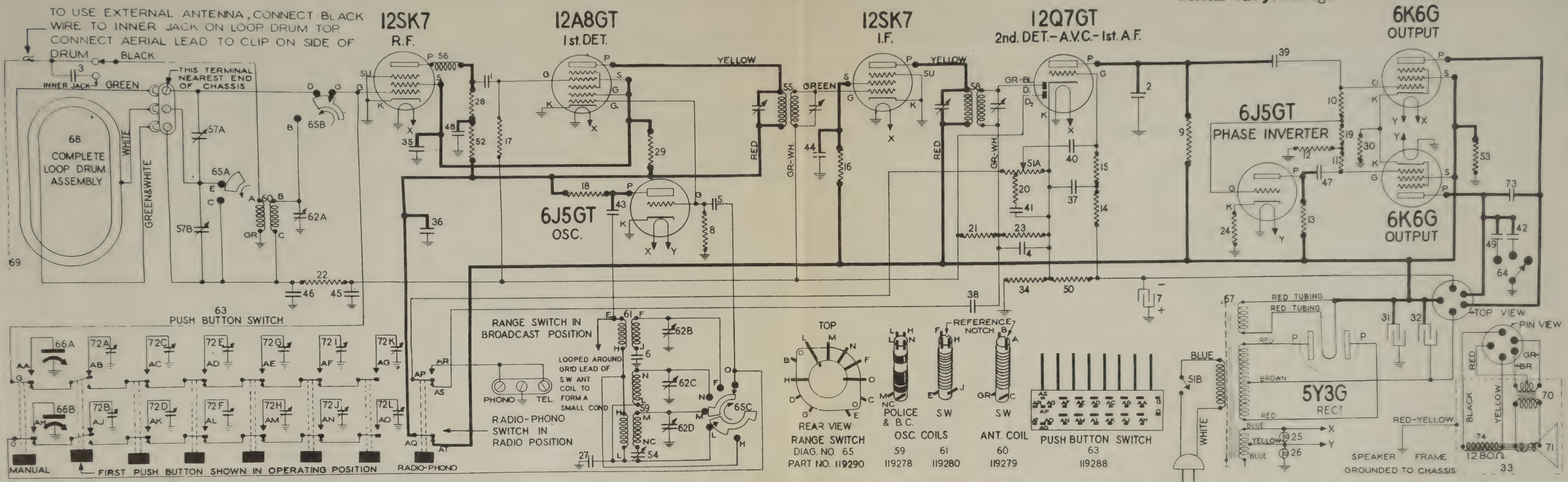
Early Type (Fig. 1a)



Late Type (Fig. 1b)

STEWART-WARNER CORP.

MODELS 01-9A7,Ch.01-9A;01-9A7-Z,Ch.01-9A-Z
Schematic,Voltage

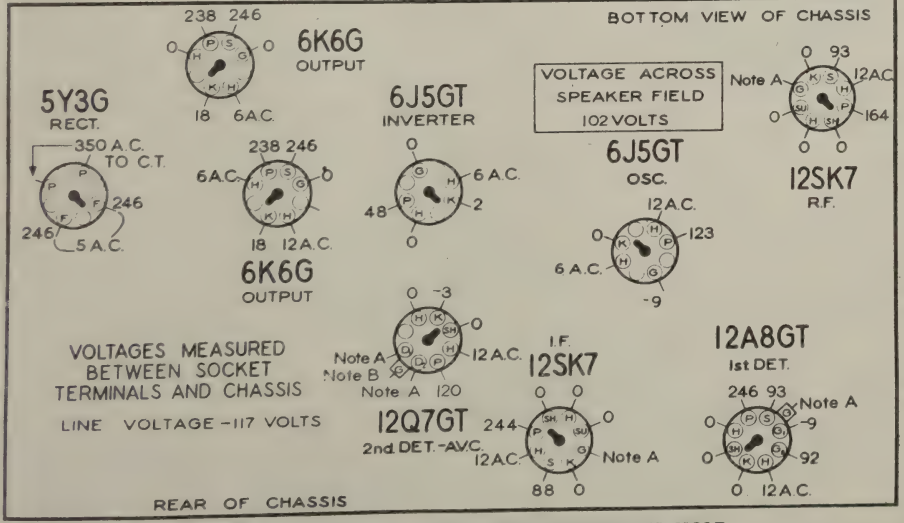


PUSH BUTTON TRIMMER RANGES

TRIMMER CONDENSERS	01-9A RANGE	01-9A-Z RANGE
72L & 72K	540 KC. to 1000 KC.	540 KC. to 1000 KC.
72J & 72I	540 KC. to 1000 KC.	540 KC. to 1000 KC.
72H & 72G	540 KC. to 1000 KC.	750 KC. to 1375 KC.
72F & 72E	750 KC. to 1375 KC.	750 KC. to 1375 KC.
72D & 72C	750 KC. to 1375 KC.	980 KC. to 1550 KC.
72B & 72A	980 KC. to 1550 KC.	980 KC. to 1550 KC.

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC



USE A HIGH RESISTANCE VOLTMETER OF AT LEAST 1000 OHMS PER VOLT.

NOTE A: The bias on the 12SK7 R.F., 12A8GT 1st Det., 12SK7 I.F., and the diode plates of the 12Q7GT 2nd Det. is —3 volts measured across resistor No. 34.

NOTE B: Bias on the grid of the 12Q7GT 1st Audio is —1.8 volts measured across resistor No. 50.

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3-4	83783	Condenser—mica 110 mmfd.	.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7	110377	Condenser—electrolytic 10 mfd. 35 volt	.80
8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9 to 13	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
14-15	110554	Resistor—carbon 1 megohm ¼ watt	.12
16-17	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
18	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
19-20	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
21	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
22-23	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
24	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
25-26	110629	Lamp—6.3 volt .25 amps.	.15
27	112426	Condenser—mica 1650 mmfd. (3%)	.30
28	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
29	112998	Resistor—insulated 22,000 ohms 2 watts	.20
30	114334	Resistor—wire wound 360 ohms 2 watts (10%)	.20
31-32	114972	Condenser—electrolytic 16 mfd. 450 volt	.78
33	R-115089	Speaker—dynamic (12")	10.00
34	116479	Resistor—wire wound 33 ohms 3 watts	.20
35 to 37	116625	Condenser—.1 mfd. 600 volt	.25
38 to 43	116640	Condenser—.01 mfd. 600 volt	15
44 to 48	116819	Condenser—.05 mfd. 600 volt	.20
49	116984	Condenser—.04 mfd. 600 volt	.20
	117022	Condenser—.002 mfd. 600 volt	.15
50	117395	Resistor—20 ohms 1 watt	.16
51A-51B	118669	Volume control—1 meg. (with switch)	1.40
52	118805	Resistor—carbon 10,000 ohms 1 watt	.12
53	118808	Resistor—27,000 ohms 3 watts	.22
54	118919	Condenser—padding	.40
55	119042	Transformer—1st I.F.	1.10
56	119138	Coil—compensating	.25
57A-57B	119275	Condenser—trimmer (for loop) 2 section	.30
58	119277	Transformer—2nd I.F.	1.10
59	119278	Coil—B.C. & Police Oscillator	.60
60	119279	Coil—short wave antenna	.62
61	119280	Coil—short wave oscillator	.62
62A to 62D	119283	Condenser—trimmer (4 section)	.60
63	119288	Switch—push button	2.50
64	119289	Switch—tone	.60
65A to 65C	119290	Switch—range	1.00
66A-66B	119291	Condenser—variable tuning	2.90
67	119381	Transformer—power	5.40
68	119391	Loop Antenna—complete	3.20
69	119392	Loop Antenna—shield	1.00
70	R-119512	Transformer—output for R-115089 speaker	1.55
71	R-119513	Cone & voice coil for R-115089 speaker	2.20
72A to 72L	119662	Condenser—P. B. Trimmer (Low) 540 to 1000 KC	.24
	119663	Condenser—P. B Trimmer (Med.) 750 to 1375 KC	.24
	119664	Condenser—P. B. Trimmer (Hi) 980 to 1550 KC	.24
73	117022	Condenser—.002 mfd. 600 volt	.15
74	R-119767	Field Coil—for R-115089 speaker	2.50

NOTES FOR 01-9A and 01-9A-Z CHASSIS

AUDIO HOWLS

For proper operation this chassis must be allowed to float on the rubber cushions on which it is mounted. If this is not done the set may howl when receiving strong signals. Loosen the four bolts holding down the chassis and remove the two wood strips which support the chassis during shipment. Make sure that neither the control knobs, their shafts nor any part of the dial mechanism touches the front panel or the set may still howl.

The speaker frame must be grounded to the chassis by the red and yellow wire provided. Reaction between the speaker and loop may otherwise result.

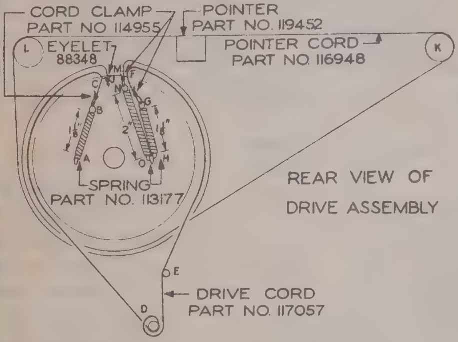
TO SET POINTER

The pointer should be set to 540 K.C. on the dial scale when the tuning condenser is in full mesh. Cement pointer to cord at this point and allow to dry before moving.

TO SET DRUM ON CONDENSER SHAFT.

With the tuning condenser plates in the horizontal (half mesh) position, the holes in the drum should be at the top. To change position of drum, loosen set screws.

REPLACING THE DRIVE CORDS



REAR VIEW OF DRIVE ASSEMBLY

TO REPLACE DIAL DRIVE CORD

1. Make a one inch loop in end of cord (Part No. 117057) using a dial cord clip (Part No. 114955).
2. Fasten a tension spring (Part No. 113177) to tab A and one end of the cord to the spring at point B.
3. Pass the other end of the dial cord through hole C on the rear of the drum.
4. Make one and one half turns of the cord about tuning shaft D.
5. Continue the cord clockwise by E to hole F in the rear of the drum.
6. The cord length should be adjusted so that the springs will be stretched to approximately the dimension indicated. Fasten a tension spring (Part No. 113177) to the cord by forming a new loop at G and then fastening spring to tab H.

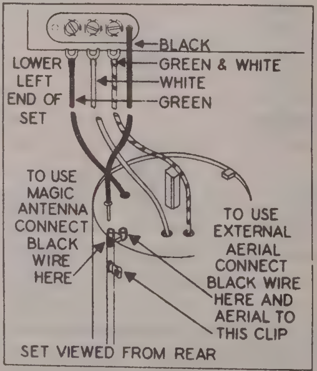
TO REPLACE THE POINTER DRIVE CORD

1. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of the cord (Part No. 116948).
2. Pass cord through hole J at the front of the drum.
3. Continue cord counter-clockwise around drum and around pulley K.
4. From pulley K go over pulley L and around front of drum through hole M.
5. The length of cord should be adjusted until the spring is stretched to approximately the length indicated. Fasten a spring with a loop and clip as indicated, to the cord.
6. Fasten spring to tab O.

MISCELLANEOUS PARTS

Part Number	*Description*	*List Price*
119376	Call Tabs and Instructions	$0.38
114955	Clamp for dial cord	.01
110140	Clip—grid	.01
112745	Clip—coil mounting	.01
116948	Cord—pointer drive (supplied in 6 ft. lengths)	.18
117057	Cord—drive (supplied in 2 ft. lengths)	.15
111973	Cushion—rubber rest for back of chassis	.06
119330	Dial scale	.35
113402	Drum—dial cord drive	.56
119215	Escutcheon—dial	1.30
119216	Escutcheon & P. B. Assembly	1.25
119217	Escutcheon for push buttons	.40
88348	Eyelet—for dial cord ......Per Dz.	.05
119167	Knob	.10
119323	Pilot Light assembly (single wire)	.18
119325	Pilot Light assembly (double wire)	.20
117758	Pin—for push button	.02
119452	Pointer	.14
119211	Push button	.10
81145	Retaining ring—for drive shaft ......Per C	.50
113463	Rubber bushing—chassis Mtg.	.03
83624	Screw—self tapping 8 x ¼	.01
85040	Screw—No. 6 Hex. Hd. ......Per C	.35
119218	Screw—Escutcheon Mtg.	.02
85827	Set Screw—8-32 Square Head	.02
85427	Socket—octal base (standard)	.15
114876	Socket—octal base (special)	.15
117704	Socket—for speaker 5 prong	.13
111090	Spacer—steel	.02
112874	Screw—No. 10 x 1⅛ chassis Mtg.	.01
113177	Spring—dial cord tension	.09
117458	Spring for push button	.05
84412	Terminal strip—phono	.03
118606	Tuning shaft	.18
110829	Washer—flat steel, for mtg. chassis	.01
111456	Washer—spring washer for tuning shaft ......Per C	.50
116530	Washer (paper) for back of knobs	.005

LOOP CONNECTIONS


BLACK
GREEN & WHITE
WHITE
GREEN
LOWER LEFT END OF SET
TO USE MAGIC ANTENNA CONNECT BLACK WIRE HERE
TO USE EXTERNAL AERIAL CONNECT BLACK WIRE HERE AND AERIAL TO THIS CLIP
SET VIEWED FROM REAR

IDENTIFICATION TABLE

Model	Input Power Frequency	Chassis	Cabinet	Speaker
480-M	50-60 Cycles	31085	31088	31087 (Bass) 31126 (Treble)
480-MB	25-60 Cycles	31086	31088	31087 (Bass) 31126 (Treble)

SPECIFICATIONS

Tuning Ranges	Frequency Modulation 40 to 44 Mc. (40,000 to 44,000 Kc.) Shortwave 5.8 to 18 Mc. (5800 to 18,000 Kc.) Standard Broadcast .54 to 1.7 Mc. (540 to 1700 Kc.)
Voltage Rating	105 to 125 Volts
Type of Circuit	Superheterodyne with Electric Tuning
Input Power Rating	225 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 3.0 Megacycles (Frequency Modulation)
Speaker Field Coil Resistance—Approximately	1125 Ohms (Bass) 200 Ohms (Treble)
Speaker Voice Coil Impedance at 400 Cycles—Approximately	24 Ohms (Bass) 11 Ohms (Treble)

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator with sweep circuit.
2. Wide band sweep signal generator.
3. Oscillograph.
4. Microammeter "0" to 200 Microamps.
5. Center "0" Microammeter with 100 divisions each side of "0".

See location chart above for location of all aligning screws.

ALIGNING PROCEDURE (follow this order exactly)

I. **Dial pointer adjustment.** With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the two vertical lines located at the extreme low frequency end of the dial scale.

II. **Intermediate frequency adjustments** (Frequency Modulation)

1. Set the range switch to Frequency Modulation position and the volume control to "off" position.
2. Tune the set to the extreme high frequency end of the dial (44.5 megacycles).
3. Disconnect the ground side of the 10000 ohm resistor R94 and connect the "0" to 200 microammeter in series with it and ground. (This resistor is connected between terminals No. 3 and 4 of the fourth I. F. transformer.)
4. Connect the oscillograph between high side of R94 resistor and ground.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6SK7 third I. F. tube socket.
6. Introduce a signal of 3 megacycles to the grid of the 6SK7 third I. F. tube (Terminal No. 4), using a 0.1 microfarad capacitor in series with the output lead of the signal generator. Keep the "0" to 200 microammeter at approximately 100 microamps.
7. Align the secondary and primary of the fourth I. F. transformer for maximum reading on the "0" to 200 microammeter.
8. Slight adjustments of the aligners may be made if necessary to obtain a symmetrical curve on the oscillograph. Try for a good curve rather than the very last bit of output.
9. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 second I. F. tube (Terminal No. 4).
10. Align the third I. F. transformer in the same manner.
11. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 first I. F. tube (Terminal No. 4).
12. Connect the ground lead to the ground terminal of the 6SK7 first I. F. tube socket.
13. Align the second I. F. transformer in the same manner.
14. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 modulator tube (Terminal No. 8).
15. Connect the ground lead to the ground terminal of the 6SA7 modulator tube socket.
16. Align the first I. F. transformer in the same manner.
17. Remove the wide band sweep signal generator.

III. **Discriminator adjustment** (Frequency Modulation)

Note: Be sure the frequency of both signal generators are the same.

1. Connect the ground terminal of the standard signal generator to the ground terminal of the 6SK7 second I. F. tube socket.
2. Introduce an unmodulated signal of 3 megacycles to the grid of the 6SK7 second I. F. tube (Terminal No. 4) using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator.
3. Connect the center "0" microammeter with a .5 megohm resistor in series across one-half of the discriminator load. (From ground to the junction of the two .1 megohm resistors R28 and R29).
4. Set the attenuator on the standard signal generator for maximum output.
5. Adjust the primary of the discriminator transformer for maximum reading on the center "0" microammeter.
6. Connect the center "0" microammeter and the .5 megohm resistor in series with it across the whole discriminator load. (Terminal No. 4 of the 6H6 Demodulator tube and ground).
7. Adjust the secondary of the discriminator transformer for center "0" reading of the microammeter.
8. Vary the frequency of the standard signal generator slightly and be sure that the center "0" microammeter reads the same on each side of resonance. If not, go back and realign both primary and secondary.

IV. **Radio frequency adjustments** (Frequency Modulation)

1. Set the signal generator frequency and the receiver tuning dial to 40 megacycles.
2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the F. M. antenna terminal nearest to the end of the antenna and ground terminal strip.
3. Connect the ground lead to the other F. M. terminal on the antenna and ground terminal strip.
4. Adjust the oscillator 40 megacycles core aligner for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 43 megacycles.
6. Adjust the oscillator shunt aligner for maximum signal.
7. Adjust the R. F. and antenna aligners for maximum signal on the "0" to 200 microammeter **maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.**
8. Remove both meters from the circuits and resolder the 10000 ohm resistor R94 in its original position to terminal No. 4 on the fourth I. F. transformer.

V. **Intermediate frequency adjustments** (Amplitude Modulation)

Adjustment of second I. F. transformer.

1. Set the range switch to standard broadcast position.
2. Set the fidelity control in the center or "sharp" position and turn the volume control "full on".
3. Connect the oscillograph to the high side of the volume control R47.
4. Replace the 100 ohm resistor in series with the output lead from the signal generator with a 0.1 microfarad capacitor and connect it to the grid cap of the 6K7 I. F. tube. (Do not remove the grid cap from this tube.)
5. Connect the ground terminal of the signal generator to the ground terminal of the receiver.
6. Introduce a modulated signal of 455 kilocycles to the grid of the 6K7 I. F. tube.
7. Adjust the second I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of second I. F. transformer.
   b. Primary of second I. F. transformer.
8. Set the fidelity control to the high fidelity (expanded) position and readjust the primary of the second I. F. transformer for symmetrical curve.
9. Set the fidelity control back to the center or "sharp" position.

Adjustment of first I. F. transformer.

1. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 Modulator Tube. (Terminal No. 4.)
2. Adjust the first I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of first I. F. transformer.
   b. Primary of first I. F. transformer.
3. After the Amplitude Modulation I. F. adjustments have been completed, the fidelity control should be turned to the high fidelity position and a check made on the shape of the curve which should show a slight double peak.
4. Turn the fidelity control back to middle or "sharp" position.
5. Remove the oscillograph from the circuit.

VI. **Radio frequency adjustments** (Amplitude Modulation)

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm resistor and connect it to the Amplitude Modulation antenna terminal on the back of the chassis.
2. Set the range switch to the short wave range position (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycle "oscillator" and "antenna" iron cores for maximum signal.
5. Set the signal generator and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles "oscillator" and "antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm resistor in series with the output lead of the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the standard broadcast range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
4. Adjust the 600 kilocycle "oscillator" , "R. F." and "Antenna" iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
6. Adjust the 1500 kilocycle "oscillator", "R. F." and "Antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

VII. **Wave trap adjustment.** (Leave the receiver connected in the same manner as when adjusting the standard broadcast range) (A Band).

1. Set the receiver's tuning dial to 1000 kilocycles.
2. Set the signal generator frequency to 455 kilocycles and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.

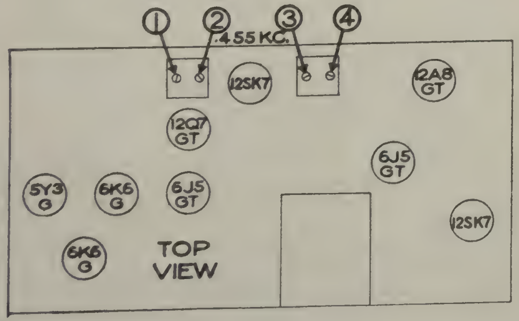
STEWART-WARNER CORP.

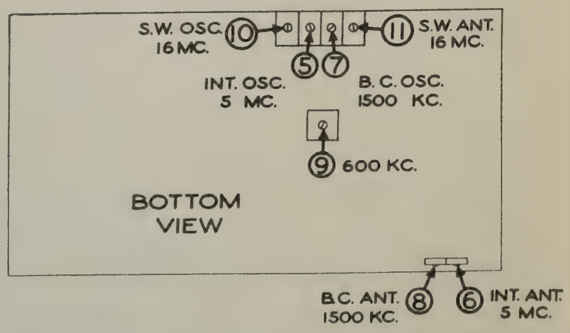
ALIGNMENT PROCEDURE FOR 01-9A & 01-9A-Z CHASSIS

1. Connect the output meter across the voice coil or from plate to plate of the 6K6G output tubes through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and change the black wire from the outer to the inner clip on top of the loop drum.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Push in the Manual button and keep it pushed in.
5. The loop must be connected as indicated in circuit diagram at all times.
6. With some signal generators, it may be found that the signal cannot be reduced to a useable value using the dummy antennas recommended below. In such cases the signal generator may be disconnected entirely from the set and the R. F. lead of the signal generator placed in the vicinity of the loop. On the Short Wave position the shield wire (black) may be disconnected from its jack and the output of the signal generator connected to the black wire through a 400 ohm resistor.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Clip on Side of Loop Drum	5 MC	Intermediate	5 MC	5	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If Image does not appear, Realign at 5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	5 MC	Intermediate	Tune to 5 MC Generator Signal	6*	Intermediate Antenna	*Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	*Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series Padder)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	16 MC	Foreign	16 MC	10	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Side of Loop Drum	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*Realign trimmer No. 6 on 5 MC, then trimmer No. 8 on 1500 KC, after set is in cabinet.





NOTES FOR 01-9A and 01-9A-Z CHASSIS

AUDIO HOWLS

For proper operation this chassis must be allowed to float on the rubber cushions on which it is mounted. If this is not done the set may howl when receiving strong signals. Loosen the four bolts holding down the chassis and remove the two wood strips which support the chassis during shipment. Make sure that neither the control knobs, their shafts nor any part of the dial mechanism touches the front panel or the set may still howl.

The speaker frame must be grounded to the chassis by the red and yellow wire provided. Reaction between the speaker and loop may otherwise result.

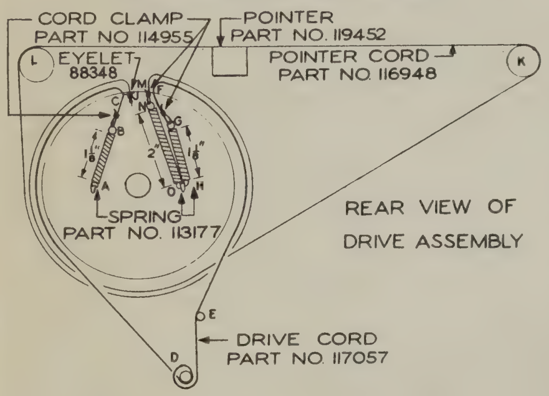
TO SET POINTER

The pointer should be set to 540 K.C. on the dial scale when the tuning condenser is in full mesh. Cement pointer to cord at this point and allow to dry before moving.

TO SET DRUM ON CONDENSER SHAFT.

With the tuning condenser plates in the horizontal (half mesh) position, the holes in the drum should be at the top. To change position of drum, loosen set screws.

REPLACING THE DRIVE CORDS



TO REPLACE DIAL DRIVE CORD

1. Make a one inch loop in end of cord (Part No. 117057) using a dial cord clip (Part No. 114955).
2. Fasten a tension spring (Part No. 113177) to tab A and one end of the cord to the spring at point B.
3. Pass the other end of the dial cord through hole C on the rear of the drum.
4. Make one and one half turns of the cord about tuning shaft D.
5. Continue the cord clockwise by E to hole F in the rear of the drum.
6. The cord length should be adjusted so that the springs will be stretched to approximately the dimension indicated. Fasten a tension spring (Part No. 113177) to the cord by forming a new loop at G and then fastening spring to tab H.

TO REPLACE THE POINTER DRIVE CORD

1. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of the cord (Part No. 116948).
2. Pass cord through hole J at the front of the drum.
3. Continue cord counter-clockwise around drum and around pulley K.
4. From pulley K go over pulley L and around front of drum through hole M.
5. The length of cord should be adjusted until the spring is stretched to approximately the length indicated. Fasten a spring with a loop and clip as indicated, to the cord.
6. Fasten spring to tab O.

MISCELLANEOUS PARTS

Part Number	Description	List Price
119376	Call Tabs and Instructions	$0.38
114955	Clamp for dial cord	.01
110140	Clip—grid	.01
112745	Clip—coil mounting	.01
116948	Cord—pointer drive (supplied in 6 ft. lengths)	.18
117057	Cord—drive (supplied in 2 ft. lengths)	.15
111973	Cushion—rubber rest for back of chassis	.06
119330	Dial scale	.35
113402	Drum—dial cord drive	.56
119215	Escutcheon—dial	1.30
119216	Escutcheon & P. B. Assembly	1.25
119217	Escutcheon for push buttons	.40
88348	Eyelet—for dial cord ... Per Dz.	.05
119167	Knob	.10
119323	Pilot Light assembly (single wire)	.18
119325	Pilot Light assembly (double wire)	.20
117758	Pin—for push button	.02
119452	Pointer	.14
119211	Push button	.10
81145	Retaining ring—for drive shaft ... Per C	.50
113463	Rubber bushing—chassis Mtg.	.03
83624	Screw—self tapping 8 x ¼	.01
85040	Screw—No. 6 Hex. Hd. ... Per C	.35
119218	Screw—Escutcheon Mtg.	.02
85827	Set Screw—8-32 Square Head	.02
85427	Socket—octal base (standard)	.15
114876	Socket—octal base (special)	.15
117704	Socket—for speaker 5 prong	.13
111090	Spacer—steel	.02
112874	Screw—No. 10 x 1⅛ chassis Mtg.	.01
113177	Spring—dial cord tension	.09
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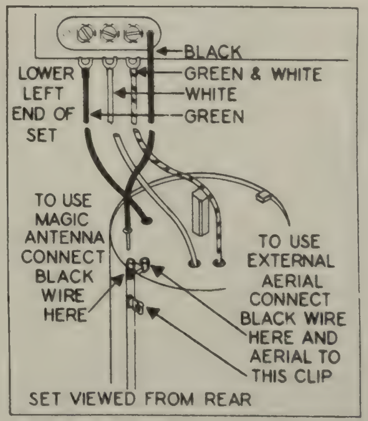
LOOP CONNECTIONS


BLACK
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SET VIEWED FROM REAR

MODELS 480M,480MB
Chassis Wiring,Notes

STROMBERG-CARLSON TEL. MFG. CO.

FEATURES

GENERAL. This is a twenty-tube, three gang, three range receiver designed for the reception of both amplitude and frequency modulated stations and is equipped with a dual coaxial speaker system. It is capable of reproducing without distortion an audio frequency range of at least 10,000 cycles.

The chassis is of the fortified type with bails provided for ease in handling and servicing. Automatic tuning is accomplished by means of a motor drive controlled by a commutator and brush assembly and the dial is of the slide rule type, edge-lighted for clear visibility without glare. Separate treble and bass controls are provided to make accurate adjustment of the tone possible.

REMOTE CONTROL. Remote selection of stations is accomplished by simply plugging the remote control unit into the socket provided on the back of the chassis. This unit enables the user to select any one of eight favorite stations which have been previously set up on the electric tuning system of the receiver.

FREQUENCY MODULATION: The "Armstrong Wide-Swing Frequency Modulation System" used in this receiver is an outstanding development in radio.

The Federal Communications Commission has established five channels between 40 and 44 megacycles for frequency modulated transmitting stations. Since this is a comparatively high frequency, the distance over which reception is possible is limited.

SPEAKER SYSTEM. A coaxial dual speaker system is used in this receiver. The low frequency speaker owes much of its effectiveness to the unusually large field structure with a subsequently increased magnetic flux in the air gap. The treble speaker with its back completely enclosed is mounted directly in front of the bass speaker; both speakers are connected by means of a frequency dividing network to the receiver at an impedance of 24 ohms. The Acoustical Labyrinth is used in conjunction with this speaker system and the complete system is capable of providing a relatively even response to all tones from 65 to more than 10,000 cycles per second.

SPECIAL CIRCUITS. A tuning indicator having two apertures is used with this receiver. For tuning stations on the standard broadcast and short-wave range, one aperture is for strong signals and the other for weak signals. One aperture will close with a signal of approximately 100,000 microvolts and the other will not close even with a two volt signal. Stations on the frequency modulation range should be tuned for maximum closing of both apertures.

Iron core coils are used in the broadcast and short-wave ranges to provide greater accuracy of alignment. The audio system employs a special inverter push-pull circuit designed to provide excellent fidelity, and the chassis is thoroughly shielded throughout with an electro-statically shielded power transformer.

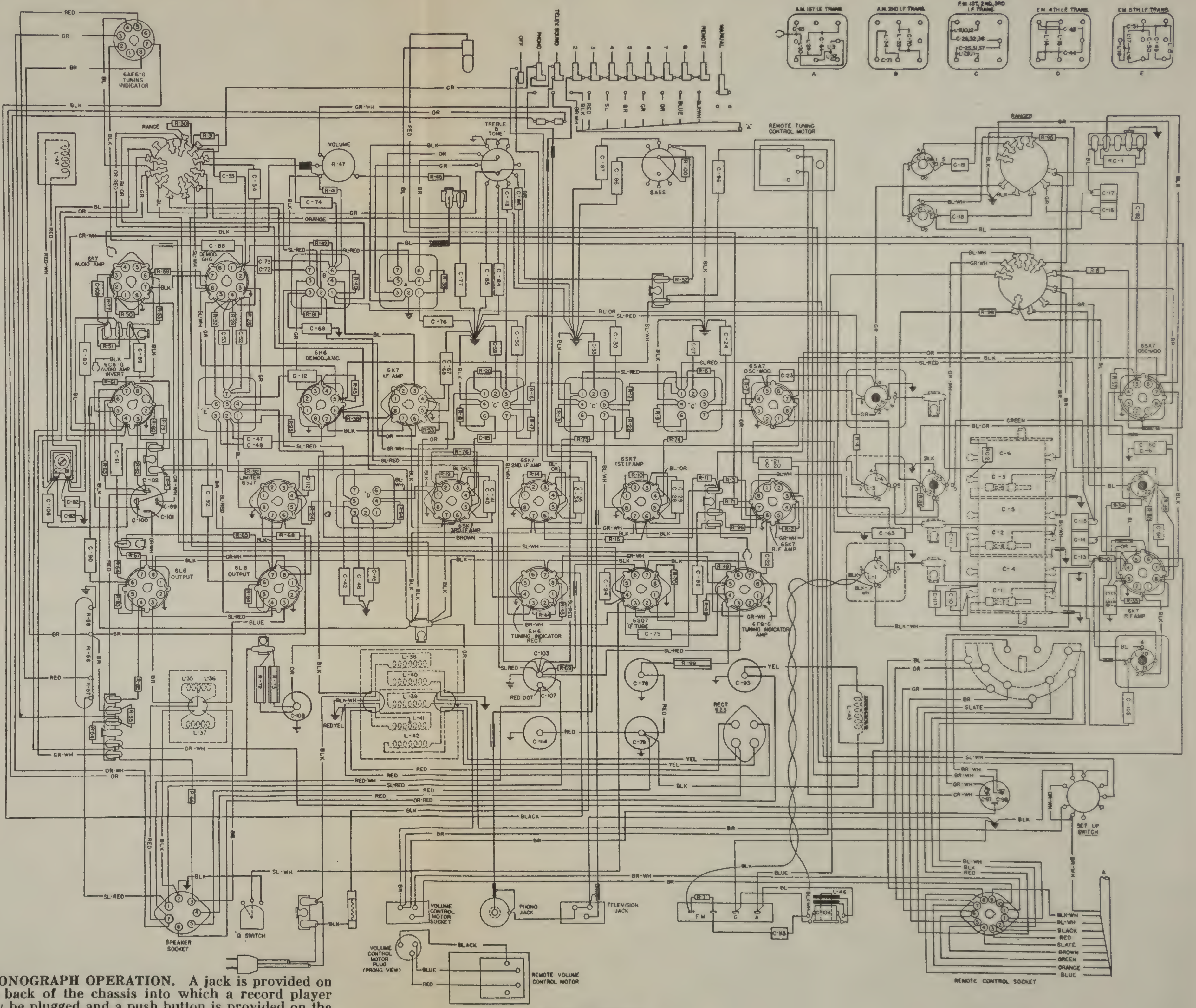
AUTOMATIC TUNING. Twelve push buttons are provided from right to left; their operation is as follows:

1. Manual Control
2. Remote Control
3–9. Pre-set Stations (7)
10. Television Sound
11. Phonograph
12. "Off" Switch

Pushing any button (except the "off" button) turns the set on and tuning is accomplished by means of an electric motor, driving the regular variable capacitor to a pre-set point.

Set up is very easily accomplished by means of a switch which causes the pilot light to go out when the brush is properly located.

TELEVISION. A socket is provided on the back of the chassis into which a television receiver may be plugged and a push button is provided on the front of the chassis for switching to television so that the audio amplifier and speaker system employed in this receiver are available for use with television receivers designed for this type of sound reproduction.



PHONOGRAPH OPERATION. A jack is provided on the back of the chassis into which a record player may be plugged and a push button is provided on the front of the chassis for switching from "Radio" to "Phonograph".

Wiring Diagram

STROMBERG-CARLSON TEL. MFG. CO.

ADJUSTING DIAL LAMP

The dial on this receiver is edge-lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

NORMAL VOLTAGE READINGS

Take all voltage readings with chassis operating and tuned manually to 1000 kilocycles or 43 megacycles—no signal.

The upper figures shown in the table are with the range switch set to the standard broadcast range and tuned to approximately 1000 kilocycles—no signal.

The lower figures shown in the table are with the range switch set to the frequency modulation position and tuned to approximately 43 megacycles—no signal.

Use a line voltage of 125 volts or make allowance for any slight variation:

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt. Take all D. C. readings on the 500 volt scale except when an asterisk appears. Read from indicated terminals to chassis base. See location chart for position of terminals.

A. C. voltages are indicated by italics.

				TERMINALS OF SOCKETS							
Tube	Circuit	Range Switch Set To	Cap	1	2	3	4	5	6	7	8
6SK7	R. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+1* +3*	— —	+1* +3*	+68 +135	*6.5* *6.5*	0 +265
6SA7	Mod. and Osc. (F. M.)	A. M. F. M.	— —	0 0	0 0	+290 +280	+70 +120	— —	0 0	*6.5* *6.5*	0 0
6SK7	1st I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+2* +4*	— —	+2* +4*	+70 +110	*6.5* *6.5*	+290 +265
6SK7	2nd I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+2* +3*	— —	+2* +3*	+55 +90	*6.5* *6.5*	+290 +270
6SK7	3rd I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	0 +6*	— —	0 +6*	0 +150	*6.5* *6.5*	+285 +260
6SJ7	Limiter (F. M.)	A. M. F. M.	— —	0 0	0 0	0 0	— —	0 0	+95 +90	*6.5* *6.5*	+95 +95
6H6	Demod. (F. M.)	A. M. F. M.	— —	0 0	0 0	— —	— —	— —	— —	*6.5* *6.5*	0 0
6SQ7	"Q" (F. M.)	A. M. F. M.	— —	0 0	0 0	+2* +2*	— —	— —	+130 +120	*6.5* *6.5*	0 0
6H6	Tun. Ind. Rect. (F. M.)	A. M. F. M.	— —	0 0	0 0	— —	— —	— —	— —	*6.5* *6.5*	— —
6F8G	Tun. Ind. Amp. (F. M.)	A. M. F. M.	0 0	0 0	0 0	+295 +275	+11** +10**	— —	+200 +185	*6.5* *6.5*	+11** +10**
6SK7	R. F. Amp. (A. M.)	A. M. F. M.	— —	0 0	0 0	+2* +2*	— —	+2* +2*	+90 +80	*6.5* *6.5*	+290 +275
6SA7	Mod. and Osc. (A. M.)	A. M. F. M.	— —	0 0	0 0	+290 +275	+70 +135	— —	0 +100	*6.5* *6.5*	0 0
6K7	I. F. Amp. (A. M.)	A. M. F. M.	0 0	0 0	0 0	+285 +260	+115 0	+4* 0	+290 0	*6.5* *6.5*	+4* 0
6H6	Demod., A. V. C., "Q" (A. M.)	A. M. F. M.	— —	0 0	0 0	— —	0 0	— —	— —	*6.5* *6.5*	0 0
6R7	Audio Amp.	A. M. F. M.	0 0	0 0	0 0	+90 +85	0 0	0 0	— —	*6.5* *6.5*	+3* +3*
6C8G	Audio Inv.	A. M. F. M.	0 0	0 0	0 0	+35 +35	— —	— —	+35 +35	*6.5* *6.5*	0 0
6L6G	Output	A. M. F. M.	— —	0 0	0 0	+415 +410	+290 +275	— —	— —	*6.5* *6.5*	+20** +20**
6L6G	Output	A. M. F. M.	— —	0 0	0 0	+415 +410	+290 +275	— —	— —	*6.5* *6.5*	+20** +20**
5Z3	Rectifier	A. M. F. M.	— —	+495 +495	*480* *480*	*480* *480*	+495 +495	— —	— —	*5* *5*	— —
6AF6G	Tun. Ind.	A. M. F. M.	— —	— —	0 0	+65 +60	+90 +185	+250 +235	— —	*6.5* *6.5*	+95 +90
	Speaker Socket	A. M. F. M.	— —	+290 +275	0 0	0 0	+495 +495	+495 +495	+486 +486	+425 +420	— —

*Read on lowest possible scale of voltmeter.
**Read on 100 volt scale of voltmeter.

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests. (If a speaker is not available when checking continuity the speaker socket may be shorted by using two pieces of bus wire and shorting together terminals 1, 6 and 7 and terminals 4 and 5 of the speaker socket. (See location chart for position and numbering of terminals.) Caution: Be sure to remove the two shorting wires when the continuity test is completed.

			TERMINALS OF SOCKETS							
Tube	Circuit	Cap	1	2	3	4	5	6	7	8
6SK7	R. F. Amp. (F. M.)	—	S	S	180¶	S	180¶	A	S	O
6SA7	Osc. and Mod. (F. M.)	—	S	S	6000¶	A	22000¶	S	S	S
6SK7	1st I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	B	S	6000¶
6SK7	2nd I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	C	S	6000¶
6SK7	3rd I. F. Amp. (F. M.)	—	S	S	390¶	470000¶	390¶	D	S	5000¶
6SJ7	Limiter (F. M.)	—	S	S	S	57000¶	S	1900¶	S	1900¶
6H6	Demod. (F. M.)	—	S	S	100000¶	200000¶	100000¶	1M	S	S
6SQ7	"Q" Tube (F. M.)	—	S	600000¶	2200¶	E	E	280000¶	S	S
6H6	Tun. Ind. Rect. (F. M.)	—	S	S	1M	2.4M	2.4M	O	S	1M
6F8G	Tun. Ind. Amp. (F. M.)	1M	S	S	5000¶	2000¶	1M	150000¶	S	2200¶
6SK7	R. F. Amp. (A. M.)	—	S	S	180¶	F	180¶	90000¶	S	5000¶
6SA7	Osc. and Mod. (A. M.)	—	S	S	6000¶	G	22000¶	H	S	I
6K7	I. F. Amp. (A. M.)	7¶	S	S	5000¶	J	470¶	K	S	470¶
6H6	Demod., A. V. C., "Q" (A. M.)	—	S	S	300000¶	S	900000¶	500000¶	S	S
6R7	Audio Amp.	1M	S	S	100000¶	S	S	1.5M	S	2200¶
6C8G	Audio Inv.	1M	S	S	350000¶	47¶	10M	350000¶	S	S
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
5Z3	Rectifier	—	5000¶	30¶	30¶	5000¶	—	—	—	—
6AF6G	Tun. Ind.	—	O	S	200000¶	L	4200¶	O	S	1900¶
—	Speaker Socket	—	5000¶	S	S	O	90000¶	90000¶	300000¶	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart for position and numbering of terminals.

A.	Push in any "Pre-set Station" Button	18,000 Ohms
	Push in "Phono" Button	300,000 Ohms
	Push in "Television" Button	300,000 Ohms
B.	Push in any "Pre-set Station" Button	20,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
C.	Push in any "Pre-set Station" Button	30,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
D.	Range switch in standard broadcast position	"Open"
	Range switch in short-wave position	"Open"
	Range Switch in frequency modulation position	38,000 Ohms
E.	"Q" Switch "On"	
	Range switch in standard broadcast position	"Open"
	Range switch in short-wave position	"Open"
	Range Switch in frequency modulation position	1 Megohm
	"Q" Switch "Off"	
	Range switch in standard broadcast, short-wave and frequency modulation positions	"Short"
	Set up switch in "Set up" position	"Short"
	Set up switch in "Operate" position	1 Megohm
F.	Range switch in standard broadcast position	3 Megohms
	Range switch in short-wave position	3 Megohms
	Range switch in frequency modulation position	550,000 Ohms
G.	Push in any "Pre-set Station" Button	20,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
H.	Range switch in standard broadcast position	"Short"
	Range switch in short-wave position	"Short"
	Range switch in frequency modulation position	"Open"
I.	Range switch in standard broadcast position	3.5 Megohms
	Range switch in short-wave position	3.5 Megohms
	Range switch in frequency modulation position	"Open"
J.	Range switch in standard broadcast position	100,000 Ohms
	Range switch in short-wave position	100,000 Ohms
	Range switch in frequency modulation position	"Open"
K.	Range switch in standard broadcast position	5,000 Ohms
	Range switch in short-wave position	5,000 Ohms
	Range switch in frequency modulation position	"Open"
L.	Range switch in standard broadcast position	900,000 Ohms
	Range switch in short-wave position	900,000 Ohms
	Range switch in frequency modulation position	1.5 Megohms

Other tests not shown on chart—

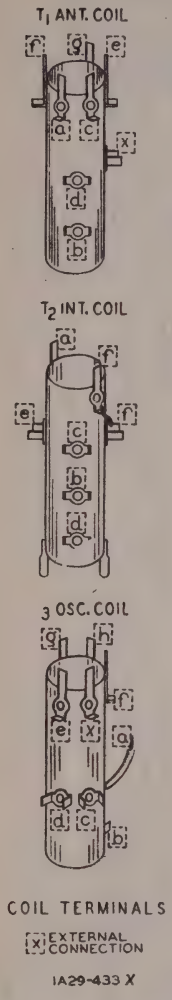
Phono jack to chassis base	
Push in "Phono" button	1 Megohm
Push in any "Pre-set" Station button	"Open"
Television jack to chassis base	
Terminal No. 1 (this is the terminal located nearest to the bottom of the chassis) Push in "Television" button	1 Megohm
Terminal Nos. 2 and 3	"Short"
Amplitude Modulation Antenna Terminal to chassis base	"Short"
Amplitude Modulation Ground Terminal to chassis base	"Short"
Frequency Modulation Terminals to chassis base	"Open"
Between Frequency Modulation Terminals	1,000 Ohms
Terminals of A. C. Plug to chassis base	"Open"
Between terminals of A. C. Plug—	
Push in "Off" button	"Open"
Push in any other button	1.5 Ohms

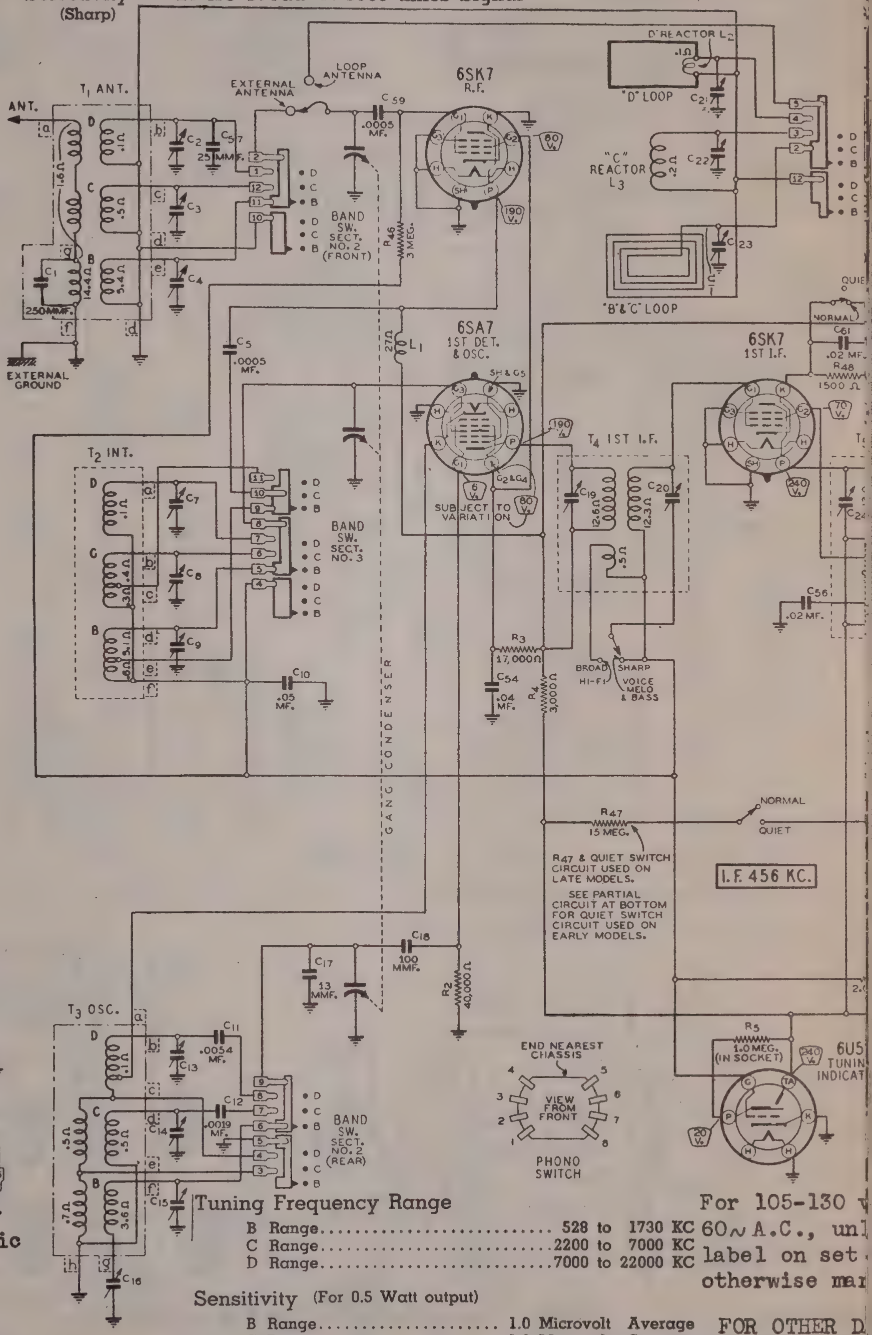
MODEL 1A29,Issue D
Schematic,Voltage,Socket,Sensitivity
Antenna,Coil Data

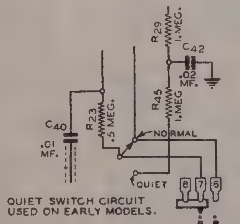
WELLS-GAR

Power Output - - - - - - 9 Watts Undistorted
10 Watts Maximum

Selectivity - 26 KC Broad at 1000 times Signal
(Sharp)







QUIET SWITCH CIRCUIT USED ON EARLY MODELS.

See also schematic of early 1A29.

Tuning Frequency Range

B Range	528	to	1730	KC
C Range	2200	to	7000	KC
D Range	7000	to	22000	KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt	Average
C Range	1.0 Microvolt	Average
D Range	3.0 Microvolts	Average

For 105-130
60~ A.C., unl
label on set
otherwise mar

FOR OTHER D
SEE INDEX

WG & C SERIES 1A29—ISSUE D

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 480M,480MB
Alignment

IDENTIFICATION TABLE

Model	Input Power Frequency	Chassis	Cabinet	Speaker
480-M	50-60 Cycles	31085	31088	31087 (Bass) 31126 (Treble)
480-MB	25-60 Cycles	31086	31088	31087 (Bass) 31126 (Treble)

SPECIFICATIONS

Tuning Ranges	Frequency Modulation 40 to 44 Mc. (40,000 to 44,000 Kc.) Shortwave 5.8 to 18 Mc. (5800 to 18,000 Kc.) Standard Broadcast .54 to 1.7 Mc. (540 to 1700 Kc.)
Voltage Rating	105 to 125 Volts
Type of Circuit	Superheterodyne with Electric Tuning
Input Power Rating	225 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 3.0 Megacycles (Frequency Modulation)
Speaker Field Coil Resistance—Approximately	1125 Ohms (Bass) 200 Ohms (Treble)
Speaker Voice Coil Impedance at 400 Cycles—Approximately	24 Ohms (Bass) 11 Ohms (Treble)

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator with sweep circuit.
2. Wide band sweep signal generator.
3. Oscillograph.
4. Microammeter "0" to 200 Microamps.
5. Center "0" Microammeter with 100 divisions each side of "0".

See location chart above for location of all aligning screws.

ALIGNING PROCEDURE (follow this order exactly)

I. **Dial pointer adjustment.** With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the two vertical lines located at the extreme low frequency end of the dial scale.

II. **Intermediate frequency adjustments** (Frequency Modulation)

1. Set the range switch to Frequency Modulation position and the volume control to "off" position.
2. Tune the set to the extreme high frequency end of the dial (44.5 megacycles).
3. Disconnect the ground side of the 10000 ohm resistor R94 and connect the "0" to 200 microammeter in series with it and ground. (This resistor is connected between terminals No. 3 and 4 of the fourth I. F. transformer.)
4. Connect the oscillograph between high side of R94 resistor and ground.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6SK7 third I. F. tube socket.
6. Introduce a signal of 3 megacycles to the grid of the 6SK7 third I. F. tube (Terminal No. 4), using a 0.1 microfarad capacitor in series with the output lead of the signal generator. Keep the "0" to 200 microammeter at approximately 100 microamps.
7. Align the secondary and primary of the fourth I. F. transformer for maximum reading on the "0" to 200 microammeter.
8. Slight adjustments of the aligners may be made if necessary to obtain a symmetrical curve on the oscillograph. Try for a good curve rather than the very last bit of output.
9. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 second I. F. tube (Terminal No. 4).
10. Align the third I. F. transformer in the same manner.
11. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 first I. F. tube (Terminal No. 4).
12. Connect the ground lead to the ground terminal of the 6SK7 first I. F. tube socket.
13. Align the second I. F. transformer in the same manner.
14. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 modulator tube (Terminal No. 8).
15. Connect the ground lead to the ground terminal of the 6SA7 modulator tube socket.
16. Align the first I. F. transformer in the same manner.
17. Remove the wide band sweep signal generator.

III. **Discriminator adjustment** (Frequency Modulation)

Note: Be sure the frequency of both signal generators are the same.

1. Connect the ground terminal of the standard signal generator to the ground terminal of the 6SK7 second I. F. tube socket.
2. Introduce an unmodulated signal of 3 megacycles to the grid of the 6SK7 second I. F. tube (Terminal No. 4) using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator.
3. Connect the center "0" microammeter with a .5 megohm resistor in series across one-half of the discriminator load. (From ground to the junction of the two .1 megohm resistors R28 and R29).
4. Set the attenuator on the standard signal generator for maximum output.
5. Adjust the primary of the discriminator transformer for maximum reading on the center "0" microammeter.
6. Connect the center "0" microammeter and the .5 megohm resistor in series with it across the whole discriminator load. (Terminal No. 4 of the 6H6 Demodulator tube and ground).
7. Adjust the secondary of the discriminator transformer for center "0" reading of the microammeter.
8. Vary the frequency of the standard signal generator slightly and be sure that the center "0" microammeter reads the same on each side of resonance. If not, go back and realign both primary and secondary.

IV. **Radio frequency adjustments** (Frequency Modulation)

1. Set the signal generator frequency and the receiver tuning dial to 40 megacycles.
2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the F. M. antenna terminal nearest to the end of the antenna and ground terminal strip.
3. Connect the ground lead to the other F. M. terminal on the antenna and ground terminal strip.
4. Adjust the oscillator 40 megacycles core aligner for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 43 megacycles.
6. Adjust the oscillator shunt aligner for maximum signal.
7. Adjust the R. F. and antenna aligners for maximum signal on the "0" to 200 microammeter maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.
8. Remove both meters from the circuits and resolder the 10000 ohm resistor R94 in its original position to terminal No. 4 on the fourth I. F. transformer.

V. **Intermediate frequency adjustments** (Amplitude Modulation)

Adjustment of second I. F. transformer.

1. Set the range switch to standard broadcast position.
2. Set the fidelity control in the center or "sharp" position and turn the volume control "full on".
3. Connect the oscillograph to the high side of the volume control R47.
4. Replace the 100 ohm resistor in series with the output lead from the signal generator with a 0.1 microfarad capacitor and connect it to the grid cap of the 6K7 I. F. tube. (Do not remove the grid cap from this tube.)
5. Connect the ground terminal of the signal generator to the ground terminal of the receiver.
6. Introduce a modulated signal of 455 kilocycles to the grid of the 6K7 I. F. tube.
7. Adjust the second I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of second I. F. transformer.
   b. Primary of second I. F. transformer.
8. Set the fidelity control to the high fidelity (expanded) position and readjust the primary of the second I. F. transformer for symmetrical curve.
9. Set the fidelity control back to the center or "sharp" position.

Adjustment of first I. F. transformer.

1. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 Modulator Tube. (Terminal No. 4.)
2. Adjust the first I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of first I. F. transformer.
   b. Primary of first I. F. transformer.
3. After the Amplitude Modulation I. F. adjustments have been completed, the fidelity control should be turned to the high fidelity position and a check made on the shape of the curve which should show a slight double peak.
4. Turn the fidelity control back to middle or "sharp" position.
5. Remove the oscillograph from the circuit.

VI. **Radio frequency adjustments** (Amplitude Modulation)

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm resistor and connect it to the Amplitude Modulation antenna terminal on the back of the chassis.
2. Set the range switch to the short wave range position (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycle "oscillator" and "antenna" iron cores for maximum signal.
5. Set the signal generator and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles "oscillator" and "antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm resistor in series with the output lead of the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the standard broadcast range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
4. Adjust the 600 kilocycle "oscillator", "R. F." and "Antenna" iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
6. Adjust the 1500 kilocycle "oscillator", "R. F." and "Antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

VII. **Wave trap adjustment.** (Leave the receiver connected in the same manner as when adjusting the standard broadcast range) (A Band).

1. Set the receiver's tuning dial to 1000 kilocycles.
2. Set the signal generator frequency to 455 kilocycles and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.

MODELS 480M,480MB
Voltage,Resistance

STROMBERG-CARLSON TEL. MFG. CO.

ADJUSTING DIAL LAMP

The dial on this receiver is edge-lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

NORMAL VOLTAGE READINGS

Take all voltage readings with chassis operating and tuned manually to 1000 kilocycles or 43 megacycles—no signal.

The upper figures shown in the table are with the range switch set to the standard broadcast range and tuned to approximately 1000 kilocycles—no signal.

The lower figures shown in the table are with the range switch set to the frequency modulation position and tuned to approximately 43 megacycles—no signal.

Use a line voltage of 125 volts or make allowance for any slight variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt. Take all D. C. readings on the 500 volt scale except when an asterisk appears. Read from indicated terminals to chassis base. See location chart for position of terminals.

A. C. voltages are indicated by italics.

				TERMINALS OF SOCKETS							
Tube	Circuit	Range Switch Set To	Cap	1	2	3	4	5	6	7	8
6SK7	R. F. Amp. (F. M.)	A. M.	—	0	0	+1*	—	+1*	+68	*6.5*	0
		F. M.	—	0	0	+3*	—	+3*	+135	*6.5*	+265
6SA7	Mod. and Osc. (F. M.)	A. M.	—	0	0	+290	+70	—	0	*6.5*	0
		F. M.	—	0	0	+280	+120	—	0	*6.5*	0
6SK7	1st I. F. Amp. (F. M.)	A. M.	—	0	0	+2*	—	+2*	+70	*6.5*	+290
		F. M.	—	0	0	+4*	—	+4*	+110	*6.5*	+265
6SK7	2nd I. F. Amp. (F. M.)	A. M.	—	0	0	+2*	—	+2*	+55	*6.5*	+290
		F. M.	—	0	0	+3*	—	+3*	+90	*6.5*	+270
6SK7	3rd I. F. Amp. (F. M.)	A. M.	—	0	0	0	—	0	0	*6.5*	+285
		F. M.	—	0	0	+6*	—	+6*	+150	*6.5*	+260
6SJ7	Limiter (F. M.)	A. M.	—	0	0	0	—	0	+95	*6.5*	+95
		F. M.	—	0	0	0	—	0	+90	*6.5*	+95
6H6	Demod. (F. M.)	A. M.	—	0	0	—	—	—	—	*6.5*	0
		F. M.	—	0	0	—	—	—	—	*6.5*	0
6SQ7	"Q" (F. M.)	A. M.	—	0	0	+2*	—	—	+130	*6.5*	0
		F. M.	—	0	0	+2*	—	—	+120	*6.5*	0
6H6	Tun. Ind. Rect. (F. M.)	A. M.	—	0	0	—	—	—	—	*6.5*	—
		F. M.	—	0	0	—	—	—	—	*6.5*	—
6F8G	Tun. Ind. Amp. (F. M.)	A. M.	0	0	0	+295	+11**	—	+200	*6.5*	+11**
		F. M.	0	0	0	+275	+10**	—	+185	*6.5*	+10**
6SK7	R. F. Amp. (A. M.)	A. M.	—	0	0	+2*	—	+2*	+90	*6.5*	+290
		F. M.	—	0	0	+2*	—	+2*	+80	*6.5*	+275
6SA7	Mod. and Osc. (A. M.)	A. M.	—	0	0	+290	+70	—	0	*6.5*	0
		F. M.	—	0	0	+275	+135	—	+100	*6.5*	0
6K7	I. F. Amp. (A. M.)	A. M.	0	0	0	+285	+115	+4*	+290	*6.5*	+4*
		F. M.	0	0	0	+260	0	0	0	*6.5*	0
6H6	Demod., A. V. C., "Q" (A. M.)	A. M.	—	0	0	—	0	—	—	*6.5*	0
		F. M.	—	0	0	—	0	—	—	*6.5*	0
6R7	Audio Amp.	A. M.	0	0	0	+90	0	0	—	*6.5*	+3*
		F. M.	0	0	0	+85	0	0	—	*6.5*	+3*
6C8G	Audio Inv.	A. M.	0	0	0	+35	—	—	+35	*6.5*	0
		F. M.	0	0	0	+35	—	—	+35	*6.5*	0
6L6G	Output	A. M.	—	0	0	+415	+290	—	—	*6.5*	+20**
		F. M.	—	0	0	+410	+275	—	—	*6.5*	+20**
6L6G	Output	A. M.	—	0	0	+415	+290	—	—	*6.5*	+20**
		F. M.	—	0	0	+410	+275	—	—	*6.5*	+20**
5Z3	Rectifier	A. M.	—	+495	*480*	*480*	+495	—	—	*5*	—
		F. M.	—	+495	*480*	*480*	+495	—	—	*5*	—
6AF6G	Tun. Ind.	A. M.	—	—	0	+65	+90	+250	—	*6.5*	+95
		F. M.	—	—	0	+60	+185	+235	—	*6.5*	+90
	Speaker Socket	A. M.	—	+290	0	0	+495	+495	+486	+425	—
		F. M.	—	+275	0	0	+495	+495	+486	+420	—

*Read on lowest possible scale of voltmeter.
**Read on 100 volt scale of voltmeter.

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests. (If a speaker is not available when checking continuity the speaker socket may be shorted by using two pieces of bus wire and shorting together terminals 1, 6 and 7 and terminals 4 and 5 of the speaker socket. (See location chart for position and numbering of terminals.) **Caution: Be sure to remove the two shorting wires when the continuity test is completed.**

			TERMINALS OF SOCKETS							
Tube	Circuit	Cap	1	2	3	4	5	6	7	8
6SK7	R. F. Amp. (F. M.)	—	S	S	180¶	S	180¶	A	S	O
6SA7	Osc. and Mod. (F. M.)	—	S	S	6000¶	A	22000¶	S	S	S
6SK7	1st I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	B	S	6000¶
6SK7	2nd I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	C	S	6000¶
6SK7	3rd I. F. Amp. (F. M.)	—	S	S	390¶	470000¶	390¶	D	S	5000¶
6SJ7	Limiter (F. M.)	—	S	S	S	57000¶	S	1900¶	S	1900¶
6H6	Demod. (F. M.)	—	S	S	100000¶	200000¶	100000¶	1M	S	S
6SQ7	"Q" Tube (F. M.)	—	S	600000¶	2200¶	E	E	280000¶	S	S
6H6	Tun. Ind. Rect. (F. M.)	—	S	S	1M	2.4M	2.4M	O	S	1M
6F8G	Tun. Ind. Amp. (F. M.)	1M	S	S	5000¶	2000¶	1M	150000¶	S	2200¶
6SK7	R. F. Amp. (A. M.)	—	S	S	180¶	F	180¶	90000¶	S	5000¶
6SA7	Osc. and Mod. (A. M.)	—	S	S	6000¶	G	22000¶	H	S	I
6K7	I. F. Amp. (A. M.)	7¶	S	S	5000¶	J	470¶	K	S	470¶
6H6	Demod., A. V. C., "Q" (A. M.)	—	S	S	300000¶	S	900000¶	500000¶	S	S
6R7	Audio Amp.	1M	S	S	100000¶	S	S	1.5M	S	2200¶
6C8G	Audio Inv.	1M	S	S	350000¶	47¶	10M	350000¶	S	S
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
5Z3	Rectifier	—	5000¶	30¶	30¶	5000¶	—	—	—	—
6AF6G	Tun. Ind.	—	O	S	200000¶	L	4200¶	O	S	1900¶
—	Speaker Socket	—	5000¶	S	S	O	90000¶	90000¶	300000¶	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart for position and numbering of terminals.

A.	Push in any "Pre-set Station" Button	18,000 Ohms
	Push in "Phono" Button	300,000 Ohms
	Push in "Television" Button	300,000 Ohms
B.	Push in any "Pre-set Station" Button	20,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
C.	Push in any "Pre-set Station" Button	30,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
D.	Range switch in standard broadcast position	"Open"
	Range switch in short-wave position	"Open"
	Range Switch in frequency modulation position	38,000 Ohms
E.	"Q" Switch "On"	
	Range switch in standard broadcast position	"Open"
	Range switch in short-wave position	"Open"
	Range Switch in frequency modulation position	1 Megohm
	"Q" Switch "Off"	
	Range switch in standard broadcast, short-wave and frequency modulation positions	"Short"
	Set up switch in "Set up" position	"Short"
	Set up switch in "Operate" position	1 Megohm
F.	Range switch in standard broadcast position	3 Megohms
	Range switch in short-wave position	3 Megohms
	Range switch in frequency modulation position	550,000 Ohms
G.	Push in any "Pre-set Station" Button	20,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
H.	Range switch in standard broadcast position	"Short"
	Range switch in short-wave position	"Short"
	Range switch in frequency modulation position	"Open"
I.	Range switch in standard broadcast position	3.5 Megohms
	Range switch in short-wave position	3.5 Megohms
	Range switch in frequency modulation position	"Open"
J.	Range switch in standard broadcast position	100,000 Ohms
	Range switch in short-wave position	100,000 Ohms
	Range switch in frequency modulation position	"Open"
K.	Range switch in standard broadcast position	5,000 Ohms
	Range switch in short-wave position	5,000 Ohms
	Range switch in frequency modulation position	"Open"
L.	Range switch in standard broadcast position	900,000 Ohms
	Range switch in short-wave position	900,000 Ohms
	Range switch in frequency modulation position	1.5 Megohms

Other tests not shown on chart—

Phono jack to chassis base	
Push in "Phono" button	1 Megohm
Push in any "Pre-set" Station button	"Open"
Television jack to chassis base	
Terminal No. 1 (this is the terminal located nearest to the bottom of the chassis) Push in "Television" button	1 Megohm
Terminal Nos. 2 and 3	"Short"
Amplitude Modulation Antenna Terminal to chassis base	"Short"
Amplitude Modulation Ground Terminal to chassis base	"Short"
Frequency Modulation Terminals to chassis base	"Open"
Between Frequency Modulation Terminals	1,000 Ohms
Terminals of A. C. Plug to chassis base	"Open"
Between terminals of A. C. Plug—	
Push in "Off" button	"Open"
Push in any other button	1.5 Ohms

MODEL 1A29 (Early)
Schematic, Voltage, Socket, Sensitivity

WELLS-GARDNER & CO.

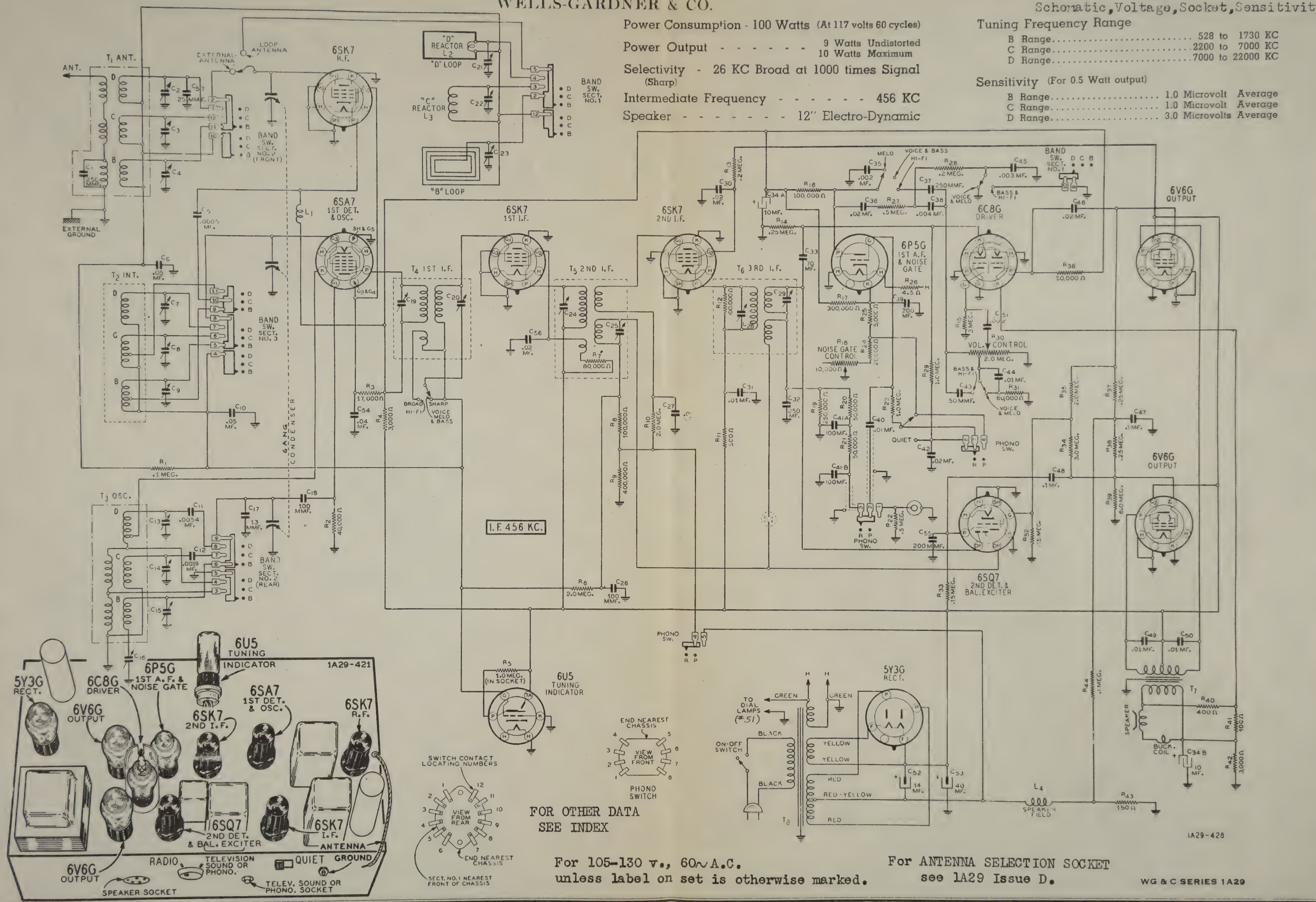
Power Consumption - 100 Watts	(At 117 volts 60 cycles)
Power Output - - - - - -	9 Watts Undistorted 10 Watts Maximum
Selectivity (Sharp) - 26 KC Broad at 1000 times Signal	
Intermediate Frequency - - - - - -	456 KC
Speaker - - - - - - -	12″ Electro-Dynamic

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average



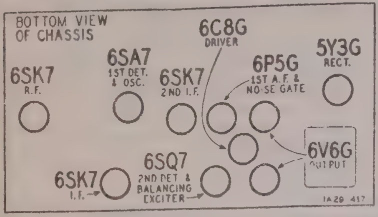
FOR OTHER DATA
SEE INDEX

For 105-130 v., 60∼A.C.
unless label on set is otherwise marked.

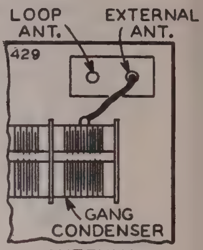
For ANTENNA SELECTION SOCKET
see 1A29 Issue D.

WG & C SERIES 1A29

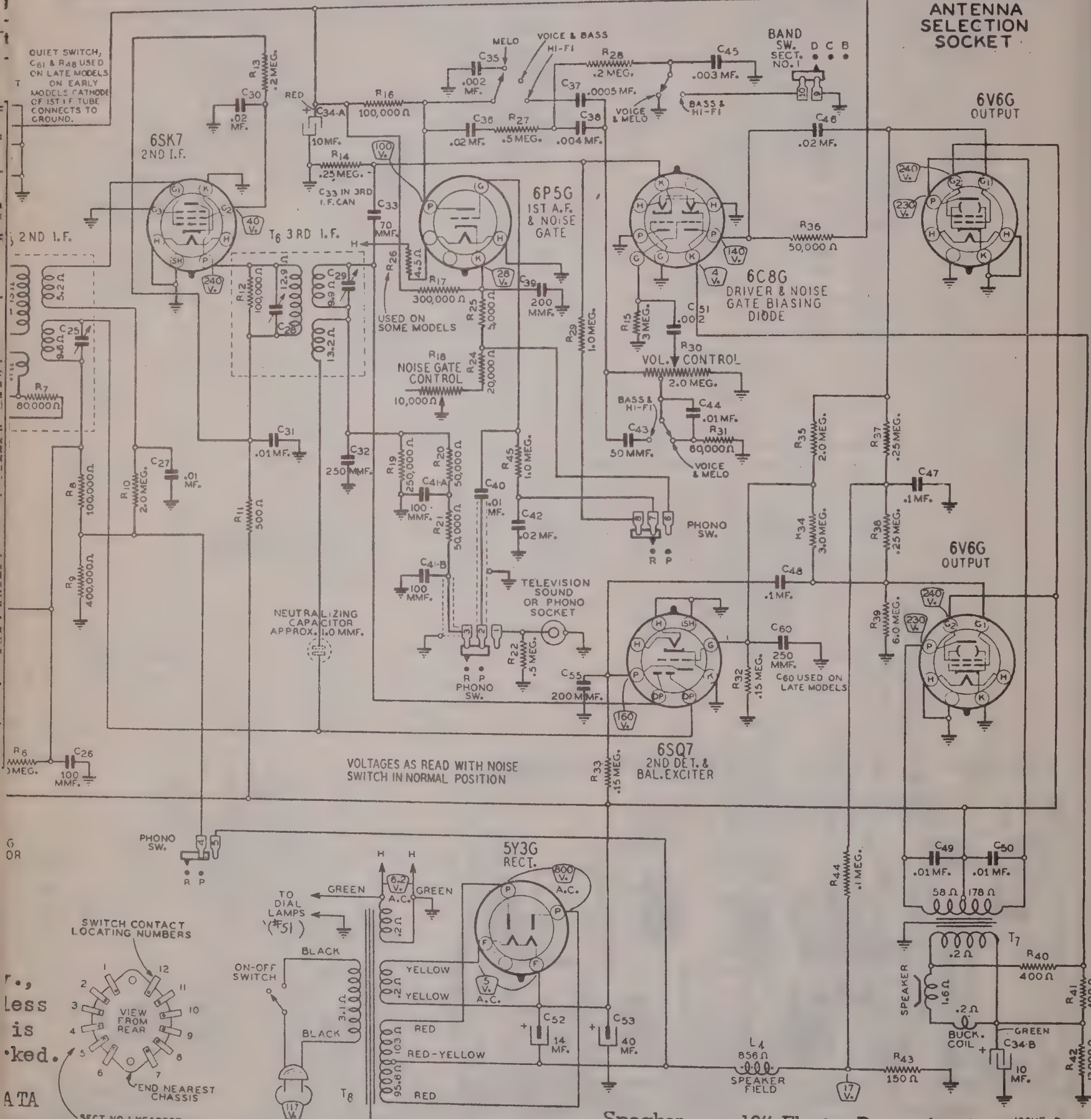
ower Consumption - 100 Watts (At 117 volts 60 cycles)



ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.



ANTENNA SELECTION SOCKET

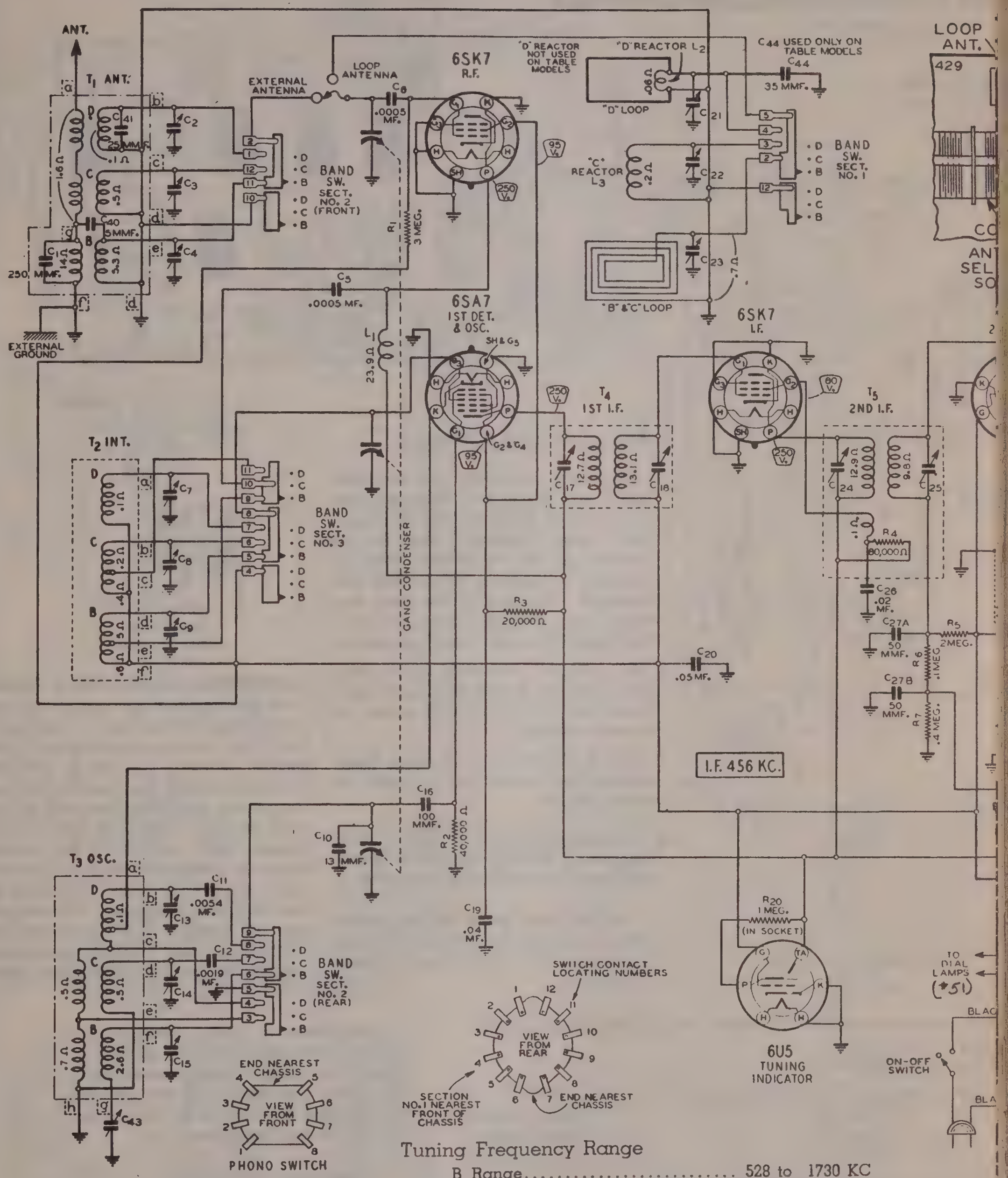


Speaker -- 12" Electro-Dynamic

ISSUE-D
1A29-510

MODEL 8A31
Schematic ,Voltage,Socket,Coils
Sensitivity,Notes

WELLS-C



Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity —External Antenna—(For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

FOR OTHE
SEE IN

MODEL 1A29, Issue D
Schematic, Voltage, Socket, Sensitivity
Antenna, Coil Data

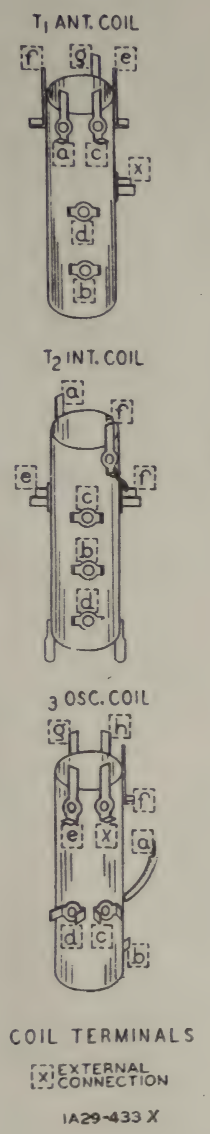
WELLS-GARDNER & CO.

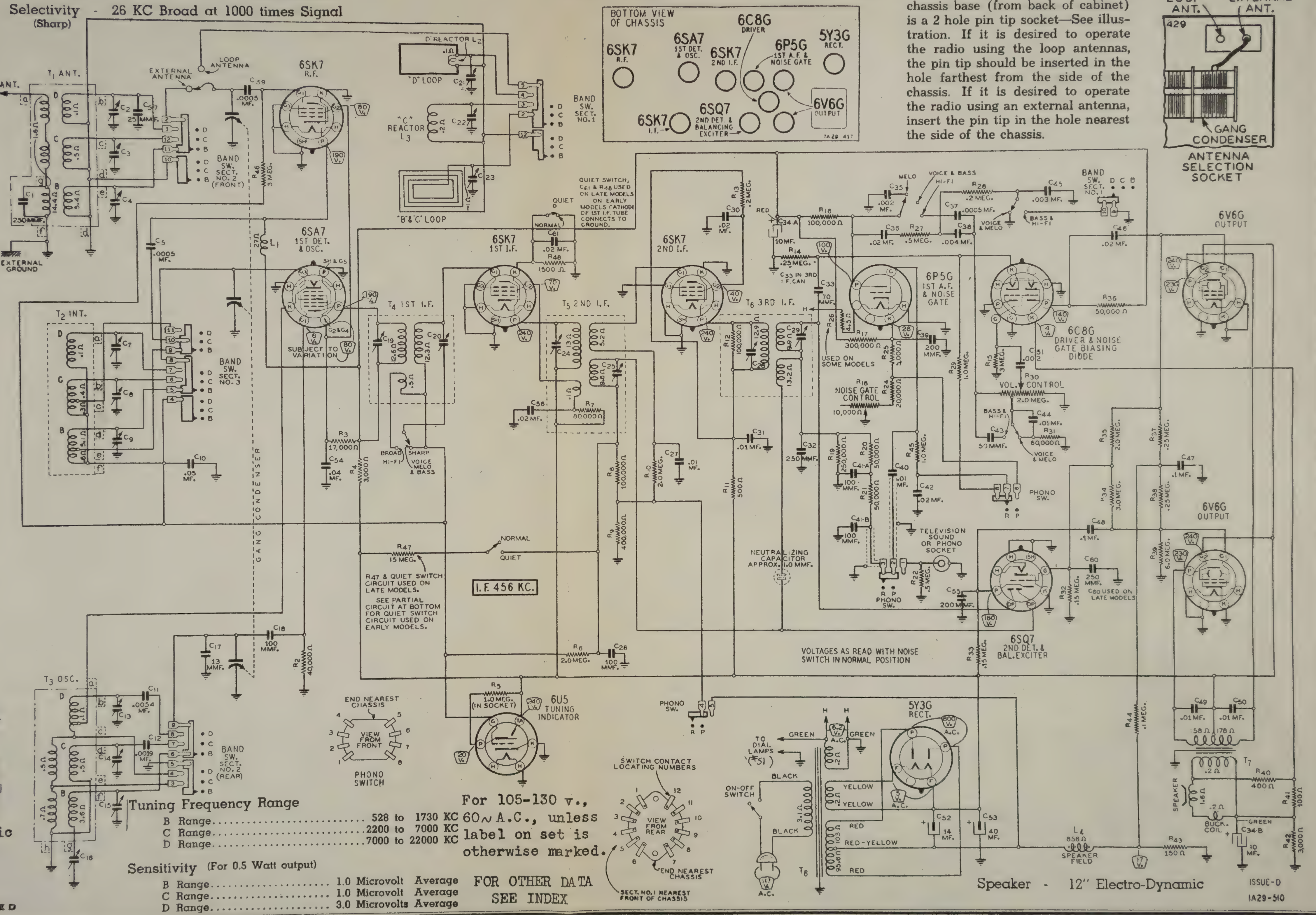
Power Output - - - - - - - 9 Watts Undistorted
10 Watts Maximum

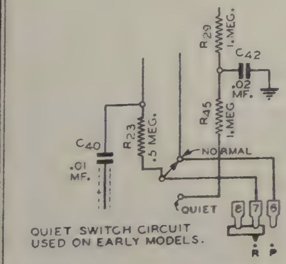
Selectivity - 26 KC Broad at 1000 times Signal (Sharp)

Power Consumption - 100 Watts (At 117 volts 60 cycles)

ANTENNA SELECTION SOCKET —At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.







QUIET SWITCH CIRCUIT USED ON EARLY MODELS.

See also schematic of early 1A29.

Tuning Frequency Range

B Range	528	to	1730	KC
C Range	2200	to	7000	KC
D Range	7000	to	22000	KC

For 105-130 v., 60~ A.C., unless label on set is otherwise marked.

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt	Average
C Range	1.0 Microvolt	Average
D Range	3.0 Microvolts	Average

FOR OTHER DATA SEE INDEX

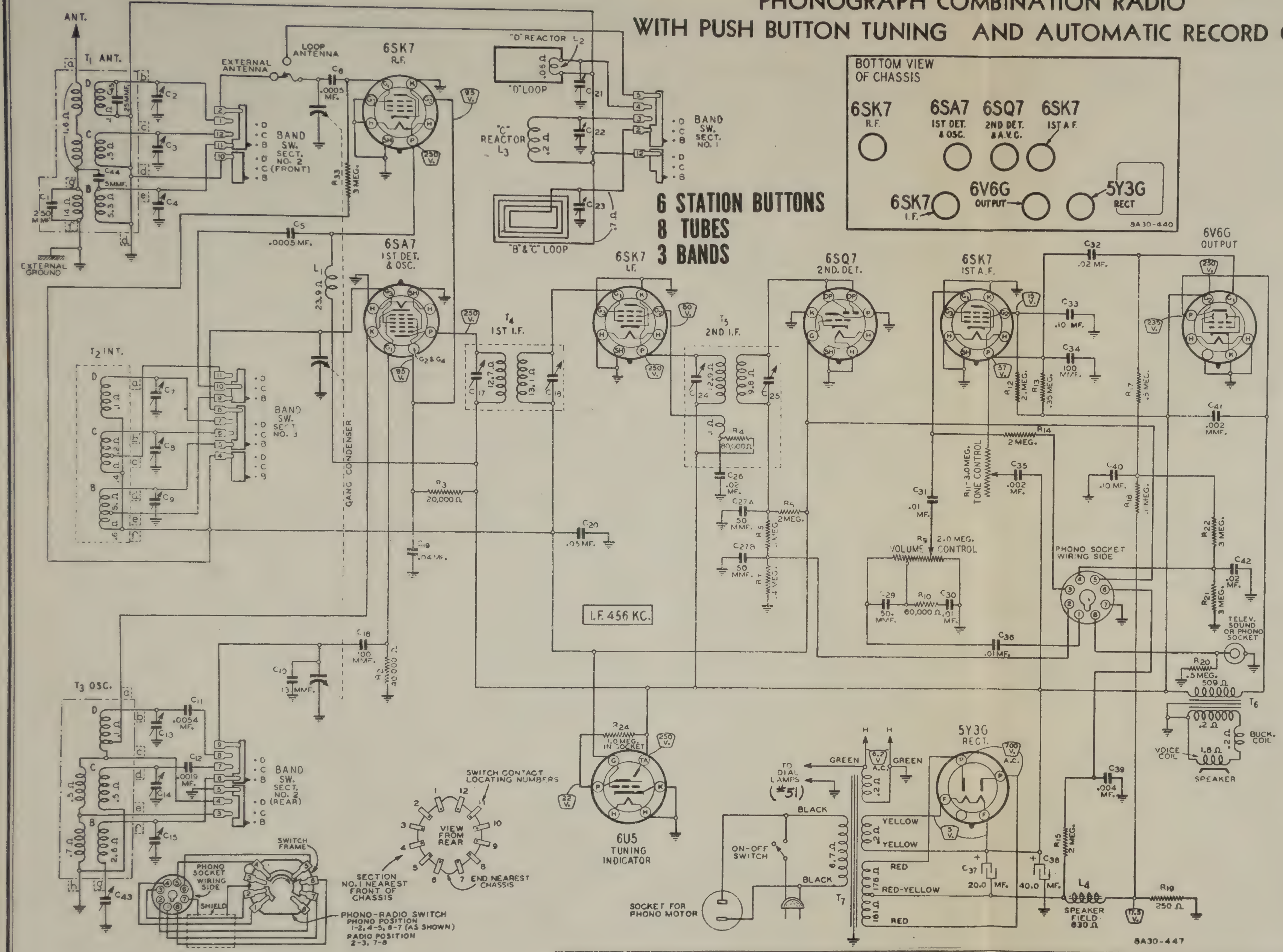
Speaker - 12" Electro-Dynamic

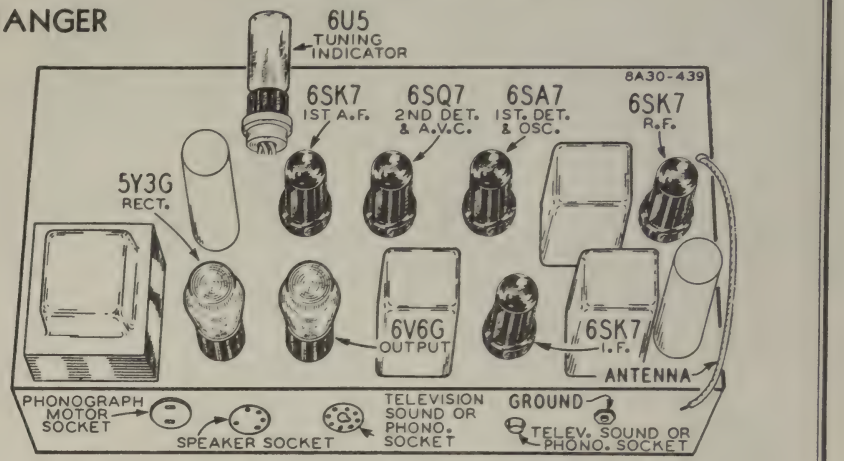
MODEL 8A30
Schematic,Voltage,Socket,Sensitivity
Antenna Data,Coils

WELLS-GARDNER & CO.

PHONOGRAPH COMBINATION RADIO WITH PUSH BUTTON TUNING AND AUTOMATIC RECORD CHANGER

6 STATION BUTTONS
8 TUBES
3 BANDS





Antenna and Ground

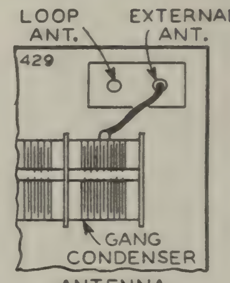
Two loop antennas are incorporated in the speaker chamber and may be used for broadcast band and short wave reception. For the reception of local or nearby stations, an outside antenna is usually not required. The use of the loop antenna may, in some locations, provide best broadcast band operation.

In general, however, more stations will be heard and noise will sometimes be reduced by using an outside antenna.

For best reception of short wave stations, an outside antenna is recommended.

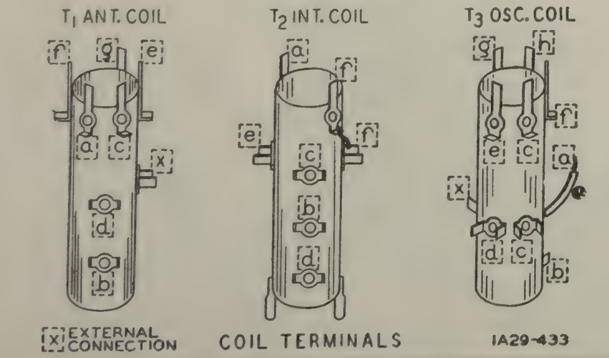
A white wire will be found coming out of the chassis. Connect this wire to the outside antenna lead.

On the back panel of the chassis base is a screw (marked GND) under which the ground wire should be fastened.



ANTENNA SELECTION SOCKET

ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis. The socket may be reached after removing the four wing nuts holding the cover over the opening in the cabinet back.



COIL TERMINALS

SPECIFICATIONS

Power Consumption 71 Watts (At 117 volts 60 cycles)
88 Watts (Phonograph Operating)

Power Output - - - - - - 4.0 Watts Undistorted
5.0 Watts Maximum

Selectivity - - 30 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - 10" Electro-Dynamic

Receivers of this model which are to be used on 25 cycle, 230 volt, or other service are so marked on label.

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

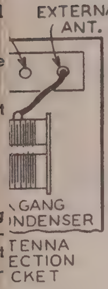
FOR OTHER DATA
SEE INDEX

Important—A good antenna and ground are essential for best operation of this radio. Connections should be clean and tight. Do not use an old outside antenna as in most cases it will be unsatisfactory.

Voltages at Sockets

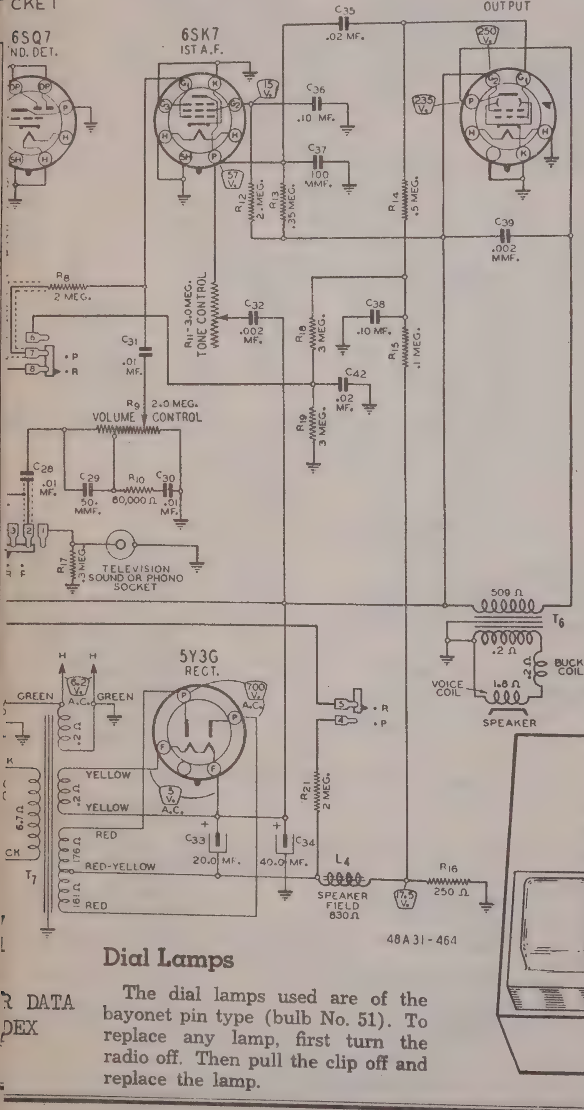
Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.

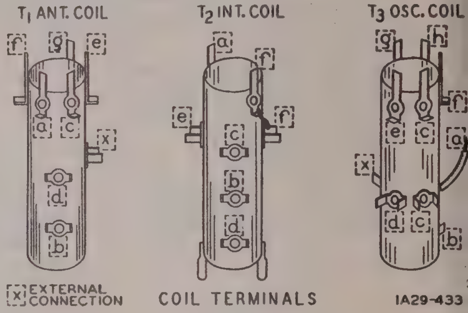
Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.



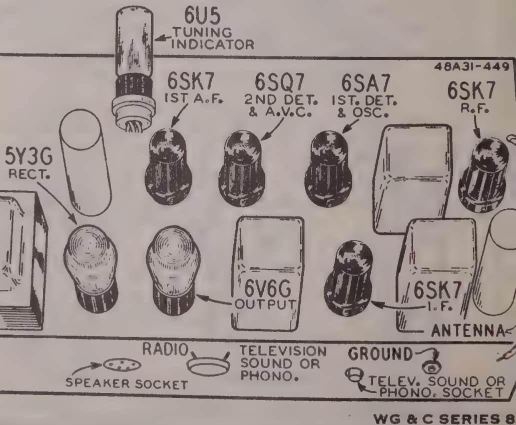
ANTENNA SELECTION SOCKET—At the right front corner (from back of cabinet) of the chassis base is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.

Power Consumption	70 Watts (At 117 volts 60 cycles)
Power Output - - - - - -	4.0 Watts Undistorted 5.0 Watts Maximum
Selectivity - -	30 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - -	456 KC
Speaker - - - -	8" or 10" Electro-Dynamic





TO REDUCE MODULATION·HUM: Interchange 1st A-F tube with R-F and I-F tubes; select tube position which reduces hum. If appreciable hum remains, try several new 6SK7 1st A-F tubes and use the one which reduces hum to a minimum.



R DATA
DEX

Dial Lamps

The dial lamps used are of the bayonet pin type (bulb No. 51). To replace any lamp, first turn the radio off. Then pull the clip off and replace the lamp.

MODEL 8A30, Automatic Record Changer
Assembly Views, Adjustments

P-12123	Swivel Shaft and Head Assem.	CA
P-2522	Fibre Washer (2 required)	CB
P-12048	Lifter Guide	CC
P-12111	Swivel Guide Arm Assembly	CD
P-12003	Lifter Rod Nut (AP)	CE
P-12072	Trunnion Shoulder Screw (2 reqd.)	CF
	Link	CG
P-12701	Swivel Tube and Trunnion Assem.	CH
P-12087	Swivel Guide Arm Spring	CI
	Trip Adjusting Cam	CJ
P-12089	Swivel Spreader Spring	CK
P-12703	Stop Lever and Trigger Adj.Assem.	CL
P-12026	Upper Swivel Spreader	CM
P-12027	Lower Swivel Spreader	CN
P-12099	Pickup Leader Spring (ER)	CO
	Trigger.	CP
P-12084	Pawl Spring	CQ
P-12085	Cam Lever Spring	CR
	Cam Lever	CS
P-12007	Shoulder Screw	CT
	Sub-Plate	CU
	Cam Connecting Rod Lift	CV

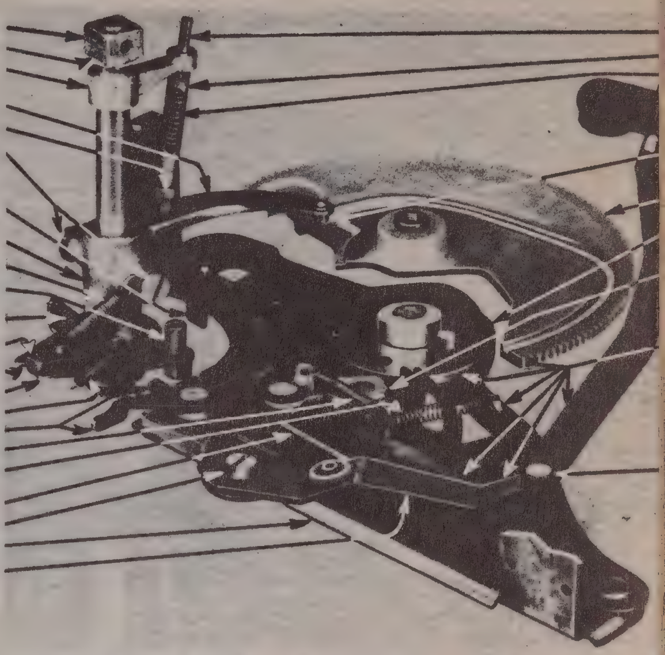


Photo C-D. View of Sub-Plate Assembly, Together with Certain Other Assemb

(Give Model No. as at EN)	Changer Motor	EA
(Give Model No.)	Main Mounting Plate Assm.	EB
	Cam Connecting Rod	EC
P-12400	Changer Shaft Collar	ED
	Spreader Hub Assembly	EE
P-12045	Spring Roller	EF
P-12088	Changer Spreader Spring	EG
	Cycling Switch	EH
P-12085	Cam Lever Spring	EI
P-12709	Sub-Plate and Gear Assem. (DI)	EJ
P-12116	Adjusting Rod Assembly	EK
	Cam Connecting Rod Lift (CV).	EL
P-12083	Cam Connecting Rod Lift Spring	EM
	Changer Model Number	EN
	Changer Serial Number	EO
P-12505	Rejection Rod Support	EP
P-12084	Adjusting Rod Lever Spring	EQ
P-12099	Pickup Leader Spring (CO)	ER
(Give Model No. as at EN)	Pickup Cord	ES
P-12053	Post Nut	ET
#1228	Shakeproof Washer	EU
M-93	Male Plug (on end of cord)	EV
	Lug on Lever-Hub Assem.	EW
	Adjusting Rod	EX

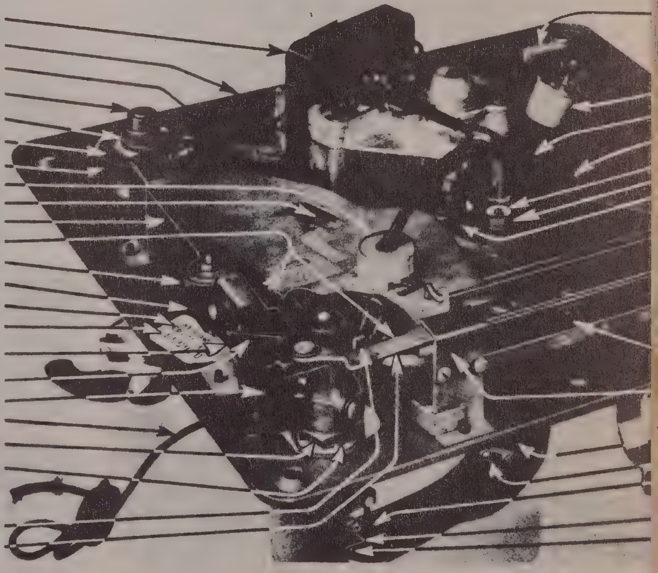
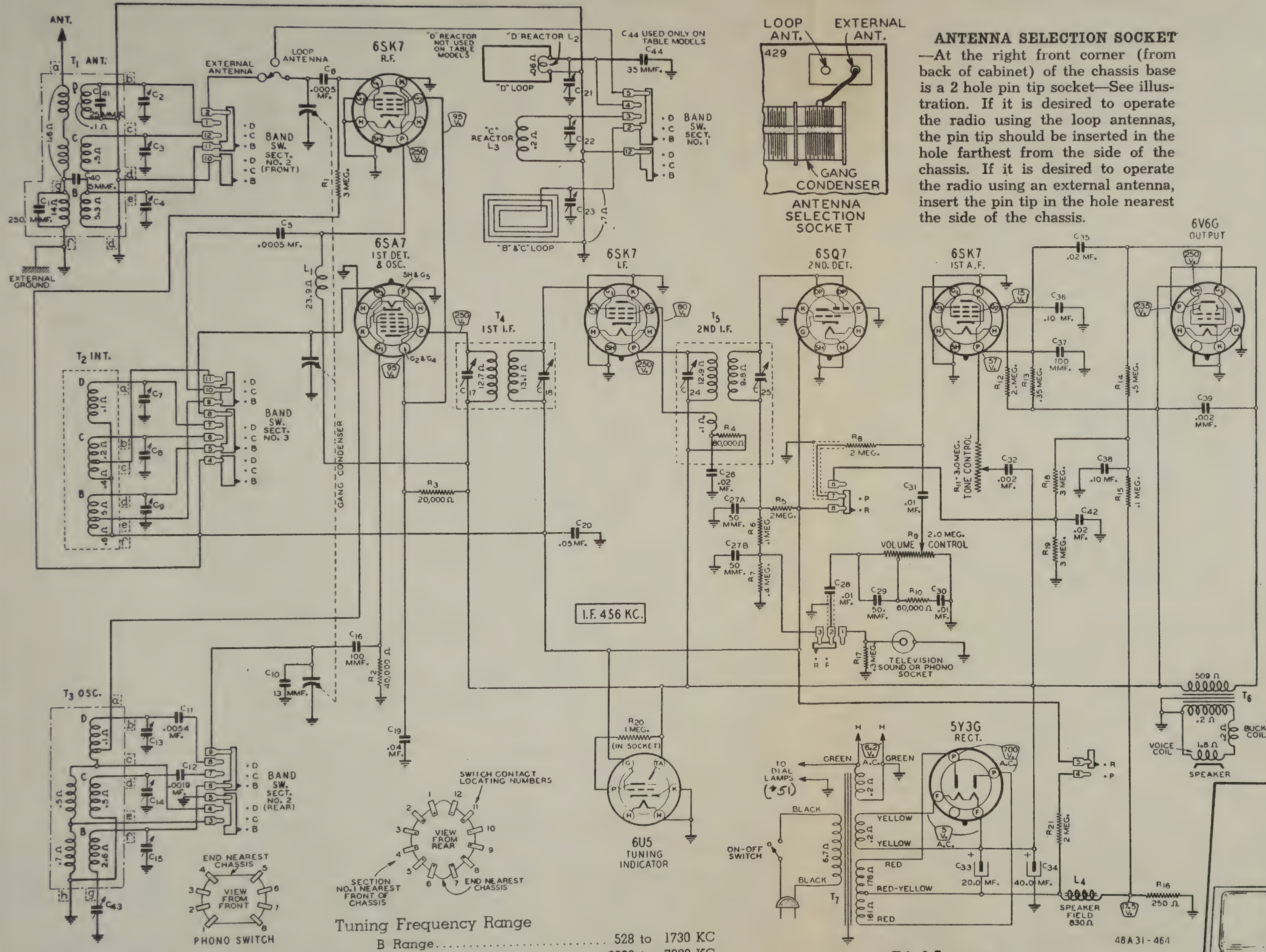


Photo E-F. Bottom View

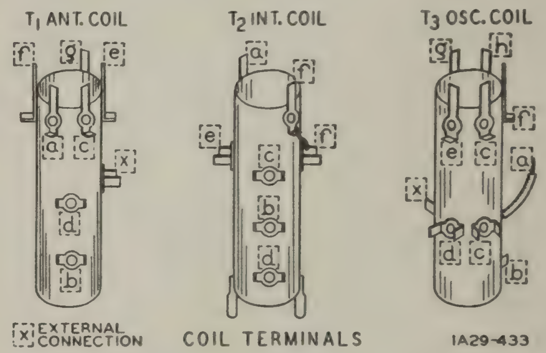
MODEL 8A31
Schematic, Voltage, Socket, Coils
Sensitivity, Notes

WELLS-GARDNER & CO.

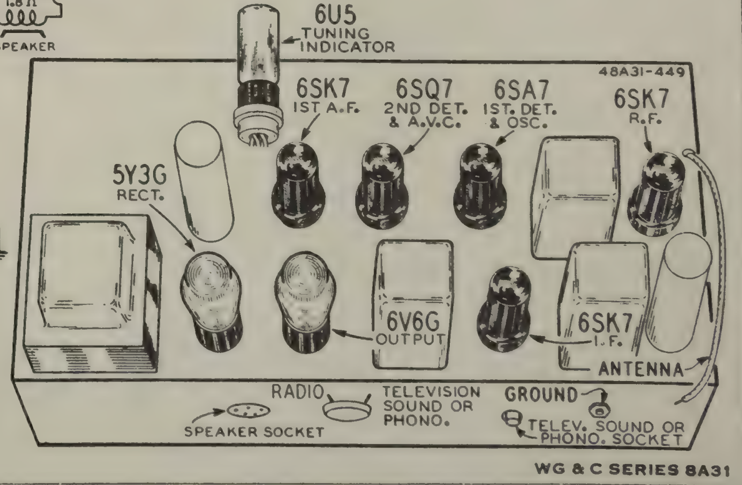


ANTENNA SELECTION SOCKET —At the right front corner (from back of cabinet) of the chassis base is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.

Power Consumption	70 Watts (At 117 volts 60 cycles)
Power Output	4.0 Watts Undistorted 5.0 Watts Maximum
Selectivity	30 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	8" or 10" Electro-Dynamic



TO REDUCE MODULATION-HUM:
Interchange 1st A-F tube with R-F and I-F tubes; select tube position which reduces hum. If appreciable hum remains, try several new 6SK7 1st A-F tubes and use the one which reduces hum to a minimum.



Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity —External Antenna—(For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

FOR OTHER DATA SEE INDEX

Dial Lamps

The dial lamps used are of the bayonet pin type (bulb No. 51). To replace any lamp, first turn the radio off. Then pull the clip off and replace the lamp.

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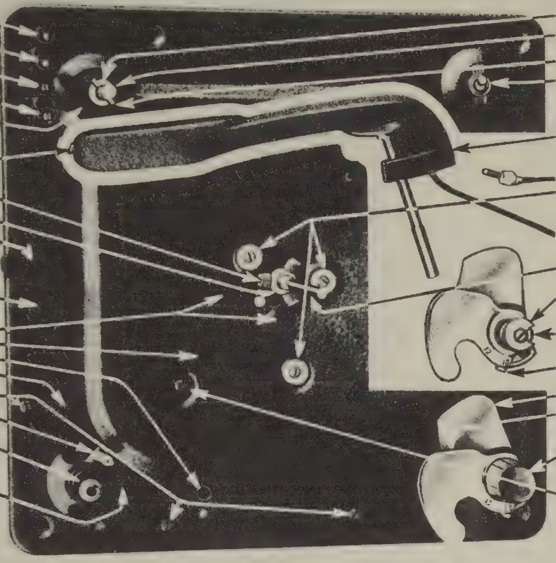
Automatic Record Changer

(Patents Pending)



P-12100A	Push Button Assembly "R"	AA
P-12100B	Push Button Assembly "M"	AB
P-12100C	Push Button Assembly "12"	AC
P-12100D	Push Button Assembly "10"	AD
P-12043	Changer Post	AE
(Give Model No. as at EN)	Needle Setscrew	AF
P-12008	Neoprene Tubing	AG
P-12127	Drive Pinion Assembly	AH
P-12126	Pickup Support Bracket Assembly	AI
	Needle Landing Adjustment Hole	AJ
	Motor Oiling Holes	AK
	Oiling Hole	AL
	Oiling Hole	AM
	Oiling Hole	AN
	(3) Sub-Plate Attachment Screws	AO
P-12003	Lifter Rod Nut (CE)	AP
P-12046	Swivel Post	AQ
	Trip Adjustment Hole	AR

BA	Changer Post Washer	P-12093
BB	Changer Shaft--Front Changer Shaft--Rear (Not shown)	P-12041 P-12073
BC	Changer Shaft Pin	P-12065
BD	On-Off Switch (Give Model No.;see at EN)	
BE	Pickup (Give Model No.; see at EN)	
BF	Grommet (3 required) Washer (3 required)	P-2518 P-2519
BG	Record Pin (with Motor)	
BH	Changer Plate Washer	P-12061
BI	Changer Plate Spring	P-12081
BJ	Pointer	
BK	Shelf Plate } Changer Plate Assembly (2 reqd.)	P-12403
BL	Selector Plate } Changer Plate Assembly (2 reqd.)	P-12403
BM	Changer Cup or Knob (2 reqd.)	P-12044
BN	Cam Gear Screw	

PHOTO A-B. Top View.

For the Service Man

This Manual is designed for the use of the service mechanic only, and is intended to facilitate as far as possible his work of caring for the Changer mechanism, whether he is called in for the purpose of assuring its continued satisfactory operation, or to remedy some difficulty which has appeared. For his convenience, the "Operating Instructions," supplied to user by the factory, may be summarized as follows:

The Changer plays twelve 10" or ten 12" records. . . . To reload, revolve the two posts slightly, grasping them underneath the Shelf Plates. Turn them back after the played records are removed; they will fall and lock when in proper position. Then place the new records on the Shelf Plates, and push "R" button to put Changer in operation. . . . To play the other size records, turn the knob at top of each post until proper figure is opposite pointer, and press the "10" or "12" button, to agree with pointer setting. . . . To reject a record (or to start a change cycle as for testing purposes) simply press the "R" (Release or Reject) button, at any time while needle is upon a record. . . . To play manually, turn plates out of the way as for reloading, and press "M" button.

(What are here called the "plates" of the Changer are frequently known among mechanics as "blades"--a name best avoided when talking with users because it may convey to some an exaggerated impression of danger in the movement of these parts).

Illustrations

The three photos illustrate all vital parts of the Changer. Letters are used alphabetically, to refer to points on the photos; thus, Motor Oiling Holes "AK" are found by simply glancing down Column A (left side of Photo A-B) to letters AK. Reference letters must NOT be used for ordering parts: order only by the factory numbers. Where no number is given, part cannot be separately supplied; order the Assembly containing it.

Oiling (reprinted from Operating Instructions)

The Changer should be lubricated once a year with about a dozen drops of a good light machine oil at each of the following 6 points. All points can be reached from above, through holes in the mounting plate, as follows:

No. 1) No. 2) No. 3)	Three oil holes on motor gear housing. Reach all three through two holes AK.
No. 4	Through hole marked AL, drop the oil upon flat surface of cam. It will distribute itself to proper points.
No. 5	Through hole marked AM, see felt wick, and drop the oil directly upon it.
No. 6	Through hole marked AN, see felt wick, and drop the oil directly upon it.

To Check Oiling

If squeaks are heard compare the squeak with and without a load of records; any stack of wax records in motion is likely to squeak a little against a pin through their center. See that all five wicks are in position, including three 1/4" round wicks in frame of Motor, one washer-shaped wick ("No. 5") on Lift CV, and one ("No. 6") on Cam Lever CS. See that each wick is thoroughly saturated (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks, with tweezers; see if old oil has become gummy (commonly due to use of low-grade oil or low-viscosity oil). If necessary, clean gummed-up wicks with kerosene. See that each is saturated with good oil; then, before replacing them, drop a little good oil into the holes. The gearbox of the Motor is packed with a semi-fluid grease at the factory, and it should never be necessary to take it apart for lubrication purposes.

General Description of the Change Cycle

An automatic record player for records of two sizes has three principal duties to perform. These duties are here performed by three mechanisms, interconnected and built together but largely separate in their operation.

(1) The record-changing mechanism--brought into operation originally by the contact of Lifter Cam DG with Pawl DH--is the simplest of the three. It is driven by the cam groove (not visible) on under side (in Photo C-D) of Cam Gear DF. As Cam Lever CS is forced, by the Pawl, out underneath Lift CV (which is shown revolved to the right for visibility) the Lift rises and forces roller DJ into the under groove in Cam Gear. The motion is transferred to Rear Changer Shaft (at ED) through Cam Connecting Rod DE (EC), thence through Changer Connecting Rod FD to Front Changer Shaft BB.

(2) The pickup-operating mechanism--likewise brought into operation originally by the cam-and-pawl action upon Cam Lever CS--is driven in part by the groove in upper (visible) side of Cam Gear DF. As Cam Lever is forced out, at the beginning of the change cycle, against Link CG, it causes the Link to push upward upon Pickup Plunger DA, thus lifting needle from record. The same pressure upon Link CG works, through Guide Arm CD, to force Stud DD down into the groove on the Cam Gear. This rotates the pickup arm, while Pickup Plunger DA holds it up off of record. It is rotated first out beyond the turntable until Selector Plates BL have dropped the next record, then rotated back to proper position to start playing.

(3) The mechanism for bringing needle into correct starting position must operate accurately for both 10" and 12" records. Partly due to this requirement, the starting position is not determined by the cam action. The upper groove on Cam Gear is designed so that it, acting alone, would carry the needle farther back toward record pin than would ever be desirable as a starting adjustment. Travel of pickup arm toward Record Pin is then stopped, at proper point for lowering onto the record, by action of Lever Hub CL. The stopping takes place as lug EW (upon the Lever Hub) strikes the shoulder on Rod EX. This enables the entire mechanism rotated by cam action on Guide Arm CD to travel on past the proper point of rotation for record-starting, while the pickup arm itself, which is held rigid to Lever Hub CL, is accurately stopped at proper record-starting point.

Correct adjustment for starting position of needle requires therefore only correct adjustment of Rods EX and FK; the radial difference of 1 inch between correct starting position for 10" and 12" records is taken care of by exact dimensioning, at the factory, of surfaces at right end of Rod FK which stop against the "10" and "12" key stems. Due to this, when Adjusting Cam at FP is turned (as directed below under Adjustment A) the starting position of needle is simultaneously altered for both 10" and 12" records.

Adjustments

There are three adjustments that can be made. Except on certain early Changers (See B, below), ALL THREE CAN BE MADE FROM ABOVE: CHANGER NEED NOT BE REMOVED FROM CABINET. All adjustments are correctly made at the factory, and ordinarily need never be altered. Should it become necessary to readjust, due to accident or tampering, proceed as follows:

A. ADJUSTING LANDING POSITION OF NEEDLE ON THE RECORD. If needle comes down on the sound track, playing of records will not start at their beginning. Insert screwdriver through hole AJ. Turn screw head on Needle Landing Adjusting Cam FP very slightly counter-clockwise. If needle comes down too close to outer edge of record, or out beyond edge of record, turn Adjusting Cam clockwise.

The factory adjustment of needle landing is 1/8" in from outer edge of record.

Compare also Paragraph 12 below.

B. ADJUSTING DISTANCE FROM RECORD PIN AT WHICH TRIGGER WILL TRIP AND CHANGE CYCLE WILL BEGIN. Insert screwdriver through hole AR. Turn screw head on Trip Adjusting Cam CJ clockwise for earlier tripping, or counter-clockwise for later tripping. (Effect is to alter position of the Cam which strikes Trigger CP. It may be found that Cam has been revolved through a half-turn; in this case, above directions would apply only after Cam has been returned to correct position by revolving screw head one-half turn).

On some models of this Changer no hole will be found in Main Plate at AR. To make the adjustment on these Changers, access must be had to the under-side of the mechanism. Instead of Cam CJ, there will be found a Trip Adjustment Screw, so placed that its end strikes the trigger directly. For earlier tripping, turn this Screw clockwise; for later tripping turn it counter-clockwise.

This Changer does not depend, for automatic tripping, on the records being provided with any special grooves at end; it trips whenever needle comes within a certain distance of Record Pin. The factory adjustment is for 1¾" to 1-7/8" from center of Record Pin. This is the most generally satisfactory distance; no modern record will then be cut off before playing is finished, and none will fail to trip at end. For certain records of

DA	Pickup Plunger	P-12095
DB	Pickup Plunger Sleeve	P-12096
DC	Pickup Plunger Spring	P-12097
DD	Stud	
DE	Cam Connecting Rod	
DF	Cam Gear	
DG	Lifter Cam	
DH	Pawl	
DI	Sub-Plate and Gear Assembly	P-12709
DJ	Roller	

lies

FA	On-Off Switch (Give Model No. see at EN)	
FB	Male Plug with #7002 Shell	M-21
FC	Cord Clamp	292-8
FD	Changer Connecting Rod Assem.	P-12122
FE	Shim (Assortment)	P-1397
FF	Grommet Sleeve (3 reqd.)	P-12059
FG	Idler Gear	
FH	Manual Key Rod	P-12077
FI	Rejection Rod	P-12510
FJ	Manual and Rejection Rod Spring	P-12090
FK	Extension Rod	
FL	Key Control Bracket	P-12038
FM	Key Control Unit	P-12079
FN	Adjusting Rod Spring	P-12087
FO	Control Unit Truss Bar	P-12094
FP	Needle Landing Adjusting Cam	
FQ	Adjusting Rod Bracket	P-12036
FR	Pickup Cartridge (Give Model No. as at EN)	
FS	Cartridge Clamp	P-2218
FT	Tone Arm Lift Plate	P-2223
FU	Hinge Pin Spring	P-2236
FV	Tone Arm Hinge Pin	P-2234

early manufacture, it may be impossible to find an adjustment that will always trip and never cut off, but these may always be played manually.

C. ADJUSTING HEIGHT TO WHICH PICKUP ARM RISES. The arm should rise, during the change cycle, high enough so that it clears by only 1/4" the record above it, next to be played. (Be careful, before deciding that readjustment is necessary, to see that the record at bottom of stack is not a warped one.) To make this adjustment, loosen Lock-Nut AP (CE) and turn Pickup Sleeve DB to lengthen or shorten Pickup Plunger DA. However, if Pickup is made to rise too close to bottom record, Stud DD may never clear the groove in Cam Gear. In making this adjustment, therefore, care must be taken to see that Pickup arm does not keep moving back and forth continuously (due to Stud DD remaining in engagement with groove). When correct adjustment is found, tighten Lock Nut securely.

Replacing Motor

The service mechanic may be called upon to adapt the Changer to a different power supply. For this purpose, or in case of any serious fault within Motor, remove entire Motor EA (with Record Pin and connecting gear drive) from the Changer, and replace it with a suitable new Motor. (In ordering a replacement Motor, specify the power supply and give Model Number at EN; also make and model number of phono-radio or other type of installation.)

When mounting replacement Motor, it is most important to see that Record Pin is centered between the two Posts of the Changer, that it stands perpendicular to Main Plate EB, and that it has not become bent. When the new Motor has been attached, with three screws through Grommet Sleeves FF into its frame, and Record Pin is seen to revolve without appreciable wobble (a wobble would indicate that it has been bent in transit from factory) the correct position of Pin midway between the Posts can be accurately checked in this way: Place a single 12" record on the Shelf Plates BK, press "R" button, and turn Turntable forward by hand. Immediately after the Shelf Plates open and let it fall, turn Turntable slightly backward, and with other hand support the record between the Shelf Plates; it can then be readily seen whether Record Pin is off center. If it is, remove the record and Turntable, and loosen slightly the screw or screws BF nearest the Shelf Plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at FE, showing a shim in place upon one of the Grommet Sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard--or an assortment of shims of different thicknesses can be had from factory (order "Assortment of P-1397 Shims"). They should be inserted, around proper screws (when screws have been sufficiently loosened) between Motor Frame and the metal Grommet Sleeve. Do not insert shims next to rubber grommet.

WESTINGHOUSE ELEC. INTERNATIONAL CO.

MODEL WR315
Socket,Trimmers
Chassis

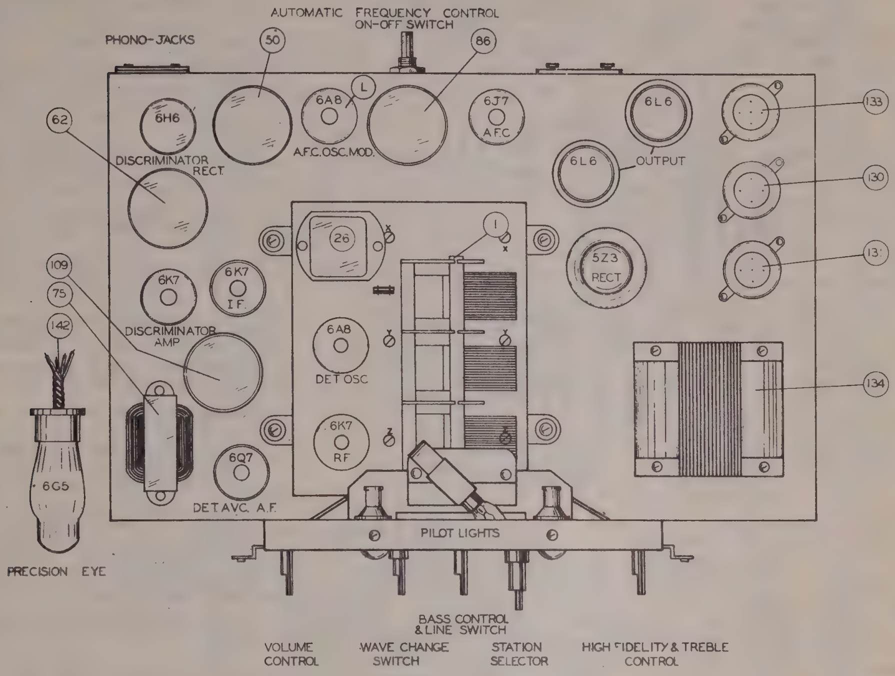


Figure No. 1

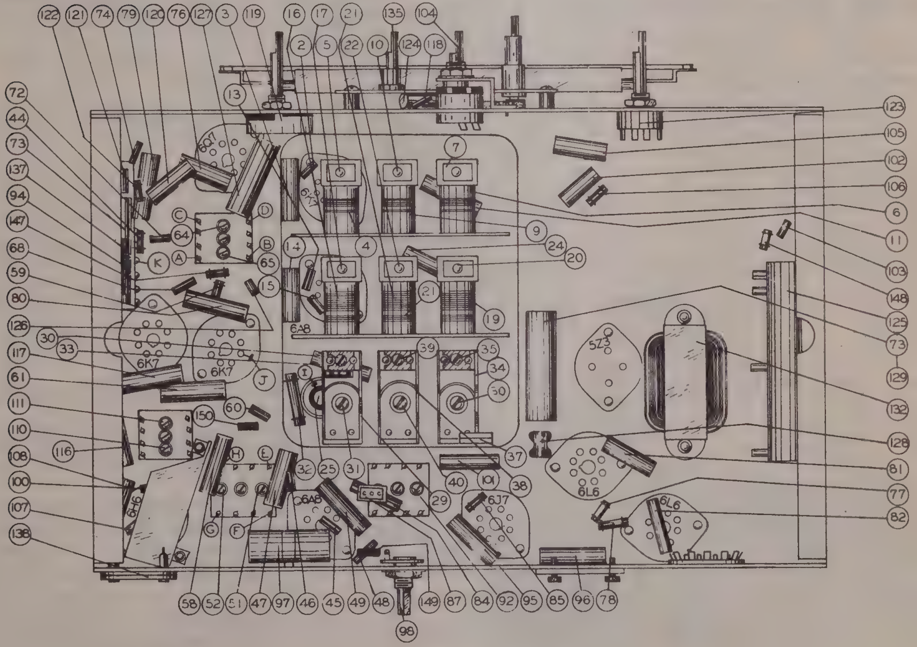
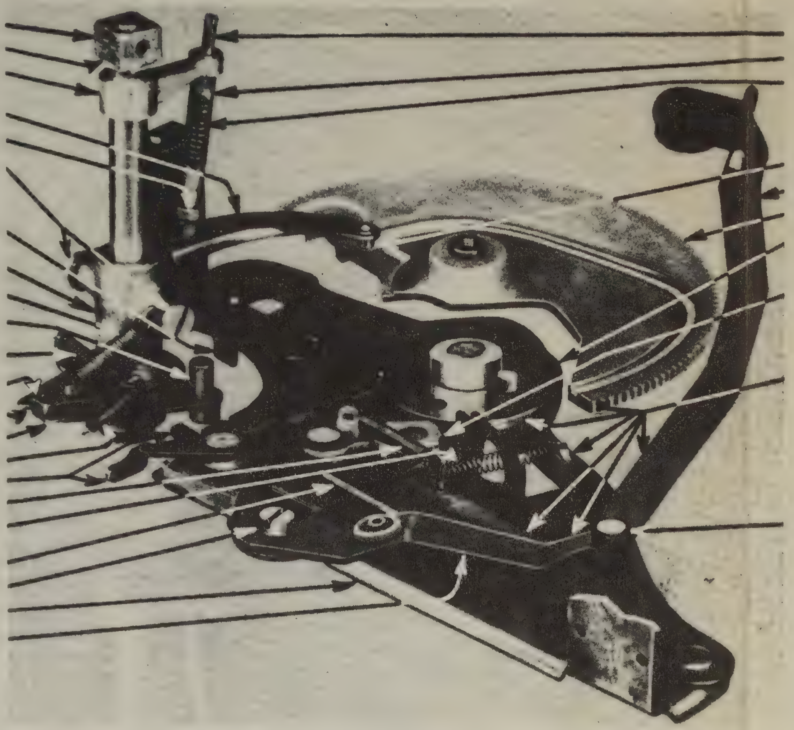


Figure No. 2

MODEL 8A30,Automatic Record Changer Assembly Views,Adjustments

P-12123	Swivel Shaft and Head Assem.	CA
P-2522	Fibre Washer (2 required)	CB
P-12048	Lifter Guide	CC
P-12111	Swivel Guide Arm Assembly	CD
P-12003	Lifter Rod Nut (AP)	CE
P-12072	Trunnion Shoulder Screw (2 reqd.)	CF
	Link	CG
P-12701	Swivel Tube and Trunnion Assem.	CH
P-12087	Swivel Guide Arm Spring	CI
	Trip Adjusting Cam	CJ
P-12089	Swivel Spreader Spring	CK
P-12703	Stop Lever and Trigger Adj.Assem.	CL
P-12026	Upper Swivel Spreader	CM
P-12027	Lower Swivel Spreader	CN
P-12099	Pickup Leader Spring (ER)	CO
	Trigger.	CP
P-12084	Pawl Spring	CQ
P-12085	Cam Lever Spring	CR
	Cam Lever	CS
P-12007	Shoulder Screw	CT
	Sub-Plate	CU
	Cam Connecting Rod Lift	CV



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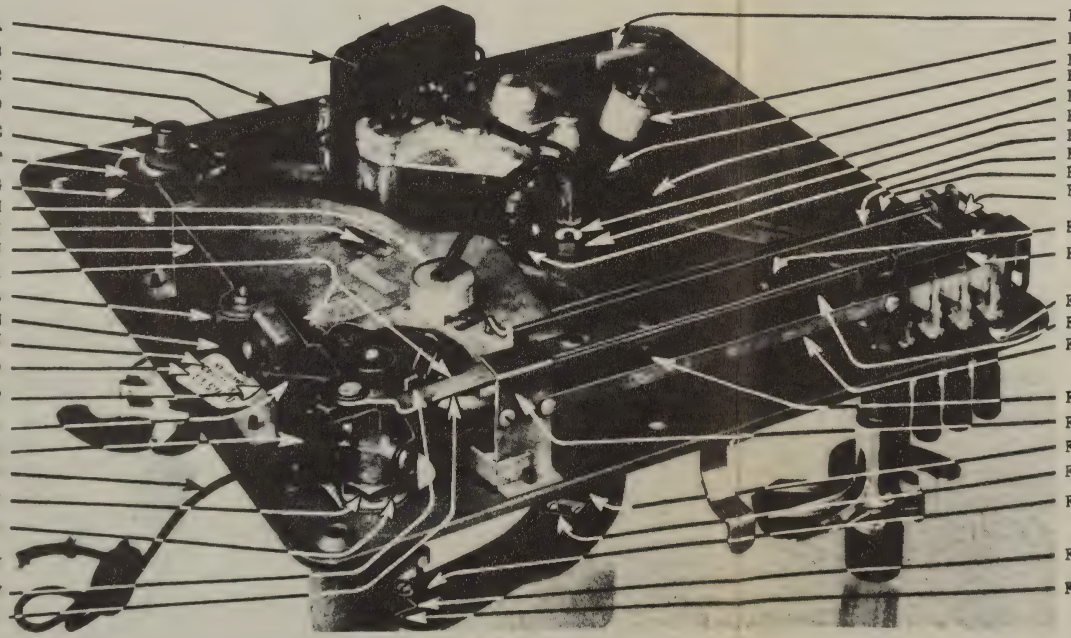
DI	Sub-Plate and Gear Assembly	P-12709
DJ	Roller	

Photo C-D. View of Sub-Plate Assembly, Together with Certain Other Assemblies

(Give Model No. as at EN)	Changer Motor	EA
(Give Model No.)	Main Mounting Plate Assm.	EB
	Cam Connecting Rod	EC
P-12400	Changer Shaft Collar	ED
	Spreader Hub Assembly	EE
P-12045	Spring Roller	EF
P-12088	Changer Spreader Spring	EG
	Cycling Switch	EH
P-12085	Cam Lever Spring	EI
P-12709	Sub-Plate and Gear Assem. (DI)	EJ
P-12116	Adjusting Rod Assembly	EK
	Cam Connecting Rod Lift (CV).	EL
P-12083	Cam Connecting Rod Lift Spring	EM
	Changer Model Number	EN
	Changer Serial Number	EO
P-12505	Rejection Rod Support	EP
P-12084	Adjusting Rod Lever Spring	EQ
P-12099	Pickup Leader Spring (CO)	ER
(Give Model No. as at EN)	Pickup Cord	ES
P-12053	Post Nut	ET
#1228	Shakeproof Washer	EU
M-93	Male Plug (on end of cord)	EV
	Lug on Lever-Hub Assem.	EW
	Adjusting Rod	EX



FA	On-Off Switch (Give Model No.; see at EN)	
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Photo E-F. Bottom View

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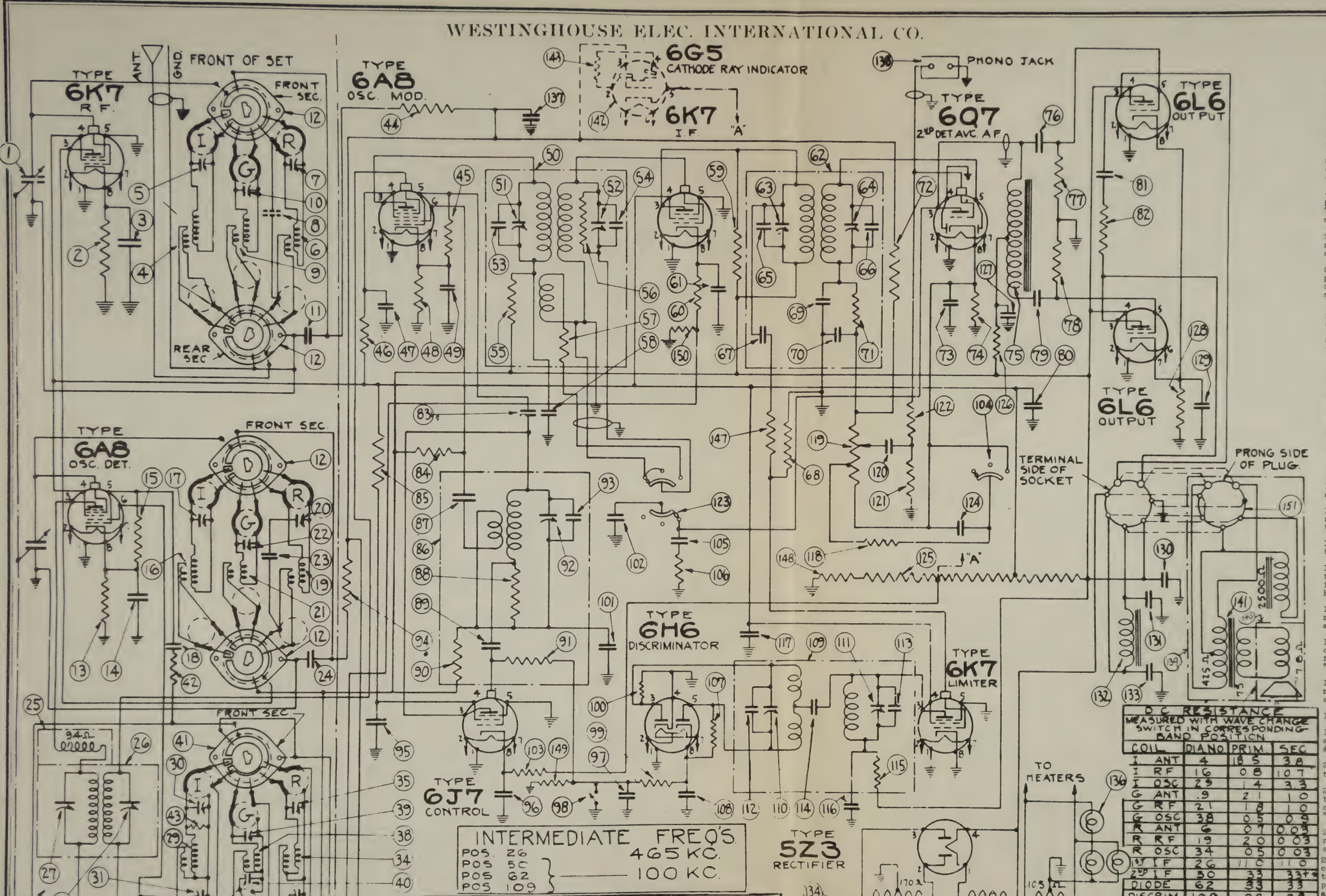
WESTINGHOUSE ELEC. INTERNATIONAL CO.

MODEL WR315

Schematic Alignment



INTERMEDIATE FREQ'S	
POS. 26	465 KC.
POS 50 POS 62 POS 109	100 KC.

SOCKET VOLTAGE-LINE: 115 VOLTS TAKEN FROM BOTTOM OF SOCKET
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL	PIN NOS	PLATE	PIN NOS	SCREEN	PIN NOS	BIAS	PIN NOS
6K7	R F	6.25	2-7	220	3-1	90	4-1	4.25	8-1
6A8	OSC-DET.	6.25	2-7	[illegible]	[illegible]	90	4-1	5.6	8-1
6A8	OSC-MOD	6.25	2-7	[illegible]	[illegible]	85	4-1	6.5	8-1
6K7	I F	6.25	2-7	215	3-1	90	4-1	6.5	8-1
6Q7	2ND DET AVC AF	6.25	2-7	200	3-1			2.25	8-1
6L6	OUTPUT	6.25	2-7	395	3-1	215	4-1	15.5	8-1
6J7	CONTROL	6.25	2-7	215	3-1	85	4-1	3.8	8-1
6H6	DISCRIM	6.25	2-7						
6K7	LIMITER	6.25	2-7	215	3-1	90	4-1		
5Z3	RECTIFIER	5		400					
6G5	CATH RAY	6.25		215					

D C RESISTANCE
MEASURED WITH WAVE CHANGE SWITCH IN CORRESPONDING BAND POSITION

COIL	DIA NO	PRIM.	SEC
I ANT	4	18.5	3.8
I RF	16	0.8	10.7
I OSC	29	1.4	3.3
G ANT	.9	2.1	1.0
G RF	21	1.8	1.0
G OSC	38	0.5	0.9
R ANT	6	0.7	0.03
R RF	19	2.0	0.03
R OSC	34	0.5	0.03
1ST I F	26	11.0	11.0
2ND I F	50	33	33+*
DIODE	62	33	33
DISCRIM	109	28	28
OSC	86	120	5.0
CHOKE (POW SUP)	132	92	
INTERSTAGE	75	4000	9200

*2.5 COUPLING WINDING

ADJUSTMENT OF I.F., CONTROL OSCILLATOR AND DISCRIMINATOR

1. Set the volume control on full and turn the bass control to the bass position (position immediately after set is turned

2. Connect the output meter across the voice coil of the speaker.

3. Set the test oscillator to 100 KC., and adjust the output to give a readable deflection on the output meter when the signal is applied to the grid of the 6K7 I.F. amplifier tube through a 0.5 mfd. blocking condenser.

4. Connect a 10,000 ohm resistor across the primary winding of the third I.F. coil #62. This should be connected to terminals marked "A" and "B" in Figure #2.

5. Adjust trimmer #64 to maximum output, reducing the output of the test oscillator as required.

6. Remove the 10,000 ohm resistor from the primary side of I.F. coil #62 and connect across the secondary winding from terminals marked "C" and "D".

7. Adjust trimmer #63 to maximum output, reducing the output of the test oscillator as required. Remove 10,000 ohm resistor.

8. Turn switch #98 to the left-hand position (viewed from rear of chassis).

9. Set the output of the test oscillator to a high level.

10. Connect a 0 to 5 microammeter across resistor #149 and adjust trimmer condenser #111 to maximum swing of the microammeter, keeping the output of the signal generator set to apoint which will give a deflection of approximately 5 microamperes when condenser #111 is tuned to maximum deflection. WHEN THE SIGNAL GENERATOR IS SET TO THIS OUTPUT, DO NOT ALTER THE OUTPUT OF THE SIGNAL GENERATOR UNTIL THE ALIGNMENT OF THE DISCRIMINATOR CIRCUIT IS COMPLETED.

11. Adjust trimmer #110 until the microammeter reading is reduced exactly to zero.

12. Turn switch #98 to the right-hand position and proceed with the alignment of the I.F.

13. Apply the test signal to the grid of the 6A8 oscillator-modulator tube.

14. Connect the 10,000 ohm resistor across the primary of I.F. coil #50 by connecting it to the terminals marked "E" and "F" in Figure #2.

15. Adjust trimmer #52 to maximum output, reducing the output of the test oscillator as required.

16. Remove the 10,000 ohm resistor and connect across the secondary of I.F. transformer #50. Connect to terminals marked "G" and "H".

17. Adjust trimmer #51 to maximum output, reducing the output of the test oscillator as required.

18. Remove the 10,000 ohm resistor.

19. Set the test oscillator to 465 KC., and adjust the control oscillator trimmer #92 to maximum output.

20. Apply the test signal to the grid of the type 6A8 oscillator-detector tube.

21. Connect the 10,000 ohm resistor across the primary of I.F. transformer #26 by connecting it to the points marked "J" and "K" in Figure #2.

22. Adjust trimmer #28 to maximum output, reducing the output of the test oscillator as required.

23. Remove the 10,000 ohm resistor and connect across the secondary of the I.F. transformer #26 by connecting it to the points marked "L" and "M" in Figures #1 and #2.

24. Adjust trimmer #27 to maximum output, reducing the output of the test oscillator as required. Remove the 10,000 ohm resistor.

ELECTRICAL SPECIFICATIONS continued

Type and Number of Tubes ------ 3 #6K7, 2 #6A8, 1 #6Q7, 2 #6L6, 1 #6H6, 1 #6J7, 1 #5Y3, 1 #6G5 - Total 12
Power Supply Characteristics -------------------- 105 to 125 volt, 50 to 60 cycle A.C.
Power Consumption -- 125 Watts
Maximum Output -- 21 Watts
Maximum Undistorted Output -- 12.5 Watts
Tuning Ranges ------------------------------------ (White Band - 525 to 1,800 KC.
(Green Band - 1750 to 6,000 KC.
(Red Band - 5800 to 18,500 KC.
Line-Up Frequencies ---------- 100 KC., 465 KC., 1600 KC., 570 KC., 5500 KC., 1900 KC., 17,000 KC., and 6000 KC.

MODEL WR315
Alignment,Part 2
Parts List

WESTINGHOUSE ELEC. INTERNATIONAL CO.

ADJUSTMENT OF BROADCAST BAND (CONT.)

1. Set the wave-change switch to the White or Broadcast Band position.

2. Set the test oscillator and dial indicator to 1600 KC.

3. Apply the test signal to the antenna terminal of the chassis through a .0002 mfd. series condenser and adjust the oscillator trimmer condenser #30 until the signal is received at a maximum.

4. Adjust trimmers #17 and #5 to maximum output.

5. Set the test oscillator and dial indicator to 570 KC., and adjust the oscillator series condenser #31 to maximum output, at the same time rocking the condenser gang.

6. Return both the test oscillator and dial indicator to 1600 KC., and check the adjustment of trimmers #30, #17 and #5 for accuracy.

ADJUSTMENT OF GREEN BAND

NOTE: In adjusting the two short-wave oands (Green and Red) a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

1. Set the wave-change switch to the Green Band position.

2. Set the test oscillator and dial indicator to 5500 KC., and adjust the oscillator trimmer condenser #39 until the signal is received at a maximum.

3. Adjust trimmer condensers #22 and #10 to maximum output.

4. Set the test oscillator and dial indicator to 1900 KC., and adjust the oscillator series condenser #40 to maximum output, at the same time rocking the condenser gang.

5. Return both the test oscillator and dial indicator to 5500 KC., and check the adjustment of trimmers #39, #22 and #10 for accuracy.

ADJUSTMENT OF RED BAND

1. Set the wave-change switch to the Red Band position.

2. Set the test oscillator and dial indicator to 17000 KC., and adjust the oscillator trimmer condenser #35 until the signal is received.

NOTE: When adjusting the oscillator trimmer condenser #35 it will be possible to secure two peaks. The peak secured with the trimmer screw turned farthest out should be used. When aligned on the correct peak a strong signal will be heard at 17000 KC., and a weaker signal at approximately 16000 KC. No signal should be heard at 18000 KC.

3. Adjust trimmer condensers #20 and #7 to maximum output.

4. Set the test oscillator and dial indicator to 6000 KC., and adjust the oscillator series condenser #36 to maximum output, at the same time rocking the condenser gang.

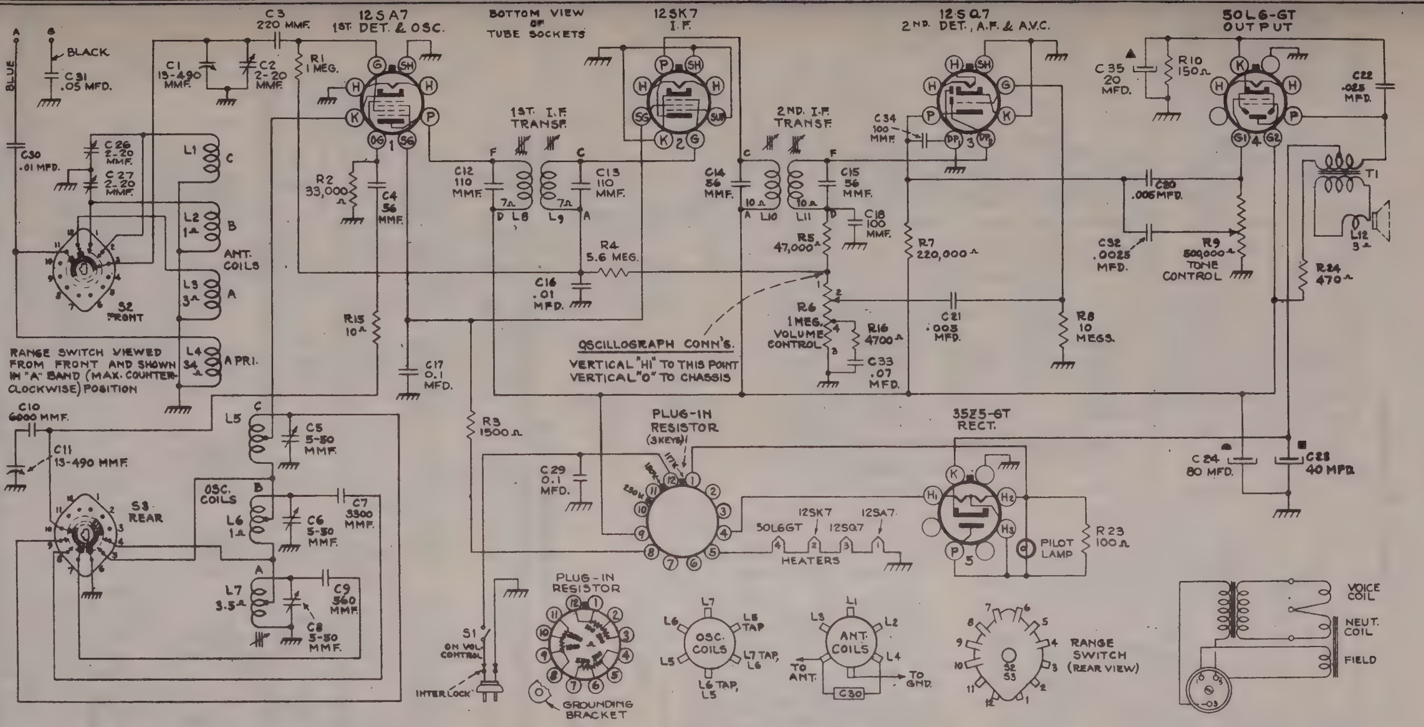
5. Return both the test oscillator and dial indicator to 17000 KC., and check adjustment of trimmers #35, #20 and #7 for accuracy.

IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condensers will come out through the air vents, making the condenser appear to be defective. If left in this position too long the condenser may be injured.

Dia. #	Part #	Description of Parts
1	CG 9551	Variable condenser
2	RE 95102	600 ohm, 1/4 W. resistor
3	CW 2-05	.05 mfd., 200 V. condenser
4	RC 95209	Antenna coil - Broadcast
5	CS 9554	4-30 mmf. trimmer condenser
6	RC 95206	Antenna coil - Red Band
7	CS 9554	4-30 mmf. trimmer condenser
8		Twisted wire - part of RC 95206
9	RC 95212	Antenna coil - Green Band
10	CS 9554	4-30 mmf. trimmer condenser
11	CW 9513	.05 mfd., 200 V. condenser
12	SW 9553	Switch and bracket assembly - antenna and R.F. sections
13	RE 95102	600 ohm, 1/4 W. resistor
14	CW 2-05	.05 mfd., 200 V. condenser
15	RE 9563	50,000 ohm, 1/2 W. insulated resistor
16	RC 95210	R.F. coil - Broadcast
17	CS 9554	4-30 mmf. trimmer condenser
18	CM 9511	.000065 mfd. mica condenser
19	RC 95207	R.F. coil - Red Band
20	CS 9554	4-30 mmf. trimmer condenser
21	RC 95214	R.F. coil - Green Band
22	CS 9553	1.5-10 mmf. trimmer condenser
23	CM 9512	6 mmf. mica condenser
24	CW 9513	.05 mfd., 200 V. condenser
25	RC 95266	Choke coil assembly
26	IC 9582	1st I.F. coil (465 KC.)
27		35-130 mmf. trimmer condenser - part of IC 9582
28		35-130 mmf. trimmer condenser - part of IC 9582
29	RC 95272	Oscillator coil - Broadcast
30		5-25 mmf. trimmer condenser - part of CS 9540
31		300-600 mmf. trimmer condenser - part of CS 9540
32	RE 9526	5000 ohm, 1 W. resistor
33	CW 9513	.05 mfd., 200 V. condenser
34	RC 95208	Oscillator coil - Red Band
35		3-15 mmf. trimmer condenser - part of CS 9520
36		800-1600 mmf. trimmer condenser - part of CS 9520
37	CM 959	.002 mfd. mica condenser
38	RC 95213	Oscillator coil - Green Band
39		3-15 mmf. trimmer condenser - part of CS 9520
40		800-1600 mmf. trimmer condenser - part of CS 9520
41	SW 9554	Switch and bracket assembly - oscillator section
42	RE 9537	50 ohm, 1/4 W. resistor
43	RE 95125	20,000 ohm, 1/2 W. insulated resistor
44	RE 95103	100,000 ohm, 1/2 W. insulated resistor
45	RE 9563	50,000 ohm, 1/2 W. insulated resistor
46	RE 95106	1000 ohm, 1/2 W. insulated resistor
47	CW 2-05	.05 mfd., 200 V. condenser
48	RE 9567	600 ohm, 1/2 W. insulated resistor
49	CW 2-05	.05 mfd., 200 V. condenser
50	IC 9584	2nd I.F. coil (100 KC.)
51		80-200 mmf. trimmer condenser - part of IC 9584
52		80-200 mmf. trimmer condenser - part of IC 9584
53	CM 9528	350 mmf. mica condenser
54	CM 9528	350 mmf. mica condenser
55	RE 95106	1000 ohm, 1/2 W. insulated resistor
56	RE 95103	100,000 ohm, 1/2 W. insulated resistor
57	RE 95104	75 ohm, 1/2 W. insulated resistor
58	CW 4-05	.05 mfd., 400 V. condenser
59	RE 95103	100,000 ohm, 1/2 W. insulated resistor
60	RE 9567	600 ohm, 1/2 W. insulated resistor
61	CW 2-05	.05 mfd., 200 V. condenser
62	IC 9585	3rd I.F. coil (100 KC.)
63		80-200 mmf. trimmer condenser - part of IC 9585
64		80-200 mmf. trimmer condenser - part of IC 9585
65	CM 9528	350 mmf. mica condenser
66	CM 9528	350 mmf. mica condenser
67	CM 953	50 mmf. mica condenser
68	RE 95105	1 meg., 1/2 W. insulated resistor
69		100 mmf. mica condenser - part of IC 9585
70		100 mmf. mica condenser - part of IC 9585
71	RE 9524	50,000 ohm, 1/4 W. resistor
72	RE 95113	1/2 meg., 1/2 W. insulated resistor
73	CE 9515	12 mfd., 25 V. electrolytic condenser
74	RE 95114	2000 ohm, 1/2 W. insulated resistor
75	TR 9579	Interstage transformer
76	CW 4-02	.02 mfd., 400 V. condenser
77	RE 95112	1/4 meg., 1/2 W. insulated resistor
78	RE 95112	1/4 meg., 1/2 W. insulated resistor
79	CW 4-02	.02 mfd., 400 V. condenser
80	CW 2-05	.05 mfd., 200 V. condenser
81	CW 4-005	.005 mfd., 400 V. condenser
82	RE 95111	20,000 ohm, 1 W. insulated resistor
83	CM 953	50 mmf. mica condenser
84	RE 95110	15,000 ohm, 1 W. insulated resistor
85	RE 95106	1000 ohm, 1/2 W. insulated resistor
86	RC 95265	Oscillator coil (365 KC.)
87	CM 9519	500 mmf. mica condenser
88	RE 95107	75 ohm, 1/8 W. resistor
89	CM 953	50 mmf. mica condenser
90	RE 95106	1000 ohm, 1/2 W. insulated resistor
91	RE 95105	1 meg., 1/2 W. insulated resistor
92		45-135 mmf. trimmer condenser - part of RC 95265
93	CM 956	250 mmf. mica condenser
94	RE 95103	100,000 ohm, 1/2 W. insulated resistor
95	CW 2-05	.05 mfd., 200 V. condenser
96	CW 2-05	.05 mfd., 200 V. condenser
97	CW 9525	1 mfd., 100 V. condenser
98	SW 9563	A. F. C. switch
99	RE 95105	1 meg., 1/2 W. insulated resistor
100	RE 95105	1 meg., 1/2 W. insulated resistor
101	CW 4-05	.05 mfd., 400 V. condenser
102	CW 4-01	.01 mfd., 400 V. condenser
103	RE 95126	300 ohm, 1/2 W. insulated resistor
104	VR 9542	Bass control
105	CW 4-02	.02 mfd., 400 V. condenser
106	RE 95103	100,000 ohm, 1/2 W. insulated resistor
107	RE 95105	1 meg., 1/2 W. insulated resistor
108	CW 2-05	.05 mfd., 200 V. condenser
109	IC 9583	Discriminator coil
110		80-200 mmf. trimmer condenser - part of IC 9583
111		80-200 mmf. trimmer condenser - part of IC 9583
112	CM 9528	350 mmf. mica condenser
113	CM 9528	350 mmf. mica condenser
114	CM 9519	500 mmf. mica condenser
115	RE 95106	1000 ohm, 1/2 W. insulated resistor
116	CW 4-05	.05 mfd., 400 V. condenser
117	CW 2-05	.05 mfd., 200 V. condenser
118	RE 95124	5000 ohm, 1/2 W. insulated resistor
119	VR 9536	Volume control - 1/2 meg.
120	CW 4-02	.02 mfd., 400 V. condenser
121	RE 95105	1 meg., 1/2 W. insulated resistor
122	RE 95103	100,000 ohm, 1/2 W. insulated resistor
123	SW 9564	Treble control
124	CW 2-05	.05 mfd., 200 V. condenser
125	RE 9597	140-4500-4500 ohm tapped resister
126	RE 95124	5000 ohm, 1/2 W. insulated resistor
127	CW 4-25	.25 mfd., 400 V. condenser
128	RE 9598	170 ohm, 4 W. resistor
129	CE 9515	12 mfd., 25 V. electrolytic condenser
130	CE 9535	16 mfd., 300 V. electrolytic condenser
131	CE 9528	8 mfd., 450 V. electrolytic condenser
132	TR 9573	Choke coil
133	CE 9536	12 mfd., 450 V. electrolytic condenser
134	TR 9580	Power transformer
135		On-Off switch - part of VR 9542
136	LP 9515	Dial lamp (3.2 V., - 0.35 amp.)
137	CW 2-05	.05 mfd., 200 V. condenser
138	SA 100050	Phono-jack
139	SK 9546	Speaker
140	DM 9518	Diaphragm and voice coil
141	TR 9595	Output transformer
142	CB 9598	Cable to "precision eye"
143		1 meg., 1/4 W. resistor - part of CB 9598
146	CB 9512	Line cable
147	RE 95103	100,000 ohm, 1/2 W. insulated resistor
148	RE 9556	25 ohm, 1/4 W. resistor
149	RE 95113	1/2 meg., 1/2 W. insulated resistor
150	RE 95108	3000 ohm, 1/2 W. insulated resistor
151	PG 9567	Speaker plug

RCA MFG. CO., INC.

MODEL 5Q66
Ch.RC-477C
Schematic,Voltage



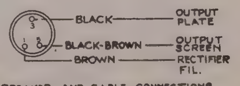
TUBES	117 V. SUPPLY				180 V. SUPPLY				230 V. SUPPLY			
	VOLTAGE			CURRENT	VOLTAGE			CURRENT	VOLTAGE			CURRENT
	P	SG	K	K	P	SG	K	K	P	SG	K	K
(1) 12SA7	106	89	—	8.3	137	98	—	12.8	146	87	—	12.8
(2) 12SK7	106	89	—	16.0	137	98	—	17.9	146	87	—	17.9
(3) 12SQ7	58*	—	—	.2	70*	—	—	.3	74*	—	—	.3
(4) 50L6-GT	114	106	6.5	45.8	142	137	8.3	50.0	157	146	8.9	52.0
(5) 35Z5-GT	—	—	119	70.3	—	—	150	80.0	—	—	160	83.0

VOLTAGES SHOULD HOLD WITHIN ± 20%.

* CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.

— 1940 —

First Edition



SPEAKER AND CABLE CONNECTIONS

T-93176
5Q66 (RC477C)

Frequency Ranges

Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)	7.0-22 mc (42.8-13.6 m)
Intermediate Frequency	455 kc

Power Output Rating
(210-250 Volt Operation)

Undistorted	3.0 watts
Maximum	4.5 watts

Loudspeaker (84905-501)

Type	5-inch
V. C. Impedance	4.5 ohms at 400 cycles

Power Supply Ratings

105-125 volts	30 watts
160-180 volts	45 watts
210-250 volts	60 watts

Pilot Lamp..........Mazda No. 47, 6.3 volts, 0.15 amp.

Ballast Tube..................RCA Stock No. 35748

WESTINGHOUSE ELEC. INTERNATIONAL CO.

MODEL WR315
Socket,Trimmers
Chassis

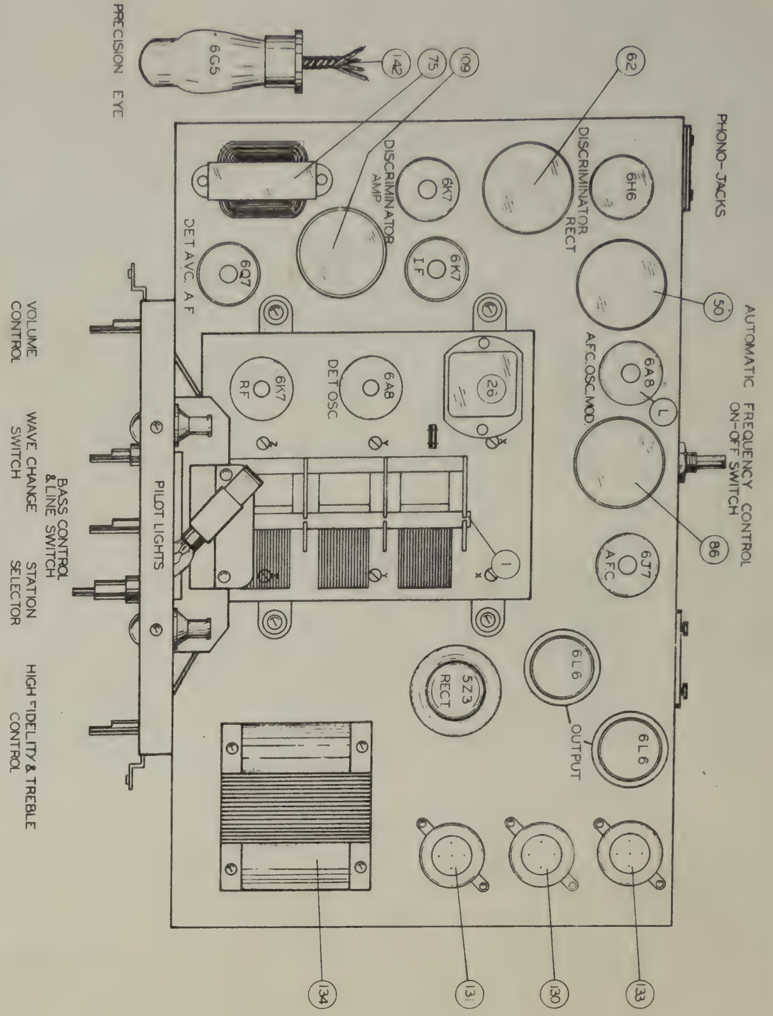


Figure No. 1

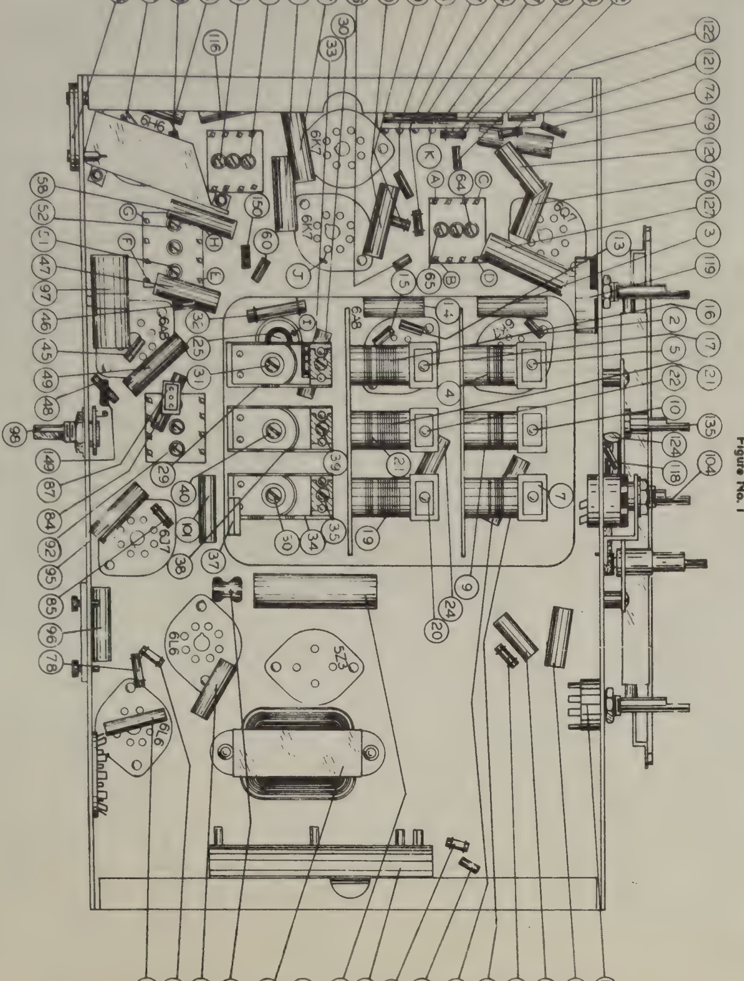


Figure No. 2

MODEL WR315
Alignment,Part 2
Parts List

WESTINGHOUSE ELEC. INTERNATIONAL CO.

ADJUSTMENT OF BROADCAST BAND (CONT.)

1. Set the wave-change switch to the White or Broadcast Band position.

2. Set the test oscillator and dial indicator to 1600 KC.

3. Apply the test signal to the antenna terminal of the chassis through a .0002 mfd. series condenser and adjust the oscillator trimmer condenser #30 until the signal is received at a maximum.

4. Adjust trimmers #17 and #5 to maximum output.

5. Set the test oscillator and dial indicator to 570 KC., and adjust the oscillator series condenser #31 to maximum output, at the same time rocking the condenser gang.

6. Return both the test oscillator and dial indicator to 1600 KC., and check the adjustment of trimmers #30, #17 and #5 for accuracy.

ADJUSTMENT OF GREEN BAND

NOTE: In adjusting the two short-wave oands (Green and Red) a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

1. Set the wave-change switch to the Green Band position.

2. Set the test oscillator and dial indicator to 5500 KC., and adjust the oscillator trimmer condenser #39 until the signal is received at a maximum.

3. Adjust trimmer condensers #22 and #10 to maximum output.

4. Set the test oscillator and dial indicator to 1900 KC., and adjust the oscillator series condenser #40 to maximum output, at the same time rocking the condenser gang.

5. Return both the test oscillator and dial indicator to 5500 KC., and check the adjustment of trimmers #39, #22 and #10 for accuracy.

ADJUSTMENT OF RED BAND

1. Set the wave-change switch to the Red Band position.

2. Set the test oscillator and dial indicator to 17000 KC., and adjust the oscillator trimmer condenser #35 until the signal is received.

NOTE: When adjusting the oscillator trimmer condenser #35 it will be possible to secure two peaks. The peak secured with the trimmer screw turned farthest out should be used. When aligned on the correct peak a strong signal will be heard at 17000 KC., and a weaker signal at approximately 16000 KC. No signal should be heard at 18000 KC.

3. Adjust trimmer condensers #20 and #7 to maximum output.

4. Set the test oscillator and dial indicator to 6000 KC., and adjust the oscillator series condenser #36 to maximum output, at the same time rocking the condenser gang.

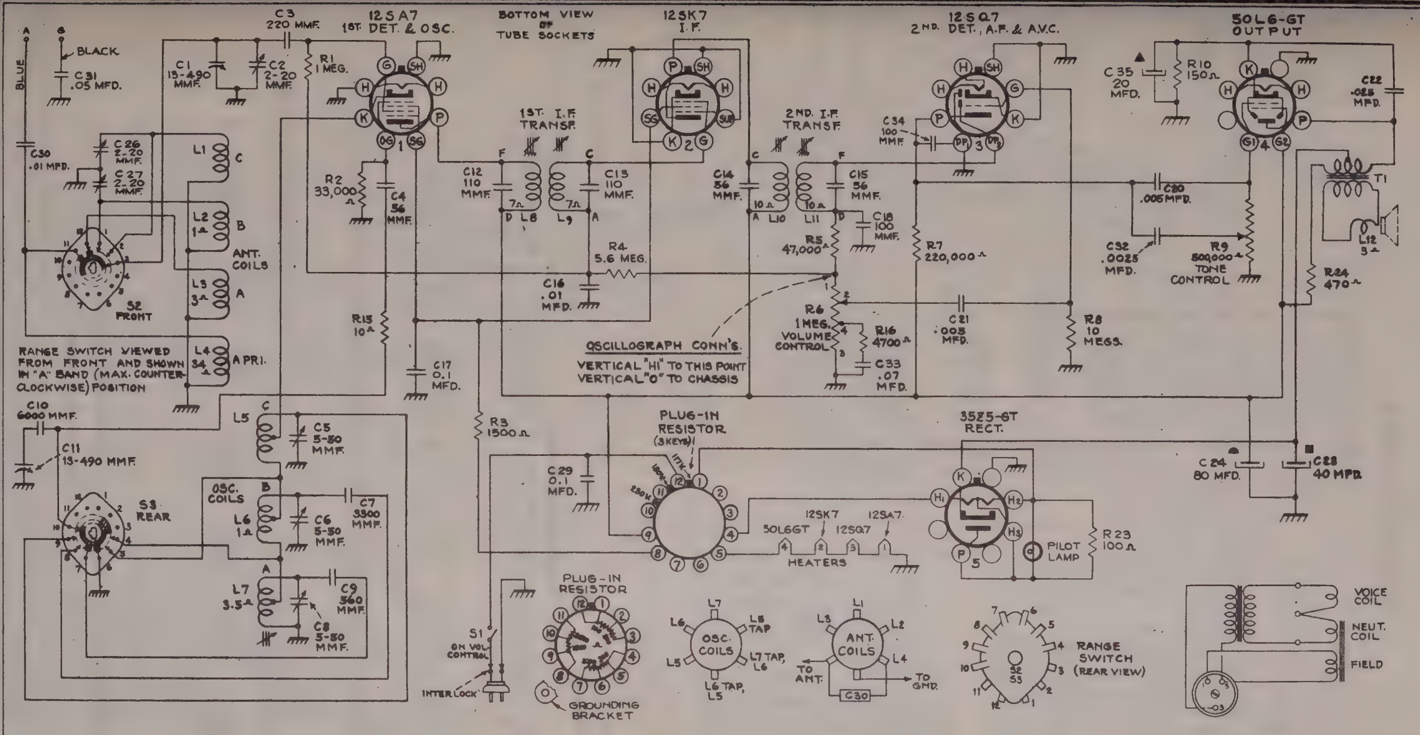
5. Return both the test oscillator and dial indicator to 17000 KC., and check adjustment of trimmers #35, #20 and #7 for accuracy.

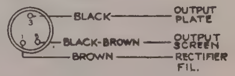
IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condensers will come out through the air vents, making the condenser appear to be defective. If left in this position too long the condenser may be injured.

Dia. #	Part #	Description of Parts
1	CG 9551	Variable condenser
2	RE 95102	600 ohm, 1/4 W. resistor
3	CW 2-05	.05 mfd., 200 V. condenser
4	RC 95209	Antenna coil - Broadcast
5	CS 9554	4-30 mmf. trimmer condenser
6	RC 95206	Antenna coil - Red Band
7	CS 9554	4-30 mmf. trimmer condenser
8		Twisted wire - part of RC 95206
9	RC 95212	Antenna coil - Green Band
10	CS 9554	4-30 mmf. trimmer condenser
11	CW 9513	.05 mfd., 200 V. condenser
12	SW 9553	Switch and bracket assembly - antenna and R.F. sections
13	RE 95102	600 ohm, 1/4 W. resistor
14	CW 2-05	.05 mfd., 200 V. condenser
15	RE 9563	50,000 ohm, 1/2 W. insulated resistor
16	RC 95210	R.F. coil - Broadcast
17	CS 9554	4-30 mmf. trimmer condenser
18	CM 9511	.000065 mfd. mica condenser
19	RC 95207	R.F. coil - Red Band
20	CS 9554	4-30 mmf. trimmer condenser
21	RC 95214	R.F. coil - Green Band
22	CS 9553	1.5-10 mmf. trimmer condenser
23	CM 9512	6 mmf. mica condenser
24	CW 9513	.05 mfd., 200 V. condenser
25	RC 95266	Choke coil assembly
26	IC 9582	1st I.F. coil (465 KC.)
27		35-130 mmf. trimmer condenser - part of IC 9582
28		35-130 mmf. trimmer condenser - part of IC 9582
29	RC 95272	Oscillator coil - Broadcast
30		5-25 mmf. trimmer condenser - part of CS 9540
31		300-600 mmf. trimmer condenser - part of CS 9540
32	RE 9526	5000 ohm, 1 W. resistor
33	CW 9513	.05 mfd., 200 V. condenser
34	RC 95208	Oscillator coil - Red Band
35		3-15 mmf. trimmer condenser - part of CS 9520
36		800-1600 mmf. trimmer condenser - part of CS 9520
37	CM 959	.002 mfd. mica condenser
38	RC 95213	Oscillator coil - Green Band
39		3-15 mmf. trimmer condenser - part of CS 9520
40		800-1600 mmf. trimmer condenser - part of CS 9520
41	SW 9554	Switch and bracket assembly - oscillator section
42	RE 9537	50 ohm, 1/4 W. resistor
43	RE 95125	20,000 ohm, 1/2 W. insulated resistor
44	RE 95103	100,000 ohm, 1/2 W. insulated resistor
45	RE 9563	50,000 ohm, 1/2 W. insulated resistor
46	RE 95106	1000 ohm, 1/2 W. insulated resistor
47	CW 2-05	.05 mfd., 200 V. condenser
48	RE 9567	600 ohm, 1/2 W. insulated resistor
49	CW 2-05	.05 mfd., 200 V. condenser
50	IC 9584	2nd I.F. coil (100 KC.)
51		80-200 mmf. trimmer condenser - part of IC 9584
52		80-200 mmf. trimmer condenser - part of IC 9584
53	CM 9528	350 mmf. mica condenser
54	CM 9528	350 mmf. mica condenser
55	RE 95106	1000 ohm, 1/2 W. insulated resistor
56	RE 95103	100,000 ohm, 1/2 W. insulated resistor
57	RE 95104	75 ohm, 1/2 W. insulated resistor
58	CW 4-05	.05 mfd., 400 V. condenser
59	RE 95103	100,000 ohm, 1/2 W. insulated resistor
60	RE 9567	600 ohm, 1/2 W. insulated resistor
61	CW 2-05	.05 mfd., 200 V. condenser
62	IC 9585	3rd I.F. coil (100 KC.)
63		80-200 mmf. trimmer condenser - part of IC 9585
64		80-200 mmf. trimmer condenser - part of IC 9585
65	CM 9528	350 mmf. mica condenser
66	CM 9528	350 mmf. mica condenser
67	CM 953	50 mmf. mica condenser
68	RE 95105	1 meg., 1/2 W. insulated resistor
69		100 mmf. mica condenser - part of IC 9585
70		100 mmf. mica condenser - part of IC 9585
71	RE 9524	50,000 ohm, 1/4 W. resistor
72	RE 95113	1/2 meg., 1/2 W. insulated resistor
73	CE 9515	12 mfd., 25 V. electrolytic condenser
74	RE 95114	2000 ohm, 1/2 W. insulated resistor
75	TR 9579	Interstage transformer
76	CW 4-02	.02 mfd., 400 V. condenser
77	RE 95112	1/4 meg., 1/2 W. insulated resistor
78	RE 95112	1/4 meg., 1/2 W. insulated resistor
79	CW 4-02	.02 mfd., 400 V. condenser
80	CW 2-05	.05 mfd., 200 V. condenser
81	CW 4-005	.005 mfd., 400 V. condenser
82	RE 95111	20,000 ohm, 1 W. insulated resistor
83	CM 953	50 mmf. mica condenser
84	RE 95110	15,000 ohm, 1 W. insulated resistor
85	RE 95106	1000 ohm, 1/2 W. insulated resistor
86	RC 95265	Oscillator coil (365 KC.)
87	CM 9519	500 mmf. mica condenser
88	RE 95107	75 ohm, 1/8 W. resistor
89	CM 953	50 mmf. mica condenser
90	RE 95106	1000 ohm, 1/2 W. insulated resistor
91	RE 95105	1 meg., 1/2 W. insulated resistor
92		45-135 mmf. trimmer condenser - part of RC 95265
93	CM 956	250 mmf. mica condenser
94	RE 95103	100,000 ohm, 1/2 W. insulated resistor
95	CW 2-05	.05 mfd., 200 V. condenser
96	CW 2-05	.05 mfd., 200 V. condenser
97	CW 9525	1 mfd., 100 V. condenser
98	SW 9563	A. F. C. switch
99	RE 95105	1 meg., 1/2 W. insulated resistor
100	RE 95105	1 meg., 1/2 W. insulated resistor
101	CW 4-05	.05 mfd., 400 V. condenser
102	CW 4-01	.01 mfd., 400 V. condenser
103	RE 95126	300 ohm, 1/2 W. insulated resistor
104	VR 9542	Bass control
105	CW 4-02	.02 mfd., 400 V. condenser
106	RE 95103	100,000 ohm, 1/2 W. insulated resistor
107	RE 95105	1 meg., 1/2 W. insulated resistor
108	CW 2-05	.05 mfd., 200 V. condenser
109	IC 9583	Discriminator coil
110		80-200 mmf. trimmer condenser - part of IC 9583
111		80-200 mmf. trimmer condenser - part of IC 9583
112	CM 9528	350 mmf. mica condenser
113	CM 9528	350 mmf. mica condenser
114	CM 9519	500 mmf. mica condenser
115	RE 95106	1000 ohm, 1/2 W. insulated resistor
116	CW 4-05	.05 mfd., 400 V. condenser
117	CW 2-05	.05 mfd., 200 V. condenser
118	RE 95124	5000 ohm, 1/2 W. insulated resistor
119	VR 9536	Volume control - 1/2 meg.
120	CW 4-02	.02 mfd., 400 V. condenser
121	RE 95105	1 meg., 1/2 W. insulated resistor
122	RE 95103	100,000 ohm, 1/2 W. insulated resistor
123	SW 9564	Treble control
124	CW 2-05	.05 mfd., 200 V. condenser
125	RE 9597	140-4500-4500 ohm tapped resister
126	RE 95124	5000 ohm, 1/2 W. insulated resistor
127	CW 4-25	.25 mfd., 400 V. condenser
128	RE 9598	170 ohm, 4 W. resistor
129	CE 9515	12 mfd., 25 V. electrolytic condenser
130	CE 9535	16 mfd., 300 V. electrolytic condenser
131	CE 9528	8 mfd., 450 V. electrolytic condenser
132	TR 9573	Choke coil
133	CE 9536	12 mfd., 450 V. electrolytic condenser
134	TR 9580	Power transformer
135		On-Off switch - part of VR 9542
136	LP 9515	Dial lamp (3.2 V., - 0.35 amp.)
137	CW 2-05	.05 mfd., 200 V. condenser
138	SA 100050	Phono-jack
139	SK 9546	Speaker
140	DM 9518	Diaphragm and voice coil
141	TR 9595	Output transformer
142	CB 9598	Cable to "precision eye"
143		1 meg., 1/4 W. resistor - part of CB 9598
146	CB 9512	Line cable
147	RE 95103	100,000 ohm, 1/2 W. insulated resistor
148	RE 9556	25 ohm, 1/4 W. resistor
149	RE 95113	1/2 meg., 1/2 W. insulated resistor
150	RE 95108	3000 ohm, 1/2 W. insulated resistor
151	PG 9567	Speaker plug

MODEL 5Q66
Ch.RC-477C
Schematic,Voltage

RCA MFG. CO., INC.





SPEAKER AND CABLE CONNECTIONS

T-93176
5Q66(RC477C)

TUBES	117 V. SUPPLY				180 V. SUPPLY				230 V. SUPPLY			
	VOLTAGE			CURRENT	VOLTAGE			CURRENT	VOLTAGE			CURRENT
	P	SG	K	K	P	SG	K	K	P	SG	K	K
(1) 12SA7	106	89	—	8.3	137	98	—	12.8	146	87	—	12.8
(2) 12SK7	106	89	—	16.0	137	98	—	17.9	146	87	—	17.9
(3) 12SQ7	58*	—	—	.2	70*	—	—	.3	74*	—	—	.3
(4) 50L6-GT	114	106	6.5	45.8	142	137	8.3	50.0	157	146	8.9	52.0
(5) 35Z5-GT	—	—	119	70.3	—	—	150	80.0	—	—	160	83.0

VOLTAGES SHOULD HOLD WITHIN ± 20%.

* CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.

— 1940 —

First Edition

Frequency Ranges

Standard Broadcast ("A" Band). 540-1,720 kc (555-174 m)
Medium Wave ("B" Band)...... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band).......... 7.0-22 mc (42.8-13.6 m)

Intermediate Frequency.......................... 455 kc

Power Output Rating

(210-250 Volt Operation)
Undistorted.................................. 3.0 watts
Maximum...................................... 4.5 watts

Loudspeaker (84905-501)
Type.. 5-inch
V. C. Impedance................. 4.5 ohms at 400 cycles

Power Supply Ratings

105-125 volts.................................. 30 watts
160-180 volts.................................. 45 watts
210-250 volts.................................. 60 watts

Pilot Lamp...........Mazda No. 47, 6.3 volts, 0.15 amp.

Ballast Tube...................... RCA Stock No. 35748

MODEL 5Q66
Alignment,Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground lead (black), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

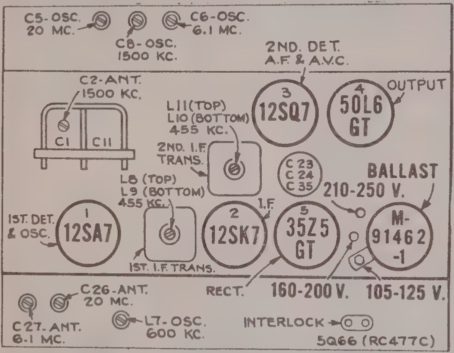
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	12SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.)* C26 (ant.)
7		6 mc	6 mc (148°) "B" Band	C6 (osc.)* C27 (ant.)
8	Antenna lead in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

* Use minimum capacity peak if two peaks can be obtained.

† Rock gang condenser slightly while adjusting L7.

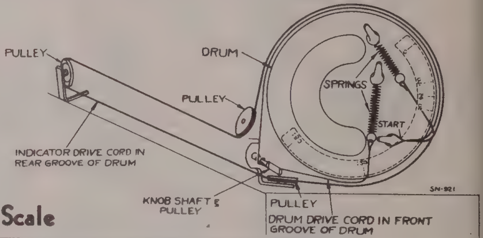
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.

Note.—Oscillator tracks 455 kc above signal on all bands.

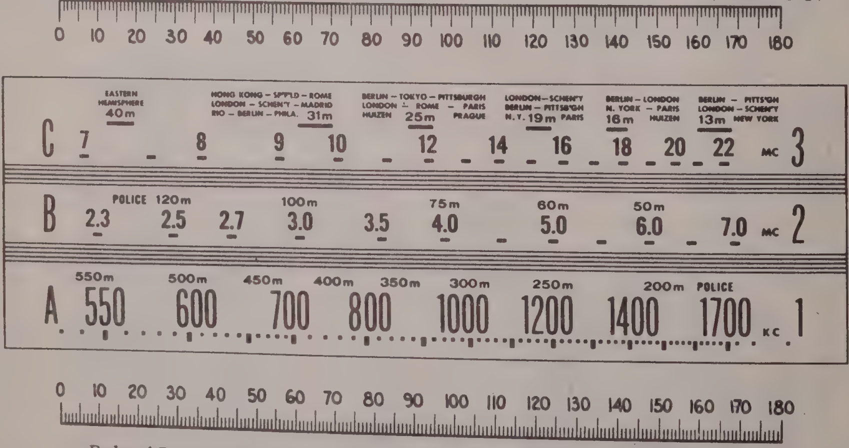


Above—Top View

At Right—Dial Mechanism


PULLEY
DRUM
PULLEY
SPRINGS
START
INDICATOR DRIVE CORD IN REAR GROOVE OF DRUM
KNOB SHAFT & PULLEY
PULLEY
DRUM DRIVE CORD IN FRONT GROOVE OF DRUM
SN-921

Calibration Scale

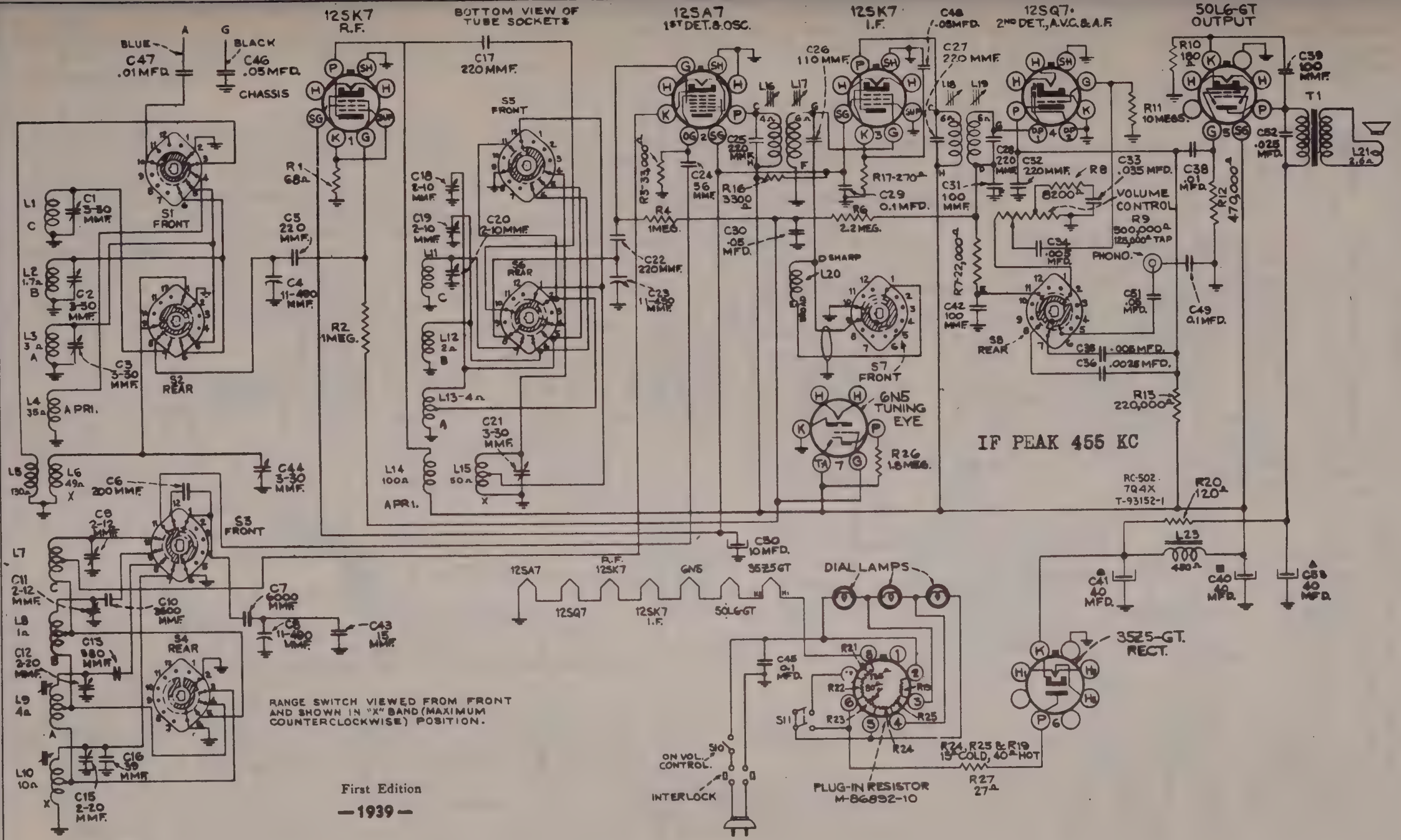


Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

MODEL 7Q4X
Ch.RC-502
Schematic

RCA MFG. CO., INC.



First Edition
—1939—

Pilot Lamps (3)	Mazda No. 47, 6.3 volts, .15 amp.

Power Supply Ratings

160-200 volts, 40-100 cycles	60 watts
160-200 volts, Direct Current	60 watts
210-250 volts, 40-100 cycles	70 watts
210-250 volts, Direct Current	70 watts

Loudspeaker (RL-90-1)

Type	8-inch permanent magnet dynamic
Voice Coil Impedance	2.6 ohms at 400 cycles

Power Output Rating

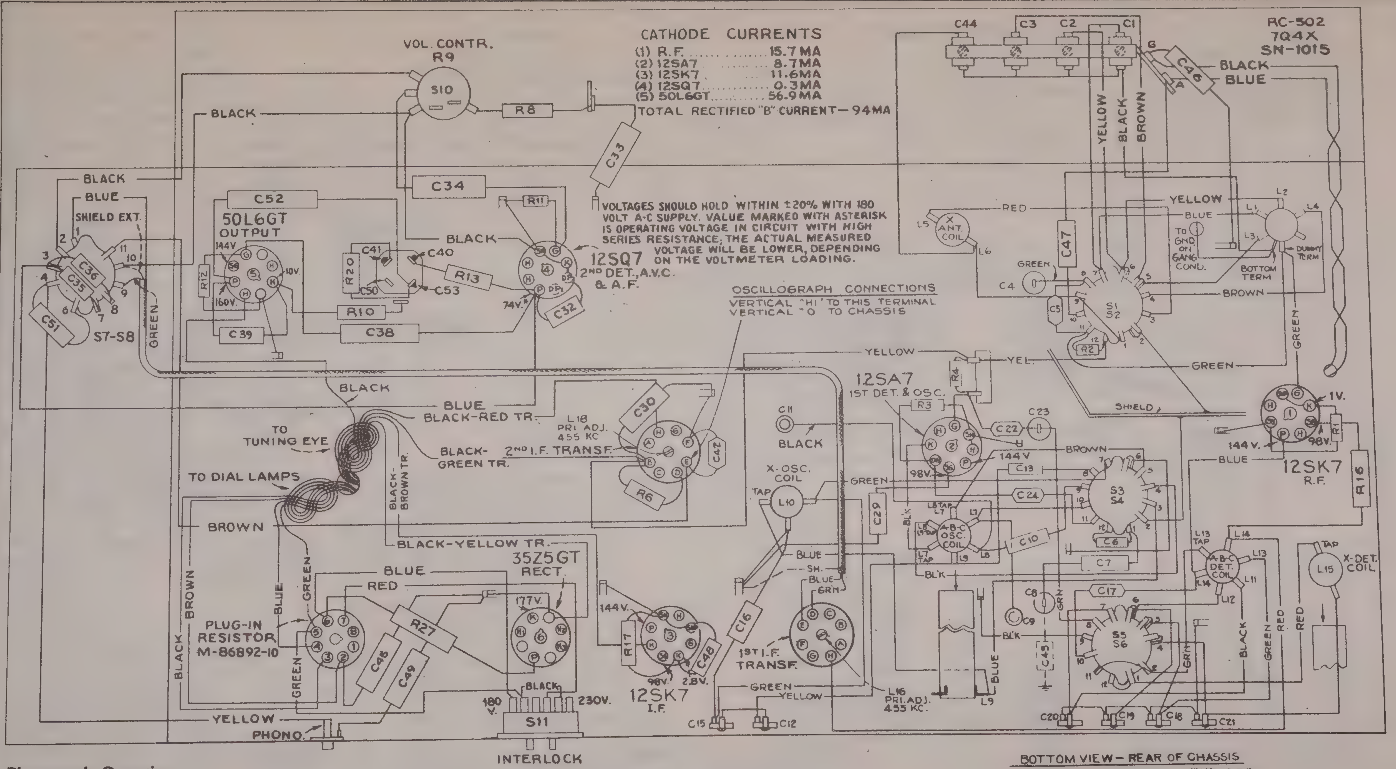
Undistorted	3.5 watts
Maximum	4.5 watts

Frequency Ranges

"X" Band	145-405 kc (2,069-740 m)
Standard Broadcast ("A")	540-1,720 kc (555-174 m)
"B" Band	2.3-7.0 mc (130-42.8 m)
"C" Band	7.0-22.0 mc (42.8-13.6 m)
Intermediate Frequency	455 kc

MODEL 7Q4X
Chassis Wiring, Voltage
Phono. Data, Lead Dress

RCA MFG. CO., INC.



CATHODE CURRENTS
(1) R.F. .... 15.7 MA
(2) 12SA7 .... 8.7 MA
(3) 12SK7 .... 11.6 MA
(4) 12SQ7 .... 0.3 MA
(5) 50L6GT .... 56.9 MA
TOTAL RECTIFIED "B" CURRENT—94 MA

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 180 VOLT A-C SUPPLY. VALUE MARKED WITH ASTERISK IS OPERATING VOLTAGE IN CIRCUIT WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGE WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS

BOTTOM VIEW—REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

Phonograph Operation:

A jack is provided on the rear of the chassis for connection to a phonograph attachment. The cable from the phonograph attachment should be terminated in a Stock No. 31048 plug to fit the jack.

The attachment must be designed to operate on the particular voltage and frequency of the power supply line. (Most attachments are for alternating current only, and can not be used on direct current.)

Precautionary Lead Dress:

1. Dress the black diode lead running between the 12SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.

2. Dress the brown lead from terminal E on the 2nd I-F transformer to terminal 11 on S8 against the chassis.

3. Dress the phono lead from phono jack to switch along the side of the chassis.

4. Dress the filament lead from No. 8 of the 12SQ7 to 12SK7 R.F. behind the 12SQ7 socket and away from diode and plate.

5. Dress C-34 and R-11 along chassis above volume control.

Caution!

Before replacing ballast resistor, check rectifier and plate circuits to be sure that there are no shorts which would cause the ballast to burn out.

RCA Tube Complement

(1) RCA-12SK7	R-F Amplifier
(2) RCA-12SA7	1st Detector, Oscillator
(3) RCA-12SK7	I-F Amplifier
(4) RCA-12SQ7	2nd Detector, A.V.C., Audio Amplifier
(5) RCA-50L6GT	Output
(6) RCA-35Z5GT	Rectifier
(7) RCA-6N5	Tuning Indicator

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connec- ons for the oscillograph are shown in the chassis drawing.

Output Meter Alignment. — If this method is used, con- ct the meter across the voice coil, and turn the receiver lume control to maximum.

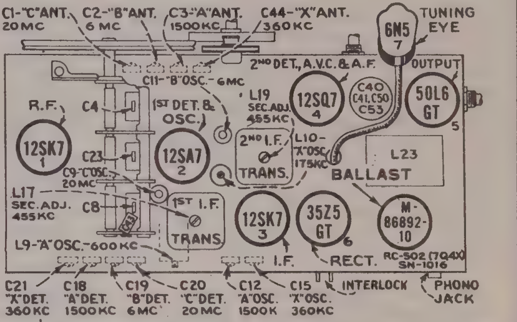
Test-Oscillator. — For all alignment operations, connect the w side of the test-oscillator to the black lead and keep the tput as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The ning dial is fastened in the cabinet and cannot be used for ference during alignment; therefore, a calibration scale is tached to the rear of the drum which is mounted on the ont shaft of the gang condenser. The setting of the gang ndenser is read on this scale, which is calibrated in degrees. he correct setting of the gang in degrees, for each align- ent frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the um. The 0° mark on the drum scale must be vertical, and rectly over the center of the gang-condenser shaft when e plates are fully meshed. The drum is held to the shaft by eans of two set screws, which must be tightened securely hen the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	12SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	12SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F response which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for the following steps.			
5	Ant. lead in series with 200 mmfd.	360 kc	360 kc (149°) "X" band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (53°) "X" band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (152°) "A" band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (32°) "A" band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. lead in series with 300 ohms	6 mc	6 mc (149°) "B" band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (157°) "C" band	C9 (osc.)** C20 (det.) C1 (ant.)

* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak y tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak y tuning receiver to approximately 19.09 mc where a weaker signal should be received.

† Preset L10 core approximately ½-inch out before adjusting C15.

†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks above signal on all bands.

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

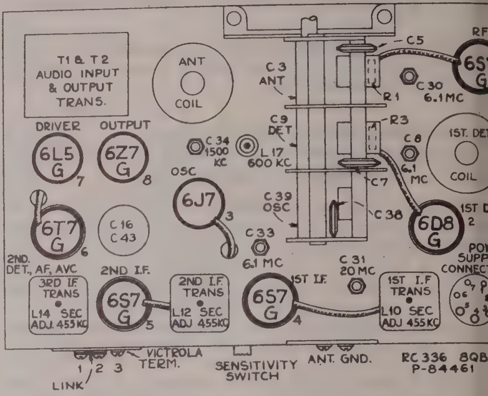
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

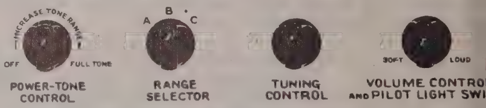
As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the gang-calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end mark on the dial scales and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Top View, Showing Location of Tubes and Trimmers



Location of Controls

The pilot lights are illuminated by pressing in the volum control knob. (The pilot lights are not controlled by th action when the receiver is operated with the CV-110 power supply unit.) Sensitivity switch is on rear of chass

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
Leave the sensitivity switch open (minimum sensitivity) during all alignment operations.				
1	6S7-G 2nd-I.F. grid cap, in series with .01 mfd.	455 kc	"B" band, Quiet point.	L13 and L14 (3rd I-F Trans.)
2	6S7-G 1st-I.F. grid cap, in series with .01 mfd.			L11 and L12 (2nd I-F Trans.)
3	6D8-G 1st-det. grid cap, in series with .01 mfd.			L9 and L10 (1st I-F Trans.)
4	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C33 (osc.)* C8 (det.)† C30 (ant.)
4A	Check to determine that C33 has been adjusted to correct peak by turning radio to 5.19 mc (50°), whe a weaker signal should be received.			
5	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C31 (osc.)*
5A	Check to determine that C31 has been adjusted to correct peak by turning radio to 19.09 mc (29.5° where a weaker signal should be received.			
6	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C34 (osc.)*
7	Antenna Terminal in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L17 (osc.)††
8	Repeat Step No. 6.			

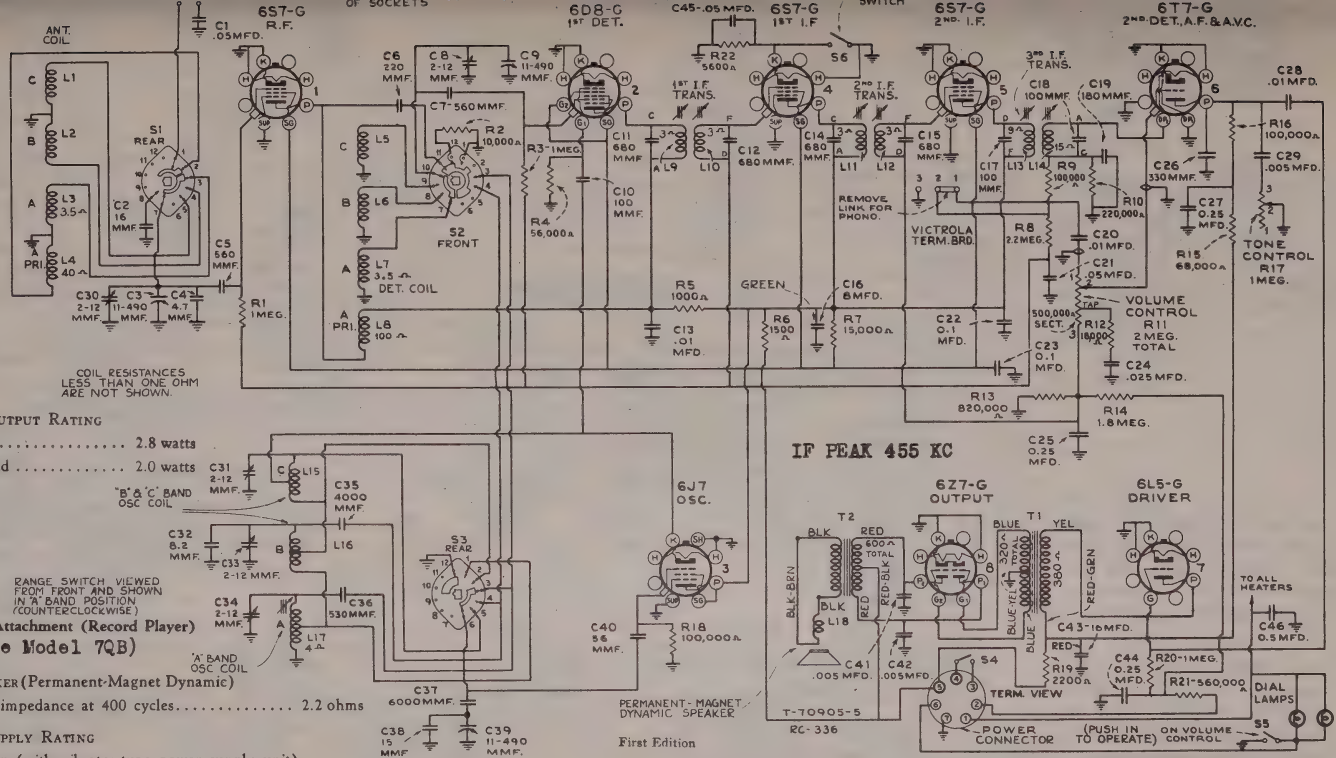
* Use **minimum** capacity peak (plunger out) if two peaks can be obtained.

† Rock the gang condenser slightly while adjusting C8, and use **maximum** capacity peak if two peaks can be obtained.

†† Rock the gang condenser slightly while adjusting L17 for maximum output.

NOTE: The oscillator tracks 455 kc **above** the signal on all bands.

MODELS 8QB,8QBK
Schematic,Lead Dress



COIL RESISTANCES LESS THAN ONE OHM ARE NOT SHOWN.

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "A" BAND POSITION (COUNTERCLOCKWISE)

IF PEAK 455 KC

First Edition

Power Output Rating

Maximum.............. 2.8 watts

Undistorted............ 2.0 watts

Victrola Attachment (Record Player)
(See Model 7QB)

Loudspeaker (Permanent-Magnet Dynamic)

Voice-coil impedance at 400 cycles............ 2.2 ohms

Power Supply Rating

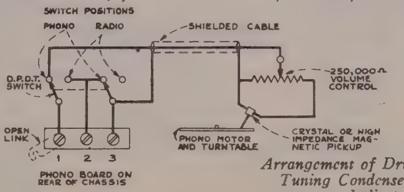
D-C Rating (with vibrator-type power supply unit)—
6.3 volts, 3.5 amps.

A-C Rating (with CV-110 A-C power supply unit)—
105-117, 117-130, 140-160, 200-225, 225-250 volts, 25-60 cycles.

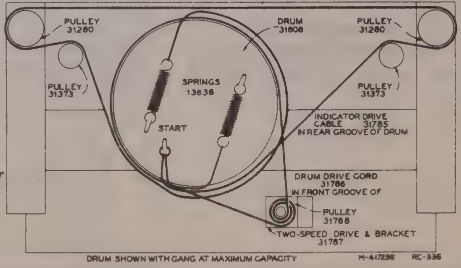
Pilot Lamps (2).....Mazda No. 44, 6.3 volts, 0.25 amp.

Precautionary Lead Dress.—

1. Dress the leads from 1st-detector coil to range switch away from trimmer C8.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the range switch close to chassis.
4. Grid-cap connectors must not ground to tube shields.
5. Dress black lead from terminal 7 on power connector into corner and close to side of chassis.


SWITCH POSITIONS
PHONO
RADIO
SHIELDED CABLE
D.P.D.T. SWITCH
250,000 Ω VOLUME CONTROL
OPEN LINK
1
2
3
PHONO BOARD ON REAR OF CHASSIS
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP

Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch


PULLEY 31280
PULLEY 31373
DRUM 31808
SPRINGS 13638
START
PULLEY 31280
PULLEY 31373
INDICATOR DRIVE CABLE 31785 IN REAR GROOVE OF DRUM
DRUM DRIVE CORD 31786 IN FRONT GROOVE OF
PULLEY 31788
TWO-SPEED DRIVE & BRACKET 31787
DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY
M-417298
RC-336

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

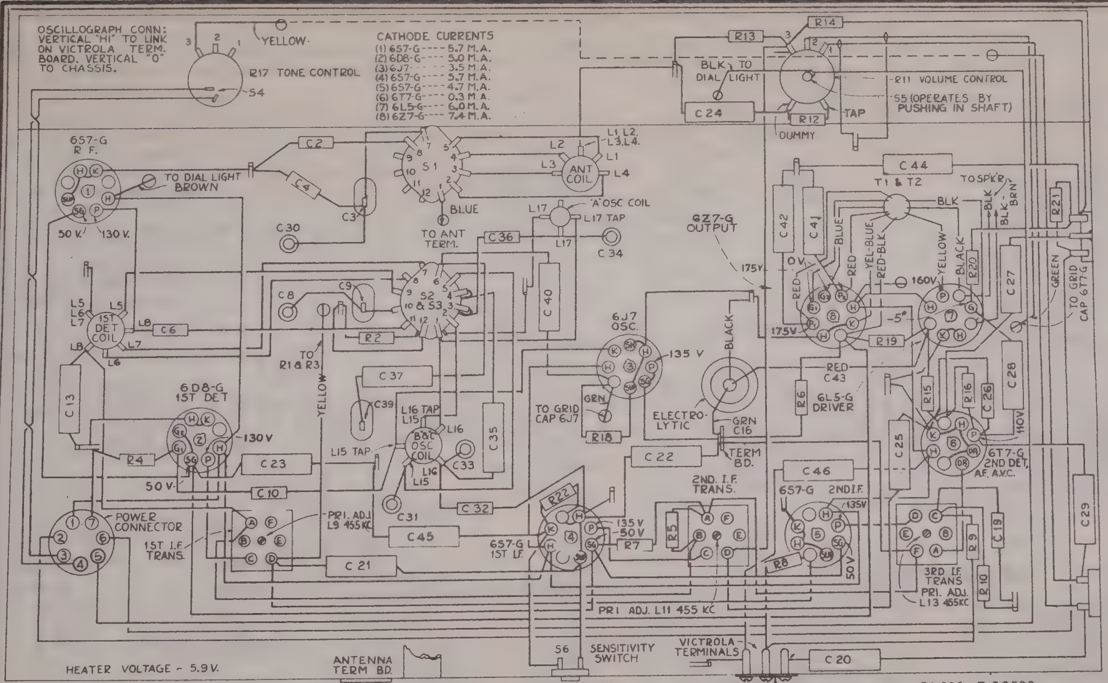
MODELS 8QB,8QBK
Chassis Wiring,Voltage
SPU Schematics

RCA MFG. CO., INC.

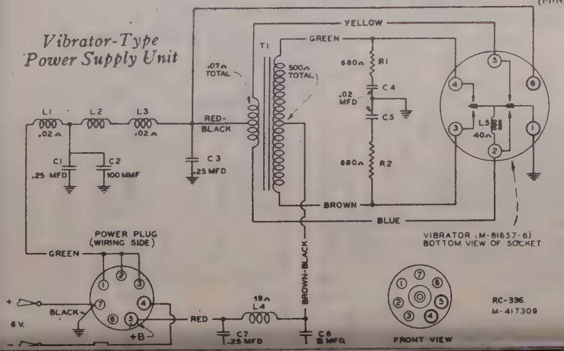
Bottom View of Chassis, with R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 6-volt d-c supply.

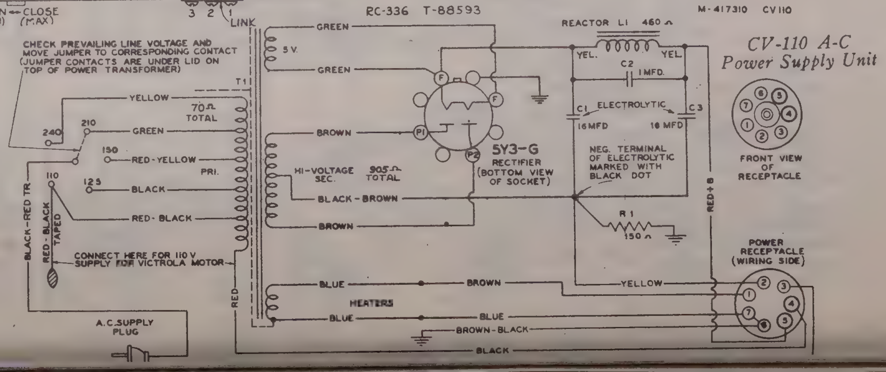
***NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.



Vibrator-Type Power Supply Unit

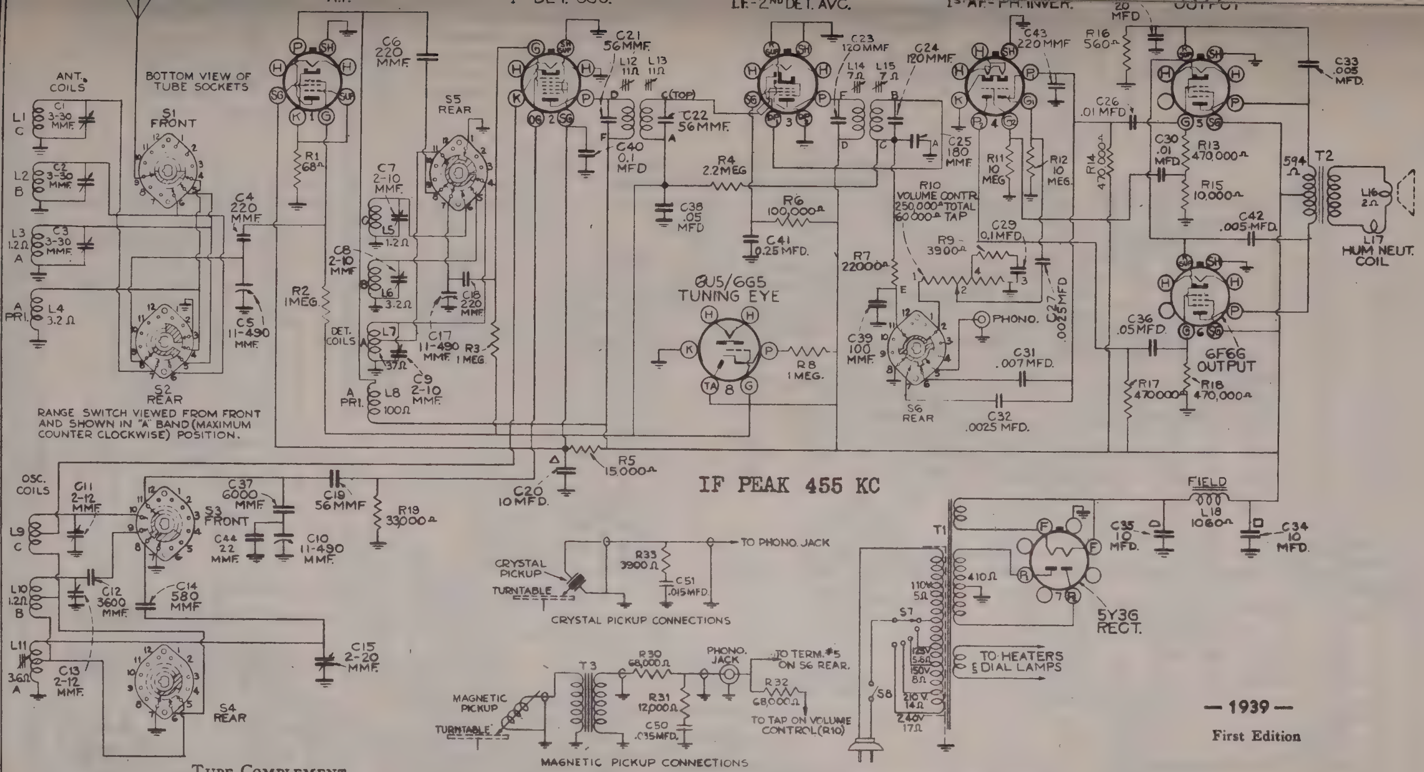


CV-110 A-C Power Supply Unit



MODELS 8Q2,Ch.RC-443
8QU5C,8QU5M,Ch.RC-443B
Schematic,Lead Dress

RCA MFG. CO., INC.



— 1939 —

First Edition

Tube Complement

(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector-Oscillator
(3)	RCA-6B8	I-F Amplifier, 2nd Det., A.V.C.
(4)	RCA-6SC7	A-F Amplifier, Phase Inverter
(5)	RCA-6F6-G	Power Output
(6)	RCA-6F6-G	Power Output
(7)	RCA-5Y3-G	Rectifier
(8)	RCA-6U5/6G5	Tuning Indicator

Frequency Ranges

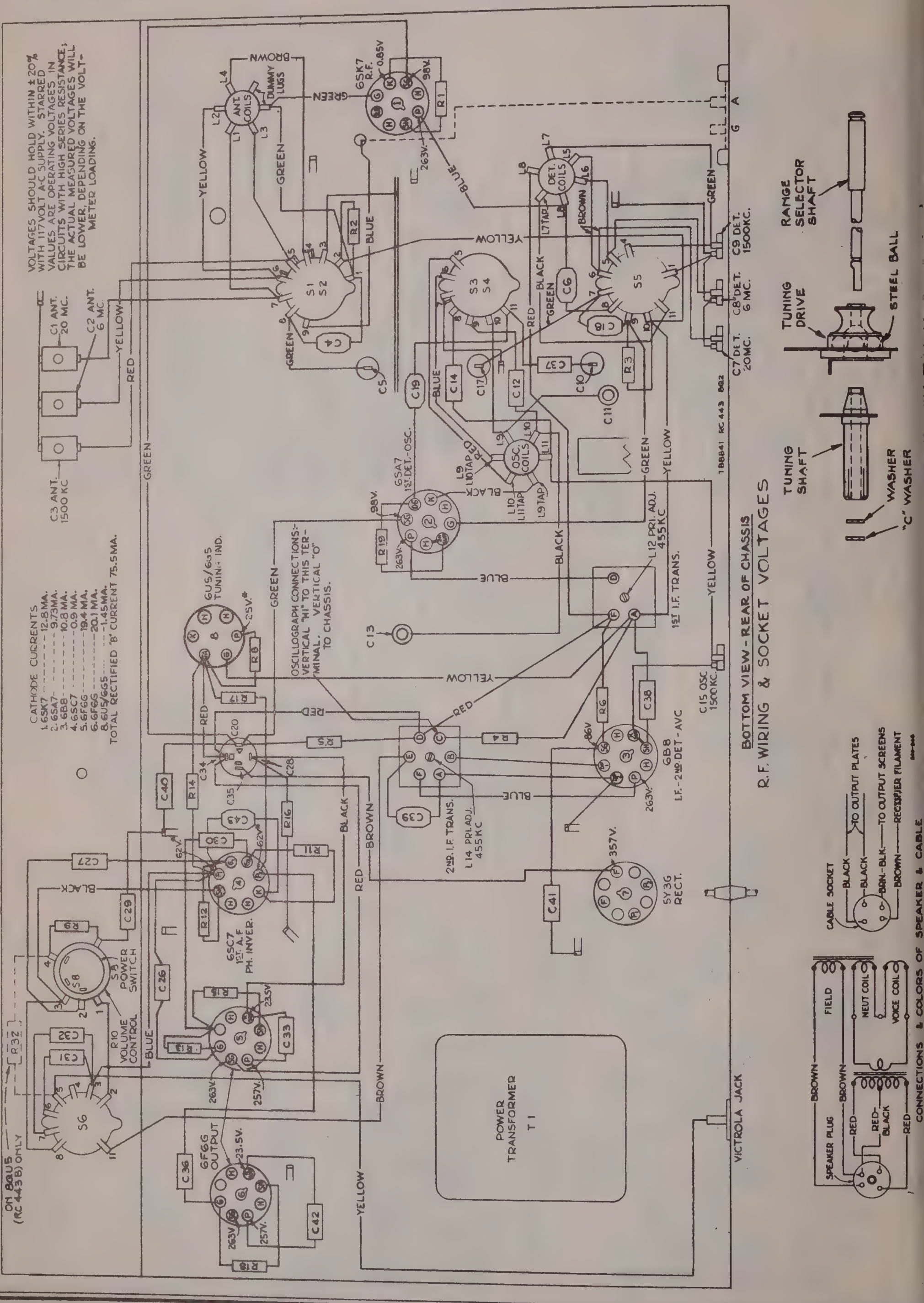
Standard Broadcast ("A" Band)	540-1,720 kc	(555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc	(130-42.8 m)
Short Wave ("C" Band)	7.0-22.0 mc	(42.8-13.6 m)

Precautionary Lead Dress:

1. Leads from L5 and L6 to terminals 5 and 6 on S5, and the leads from these terminals to C7 and C8, should be dressed as far as possible from parts at ground potential.
2. The lead from the detector gang (C17) to terminal 7 on S5, and the lead from the 6SA7 grid to terminal 9 on S5 should be kept away from ground and from parts in the oscillator grid circuit, such as C37, C19, S3 and S4.
3. The lead from terminal E on the second I-F transformer to terminal 11 on S6 should be dressed against the sub-base.
4. The lead from the plate of the 6SK7 (R-F) to L8 should be dressed away from parts at ground potential.
5. The lead from the grid of the 6SK7 (R-F) to terminal 1 on S1 should be kept as far as possible from the antenna lead running to terminal 9 on S1.

MODELS 8Q2,8QU5C,8QU5M
Chassis Wiring,Voltage

RCA MFG. CO., INC.



VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 VOLT A-C SUPPLY. STARRED VALUES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

CATHODE CURRENTS
1. 6SK7 ---------- 12.8 MA.
2. 6SA7 ---------- 9.73 MA.
3. 6B8 ---------- 10.8 MA.
4. 6SC7 ---------- 0.9 MA.
5. 6F6G ---------- 19.4 MA.
6. 6F6G ---------- 20.1 MA.
8. 6U5/6G5 ---------- 1.45 MA.
TOTAL RECTIFIED "B" CURRENT 75.5 MA.

OSCILLOGRAPH CONNECTIONS:- VERTICAL "HI" TO THIS TERMINAL. VERTICAL "O" TO CHASSIS.

BOTTOM VIEW - REAR OF CHASSIS
R.F. WIRING & SOCKET VOLTAGES

CONNECTIONS & COLORS OF SPEAKER & CABLE

©John F. Rider, Publisher

RCA MFG. CO., INC.

Specifications

TERMEDIATE FREQUENCY .... 455 kc

RYSTAL PICKUP
npedance .... 100,000 ohms at 1,000 c.p.s.
verage Output ... 1.5 volts at 1,000 c.p.s. across 500,000 ohms load

LOT LAMPS (3) ... 2-Mazda No. 44, 6.3 volts, 0.25 amp.; 1-Mazda No. 47, 6.3 volts, 0.15 amp

OWER OUTPUT RATING
ndistorted .... 4.5 watts
aximum .... 5.5 watts

OUDSPEAKER (RL-63J-6)
ype .... 8-inch electrodynamic
C Impedance .... 2.2 ohms at 400 c.p.s.

HONOGRAPH MOTOR.......... self-starting, constant-speed, induction type

MAGNETIC PICKUP
Impedance .... 96 ohms at 1,000 c.p.s.
Average Output .. 0.14 volts at 400 c.p.s. across open circuit

POWER SUPPLY RATINGS

8Q2:
Rating A .... 105-125 volts, 50-60 cycles, 75 watts
Rating B .... 105-125 volts, 25-60 cycles, 75 watts
Rating C .... 100-130, 140-160, 195-250 volts, 40-60 cycles, 75 watts

8QU5C and 8QU5M
Rating A5............ 105-125 volts, 50 cycles, 105 watts
Rating A6............ 105-125 volts, 60 cycles, 105 watts
Rating C5..... 105-125; 200-250 volts, 50 cycles, 105 watts
Rating C6..... 105-125; 200-250 volts, 60 cycles, 105 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for e oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the eter across the voice coil, and turn the receiver volume control to aximum.

Test-Oscillator.—For all alignment operations, connect the low side the test-oscillator to the receiver chassis, and keep the output as w as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning al is fastened in the cabinet and cannot be used for reference during gnment; therefore, a calibration scale is attached to the rear of the um which is mounted on the front shaft of the gang condenser. e setting of the gang condenser is read on this scale, which is librated in degrees. The correct setting of the gang in degrees, for ch alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. e 180° mark on the drum scale must be vertical, and directly er the center of the gang-condenser shaft when the plates are fully eshed. The drum is held to the shaft by means of two set screws, ich must be tightened securely when the drum is in the correct sition.

Pointer for Calibration Scale.—Improvise a pointer for the calibra-n scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

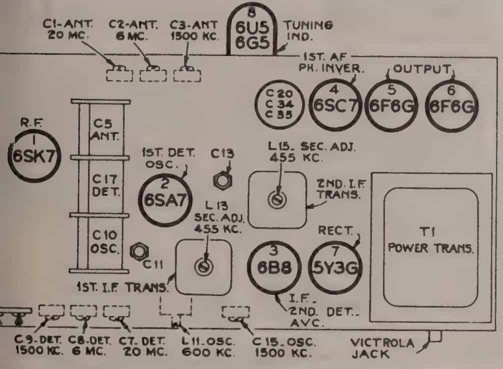
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

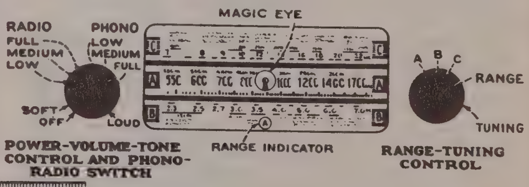
Steps	Connect the high side of test-osc. to	Tune test-osc. to	Turn radio dial to	Adjust the following for maximum peak output
1	6B8-I-F grid in series with .01 mfd.	455 kc	Quiet point on "C" Band	L14 and L15 (2nd I-F Trans.)
2	Stator of middle section of gang [C17] in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmfd.	600 kc	600 kc (148°) "A" Band	L11 (osc.) Rock gang
4		1,500 kc	1,500 kc (28°) "A" Band	C15 (osc.)* C9 (det.)† C3 (ant.)
5	Ant. terminal in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" Band	C13 (osc.)* C8 (det.)† C2 (ant.)
6		20 mc	20 mc (23°) "C" Band	C11 (osc.)* C7 (det.)† C2 (ant.)

* Use minimum capacity peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained.

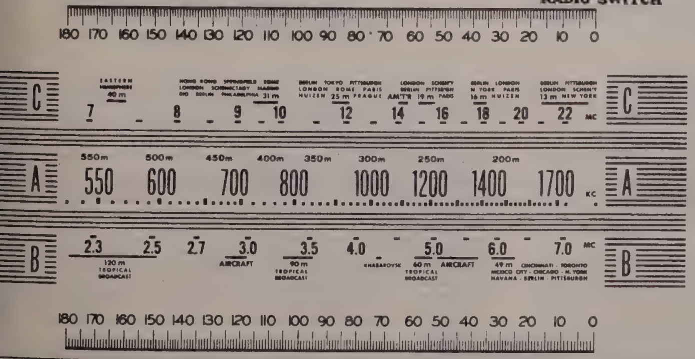
NOTE: Oscillator tracks 455 kc above signal on all bands.





POWER-VOLUME-TONE CONTROL AND PHONO-RADIO SWITCH

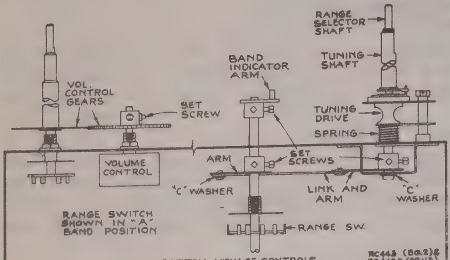
RANGE-TUNING CONTROL



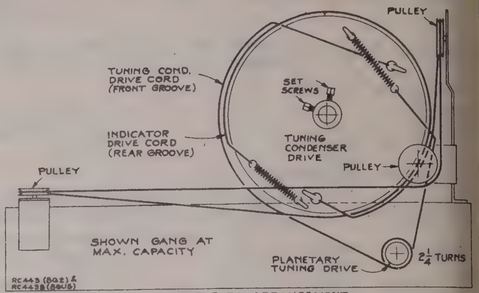
Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."



BOTTOM VIEW OF CONTROLS


PULLEY
TUNING COND. DRIVE CORD (FRONT GROOVE)
SET SCREWS
INDICATOR DRIVE CORD (REAR GROOVE)
TUNING CONDENSER DRIVE
PULLEY
PULLEY
SHOWN GANG AT MAX. CAPACITY
PLANETARY TUNING DRIVE
$2\frac{1}{4}$ TURNS
RC443 (8Q2) & RC443B (8QU5)

DRIVE CORD ARRANGEMENT

Victrola Data

The 8QU5M is equipped with a magnetic pickup, and the 8QU5C with a crystal pickup. The output of the crystal pickup is fed directly into the Victrola jack at the rear of the chassis. On instruments using a magnetic pickup, a transformer and compensating circuit are used between the pickup and the Victrola jack (see schematic diagram). The transformer has two jacks, the larger one (primary) for input from the pickup and the smaller one (secondary) for output to the compensating circuit. The components of the compensating circuit are mounted externally to the chassis on a terminal board in the rear of the cabinet.

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the spindle bearing and oil hole.

The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is $1\frac{3}{4}$ inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

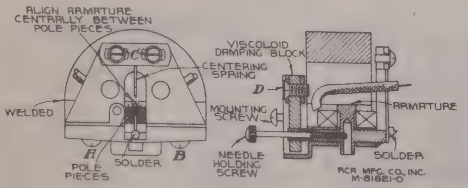
Crystal Pickup;

The crystal pickup is sealed in a metal case; if failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Magnetic Pickup:

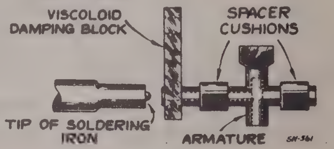
The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

Centering Armature.—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm for re-adjustment. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.



Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.



Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves to reduce undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

RCA MFG. CO., INC.

MODELS 8Q2,8QU5C,8QU5M
MODEL 8Q4
MODEL 95T5LW
Parts Lists

REPLACEMENT PARTS

Models 8Q2,8QU5C,8QU5M **Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.**

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-443 and RC-443B)	
34133	Arm—Band indicator arm—located on range switch shaft	.45
34502	Arm—Operating arm on range switch shaft	.25
10194	Ball—Steel ball	.02
31767	Board—Antenna ground terminal board	.20
34131	Bracket—Drive cord pulley and brackets	.55
33819	Capacitor—Trimmer capacitor—3 sections of 2-10 mmfd. each	.60
12714	Capacitor—Air trimmer capacitor—2-12 mmfd. (C11, C13)	.50
33817	Capacitor—Trimmer capacitor—1 section of 2-20 mmfd. (C15)	.30
33820	Capacitor—Trimmer capacitor—3 sections of 3-30 mmfd. each (C1, C2, C3)	.60
31868	Capacitor—22 mmfd. (C44)	.30
12723	Capacitor—56 mmfd. (C19)	.35
30949	Capacitor—56 mmfd. (C21, C22)	.25
12720	Capacitor—100 mmfd. (C39)	.35
12404	Capacitor—120 mmfd. (C23, C24)	.30
14712	Capacitor—180 mmfd (C25)	.30
12694	Capacitor—220 mmfd. (C4, C6, C18, C43)	.35
33235	Capacitor—580 mmfd. (C14)	.40
12811	Capacitor—3,600 mmfd. (C12)	.60
31405	Capacitor—6,000 mmfd. (C37)	.75
5107	Capacitor—.0025 mfd. (C27, C32)	.20
4838	Capacitor—.005 mfd. (C33, C42)	.25
13033	Capacitor—.007 mfd. (C31)	.25
4858	Capacitor—.01 mfd. (C26, C30)	.25
32787	Capacitor—.05 mfd (C36, C38)	.20
32786	Capacitor—0.1 mfd. (C29, C40)	.25
12484	Capacitor—0.25 mfd. (C41)	.30
33014	Capacitor—Comprising 3 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts (C20, C28, C34, C35)	1.90
33762	Coil—Antenna coil—A-B-C bands (L1, L2, L3, L4)	1.20
33763	Coil—Detector coil—A-B-C bands (L5, L6, L7, L8)	1.60
32824	Coil—Oscillator coil—A-B-C bands (L9, L10, L11)	1.00
33756	Condenser—Variable tuning condenser (C5, C10, C17)	5.50
33814	Control—Volume control and switch (R10, S8)	2.00
32635	Cord—Indicator drive cord	.24
32634	Cord—Tuning condenser drive cord	.10
32713	Core—Adjustable core and stud for oscillator coils	.35
33770	Drive—Plan tary tuning drive—less shafts and balls, and shaft retainer	.90
33773	Drum—Variable tuning condenser drum and hub	.90
33185	Gear—Shaft and gear for volume control	.50
34132	Gear—Shaft and gear for tone control	.55
11891	Lamp—Pilot lamp	.17
33767	Link—Operating link and arm on range switch knob shaft	.60
5040	Plug—4-contact female plug for speaker cable	.30
34130	Pulley—Drive pulley and brackets	.30
14281	Resistor—68 ohms, ½ watt (R1)	.20
17214	Resistor—560 ohms, 2 watt (R16)	.22
12955	Resistor—3,900 ohms, ½ watt (R9)	.20
14559	Resistor—10,000 ohms, ½ watt (R15)	.20
33489	Resistor—15,000 ohms, 2½ watt (R5)	.55
14284	Resistor—22,000 ohms, 1/10 watt (R7)	.15
12454	Resistor—33,000 ohms, ½ watt (R19)	.20
3252	Resistor—100,000 ohms, ½ watt (R6)	.20
12285	Resistor—470,000 ohms, ½ watt (R13, R14, R17, R18)	.20
13730	Resistor—1 megohm, ½ watt (R2, R3, R8)	.20
12679	Resistor—2.2 megohms, ½ watt (R4)	.20
13601	Resistor—10 megohms, ½ watt (R11, R12)	.20
14350	Screw—No. 8-32 x 11/32 square head set screw for gear and drum	.03
34134	Shaft—Range switch shaft	.80
34135	Shaft—Tuning knob shaft	.70
33829	Socket—Magic Eye bracket and socket	.50
14278	Socket—Phonograph input socket	.25
31364	Socket—Pilot lamp socket	.20
31251	Socket—Tube socket	.25
13638	Spring—Indicator drive cord spring	.08
33769	Spring—Planetary tuning drive spring	.15
31418	Spring—Tuning condenser drive cord spring	.05
33757	Switch—Range switch (S1, S2, S3, S4, S5)	2.25
34602	Switch—Tone control (S6)	1.25
32263	Transformer—1st I.F. transformer (L12, L13, C21, C22)	2.30
14308	Transformer—2nd I.F. transformer (L14, L15, C23, C24, C25, R7)	2.90
31734	Transformer—Power transformer—105/125 volts, 25/60 cycle (T1)	10.35
31733	Transformer—Power transformer—105/125 volts, 50/60 cycle (T1)	4.75
31735	Transformer—Power transformer—105/130, 140/160, 200/250 volts, 50/60 cycle (T1, S7)	10.80
	MOTOR ASSEMBLIES (Model 8QU5-C) (Model 8QU5-M)	
32650	Field—Motor field coils and laminations, 110 volts, 50 cycle	5.10
32336	Field—Motor field coils and laminations, 110 volts, 60 cycle	5.10
33220	Motor—105-125 volts, 50 cycles—less mounting plate	11.25
33219	Motor—105-125 volts, 60 cycles—less mounting plate	10.75
33361	Shaft—Turntable spindle shaft and gear—50 cycle	1.40
33360	Shaft—Turntable spindle shaft and gear—60 cycle	1.40

STOCK No.	DESCRIPTION	Unit List Price
	PICKUP AND ARM ASSEMBLIES (Model 8QU5-M)	
34304	Arm—Pickup arm—less unit cable and pivot arm	1.50
34303	Arm—Pivot arm and set screw	1.40
14291	Armature—Pickup armature	1.45
14930	Coil—Pickup coil	1.20
14292	Damper—Pickup armature damper	.25
32228	Pickup Unit—Magnet, coil, needle screw, and armature, assembled	4.95
34300	Screw—No. 6-32 x ¼ headless set screw for pickup pivot arm	.15
3811	Screw—Needle screw	.10
	PICKUP AND ARM ASSEMBLIES (Model 8QU5-C)	
34305	Arm—Pickup arm—less crystal, cable, and pivot arm	1.80
34306	Arm—Pickup pivot arm with set screw	.80
34550	Bushing—Rubber bushing for pickup pivot arm	.05
34307	Crystal—Pickup crystal cartridge and needle screw	3.75
33529	Screw—Needle screw	.10
34300	Screw—No. 6-32 x ¼ headless set screw for pickup pivot arm	.15
	AUTOMATIC SWITCH ASSEMBLIES (Model 8QU5-C) (Model 8QU5-M)	
34315	Base—Pickup arm base for crystal pickup—Model 8QU5-C	.85
34312	Base—Pickup arm base for magnetic pickup—Model 8QU5-M	.30
32865	Bracket—Switch bracket and terminal board	.40
34308	Cam—Switch cam assembly with spring	.55
32864	Lever—Switch actuating lever, roller, and clip	.45
34309	Mounting—Pickup arm base mounting (rubber grommet, washers, and nut)	.20
34311	Ring—Retaining ring for pickup arm pivot shaft	.05
14195	Screw—No. 10-32 x 5/16 set screw for switch cam hub	.05
34314	Shaft—Pickup arm pivot shaft—for crystal pickup—Model 8QU5-C	.65
34313	Shaft—Pickup arm pivot shaft—for magnetic pickup—Model 8QU5-M	.65
34310	Spool—Insulating spool for switch leads	.10
32868	Spring—Switch lever spring	.05
32867	Spring—Tension spring for switch cam	.05
32866	Switch—Mercury tube and leads	1.75
31608	Washer—Retaining washer for switch lever	.01
	SPEAKER ASSEMBLIES (RL-63-J6)	
31825	Cap—Dust cap	.02
12079	Coil—Field coil (L18)	3.30
11469	Coil—Neutralizing coil (L17)	.30
34274	Cone—Cone, complete with voice coil and dust cap (L16)	1.50
5039	Plug—4 prong male for speaker	.30
14534	Transformer—Output transformer (T2)	2.10
	MISCELLANEOUS ASSEMBLIES	
32610	Bumper—Rubber bumper for pickup arm—Models 8QU5-C and 8QU5-M	.10
34308	Cam—Actuating cam for automatic switch—Models 8QU5-C and 8QU5-M	.55
11315	Capacitor—.015 mfd.—Model 8QU5-C (C51)	.20
5196	Capacitor—.035 mfd.—Model 8QU5-M (C50)	.20
33680	Cup—Needle cup—Models 8QU5-C and 8QU5-M	.15
31464	Damper—Turntable rubber drive sleeve and metal damper plate—Models 8QU5-C and 8QU5-M	.30
34142	Dial—Dial glass scale	1.95
34140	Frame—Dial frame less pointers, dial glass and guide rods	2.50
13085	Hinge—Cabinet lid hinge—Models 8QU5-C and 8QU5-M	.22
11607	Holder—Packaged needle holder—Models 8QU5-C and 8QU5-M	.85
34144	Indicator—Band indicator strip	.30
34141	Indicator—Station selector indicator and carriage	.40
34139	Knob—Range switch knob	.20
34137	Knob—Tone control knob	.20
34136	Knob—Volume control or tuning knob	.30
31048	Plug—2-contact male plug for phono. input cable—Models 8QU5-C and 8QU5-M	.15
12955	Resistor—3,900 ohms, ½ watt—Model 8QU5-C (R33)	.20
30128	Resistor—12,000 ohms, ½ watt—Model 8QU5-M (R31)	.20
13715	Resistor—68,000 ohms, ½ watt—Model 8QU5-M (R30)	.20
34568	Rest—Pickup rest—Models 8QU5-C and 8QU5-M	.40
34143	Rod—Dial pointer slide rod—Models 8QU5-C and 8QU5-M	.15
34491	Rod—Pointer carriage guide rod—Model 8Q2	.15
34316	Screw—Motor mounting screws, washers, and spacers (sufficient for 1 motor)—Models 8QU5-C and 8QU5-M	.40
14195	Screw—No. 10-32 set screw for cam, Stock No. 34308	.05
34145	Slide—Band indicator slide less strip	.30
32867	Spring—Actuating cam spring	.05
4982	Spring—Retaining spring for knob, Stock No. 34136	.05
14270	Spring—Retaining spring for knob, Stock No. 34137	.05
34138	Spring—Retaining spring for knob, Stock No. 34139	.05
31164	Support—Cabinet lid support—Models 8QU5-C and 8QU5-M	.45
14609	Transformer—Phono. input transformer for model with magnetic pickup—Model 8QU5-M	4.15
33532	Turntable—10-inch turntable—Models 8QU5-C and 8QU5-M	2.90

Model 8Q4

STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES (RC-337A)	
31815	Board—Antenna and ground terminal board	.20
12717	Board—Phonograph input terminal board	.22
31303	Bracket—Band indicator mounting bracket—less indicating strip, spring, and cord	.40
31820	Cable—Indicator pointer drive cable	.55
30766	Cap—Rubber cap for Magic Eye	.15
12607	Cap—Top shield cap for first or second i-f transformer	.20
12714	Capacitor—Trimmer 2-12 mmfd. (C1, C3, C10, C11, C35, C37, C38, C39)	.50
14079	Capacitor—6.8 mmfd. (C54)	.35
13200	Capacitor—10 mmfd. (C43, C45)	.35
12722	Capacitor—18 mmfd. (C2)	.35
13545	Capacitor—39 mmfd. (C44)	.35
31270	Capacitor—100 mmfd. (C17, C18)	.35
31813	Capacitor—120 mmfd. (C15, C16, C51, C53)	.30
12724	Capacitor—120 mmfd. (C24, C48)	.35
13003	Capacitor—180 mmfd. (C19, C49)	.35
12952	Capacitor—330 mmfd. (C5, C7, C8)	.35
31790	Capacitor—530 mmfd. (C42)	.40
31792	Capacitor—4,000 mmfd. (C36)	.60
31405	Capacitor—6,000 mmfd. (C47)	.75
4838	Capacitor—.005 mfd. (C26, C28)	.25
14393	Capacitor—.01 mfd. (C21, C22, C25)	.30
11315	Capacitor—.015 mfd. (C52)	.20
4886	Capacitor—.05 mfd. (C20)	.20
4839	Capacitor—0.1 mfd. (C6, C50)	.30
12484	Capacitor—0.25 mfd. (C23)	.30
5212	Capacitor—16 mfd. (C29)	1.35
31818	Clip—Magic Eye mounting clip	.15
31810	Coil—Antenna coil (L1, L2, L3, L4, L5)	2.50
31782	Coil—Oscillator coil—"A" band only (L13)	.80
31783	Coil—Oscillator coil—"B" and "C" bands only (L11, L12)	1.05
31812	Coil—Oscillator coil—"X" band only (L14)	.80
31811	Coil—R-f coil (L6, L7, L8, L9, L10)	2.40
31774	Condenser—3-gang variable tuning condenser (C4, C9, C46)	5.89
31278	Cord—Band indicator cord	.12
31786	Cord—Variable condenser drive cord	.25
31787	Drive—Two-speed drive and mounting bracket	1.95
31808	Drum—Variable condenser drive cord drum	.80
31819	Indicator—Band indicator strip	.15
11891	Lamp—Dial lamp	.17
31817	Plate—Cushion socket mounting plate—less socket	.10
5040	Plug—4-contact female plug for speaker cable	.30
14404	Plug—7-contact male plug for power input	.35
31788	Pulley—Two-speed drive pulley	.20
31280	Pulley—Indicator pointer drive cord pulley (large)	.10
31373	Pulley—Indicator pointer drive cord pulley (small)	.08
31272	Pulley—Range switch pulley	.20
14660	Resistor—18 ohms, ½ watt (R15)	.20
14526	Resistor—200 ohms, wire-wound, 2½ watt (R14)	.30
14837	Resistor—1,000 ohms, 1/10 watt (R22)	.15
13204	Resistor—8,200 ohms, 2 watt (R16)	.25

STOCK No.	DESCRIPTION	Unit List Price
13302	Resistor—10,000 ohms, 1/10 watt (R23)	.15
14559	Resistor—10,000 ohms, ½ watt (R20)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R6)	.15
12738	Resistor—27,000 ohms, ½ watt (R8)	.20
14167	Resistor—27,000 ohms, 2 watt (R21)	.25
11300	Resistor—33,000 ohms, 1/10 watt (R19)	.15
14023	Resistor—82,000 ohms, ½ watt (R13)	.20
14560	Resistor—100,000 ohms, ½ watt (R9)	.20
11453	Resistor—270,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ½ watt (R11)	.20
13005	Resistor—390,000 ohms, 1/10 watt (R12)	.15
12013	Resistor—1 meg., 1/10 watt (R1, R2, R18)	.15
5131	Resistor—2.2 meg., 1/10 watt (R4)	.15
14887	Retainer—Indicator drive cord pulley retainer	.01
4669	Screw—No. 8-32 x 3/8-in. square head set screw for pulley, Stock Nos. 31272 and 31788, and drum, Stock No. 31808	.03
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye socket	.45
31251	Socket—Octal base tube socket	.25
31279	Spring—Band indicator tension spring	.03
13638	Spring—Tension spring for pointer drive cable, or variable condenser drive cord	.08
31823	Switch—D.P.S.T. power switch with leads (S5, S8)	1.40
31806	Switch—Range switch (S1, S2, S3, S4, S6, S7)	2.25
31546	Tone Control and selectivity switch (R10, S6)	1.50
31063	Transformer—First i-f transformer (L15, L16, L24, C15, C16)	2.25
31064	Transformer—Second i-f transformer (L22, L23, L25, C51, C53)	2.25
31268	Transformer—Third i-f transformer (L17, L18, C17, C18)	2.05
31450	Volume Control (R7)	1.50
	SPEAKER ASSEMBLIES (RL63J-1)	
31825	Cap—Speaker cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L20)	.30
12012	Coil—Speaker field coil (L21)	2.90
31828	Cone—Speaker cone and voice coil (L19)	1.55
31826	Plug—4-contact male plug for speaker	.30
31827	Speaker—Complete	10.45
14355	Transformer—Output transformer (T1)	2.00
	MISCELLANEOUS ASSEMBLIES	
31834	Dial—Dial scale and crystal	1.20
31832	Escutcheon—Dial scale escutcheon—less dial scale and crystal	2.40
31717	Indicator—Indicator pointer and carriage	.40
31802	Knob—Station selector, tone control, volume control or range switch knob	.15
30868	Plug—2-contact female plug for speaker cable	.35
30870	Plug—2-contact male plug for speaker cable	.35
31287	Rod—Pointer carriage slide rod	.15
14270	Spring—Retaining spring for knob, Stock No. 31802	.05
31558	Spring—Stop spring for pointer slide rod	.02

Model 95T5LW

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-348-F)	
32216	Capacitor—Antenna trimmer capacitor bank (C31, C21, C22, C23, C24)	1.20
32217	Capacitor—Trimmer capacitor bank (C18, C19)	.70
12723	Capacitor—56 mmfd. (C4)	.35
30904	Capacitor—100 mmfd. (C7, C8, C9, C10)	.25
12725	Capacitor—150 mmfd. (C30)	.35
13003	Capacitor—180 mmfd. (C12, C20)	.35
12537	Capacitor—560 mmfd. (C29)	.35
31435	Capacitor—750 mmfd. (C25)	.40
12636	Capacitor—1,000 mmfd. (C27)	.50
4838	Capacitor—.005 mfd. (C15)	.25
14393	Capacitor—.01 mfd. (C13, C14)	.30
4886	Capacitor—.05 mfd. (C11)	.20
30899	Capacitor—0.1 mfd. (C1, C26)	.30
31423	Capacitor—Comprising 2 sections 5 mfd. each (C16, C17)	1.40
31382	Clip—Oscillator coil and core mounting clip	.04
32218	Coil—Antenna coil (L1, L2)	1.90
31098	Coil—Oscillator coil (L3, L4)	.85
31383	Coil—Oscillator coil (L16)	.30
31384	Coil—Oscillator coil (L15)	.30
31415	Coil—Oscillator coil (L14)	.30
31097	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C28)	2.70
30877	Cord—Indicator drive cord	.20
30905	Core—Adjustable core and stud for i-f transformers	.35
31388	Core—Adjustable core and stud for oscillator coils	.15
31421	Drum—Variable condenser drive cord drum	.45
32219	Indicator—Station selector indicator pointer	.20
11891	Lamp—Dial lamp	.17
31419	Plate—Dial color plate	.12
31373	Pulley—Indicator drive cord pulley	.08
13428	Resistor—150 ohms, ½ watt (R11)	.20
31024	Resistor—680 ohms, ½ watt (R9)	.20
30151	Resistor—18,000 ohms, 1 watt (R12)	.22
12788	Resistor—27,000 ohms, ½ watt (R10)	.20

STOCK No.	DESCRIPTION	Unit List Price
12286	Resistor—56,000 ohms, ½ watt (R2)	.20
12199	Resistor—270,000 ohms, ½ watt (R7)	.20
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 meg., ½ watt (R4)	.20
13601	Resistor—10 meg., ½ watt (R6)	.20
14887	Retainer—Pulley retainer	.01
14350	Screw—No. 8-32 square head set screw for drum Stock No. 31421	.03
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Indicator drive cord tension spring	.05
32215	Switch—Push button station selector switch (S12, S13, S14, S15, S16, S17, S20, S21, S22, S23, S24, S25)	3.00
31412	Volume control and power switch (R5, S1)	1.50
30902	Transformer—First i-f transformer (L5, L6, C7, C8)	1.90
30903	Transformer—Second i-f transformer (L7, L8, C9, C10)	1.80
31410	Transformer—Power transformer, 100-120 and 200-210 volts, 50-60 cycle (T1)	5.80
	SPEAKER ASSEMBLIES (Speaker 84326-2)	
31473	Cone—Speaker cone and voice coil (L9)	1.70
31472	Speaker—Complete	4.05
31474	Transformer—Output transformer (T2)	1.65
	MISCELLANEOUS ASSEMBLIES	
31428	Button—Station selector switch push button	.06
32220	Dial—Station selector dial scale	.45
31095	Discs—10 celluloid protector discs for call letter markers	.10
30863	Knob—Volume control and power switch, or tuning condenser knob	.15
30997	Marker—Station call letter markers	.40
30900	Spring—Retaining spring for knob Stock No. 30863	.06

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

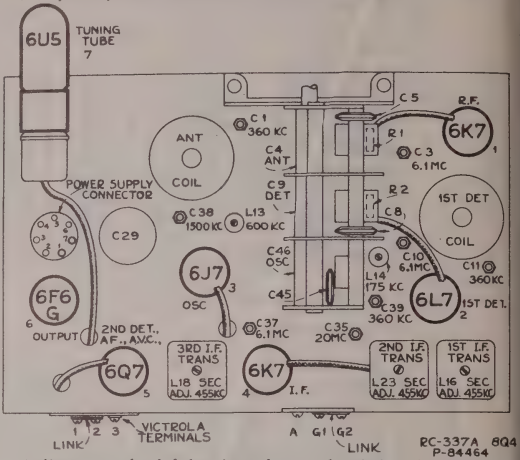
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand marks on the dial scale, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, with 300 ohm resistor from cap to chassis	455 kc	———	L17 and L18* (3rd I-F Trans.)
2	6L7 1st-Det. grid cap, with 300 ohm resistor from cap to chassis, regular grid lead removed from cap	455 kc	Fidelity control counter-clockwise (sharp)	L23 and L22 (2nd I-F Trans.) and L16 and L15** (1st I-F Trans.)
3	Antenna terminal (A), in series with 300 ohms	6.1 mc	6.1 mc (28.2°) "B" band	C37 (osc.)*** C10 (det.)† C3 (ant.)
4	Antenna terminal, in series with 300 ohms	20 mc	20 mc (22.5°) "C" band	C35 (osc.)††
5	Antenna terminal, in series with 200 mmf.	1,500 kc	1,500 kc (32°) "A" band	C38 (osc.)
6	Antenna terminal, in series with 200 mmf.	600 kc	600 kc (143.8°) "A" band	L13 (osc.)
7	Repeat steps 5 and 6.			
8	Adjust C39 so that it projects approximately 15/16-inch above top of chassis.			
9	Antenna terminal, in series with 200 mmf.	175 kc	175 kc (121.3°) "X" band	L14 (osc.)
10	Antenna terminal, in series with 200 mmfd.	360 kc	360 kc (30.2°) "X" band	C39 (osc.) C11 (det.) C1 (ant.)
11	Repeat oscillator adjustments in steps 9 and 10.			

* Adjust for coincident response curves when using oscillograph.

** Readjust L23, L22, L16, and L15 several times to secure coincident curves. Turn fidelity control full clockwise (broad) and check response, which should be symmetrical, and with **greater** gain than on sharp.

*** Use **minimum** capacity peak if two peaks can be obtained with C37.

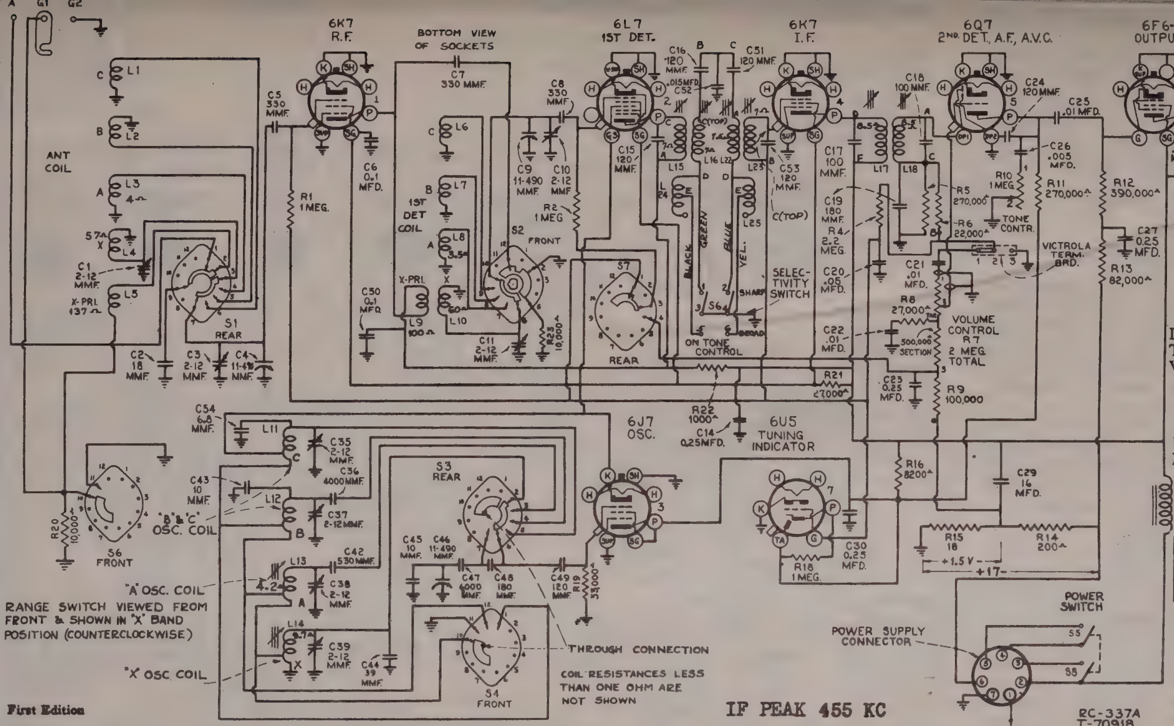
† Rock the gang condenser slightly and use **maximum** capacity peak if two peaks can be obtained with C10. Check to determine that C37 has been adjusted to the correct peak by turning receiver to 5.19 mc (50°) where a weaker signal should be received.

†† Use **minimum** capacity peak if two peaks can be obtained, and check to determine that C35 has been adjusted to the correct peak by turning the receiver to 19.09 mc (27½°) where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on all bands.

RCA MFG. CO., INC.

MODEL 8Q4
Ch.RC-337A
Schematic,Lead Dress
Phono.Data

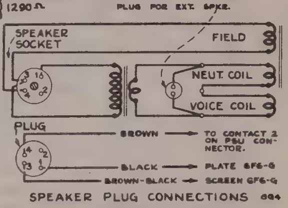


IF PEAK 455 KC

FOR SPU SERVICE DATA SEE MODELS 8A,8B,8C,8E IN INDEX.

Loudspeaker (RL-63J-1)
Type .... 8-inch electrodynamic
Voice-Coil Impedance
at 400 cycles............. 2.2 ohms

Power Output
Undistorted.............. 2.5 watts
Maximum .... 4.5 watts



SPEAKER PLUG CONNECTIONS 8Q4

First Edition

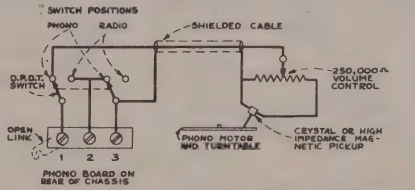
Pilot Lamps (2) .... Mazda No. 44, 6.3 volts, .25 amp.

Frequency Ranges
Long Wave ("X" Band)....... 150-400 kc (2,000-750 m)
Standard Broadcast ("A" Band). 530-1,720 kc (566-174 m)

Medium Wave ("B" Band)...... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)........ 7.0-22 mc (42.8-13.6 m)

Precautionary Lead Dress.—

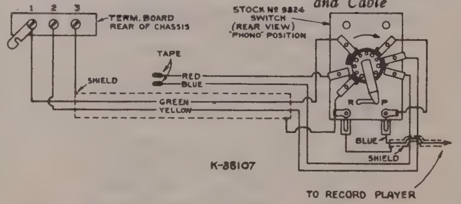
1. Dress all leads and wiring parts away from 6J7 oscillator grid.
2. Twist together the two leads from the 1st i-f transformer to the fidelity switch. Also the two leads from the 2nd i-f transformer.
3. Dress all leads away from the detector coil.
4. Dress leads from the detector coil to the range switch (contacts 7 and 8 on detector section of switch) away from the detector trimmer C10.


SWITCH POSITIONS
PHONO
RADIO
SHIELDED CABLE
D.P.D.T. SWITCH
250,000Ω VOLUME CONTROL
OPEN LINK
1
2
3
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP
PHONO BOARD ON REAR OF CHASSIS

In the event that a Stock No. 9824 switch is not available, a double-pole—double-throw toggle switch may be used, connecting it as shown above.

The radio volume control may be used to regulate the volume of the record player.

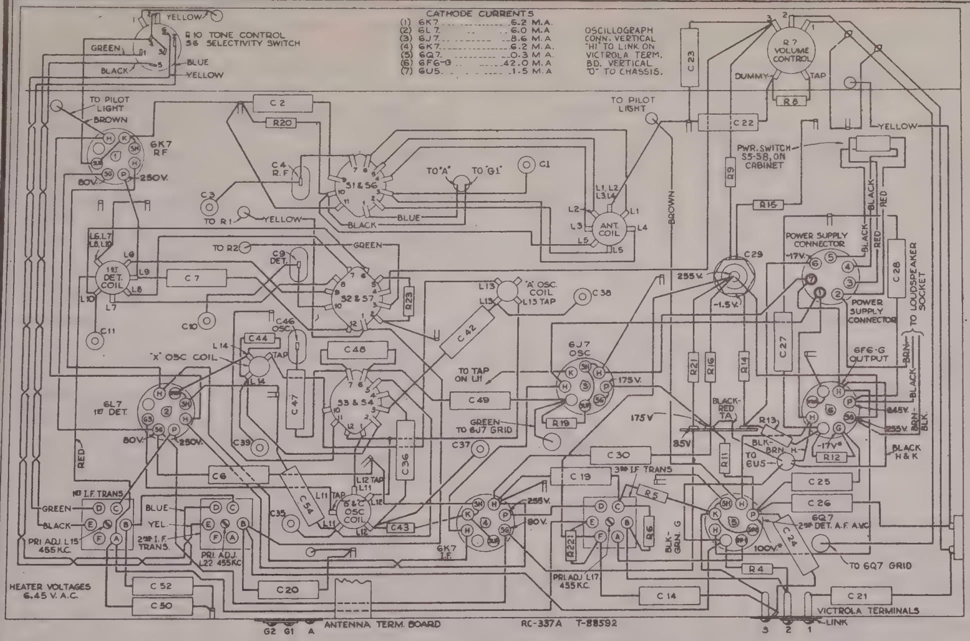
Connections of Loudspeaker and Cable


1
2
3
TERM. BOARD REAR OF CHASSIS
STOCK No 9824 SWITCH (REAR VIEW) "PHONO" POSITION
TAPE
RED
BLUE
SHIELD
GREEN
YELLOW
R
P
BLUE
SHIELD
K-88107
TO RECORD PLAYER

Victrola Attachment (Record Player).—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment (record player) such as the RCA R-93 and R-94 series. A stock No. 9824 switch may be used to change from radio to record player as shown above.

MODEL 8Q4
Chassis Wiring, Voltage
SPU Notes, Dial Data

RCA MFG. CO., INC.



Bottom View of Chassis, with R-F Wiring Diagram and Socket Voltages

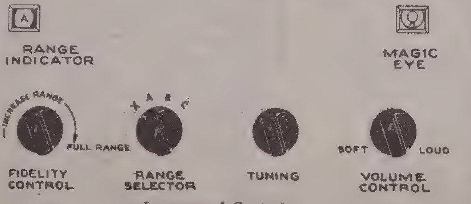
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Miscellaneous Service Data

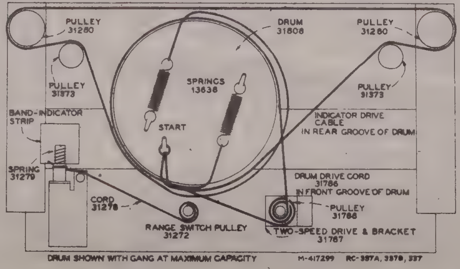
Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired. A permanent-magnet dynamic speaker, with voice-coil impedance of **not less than 2 ohms** is recommended. The voice coil of the extension speaker should be connected by means of two-conductor cable (such as is used on electric appliances) to the male plug. This cable may be any desired length up to several hundred feet. With a long run, it is advisable to use heavier cable. An extension speaker with 2-ohm voice coil will receive approximately half the power output of the receiver. With a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased. (A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.) The RCA MI-6248 Alnico 8-inch diameter permanent-magnet dynamic loudspeaker with 2-ohm voice coil, and 5-watt power-handling capacity is recommended. This speaker may be housed in the RCA MI-6292 sloping-front walnut-finished wood housing.

Antenna Connections.—Three terminals ("A," "G1," and "G2") are provided on the rear of chassis. Connect the antenna to "A." Connect "G1" to a nearby ground. A link connects "G1" and "G2." In case of electrical interference (especially on "X" band) open the link and connect "G2" separately to ground. This also applies when a D-C power supply is used.



Location of Controls

A toggle-type power switch is mounted on the right-hand side of the cabinet


PULLEY 31280
PULLEY 31373
DRUM 31808
SPRINGS 13638
START
BAND-INDICATOR STRIP
SPRING 31279
CORD 31278
RANGE SWITCH PULLEY 31272
INDICATOR DRIVE CABLE IN REAR GROOVE OF DRUM
DRUM DRIVE CORD 31786 IN FRONT GROOVE OF DRUM
PULLEY 31788
TWO-SPEED DRIVE & BRACKET 31787
DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY
M-417299 RC-337A, 337B, 337

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Power Supply Units

Model 8Q4 has a seven-prong connector for connection to a separate power supply unit. Units are available in different ratings for a-c and d-c operation, as listed under "Power Supply Ratings" in the electrical specifications.

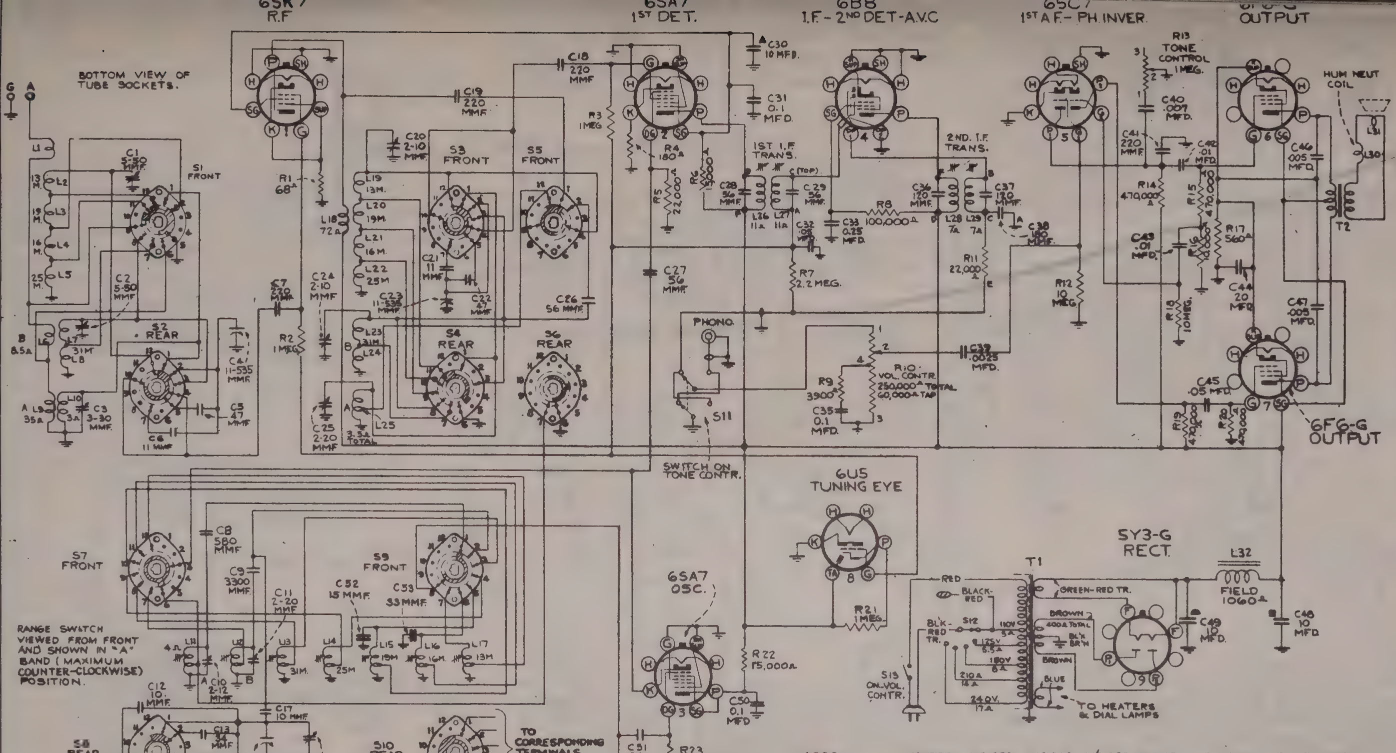
The d-c power supply unit (PSU 8E) is too large to be mounted inside the cabinet and may be placed on the table behind the receiver, or in any other convenient location that permits plugging into the connector on the receiver chassis.

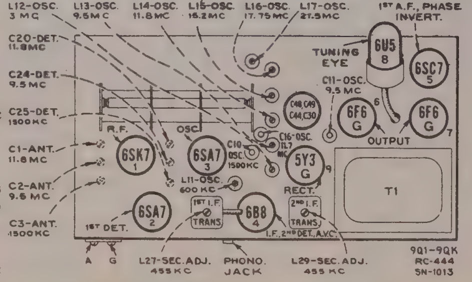
Service data, diagrams, and replacement parts lists for the power supply units are printed in separate service data sheets, which should be referred to for further information.

POWER SUPPLY RATINGS

	Volts	Cycles
A-C Ratings		
With PSU 8A	105-125	50-60
With PSU 8B	105-125	25-60
With PSU 8C	105-130, 140-160, 200-225, 225-250	50-60
D-C Rating		
With PSU 8E	105-125, 210-250	D-C

MODELS 9Q1, 9QK
Chassis RC-444
Schematic, Socket
Trimmers, Lead Dress





—1939—

First Edition

Precautionary Lead Dress.—

1. C-39 must be pushed downward as close to the chassis and front apron as possible.
2. The power cord leads must be pushed as far away from C-39 and the 6SC7 and 6F6G sockets as possible, preferably toward the center of the chassis.
8. Dress the green lead from the volume control to the phono. switch directly against the front apron for its entire length.

Power Supply Ratings

Symbol	Voltage	Frequency (cycles)	Watts
Rating A	105-125	50-60	100
Rating B	105-125	25-60	100
Rating C	100-130, 140-160, 195-250	40-60	100

Loudspeaker	9Q1	9QK
Model	(RL-63K-5)	(RL-70J-3)
Type	8-inch Electrodynamic	12-inch Electrodynamic
V.C. Impedance at 400 C.P.S.	2.2 ohms	2.2 ohms

Power Output Rating

Undistorted .... 4.5 watts
Maximum .... 5 watts

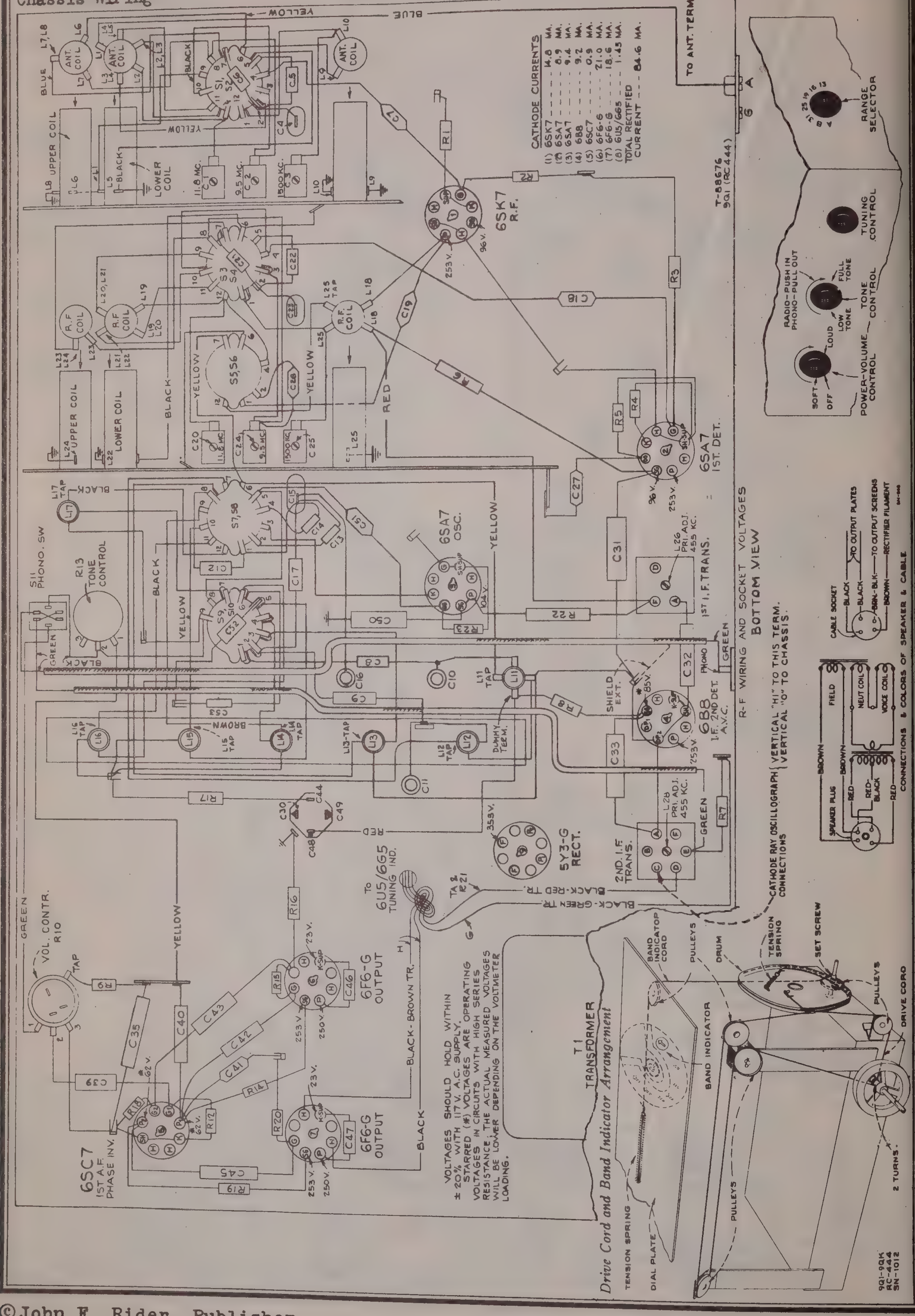
Pilot Lamps (3) .... Mazda 51, 7.5 volts, 0.2 amp.

Intermediate Frequency .... 455 kc

MODELS 9Q1,9QK
Chassis Wiring

RCA MFG. CO., INC.

Voltage,Dial Assembly



CATHODE CURRENTS
(1) 6SK7 - - - - 14.8 MA.
(2) 6SA7 - - - - 6.9 MA.
(3) 6SA7 - - - - 9.4 MA.
(4) 6B8 - - - - 9.2 MA.
(5) 6SC7 - - - - 0.9 MA.
(6) 6F6-G - - - - 21.0 MA.
(7) 6F6-G - - - - 18.6 MA.
(8) 6U5/6G5 - - - 1.45 MA.
TOTAL RECTIFIED CURRENT - - - 84.6 MA.

R-F WIRING AND SOCKET VOLTAGES BOTTOM VIEW

CATHODE RAY OSCILLOGRAPH CONNECTIONS { VERTICAL "HI" TO THIS TERM. VERTICAL "O" TO CHASSIS.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY. STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER DEPENDING ON THE VOLTMETER LOADING.

Drive Cord and Band Indicator Arrangement

CONNECTIONS & COLORS OF SPEAKER & CABLE

RCA MFG. CO., INC.

Cathode-Ray Alignment is the preferable method. Connec- ns for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect e meter across the voice coil, and turn the receiver volume ntrol to maximum.

Test-Oscillator.—For all alignment operations, connect the w side of the test-oscillator to the receiver chassis, and keep e output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tun- g dial is fastened in the cabinet and cannot be used for ref- ence during alignment, therefore a calibration scale is at- ched to the indicator-drive-cord drum which is mounted on e shaft of the gang condenser. The setting of the gang ndenser is read on this scale, which is calibrated in degrees. he correct setting of the gang in degrees, for each align- ent frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the um. The "0" mark on the drum scale must be vertical, d directly over the center of the gang-condenser shaft when e plates are fully meshed. The drum is held to the shaft by eans of two set screws, which must be tightened securely hen the drum is in the correct position.

To determine the corresponding frequency for any setting the calbration scales, refer to the accompanying drawing hich shows the dial with 0-180° calibration scales drawn top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the libration scale by fastening a piece of wire to the gang- ndenser frame, and bend the wire so that it points to the " mark on the calibration scale when the plates are fully eshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6B8 I-F Grid in series with .01 mfd.	455 kc	A	Quiet Point Near 0°	L29 and L28 (2nd I.F. Trans.)
2	6SA7 1st Detector Grid in series with .01 mfd.				L27 and L26 (1st I.F. Trans.)
3	Antenna Terminal in series with 300 ohms	9.5 mc	31M	20°	L13 (osc.)* C24 (det.)† C2 (ant.)
4		11.7 mc		171°	C16 (osc.)*
4A		Check to determine that C16 has been adjusted to the correct peak by turning radio to 10.8 mc (141°) where a weaker signal should be received.			
5		9.5 mc	B	180°	C11 (osc.)*
5A		Check to determine that C11 has been adjusted to the correct peak by turning radio to 8.6 mc (156°) where a weaker signal should be received.			
6		3.0 mc	B	0°	L12 (osc.)* (Rock Gang)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	A	149°	C10 (osc.) C3 (ant.) C25 (det.)
8		600 kc		27°	L11 (osc.) (Rock Gang)
8A		Repeat steps 7 and 8.			
9	Antenna Terminal in series with 300 ohms	11.8 mc	25M	33°	L14 (osc.)* C20 (det.)† C1 (ant.)
10		15.2 mc	19M	37°	L15 (osc.)*
11		17.75 mc	16M	40°	L16 (osc.)**
12		21.5 mc	13M	55°	L17 (osc.)**

se peak with plunger out if two peaks can be obtained. ** Use peak with plunger in if two peaks can be obtained.
† Rock gang condenser slightly while peaking. Use maximum capacity peak if two peaks can be obtained.
Note: Oscillator tracks **above** signal on A, B, 31M, 25M and 19M bands; **below** signal on 16M and 13M bands.

MODELS 9Q1,9QK
MODEL 9Q4
Parts Lists

RCA MFG. CO., INC.

MODEL 9Q4

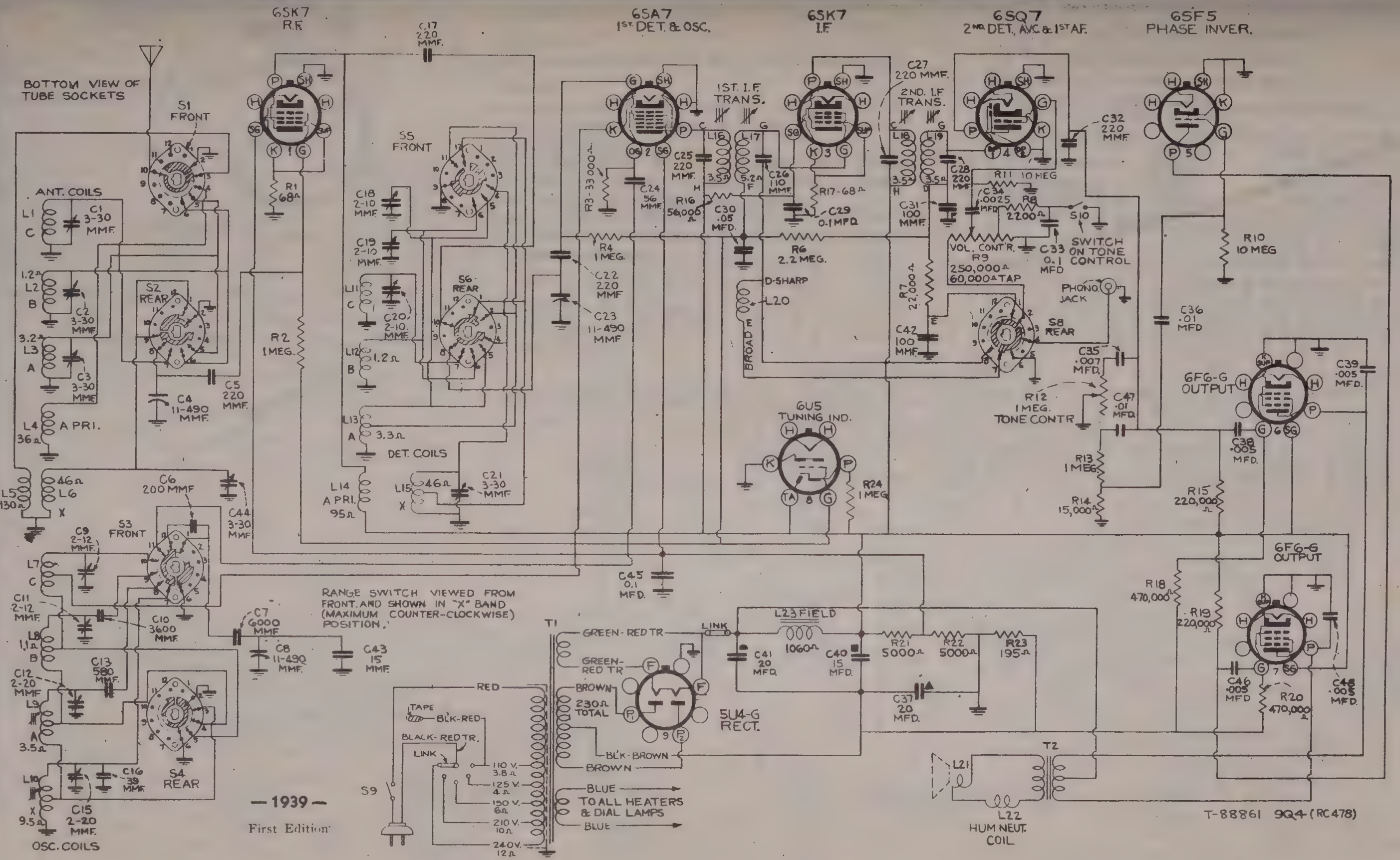
STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES (RC-478)
34401	Arm—Arm and hub for band indicator less cable—fastens on range switch shaft
34400	Belt—Drive belt
31767	Board—"Ant.-Grd." terminal board
32635	Cable—Cable and clips for band indicator
33821	Capacitor—Mica trimmer—3 sections 2-10 mmfd. and 1 section 3-30 mmfd. (C18, C19, C20; C21)
12714	Capacitor—Air trimmer, 2-12 mmfd. (C9, C11)
33818	Capacitor—Mica trimmer, 2 sections 2-20 mmfd. each (C12, C15)
12896	Capacitor—15 mmfd. (C43)
33822	Capacitor—Mica trimmer, 4 sections 3-30 mmfd. each (C1, C2, C3, C44)
13545	Capacitor—39 mmfd. (C16)
12723	Capacitor—56 mmfd. (C24)
12720	Capacitor—100 mmfd. (C42, C31)
32239	Capacitor—110 mmfd. (C26)
30232	Capacitor—200 mmfd. (C6)
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)
33760	Capacitor—220 mmfd. (C25, C27, C28)
33235	Capacitor—580 mmfd. (C13)
12811	Capacitor—3,600 mmfd. (C10)
31405	Capacitor—6,000 mmfd. (C7)
34459	Capacitor—.0025 mfd. (C34)
33584	Capacitor—.005 mfd. (C38, C39, C46, C48)
5148	Capacitor—.007 mfd. (C35)
4937	Capacitor—.01 mfd. (C36, C47)
32787	Capacitor—.05 mfd. (C30)
4839	Capacitor—0.1 mfd. (C29, C33, C45)
34393	Capacitor—Electrolytic—2 sections 20 mfd. and 1 section 15 mfd. (C37, C40, C41)
33762	Coil—Antenna coil A-B-C Bands (L1, L2, L3, L4)
32823	Coil—Antenna coil X Band (L5, L6)
33763	Coil—Detector coil A-B-C Bands (L11, L12, L13, L14)
33765	Coil—Detector coil X Band (L15)
33764	Coil—Oscillator coil A-B-C Bands (L7, L8, L9)
32931	Coil—Oscillator coil X Band (L10)
33756	Condenser—3-gang variable tuning condenser (C4, C8, C23)
34595	Control—Tone control (R12)
32634	Cord—Pointer drive cord
32713	Core—Adjustable core and stud for A-B-C Band coil
34392	Drum—Variable condenser drive drum
11891	Lamp—Dial lamp
14028	Nut—Clamping nut for air trimmer
31817	Plate—Cushion socket mounting plate, less socket
12493	Plug—5-contact female plug for speaker cable
34399	Pulley—Drive belt pulley and set screws for tuning knob shaft
34398	Pulley—Drive belt pulley and set screws for intermediate drive shaft
31373	Pulley—Drive cord pulley for L.H. support
34402	Pulley—Drive cord pulley and bracket for R.H. support
34394	Pulley—L.H. support and drive cord pulleys (2) assembled, less loose pulley
34395	Pulley—R.H. support and drive cord pulleys (2) assembled, less loose pulley and bracket
14281	Resistor—68 ohms, ¼ watt (R1, R17)
13716	Resistor—2,200 ohms, ¼ watt (R8)
34189	Resistor—Voltage divider, 2 sections 5,000 ohms and 1 section 195 ohms (R21, R22, R23)
12695	Resistor—15,000 ohms, ¼ watt (R14)
13998	Resistor—22,000 ohms, ¼ watt (R7)
12454	Resistor—33,000 ohms, ¼ watt (R3)
30650	Resistor—56,000 ohms, ½ watt (R16)
12264	Resistor—220,000 ohms, ¼ watt (R15, R19)
12285	Resistor—470,000 ohms, ¼ watt (R18, R20)
12013	Resistor—1 megohm, 1/10 watt (R24)
13730	Resistor—1 megohm, ¼ watt (R2, R4, R13)
12679	Resistor—2.2 megohm, ¼ watt (R6)
13601	Resistor—10 megohm, ¼ watt (R11, R10)
30340	Retainer—Retaining clip for pulley, Stock No. 31373
34396	Shaft—Intermediate tuning drive shaft, and drive cord pulley—less drive belt pulley and set screws
34397	Shaft—Intermediate tuning drive shaft, and flywheel—less drive belt pulley and set screws
31364	Socket—Dial lamp socket
34864	Socket—Magic Eye socket
14278	Socket—Phono. input socket
31251	Socket—Tube socket
31418	Spring—Pointer drive cord tension spring
34391	Switch—Phono. switch and fidelity control switch (S8)
34390	Switch—Range switch (S1, S2, S3, S4, S5, S6)
34596	Switch—Slide switch for tone control (S10)
33759	Transformer—First i-f transformer (L16, L17, L20, C25, C26)
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, C31, R7)
34183	Transformer—Power transformer — 100/130, 140/160, 195/250 volts, 50/60 cycles (T1)
34389	Volume Control—Volume control and power switch (R9, S9)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES (RL63K3)
31825	Cap—Dust cap
34615	Cone—Cone complete with voice coil (L2)
31539	Plug—5-prong male plug for speaker
34691	Speaker—8-inch dynamic complete with cone and voice coil—less output transformer
14534	Transformer—Output transformer (T2)

MODEL 9Q1,9QK

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
14517	Board—"Antenna-Ground" board
34665	Bracket—Drive cord bracket and pulley—long bracket with one pulley
34660	Bracket—Drive cord bracket and pulley—short bracket with one pulley
34656	Bracket—Drive cord bracket and pulleys—long bracket with two pulleys
12714	Capacitor—Air trimmer—2-12 mmfd. (C10)
12884	Capacitor—Air trimmer—long—2-20 mmfd. (C11, C16)
34654	Capacitor—Trimmer comprising 2 sections of 2.5-10 mmfd. and 1 section of 2.5-20 mmfd. (C20, C24, C25)
34653	Capacitor—Trimmer comprising 2 sections of 5-50 mmfd. and 1 section of 3-30 mmfd. (C1, C2, C3)
13200	Capacitor—10 mmfd. (C12, C17)
34668	Capacitor—11 mmfd. (C6, C21)
33380	Capacitor—12 mmfd. (C14)
12896	Capacitor—15 mmfd. (C52)
12948	Capacitor—33 mmfd. (C53)
34670	Capacitor—34 mmfd. (C13)
13141	Capacitor—47 mmfd. (C5, C22)
12723	Capacitor—56 mmfd. (C26, C27, C51)
30949	Capacitor—56 mmfd. (C28, C29)
31813	Capacitor—120 mmfd. (C36, C37)
14712	Capacitor—180 mmfd. (C38)
12694	Capacitor—220 mmfd. (C7, C18, C19, C41)
33235	Capacitor—580 mmfd. (C8)
31403	Capacitor—3,300 mmfd. (C9)
34459	Capacitor—.0025 mfd. (C39)
33584	Capacitor—.005 mfd. (C46, C47)
5148	Capacitor—.007 mfd. (C40)
4937	Capacitor—.01 mfd. (C42, C43)
32787	Capacitor—.05 mfd. (C32, C45)
4839	Capacitor—0.1 mfd. (C31, C35, C50)
12484	Capacitor—0.25 mfd. (C33)
33014	Capacitor—Electrolytic comprising 3 sections of 10 mfd. and 1 section of 20 mfd. (C30, C44, C48, C49)
34648	Coil—Antenna coil—AT160
34649	Coil—Antenna coil—AT161
34647	Coil—Antenna coil—AT163
31782	Coil—Oscillator coil for "A" band
34659	Coil—Oscillator coil for "B" band and 31 meter bands
34661	Coil—Oscillator coil for 13 meter band
34657	Coil—Oscillator coil for 16 meter and 19 meter bands
34658	Coil—Oscillator coil for 25 meter band
34652	Coil—R. F. coil—RFT 108A
34651	Coil—R. F. coil—RFT 110
34650	Coil—R. F. coil—RFT 112
34645	Condenser—Variable tuning condenser
34666	Control—Tone control
34667	Control—Volume control and power switch
34662	Cord—Tuning condenser drive cord
34392	Drum—Variable tuning condenser drive drum
11765	Lamp—Dial lamp
5040	Plug—4 contact female plug for speaker
34663	Pulley—Range switch pulley and hub
14281	Resistor—68 ohms, ¼ watt (R1)
30545	Resistor—180 ohms, ¼ watt (R4)
30735	Resistor—560 ohms, 1 watt (R17)
12955	Resistor—3,900 ohms, ¼ watt (R9)
14559	Resistor—10,000 ohms ¼ watt (R16)
33489	Resistor—15,000 ohms 2¼ watt (R6, R22)
14284	Resistor—22,000 ohms 1/10 watt
13998	Resistor—22,000 ohms ¼ watt (R5)
12454	Resistor—33,000 ohms ¼ watt (R23)
14560	Resistor—100,000 ohms ¼ watt (R8)
12285	Resistor—470,000 ohms ¼ watt (R14, R15, R19, R20)
12013	Resistor—1 meg., 1/10 watt (R21)
13730	Resistor—1 megohm ¼ watt (R2, R3)
12679	Resistor—2.2 megohm ¼ watt (R7)
13601	Resistor—10 megohm ¼ watt (R12, R18)
4669	Screw—No. 8-32 square head set screw for drum Stock No. 34392
14350	Screw—Square head set screw for pulley Stock No. 34663
34655	Shaft—Tuning knob shaft and flywheel
31364	Socket—Dial lamp socket
34864	Socket—Magic Eye socket
14278	Socket—Phonograph input socket
31251	Socket—Tube socket
13638	Spring—Tuning condenser drive drum spring
34646	Switch—Range switch
34664	Switch—Slide switch for tone control
32263	Transformer—1st I.F. transformer
14308	Transformer—2nd I.F. transformer
31734	Transformer—Power transformer—110 volts 25 cycle
31735	Transformer—Power transformer—Universal 50-60 cycle
31733	Transformer—Power transformer—110 volt 60 cycle
	SPEAKER ASSEMBLIES MODEL 9Q1 (RL-63K5)
31825	Cap—Dust cap
34615	Cone—Cone complete with voice coil
5039	Plug—4 contact male plug for speaker
34671	Speaker—8" Dynamic complete with cone and voice coil less output transformer and plug
14534	Transformer—Output transformer
	SPEAKER ASSEMBLIES MODEL 9QK (RL-70J3)
31825	Cap—Dust cap
12079	Coil—Field coil
11469	Coil—Neutralizing coil
31275	Cone—Cone complete with voice coil
5039	Plug—4 prong male plug for speaker
14534	Transformer—Output transformer

RCA MFG. CO., INC.

MODEL 9Q4
Chassis RC-478
Schematic



— 1939 —

First Edition

T-88861 9Q4 (RC478)

Intermediate Frequency .... 455 kc

Power Output Rating

Undistorted	10 watts
Maximum	12 watts

Loudspeaker (RL-63K-3)

Type	8-inch electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles

Power Supply Ratings

Rating A	105-125 volts, 50-60 cycles, 115 watts
Rating B	105-125 volts, 25-60 cycles, 115 watts
Rating C	105-130, 140-160, 200-250 volts, 40-60 cycles, 115 watts

Tube Complement

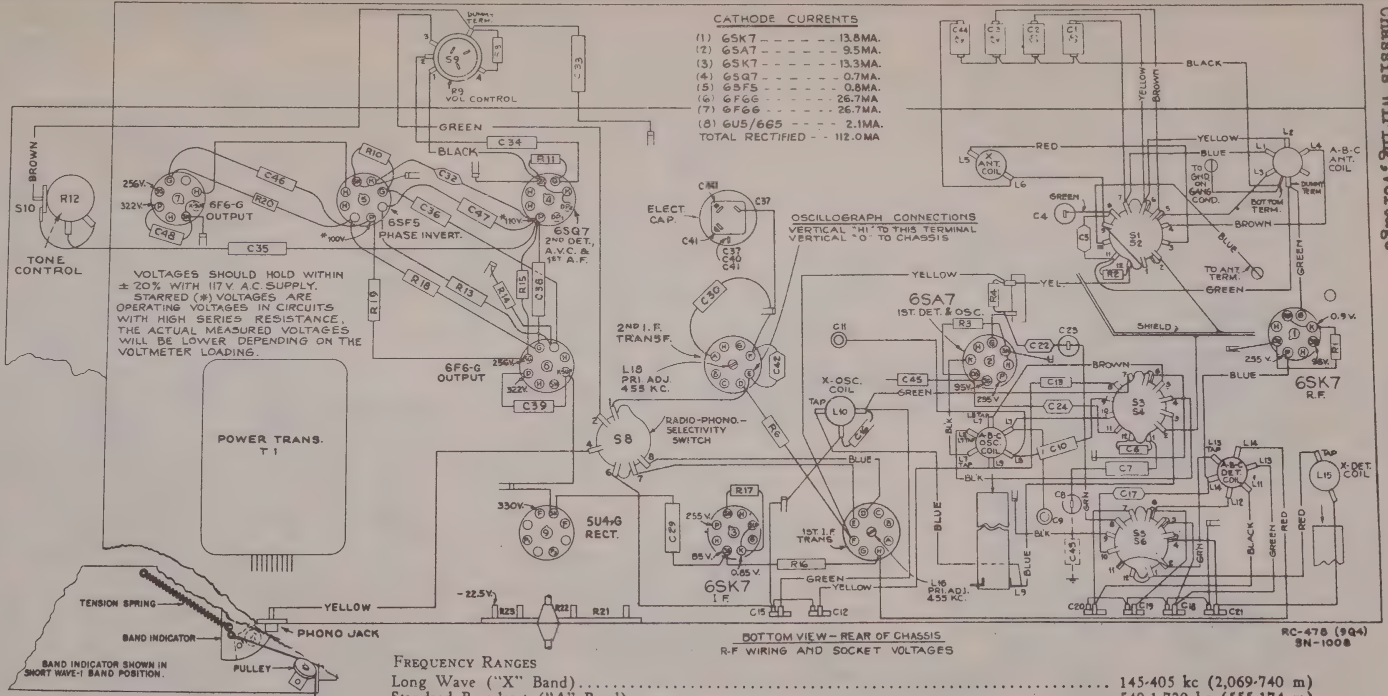
(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector-Oscillator
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6SQ7	2nd Detector, A.V.C., and A-F Amplifier
(5)	RCA-6SF5	Phase Inverter
(6)	RCA-6F6-G	Output
(7)	RCA-6F6-G	Output
(8)	RCA-6U5/6G5	Tuning Indicator
(9)	RCA-5U4-G	Rectifier

Pilot Lamps (2)...... Mazda No. 44, 6.3 volts, 0.25 amp.

MODEL 9Q4
Chassis Wiring, Voltage

RCA MFG. CO., INC.

Lead Dress, Dial Data



BOTTOM VIEW—REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

CATHODE CURRENTS

	Tube	Current
(1)	6SK7	13.8MA.
(2)	6SA7	9.5MA.
(3)	6SK7	13.3MA.
(4)	6SQ7	0.7MA.
(5)	6SF5	0.8MA.
(6)	6F6G	26.7MA
(7)	6F6G	26.7MA.
(8)	6U5/665	2.1MA.
	TOTAL RECTIFIED	112.0MA

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS

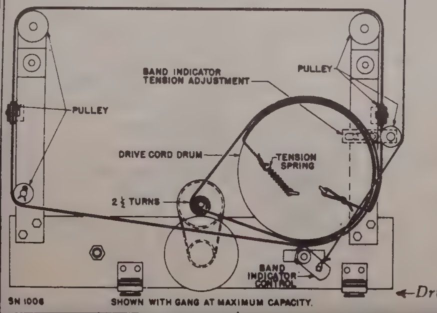
VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117V. A.C. SUPPLY. STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE, THE ACTUAL MEASURED VOLTAGES WILL BE LOWER DEPENDING ON THE VOLTMETER LOADING.

Frequency Ranges

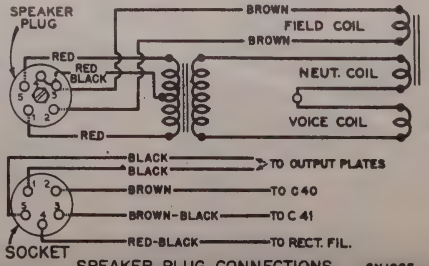
Band	Range
Long Wave ("X" Band)	145-405 kc (2,069-740 m)
Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)	7.0-22.0 mc (42.8-13.6 m)

Precautionary Lead Dress:

1. Dress black lead from L11 to C20 away from other leads.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.
4. Twist the power leads together and dress them away from the 6SQ7 socket, and also away from the yellow phono input lead.
5. Keep green lead of 6SK7 R-F grid circuit away from blue antenna lead.



←*Drive Cord and Band Indicator Arrangement*



SPEAKER PLUG CONNECTIONS

RCA MFG. CO., INC.

MODEL 9Q4
Alignment,Trimmers
Socket

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

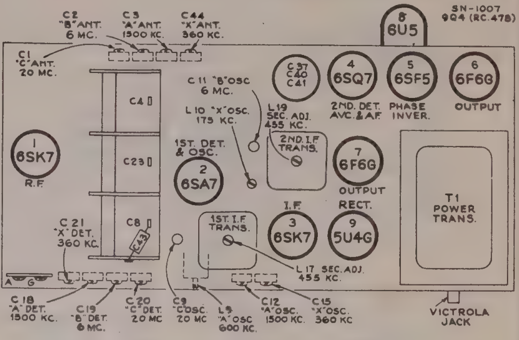
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

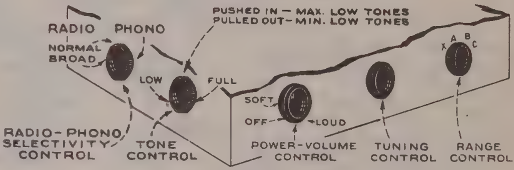
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 0° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.





Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 2nd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to maximum counter-clockwise (broad) position and check I-F response which should be a slightly double-peaked curve. Return tone control to 2nd position (sharp) for the following steps.			
5	Ant. terminal in series with 200 mmfd.	175 kc	175 kc (52.5°) "X" Band	L10 (osc.) Rock gang
6		360 kc	360 kc (148.5°) "X" Band	C15 (osc.) C21 (det.) C44 (ant.)
7		600 kc	600 kc (32°) "A" Band	L9 (osc.) Rock gang
8		1,500 kc	1,500 kc (152°) "A" Band	C12 (osc.) C18 (det.) C3 (ant.)
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6.1 mc	6.1 mc (151°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (157°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

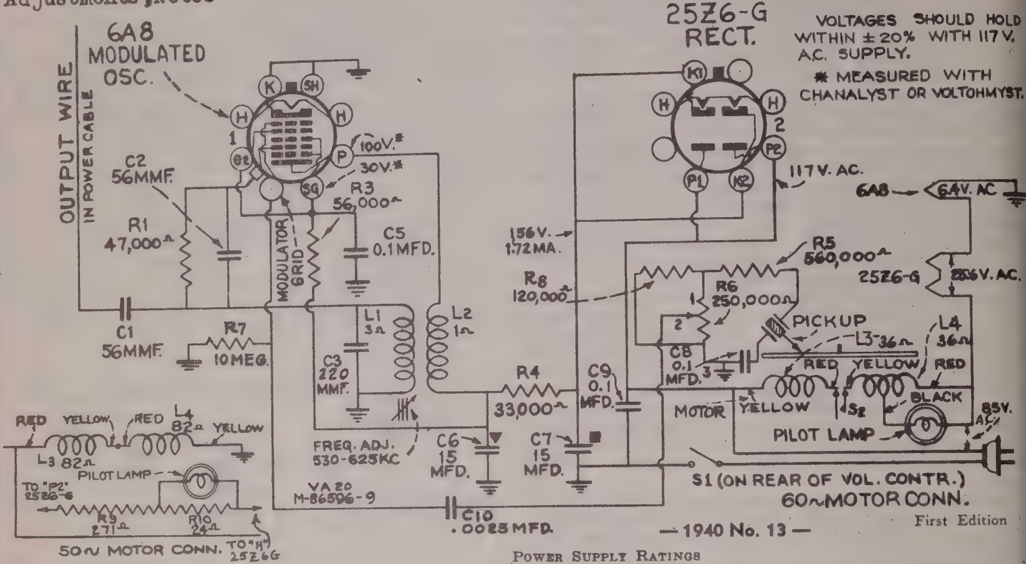
* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning receiver to approximately 5.19 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note.—Oscillator tracks **above** signal on all bands.

MODEL VA-21
Wireless Record Player
Schematic, Voltage
Adjustments, Notes

RCA MFG. CO., INC.



First Edition

— 1940 No. 13 —

General Description

The crystal pickup in Model VA-21 is connected through a volume control to grid No. 1 in an RCA-6A8 tube which functions as a modulated r-f oscillator. The oscillator frequency can be adjusted from 530 to 625 kc by means of a magnetite core in the oscillator transformer, L1-L2. (This is a screwdriver adjustment at the rear of the cabinet.) An output wire is connected to the grid circuit of the oscillator, and is run parallel with the power cable. The output is sufficient to permit operation within approximately 20 feet of a radio receiver.

Set-Up Procedure

1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-21 to full clockwise position. Start a record on the VA-21. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.

2. Tune the radio receiving set to a quiet point between 530-625 kc.

3. Tune the oscillator in the VA-21 to this frequency by adjusting the button on the rear of the VA-21 cabinet to obtain peak output on the receiver. Clockwise rotation decreases the frequency; counter-clockwise rotation increases the frequency.

4. Adjust the radio volume control for the highest volume that is likely to be required, and then use the VA-21 volume control for further adjustment.

5. In noisy locations, it may be desirable to leave the VA-21 volume control turned full clockwise, and regulate the radio volume control for the desired level.

6. If there is insufficient volume, or excessive noise, the remedy is to couple the VA-21 to the radio receiver, by running a piece of insulated wire between the two units: Wrap one end (three or four turns) around the antenna lead-in on the radio, and wrap the other end (three or four turns) around the short wire that projects from the plug on the power cord of the VA-21. With an RCA Master Antenna, wrap the wire around the counter-poise lead where it attaches to the receiver (terminal A3) or to the coupling unit (terminal B). With a loop receiver, place the end of the wire close to the loop.

7. If the radio receiver has push-button tuning, one of the buttons may be set up to tune in the VA-21 oscillator frequency. This button should be marked "Record Player."

Precautionary Lead Dress

1. The power supply cord must be dressed between chassis and top of cabinet, away from grid of 6A8, and entirely away from 25Z6-G.

2. All leads to oscillator coil must be as short as possible.

3. All motor leads must be dressed away from rotor.

4. Pickup leads must be dressed away from the top grid of 6A8, and kept away from the 25Z6-G.

Power Supply Ratings

A-6	105-125 volts, 60 cycles, 50 watts
A-5	105-125 volts, 50 cycles, 50 watts

Motor

Type	Synchronous (Manual Starting)
Turntable Speed	78 r.p.m.

Pickup

Type	Crystal
Pickup Impedance	100,000 ohms at 1000 cycles
Average Output Voltage	1½ volts at 1000 cycles with 250,000 ohm load.

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

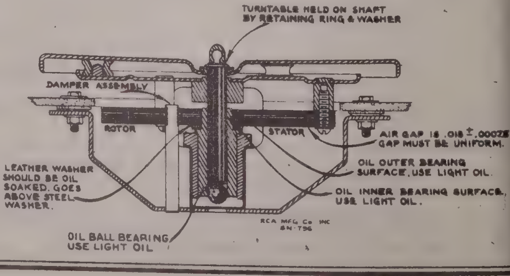
Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

The damper spring must fit without binding or chattering in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. The damper spring must exert approximately equal force in restoring the stator to its mid-position when the stator is deflected manually in each direction.

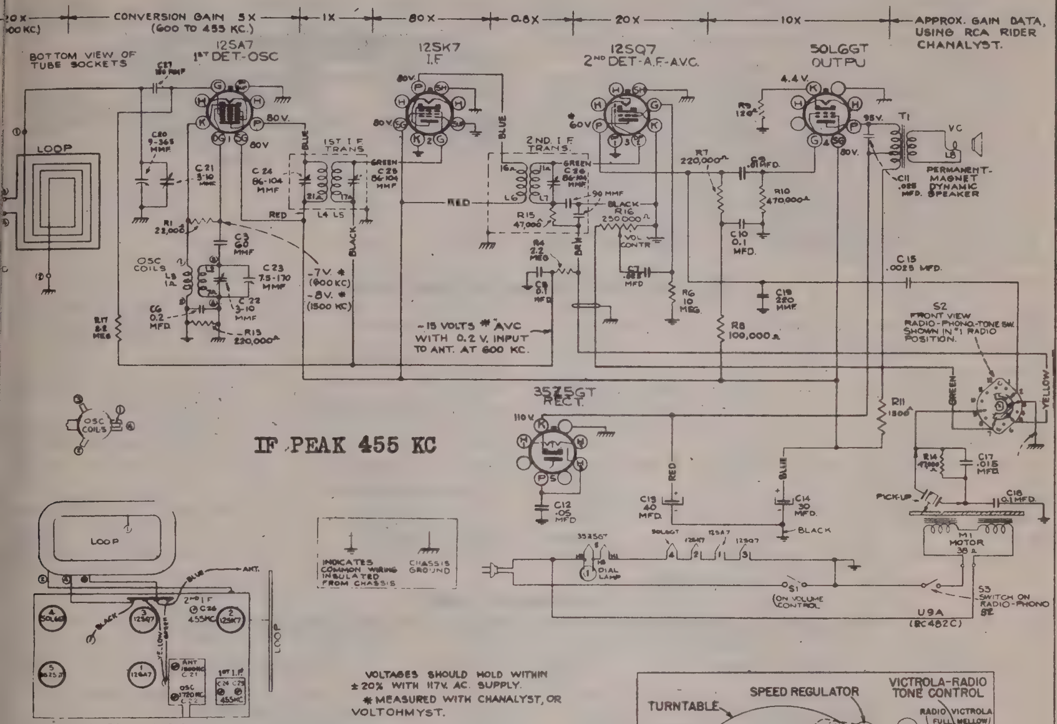
Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting upward.

Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.



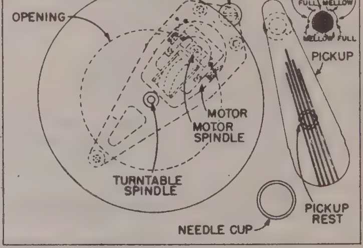
RCA MFG. CO., INC.

MODEL U9(2nd Production)
Schematic,Gain,Voltage
Alignment,Trimmers,Socket
Lead Dress,Phono.Data



TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. AC. SUPPLY.
* MEASURED WITH CHANALYST, OR VOLTOHMYST.



—1940 No. 12—

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillator to the receiver chassis through a 0.01 mfd capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should coincide with the left hand mark stamped in the dial backplate.

Antenna.—This set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the green antenna lead, stapled to the base of the cabinet. The antenna should not be longer than 100 feet including the lead-in. If it is longer, connect a 100 mmfd. capacitor in series with the lead-in.

Steps	Connect the high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. output—
1	Tuning Cond. stator (det.) in series with 0.01 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C24, C25, C26 (1st and 2nd I-F transformers)
2	Antenna lead (green) in series with 100 mmfd.	1,720 kc	Full Clockwise (out of mesh)	C22 (osc.)
3		1,500 kc	Resonance on 1,500 kc signal	C21 (ant.)

LEAD	DRESS
black-high side of AC line	Away from R10; C9, R7 and C15; against side of chassis
heaters	down against chassis
C7, C9, C19, C15, R6, R7, R10, Shield Cable (green and yellow)	up away from chassis
blue and brown leads from phono switch	Tape to shielded cable away from phone switch black leads
green converter lead	Against base and away from diode lead
green diode lead	Away from 12SQ7 grid

RCA MFG. CO., INC.

Miscellaneous Service Data

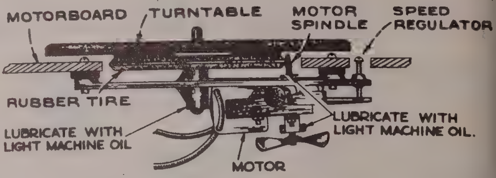
PHONOGRAPH MECHANISM.—

The phonograph motor is self-starting and operates the turntable through friction drive between the motor spindle and the rubber tire on the underside of the turntable.

The rubber driving tire on the turntable should never be removed since it is ground in to be concentric with the spindle. If replacement is required, the entire turntable should be replaced.

The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and saturate the oil retaining felt pads on the motor shaft with S.A.E. 10 oil. This oiling process should be repeated once or twice a year. **CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER DRIVING TIRE ON THE TURNTABLE MUST BE KEPT CLEAN AND ENTIRELY FREE FROM OIL AND GREASE AT ALL TIMES.**


MOTORBOARD
TURNTABLE
MOTOR SPINDLE
SPEED REGULATOR
RUBBER TIRE
LUBRICATE WITH LIGHT MACHINE OIL.
LUBRICATE WITH LIGHT MACHINE OIL
MOTOR

Electrical and Mechanical Specifications

FREQUENCY RANGE	
Standard Broadcast and one Police Band	540-1,720 kc
INTERMEDIATE FREQUENCY	455 kc
TUBE COMPLEMENT	
(1) RCA-12SA7	1st Detector—Oscillator
(2) RCA-12SK7	I-F Amplifier
(3) RCA-12SQ7	2nd Detector, A.V.C., A.F.
(4) RCA-50L6GT	Power Output
(5) RCA-35Z5GT	Rectifier
PILOT LAMP (1)	Mazda No. 51, 7.5 volts, 0.2 amp.
LOUDSPEAKER (RL-81-A3)	
Type	5-inch P M Dynamic
Voice Coil Impedance	4.0 ohms at 400 cycles
PICKUP	Crystal
Pickup Impedance	0.1 meg. at 1,000 cycles

PHONO MECHANISM	Self-starting motor Edge-driven turntable Adjustable Speed
POWER OUTPUT RATING	
Undistorted	0.71 watts
Maximum	1.36 watts
POWER SUPPLY RATINGS	
A-6	105-125 volts, 60 cycles
A-5	105-125 volts, 50 cycles
POWER CONSUMPTION	55 watts
CABINET DIMENSIONS	
10-5/16 in. high .... 17-7/16 in. wide	13⅜ in. deep
Tuning Drive Ratio	12 to 1
Shipping Weight	23½ lbs.
Net Weight	22 lbs.

Replacement Parts

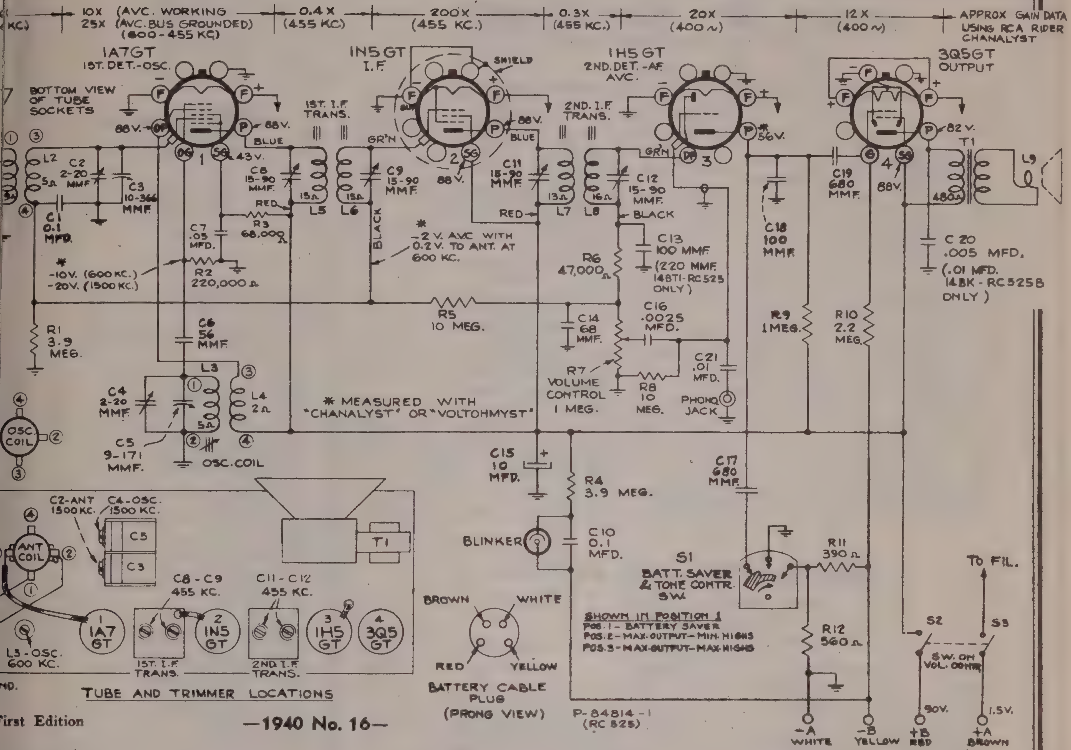
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-482C)	
12724	Capacitor—120 mmfd. (C27)	.35
13057	Capacitor—68 mmfd. (C3)	.35
34459	Capacitor—.0025 mfd. (C15)	.20
11315	Capacitor—.015 mfd. (C17)	.20
30938	Capacitor—.025 mfd. (C7, C11)	.20
4937	Capacitor—.01 mfd. (C8, C9)	.25
32787	Capacitor—.05 mfd. (C12)	.20
4839	Capacitor—0.1 mfd. (C5, C10, C18)	.30
34505	Capacitor—0.2 mfd. (C6)	.30
34873	Capacitor—Electrolytic comprising 1 section of 40 mfd. and 1 section of 30 mfd.	1.00
34443	Coil—Oscillator coil	.60
34843	Condenser—Tuning condenser	2.20
34034	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
33453	Drum—Drive cord drum	.50
34841	Frame—Dial and drive frame complete—less indicator drive cord, tuning shaft and drive drum	1.45
34842	Indicator—Station selector indicator	.30
11765	Lamp—Dial lamp	.15
35130	Loop—Antenna loop	1.45
30868	Plug—2-contact female plug for motor cable	.35
5119	Plug—3-contact female plug for speaker cable	.25
12071	Resistor—120 ohms, ¼ watt (R9)	.20
3153	Resistor—1,500 ohms, 1 watt (R11)	.22
13998	Resistor—22,000 ohms, ¼ watt (R1)	.20
5132	Resistor—47,000 ohms, 1/10 watt	.15
12412	Resistor—47,000 ohms, ¼ watt (R14)	.20
14560	Resistor—100,000 ohms, ¼ watt (R8)	.20
12264	Resistor—220,000 ohms, ¼ watt (R7, R13)	.20
12285	Resistor—470,000 ohms, ¼ watt (R10)	.20
12679	Resistor—2.2 meg., ¼ watt (R4, R17)	.20
13601	Resistor—10 meg., ¼ watt (R6)	.20
34033	Shaft—Tuning shaft	.25
34449	Socket—Dial lamp socket	.30
32537	Socket—Tube socket	.20
33296	Spring—Retaining spring for drum Stock No. 33453	.06
34844	Transformer—First I-F transformer	1.25
34442	Transformer—Second I-F transformer	1.50
11908	Washer—"C" washer for holding shaft Stock No. 34033	.03
	MOTOR ASSEMBLIES	
32654	Ball—Ball for turntable bearing	.06
33897	Base—Motor base and ball assembled	.80
33902	Motor—Complete motor 105-125 volts, 60 cycle (M1)	3.70
34496	Motor—Complete motor 105-125 volts, 50 cycle (M1)	4.60
33896	Mounting—Motor cradle mounting hardware and retainer	.10
	PICKUP AND ARM ASSEMBLIES	
33591	Arm—Pickup arm only—less cartridge, base and cable	.50
34481	Arm—Pickup pivot arm and shaft	.70
34482	Base—Pickup mounting base	.30
34758	Bushing—Rubber bushing and metal bushing for pickup pivot arm shaft	.15
33122	Crystal—Pickup crystal cartridge and needle screw	3.75
34311	Ring—Retaining ring for pivot shaft	.05
33529	Screw—Needle screw	.10
	SPEAKER ASSEMBLIES (RL-81A3)	
32907	Cap—Dust cap	.02
35570	Cone—Cone complete with voice coil	1.35
5118	Plug—3-prong male plug for speaker	.25
35904	Transformer—Output transformer	1.45
	MISCELLANEOUS ASSEMBLIES	
33680	Cup—Needle cup	.15
34849	Dial—Glass dial scale	1.50
34850	Hinge—Lid hinge	.25
33942	Knob—"Radio-Phono." switch knob	.25
30863	Knob—Tuning or volume control and power switch knob	.15
30870	Plug—2-contact male plug for motor leads	.35
32610	Rest—Rubber pickup rest	.10
30900	Spring—Retaining spring for knobs Stock No. 33942 and 30863	.05
32627	Support—Lid support	.40
33467	Switch—Combination "Radio-Phono." switch tone control	1.35
33899	Turntable—Turntable complete with spindle and rubber drive tire	3.70

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODELS 14BT1,14BT2,14BK
Ch.RC-525,RC-525A,RC-525B
Schematic,Gain,Voltage
Alignment,Trimmers,Socket
Lead Dress,Batt.Connection



irst Edition —1940 No. 16—

requency Range.. 540-1,720 kc
ntermediate Frequency.................................... 455 kc
OUDSPEAKER
ype.............................. Permanent-magnet Dynamic
iameter (14BT1, 14BT2) 5 in. (14BK) 6 in.
oice Coil Impedance (14BT1. 14BT2) 4 ohms (14BK) 3.4 ohms

POWER OUTPUT	Switch at "Battery Saver"	Switch at "Music" or "Speech"
Undistorted	.065 watts	.140 watts
Maximum	.180 watts	.250 watts

BATTERIES REQUIRED

1 "A"—"B" Pack (Burgess Type 17GD60 or equivalent).

CURRENT CONSUMPTION

"A" 0.25 amperes
"B" { 7.3 m.a. (switch at "Battery Saver" position). 11.8 m.a. (switch at "Music" or "Speech" position).

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the eter across the voice coil, and turn the receiver volume control to aximum.

Test-oscillator.—For all alignment operations, keep the output as w as possible to avoid a-v-c action.

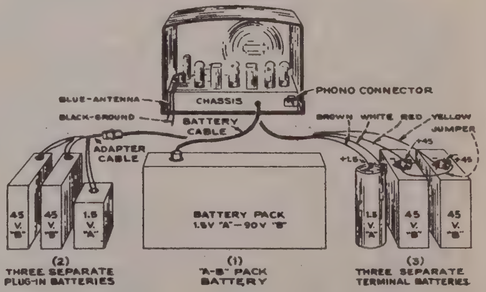
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5-GT grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	C11 and C12 (2nd I-F transformer)
2	1A7-GT grid cap, in series with .01 mfd.	455 kc		C8 and C9 (1st I-F transformer)
3	Antenna terminal, in series with 200 mmfd. Connect low side of test-osc. to "G" term.	1500 kc	1500 kc	C4 (osc.) C2 (ant.)
4		600 kc	600 kc	L3 (osc.) Rock in
5	Repeat steps 3 and 4			

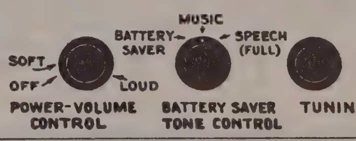
Precautionary Lead Dress

The phono input leads should be dressed away from 3Q5GT output leads.

C21 should be dressed away from the 3Q5GT output leads.

The lead from the 3Q5GT plate to output transformer should be dressed under clip and away from audio input plate leads.





MODELS 14BT1,14BT2,14BK
MODELS 16K,16T2,16T3
MODEL 16T4
Parts Lists

RCA MFG. CO., INC.

MODELS 14BT1, 14BT2 and 14BK

Chassis Nos. RC-525, 525A, 525B

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
36088	Bearing—Tuning shaft bearing and nut	.10
35097	Can—Shield can for I-F transformer Stock No. 36084	.30
36083	Can—Shield can for I-F transformer Stock No. 36083	.30
12723	Capacitor—56 mmfd.	.35
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd.	.35
12694	Capacitor—220 mmfd.	.35
14496	Capacitor—680 mmfd.	.45
34459	Capacitor—.0025 mfd.	.20
33564	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
33911	Capacitor—Electrolytic 10 mfd., 150 volts	.70
36085	Coil—Antenna coil	1.00
36092	Coil—Oscillator coil	.50
36091	Condenser—Variable tuning condenser Models 14BT2 and 14BK	2.25
36079	Condenser—Variable tuning condenser Model BT1	2.25
36080	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
36093	Core—Adjustable core and stud for oscillator coil	.15
36087	Frame—Dial frame complete with pulleys Models 14BT2 and 14BK	.75
36086	Frame—Dial frame—less dial—Model 14BT1	.30
35091	Indicator—Station selector indicator Model 14BT1	.25
36090	Indicator—Station selector indicator Model 14BT2 and 14BK	.20
34256	Lamp—Blinker lamp	1.35
5119	Plug—3-prong male plug for speaker cable	.25
30550	Plug—4-prong male plug for battery cable	.20
32289	Pulley—Drive cord pulley	.10
12261	Resistor—390 ohms, ½ watt	.20
12414	Resistor—560 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
13715	Resistor—68,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
13730	Resistor—1 meg., ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13167	Resistor—3.9 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
36089	Shaft—Tuning shaft	.10
35787	Socket—Phono. input socket only	.15
31319	Socket—Tube socket	.25
33175	Spring—Drive cord spring	.05
31261	Spring—Oscillator coil mounting spring	.01
35098	Spring—Spring to hold transformer in shield can	.08
36081	Switch—Battery saver and tone switch	.75
36082	Transformer—First I-F transformer—less shield can	1.40
36084	Transformer—Second I-F transformer—less shield can	1.40
34373	Washer—"C" washer for tuning shaft	.03
	SPEAKER ASSEMBLIES Model 14BT1, 14BT2 (RL-85-4)	
32907	Cap—Dust cap	.02
36295	Cone—Cone complete with voice coil	.75
36098	Transformer—Output transformer	1.25
	SPEAKER ASSEMBLIES (RL-92-3) Model 14BK	
32907	Cap—Dust cap	.02
36077	Cone—Cone complete with voice coil	1.25
5118	Plug—3-prong male plug for speaker	.25
36098	Transformer—Output transformer	1.25
	MISCELLANEOUS ASSEMBLIES	
35104	Crystal—Escutcheon and crystal—Model 14BT1	1.00
36099	Decalcomania—Control marker decal	.05
36100	Dial—Dial scale—Model 14BTL	.50
36102	Dial—Glass dial scale—Model 14BK	1.00
36101	Dial—Glass dial scale—Model 14BT2	.80
35937	Escutcheon—Dial scale escutcheon—less dial for Model 14BK	1.25
35916	Escutcheon—Dial scale escutcheon—less dial—Model 14BT2	.90
35678	Fastener—Push-on fastener for crystal Stock No. 35104	.02
36297	Knob—Volume control, power switch, tone switch, or tuning knob	.25
30900	Spring—Retaining spring for knobs	.05

MODELS 16K, 16T2 and 16T3

Chassis No. RC-509C RC-509B RC-509A

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	MODEL 16T2 (RC-509B) MODEL 16T3 (RC-509A) MODEL 16K (RC-509C)	
34785	Board—"Antenna-Ground" board	.20
35857	Capacitor—Mica trimmer—1 section of 3-30 mmfd. and 1 section of 8-80 mmfd.	.35
35867	Capacitor—Mica trimmer comprising 2 sections of 8-80 mmfd.	.40
35869	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 1 section of 50-400 mmfd., and 1 section of 100-540 mmfd. (Models 16T3 and 16K)	1.00
34699	Capacitor—100 mmfd., mica	.30
12720	Capacitor—100 mmfd., moulded	.35
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
13895	Capacitor—5,600 mmfd.	.70
30303	Capacitor—.0035 mfd. (Models 16T2 and 16T3)	.40
33640	Capacitor—.005 mfd.	.25
5148	Capacitor—.007 mfd.	.20
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts	1.70
35876	Coil—Coil and resistor assembly [R16 and L2 (L4 in 16T2)]	.30
35785	Coil—Loop primary (L1)	.50
35803	Coil—Oscillator coils for push button switch—(Models 16T3 and 16K)	.30
35854	Coil—Oscillator coil	.85
35874	Condenser—Variable tuning condenser	2.85
35861	Control—Tone control—(Models 16T3 and 16T2)	.95
35935	Control—Tone control—(Model 16K)	.90
35859	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
35871	Core—Adjusting core and stud for oscillator coils—(Models 16T3 and 16K)	.55
35768	Core—Core and stud for oscillator coil	.15
35870	Indicator—Station selector indicator	.20
35856	Loop—Antenna loop winding	.80
35855	Loop—Antenna loop complete	3.00
35936	Plate—Dial back plate—(Model 16K)	.95
35873	Plate—Dial back plate—(Model 16T2)	.80
35872	Plate—Dial back plate—(Model 16T3)	.95
5119	Plug—3-contact female plug for speaker cable—(Model 16K)	.25
32289	Pulley—Drive cord pulley and rivet	.10
30681	Resistor—470 ohms, 1 watt	.22
14720	Resistor—1,000 ohms, ½ watt	.20
14024	Resistor—2,700 ohms, ½ watt	.20
30694	Resistor—3,900 ohms, ½ watt	.20
35875	Resistor—12,000 ohms, 3 watts	.35
13998	Resistor—22,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35862	Shaft—Tuning shaft	.20
35772	Shield—Power transformer bottom shield	.30
35934	Shield—Power transformer top shield assembly	.55
31364	Socket—Dial lamp socket	.20
35787	Socket—Phono. input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35868	Switch—Push button switch—(Models 16T3 and 16K)	3.15
35864	Switch—Range switch—(Models 16T3 and 16K)	1.95
35865	Switch—Range switch—(Model 16T2)	1.20
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35587	Transformer—Power transformer—110 volts, 60 cycle—(Model 16K)	4.00
35853	Transformer—Power transformer—less end shields—110 volts, 60 cycle (Models 16T2 and 16T3)	3.45
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70H6) Model 16K	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil, and dust cap	1.50
5118	Plug—3-contact male for speaker	.25
31301	Transformer—Output transformer	1.70
	SPEAKER ASSEMBLIES (RL-79B1) Models 16T2 and 16T3	
35849	Cap—Dust cap	.03
35880	Coil—Field coil	1.50
35441	Cone—Cone complete with voice coil	1.25
35879	Transformer—Output transformer	1.50
	MISCELLANEOUS ASSEMBLIES	
35883	Button—Push button—(Models 16T3 and 16K) (dark brown)	.15
36299	Button—Push button (light brown)	XX
35921	Decalcomania—Control panel decal—(Model 16T2)	.10
35920	Decalcomania—Control panel decal—(Models 16T3 and 16K)	.10
35393	Decalcomania—"Television" decal	.05
35938	Dial—Glass dial scale—(Model 16K)	1.00
35918	Dial—Glass dial scale—(Model 16T2)	1.00
35917	Dial—Glass dial scale—(Model 16T3)	1.00
35937	Escutcheon—Dial scale escutcheon—(Model 16K)	1.25
35882	Escutcheon—Dial scale escutcheon—(Model 16T2)	.85
35915	Escutcheon—Dial scale escutcheon—less dial—(Model 16T3)	.90
35881	Escutcheon—Push button escutcheon—(Models 16T3 and 16K)	.85
35814	Knob—Tone control or range switch knob (dark brown)	.25
36297	Knob—Tone control or range switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
[illegible]	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
33842	Marker—Station selector marker	.25
34053	Spring—Retaining spring for button Stock No. 35883	.02
30900	Spring—Retaining spring for knobs Stock Nos. 35814 and 35775	.05

MODEL 16T4

Chassis No. RC-509

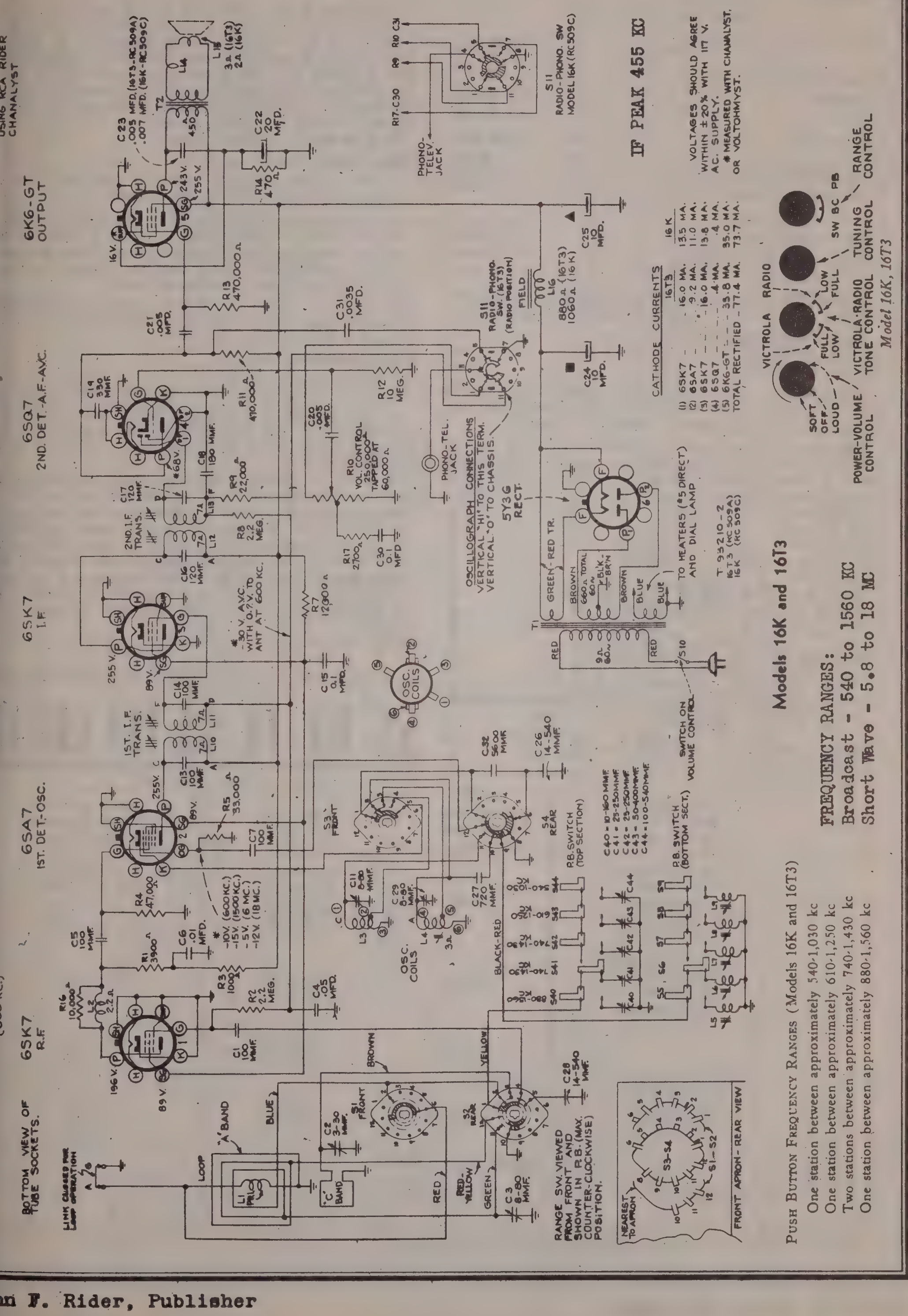
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-509)	
34785	Board—"Antenna-Ground" board	.20
35857	Capacitor—Mica trimmer—1 section of 3-30 mmfd. and 1 section of 8-80 mmfd.	.35
35866	Capacitor—Mica trimmer—3 sections of 8-80 mmfd.	.50
35869	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 1 section of 50-400 mmfd., and 1 section of 100-540 mmfd.	1.00
12720	Capacitor—100 mmfd. (C1, C5, C7)	.35
34699	Capacitor—100 mmfd.	.30
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd. (C18)	.35
12952	Capacitor—330 mmfd. (C19)	.35
35877	Capacitor—720 mmfd. (C27)	.45
13895	Capacitor—5,600 mmfd. (C32)	.70
34459	Capacitor—.0025 mfd. (C33)	.20
33640	Capacitor—.005 mfd. (C20, C21, C23, C31)	.25
4937	Capacitor—.01 mfd. (C6)	.25
32787	Capacitor—.05 mfd. (C4)	.20
4839	Capacitor—0.1 mfd. (C15, C30)	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 25 volts	1.70
35876	Coil—Coil and resistor assembly (L2 and R16)	.30
35785	Coil—Loop primary (L1)	.50
35789	Coil—Oscillator coil	1.15
35803	Coil—Oscillator coils for push button switch	.30
35874	Condenser—Variable tuning condenser	2.85
35860	Control—Tone control	1.10
35859	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
35871	Core—Adjusting core and stud for oscillator coils	.55
35788	Core—Core and stud for oscillator coil	.15
35870	Indicator—Station selector indicator	.20
35855	Loop—Antenna loop complete	3.00
35856	Loop—Antenna loop winding	.80
35872	Plate—Dial back plate	.95
32289	Pulley—Drive cord pulley and rivet	.10
30681	Resistor—470 ohms, 1 watt (R14)	.22
14720	Resistor—1,000 ohms, ½ watt (R3)	.20
14024	Resistor—2,700 ohms, ½ watt (R17)	.20
30694	Resistor—3,900 ohms, ½ watt (R1)	.20
35875	Resistor—12,000 ohms, 3 watts (R7)	.35
13998	Resistor—22,000 ohms, ½ watt (R9)	.20
12454	Resistor—33,000 ohms, ½ watt (R5)	.20
12412	Resistor—47,000 ohms, ½ watt (R4)	.20
12285	Resistor—470,000 ohms, ½ watt (R11, R13)	.20
12679	Resistor—2.2 meg., ½ watt (R2, R8)	.20
13601	Resistor—10 meg., ½ watt (R12)	20
35862	Shaft—Tuning shaft	.20
35772	Shield—Power transformer bottom shield	.30
35934	Shield—Power transformer top shield assembly	.55
31364	Socket—Dial lamp socket	.20
35787	Socket—Phono. input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35868	Switch—Push button switch	3.15
35863	Switch—Range switch	1.80
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35853	Transformer—Power transformer—less end shields 110 volts, 60 cycle	3.45
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-79B1)	
35849	Cap—Dust cap	.03
35880	Coil—Field coil	1.50
35441	Cone—Cone complete with voice coil	1.25
35879	Transformer—Output transformer	1.50
	MISCELLANEOUS ASSEMBLIES	
35883	Button—Push button (dark brown)	.15
36299	Button—Push button (light brown)	XX
35919	Decalcomania—Control panel decal	.10
35393	Decalcomania—"Television" decal	.05
35916	Dial—Glass dial scale	1.25
35915	Escutcheon—Dial scale escutcheon—less dial	.90
35881	Escutcheon—Push button escutcheon	.85
35814	Knob—Tone control or range switch knob (dark brown)	.25
36297	Knob—Tone control or range switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
36298	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
33842	Marker—Station selector marker	.25
34053	Spring—Retaining spring for button Stock No. 35883	.02
30900	Spring—Retaining spring for knobs Stock Nos. 35814 and 35775	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

XX—Price upon application to your local RCA Victor Parts Distributor.

RCA MFG. CO., INC.

MODELS 16K, Ch. RC-509C
16T3, Ch. RC-509A
Schematic, Gain, Voltage


BOTTOM VIEW OF TUBE SOCKETS.
USING RCA RIDER CHANALYST
6SK7 R.F.
6SA7 1ST. DET.-OSC.
6SK7 I.F.
6SQ7 2ND. DET.-A.F.-A.V.C.
6K6-GT OUTPUT
5Y3G RECT.
1ST. I.F. TRANS.
2ND. I.F. TRANS.
OSC. COILS
RANGE SW. VIEWED FROM FRONT AND SHOWN IN R.B. (MAX. COUNTER-CLOCKWISE) POSITION.
R.B. SWITCH (TOP SECTION)
R.B. SWITCH (BOTTOM SECT.)
C40 = 10-160 MMF.
C41 = 25-250 MMF.
C42 = 25-250 MMF.
C43 = 50-400 MMF.
C44 = 100-540 MMF.
SWITCH ON VOLUME CONTROL
* -10V. (600 KC.) -15V. (1500 KC.) -5V. (6 MC.) -12V. (18 MC.)
* -30 V. A.V.C. WITH 0.7 V. TO ANT AT 600 KC.
OSCILLOGRAPH CONNECTIONS VERTICAL "HI" TO THIS TERM. VERTICAL "O" TO CHASSIS.
PHONO-TEL. JACK
PHONO-TELEV. JACK
S11 RADIO-PHONO. SW. (16T3) (RADIO POSITION)
S11 RADIO-PHONO. SW MODEL 16K (RC509C)
R10 VOL. CONTROL 250,000 Ω TAPPED AT 60,000 Ω
TO HEATERS (#5 DIRECT) AND DIAL LAMP
T 93210-2 16T3 (RC509A) 16K (RC509C)
C23 .005 MFD. (16T3-RC509A) .007 MFD. (16K-RC509C)
L15 3 Ω (16T3) 2 Ω (16K)
L16 880 Ω (16T3) 1060 Ω (16K)
FIELD
LINK CLOSED FOR LOOP OPERATION
FRONT APRON - REAR VIEW
NEAREST TO APRON

IF PEAK 455 KC

VOLTAGES SHOULD AGREE WITHIN ±20% WITH 117 V. AC. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.

CATHODE CURRENTS

		16T3	16K
(1)	6SK7	16.0 MA.	13.5 MA.
(2)	6SA7	9.2 MA.	11.0 MA.
(3)	6SK7	16.0 MA.	13.8 MA.
(4)	6SQ7	.4 MA.	.4 MA.
(5)	6K6-GT	35.8 MA.	35.0 MA.
TOTAL RECTIFIED		77.4 MA.	73.7 MA.

VICTROLA
RADIO
SOFT
OFF
LOUD
FULL
LOW
LOW
FULL
SW BC PB
POWER-VOLUME CONTROL
VICTROLA-RADIO TONE CONTROL
TUNING CONTROL
RANGE CONTROL

Model 16K, 16T3

Models 16K and 16T3

FREQUENCY RANGES:
Broadcast - 540 to 1560 KC
Short Wave - 5.8 to 18 MC

PUSH BUTTON FREQUENCY RANGES (Models 16K and 16T3)

One station between approximately 540-1,030 kc
One station between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
One station between approximately 880-1,560 kc

RCA MFG. CO., INC.

Models 16K, 16T2, 16T3

Pilot Lamp .... Mazda No. 51, 7.5 volts, 0.20 amp.

Power Output Rating

Undistorted .... 2.5 watts
Maximum .... 4.5 watts

Loudspeakers	16K	16T2, 16T3
Size	12-inch	6-inch
V. C. impedance at 400 cycles	2.2 ohms	3.4 ohms
Identification Number	RL-70H6	RL-79B1

Power Supply Ratings

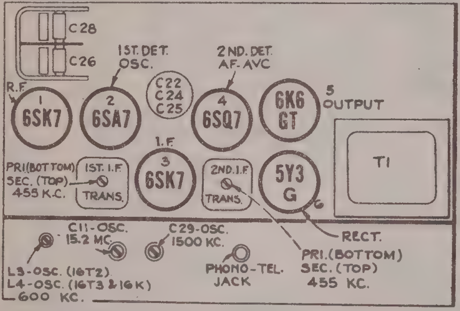
105-125 volts, 50-60 cycles .... 70 watts
105-125 volts, 25-60 cycles .... 70 watts
105-125, 200-250 volts, 50-60 cycles .... 70 watts

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.



Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

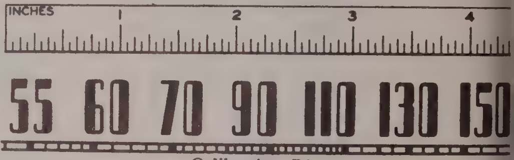
Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.
4. After completion of alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,500 kc is approximately 4 inches from the reference mark.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.



Calibration Dial

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01 mfd.	455 kc	"A" band, Quiet Point at 1,500 kc end of dial	L7 and L8 (2nd I.F. Trans.)
2	1st det. grid, in series with .01 mfd.			L5 and L6 (1st I.F. Trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C11 (osc.)* C2 (ant.)
4	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
5		600 kc	600 kc "A" band	L3 (in 16T2) L4 (in 16K and 16T2) Rock in
6	Repeat steps 4 and 5.			

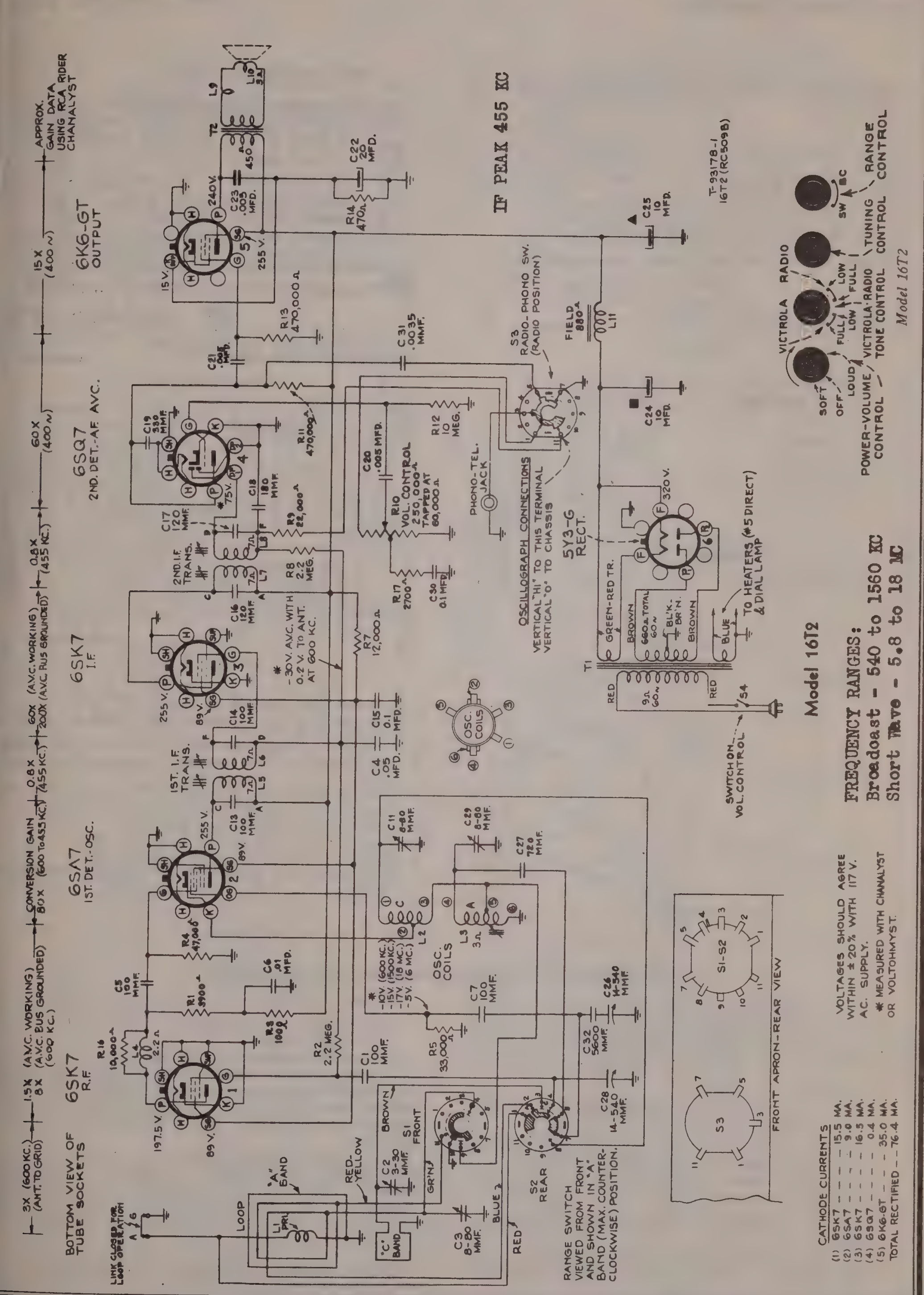
In case of instability during R-F alignment, connect a 27,000 ohm 1/4 watt resistor across "D" and "F" of 2nd I-F tran former.

* Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tu ing receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks **above** signal on both bands.

RCA MFG. CO., INC.

MODEL 16T2,Ch.RC-509B
Schematic,Gain,Voltage



IF PEAK 455 KC

T-93178-1
16T2 (RC509B)

BOTTOM VIEW OF TUBE SOCKETS

OSCILLOGRAPH CONNECTIONS
VERTICAL 'HI' TO THIS TERMINAL
VERTICAL 'O' TO CHASSIS

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN 'A' BAND (MAX. COUNTER-CLOCKWISE) POSITION.

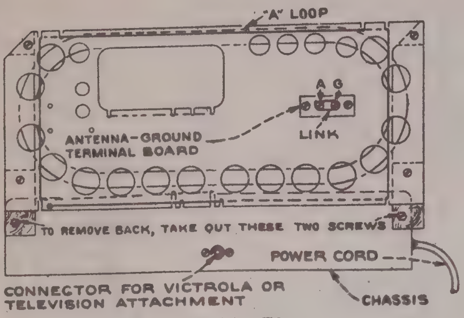
Model 16T2

Model 16T2

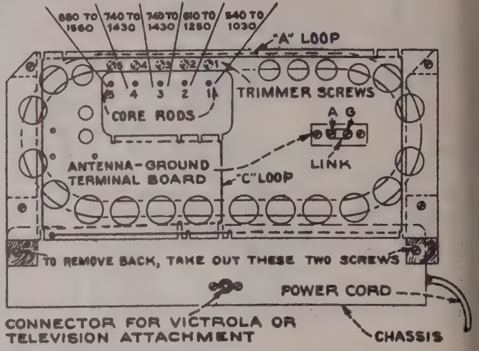
FREQUENCY RANGES:
Broadcast - 540 to 1560 KC
Short Wave - 5.8 to 18 MC

VOLTAGES SHOULD AGREE WITHIN ± 20% WITH 117 V. AC. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.

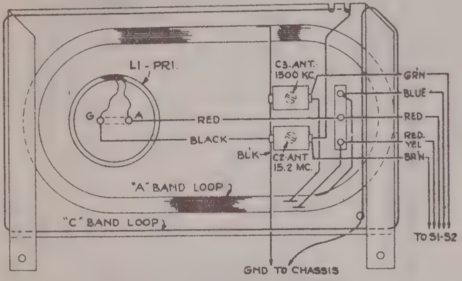
CATHODE CURRENTS
(1) 6SK7 - - - - - 15.5 MA.
(2) 6SA7 - - - - - 9.0 MA.
(3) 6SK7 - - - - - 16.5 MA.
(4) 6SQ7 - - - - - 0.4 MA.
(5) 6K6-GT - - - - 35.0 MA.
TOTAL RECTIFIED - - 76.4 MA.


"A" LOOP
A G
LINK
ANTENNA-GROUND TERMINAL BOARD
TO REMOVE BACK, TAKE OUT THESE TWO SCREWS
POWER CORD
CONNECTOR FOR VICTROLA OR TELEVISION ATTACHMENT
CHASSIS

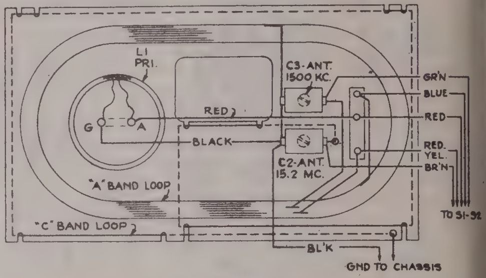
Model 16T2



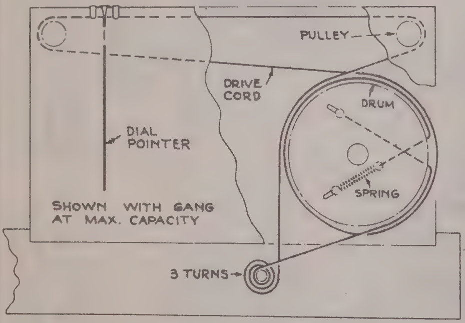
Model 16K, 16T3



Model 16T2



Model 16K, 16T3



Precautionary Lead Dress.—

1. Dress red leads from C band trimmer to coil and switch away from each other (16T2).
2. Keep bus from range switch to lance short as possible (16T2).
3. Tape together red, blue, and brown leads from chassis to loop (16T2).
4. Dress yellow lead from IF to tone switch up away from chassis.
5. Dress C-20 from volume control up away from chassis.
6. Keep grid end of R-12 as short as possible.
7. Dress C-30 away from red and brown A.C. leads.
8. Dress power transformer leads down against chassis.
9. Dress brown power transformer leads back away from IF transformer.

At left—Dial Drive in Models 16K, 16T2, 16T3

Push Button Adjustment (Models 16K and 16T3)

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast (BC) position and manually tune in the first station on the list.
3. Turn range switch to push-button (PB) position and press in the left-hand button.
4. Unscrew the push-button loop trimmers to minimum capacity.
5. Adjust L9 to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust L9 for peak output.
6. Adjust C44 for peak output on the first station.
7. Proceed in the same manner to adjust for the remaining four stations.

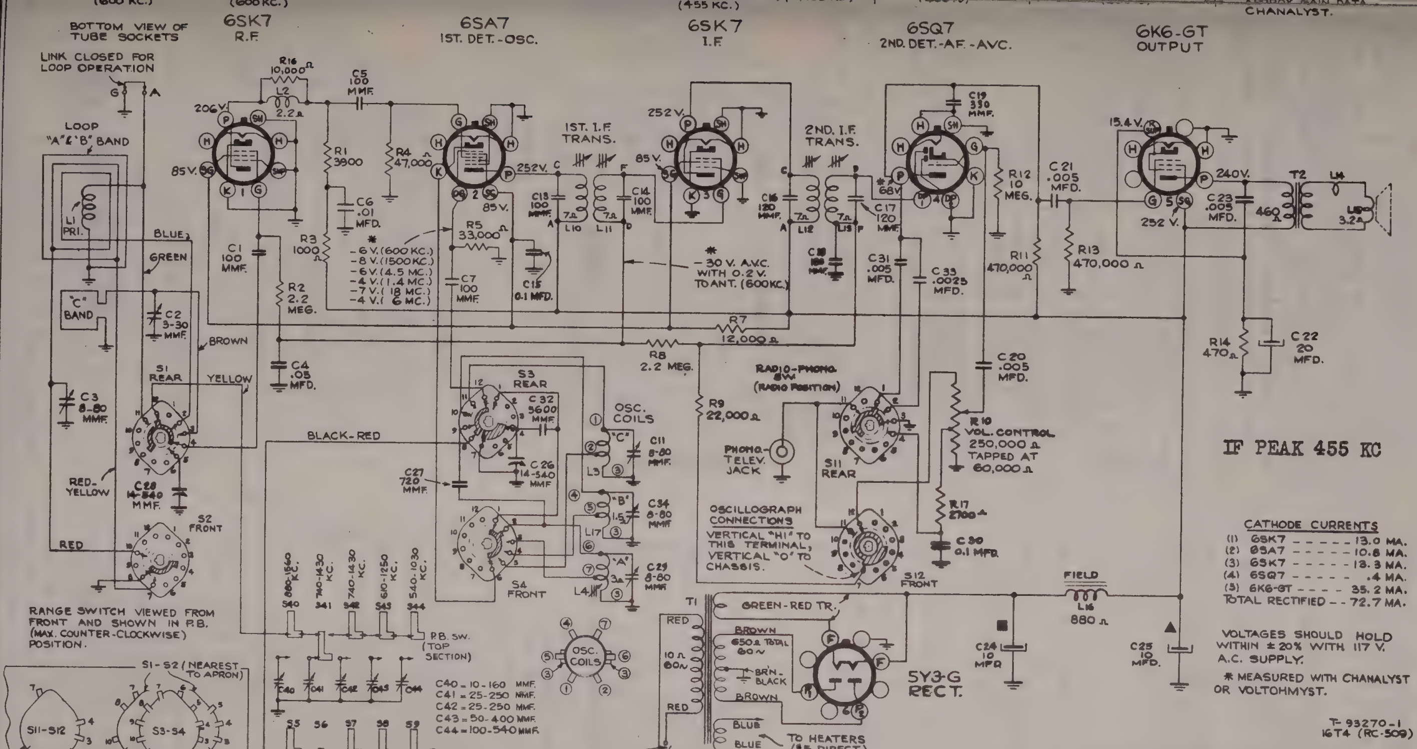
Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. The procedure outlined above (backing the push-button loop trimmers to minimum capacity before adjusting the cores) will reduce this effect.

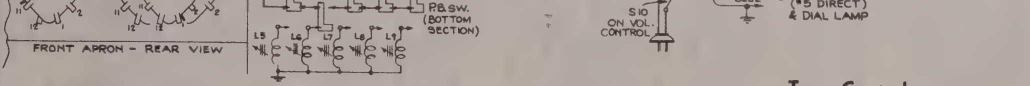
On the 880 to 1,560 kc push-button, the higher frequency stations may be received with L5 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

MODEL 16T4,Ch.RC-509
Schematic,Gain,Voltage
Dial,Tone Cont.Data

RCA MFG. CO., INC.



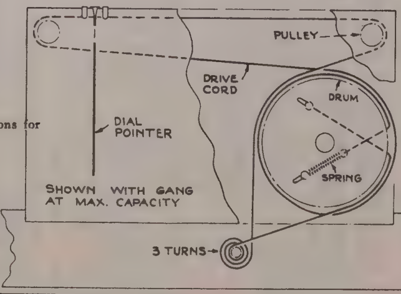


IF PEAK 455 KC

CATHODE CURRENTS
(1) 6SK7 - - - - - 13.0 MA.
(2) 6SA7 - - - - - 10.8 MA.
(3) 6SK7 - - - - - 13.3 MA.
(4) 6SQ7 - - - - - .4 MA.
(5) 6K6-GT - - - - 35.2 MA.
TOTAL RECTIFIED - - 72.7 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST.



FREQUENCY RANGES

Broadcast.....	540-1,560 kc
"B" Band.......	1.4-4.5 mc
"C" Band.......	5.8-18 mc

PILOT LAMP

Mazda No. 51, 7.5 volts, 0.20 amp.

POWER OUTPUT RATING

Undistorted.......................	2.5 watts
Maximum..........................	4.5 watts

PUSH BUTTON FREQUENCY RANGES

One station between approximately 540-1,030 kc
One station between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
One station between approximately 880-1,560 kc

LOUDSPEAKERS

Size..........................	6-inch
V.C. impedance at 400 cycles...	3.4 ohms
Identification Number........	RL-79B1

POWER SUPPLY RATINGS

105-125 volts, 50-60 cycles...	70 watts
105-125 volts, 25-60 cycles...	70 watts

Tone Control

The tone control has four positions for radio, and four positions for Victrola or Television sound:

No. 1—Radio—maximum low—minimum high
No. 2—Radio—maximum low—reduced high
No. 3—Radio—maximum low—maximum high
No. 4—Radio—minimum low—maximum high
No. 5—Phono—maximum low—minimum high
No. 6—Phono—maximum low—reduced high
No. 7—Phono—maximum low—maximum high
No. 8—Phono—minimum low—maximum high

(No. 1 is full counter-clockwise, and No. 8 is full clockwise.)

MODEL 16T4
Alignment,Trimmers,Socket
Tuner,Loop Connections

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.
4. After completion of the alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note.* This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,500 kc is approximately 4 inches from the reference mark.

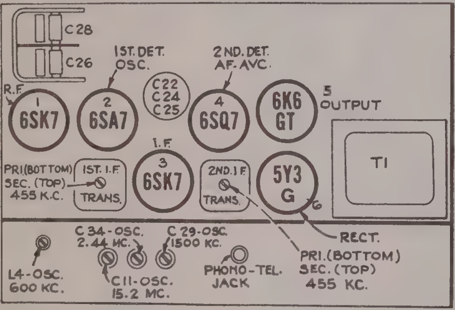
* see Calibration Dial Model 16K

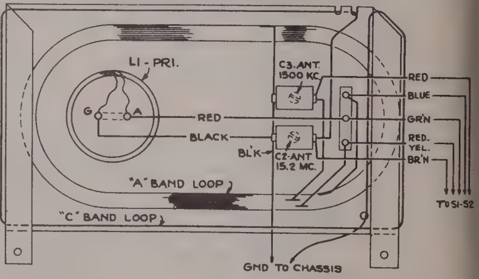
Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01	455 kc	"A" band, Quiet Point at 1,500 kc end of dial	L12 and L13 (2nd I.F. Trans.)
2	1st-Det. grid, in series with .01			L10 and L11 (1st I.F. Trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C11 (osc.)* C2 (ant.)
4		2.44 mc	2.44 mc "B" band	C34 (osc.) Rock in
5	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
6		600 kc	600 kc "A" band	L4 Rock in
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks above signal on all bands.





Push Button Adjustment

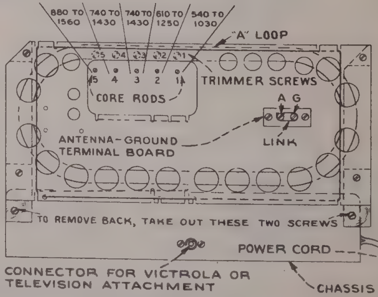
The push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

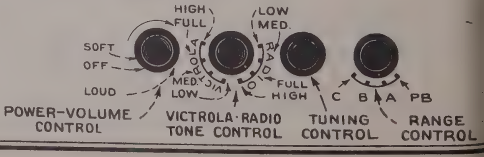
In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across "A" and "G" terminals on back of set. In either case the procedure is as follows:

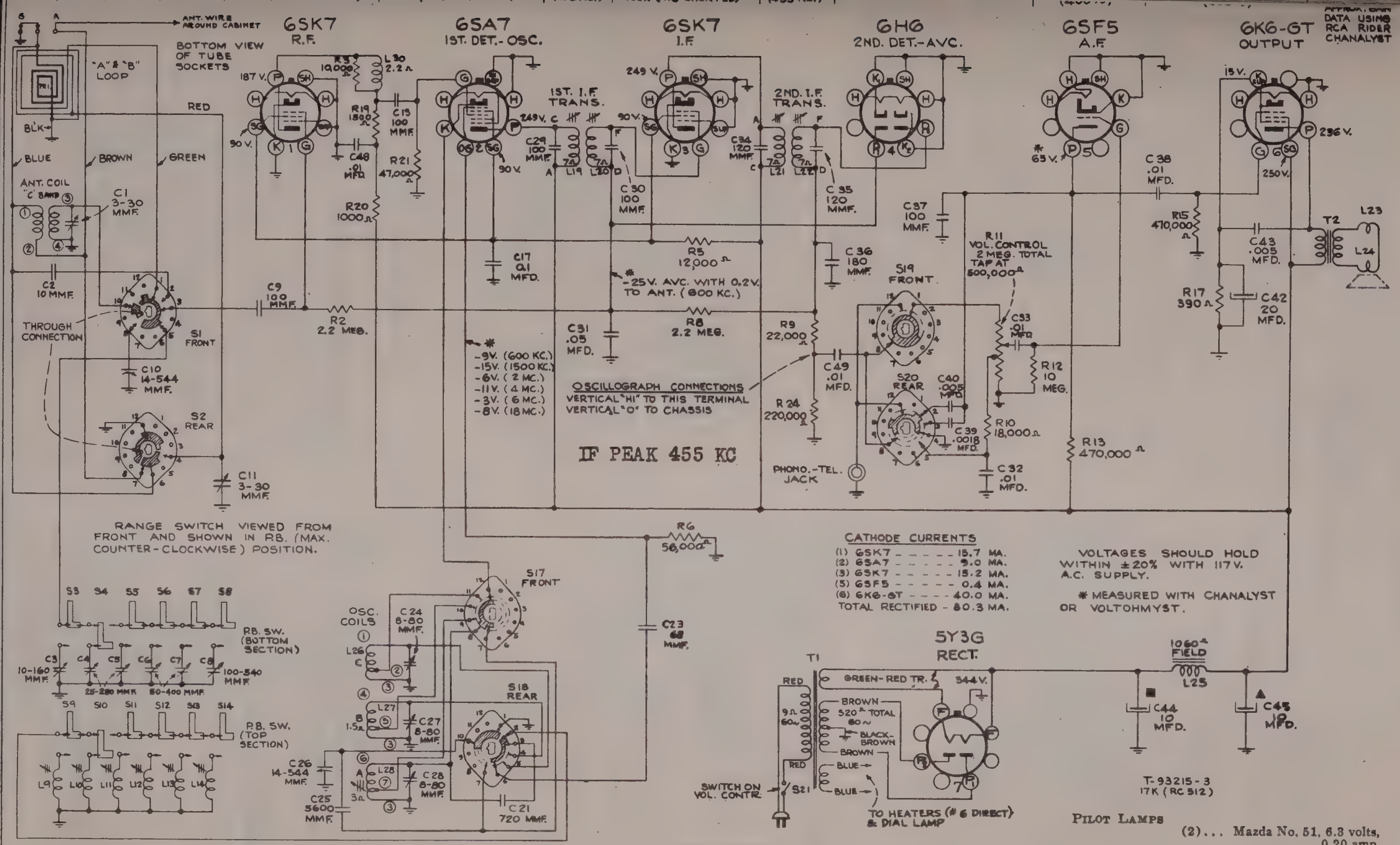
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L9) to receive the station.
4. After oscillator core is adjusted properly, adjust C-44 for maximum output.

   Owing to the relatively high RF gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push-button loop trimmers to minimum capacity before adjusting the push-button magnetite cores.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.


880 TO 1560
740 TO 1430
740 TO 1430
610 TO 1250
540 TO 1030
"A" LOOP
5
4
3
2
1
TRIMMER SCREWS
CORE RODS
A G
LINK
ANTENNA-GROUND TERMINAL BOARD
TO REMOVE BACK, TAKE OUT THESE TWO SCREWS
POWER CORD
CONNECTOR FOR VICTROLA OR TELEVISION ATTACHMENT
CHASSIS





CATHODE CURRENTS

(1) 6SK7 - - - - - 15.7 MA.
(2) 6SA7 - - - - - 9.0 MA.
(3) 6SK7 - - - - - 15.2 MA.
(5) 6SF5 - - - - - 0.4 MA.
(6) 6K6-GT - - - - 40.0 MA.
TOTAL RECTIFIED - 80.3 MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST.

Pilot Lamps

(2)... Mazda No. 51, 6.3 volts, 0.20 amp.

Frequency Ranges

Standard Broadcast	540-1,600 kc
Medium Wave	1.5-4.0 mc
Short Wave	5.8-18.0 mc

Power Supply Ratings

105-125 volts, 50-60 cycles, 90 watts
105-125 volts, 25-60 cycles, 90 watts

Loudspeaker (RL-70-L5)

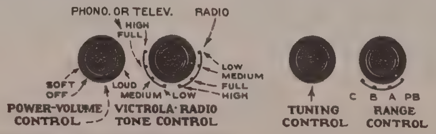
Type	12-inch Electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles

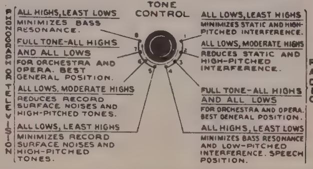
Push-Button Ranges

One station between approximately	540-1,030 kc
Two stations between approximately	610-1,250 kc
Two stations between approximately	740-1,430 kc
One station between approximately	880-1,550 kc

Power Output Rating

Undistorted	2.5 watts
Maximum	4.5 watts





ALL HIGHS, LEAST LOWS
MINIMIZES BASS RESONANCE.

FULL TONE-ALL HIGHS AND ALL LOWS
FOR ORCHESTRA AND OPERA. BEST GENERAL POSITION.

ALL LOWS, MODERATE HIGHS
REDUCES RECORD SURFACE NOISES AND HIGH-PITCHED TONES.

ALL LOWS, LEAST HIGHS
MINIMIZES RECORD SURFACE NOISES AND HIGH-PITCHED TONES.

ALL LOWS, LEAST HIGHS
MINIMIZES STATIC AND HIGH-PITCHED INTERFERENCE.

ALL LOWS, MODERATE HIGHS
REDUCES STATIC AND HIGH-PITCHED INTERFERENCE.

FULL TONE-ALL HIGHS AND ALL LOWS
FOR ORCHESTRA AND OPERA. BEST GENERAL POSITION.

ALL HIGHS, LEAST LOWS
MINIMIZES BASS RESONANCE AND LOW-PITCHED INTERFERENCE. SPEECH POSITION.

MODEL 17K
Alignment, Trimmers
Socket, Dial, Loop

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

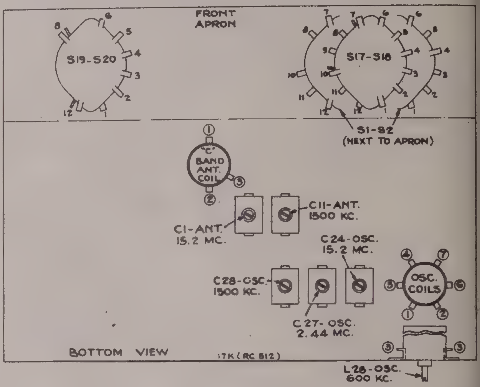
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

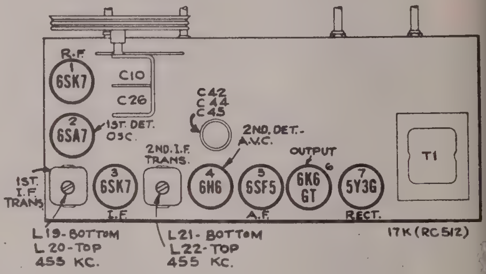
Calibration for Alignment.—The proper dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial slipped under the pointer so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

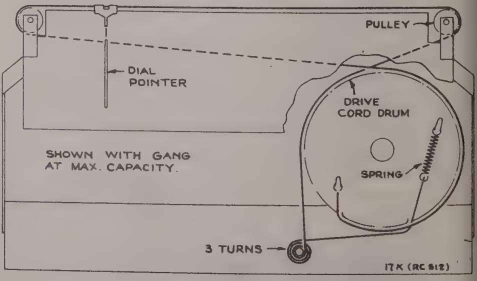


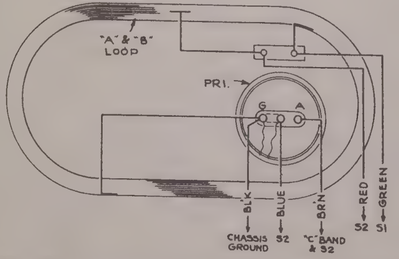
Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" band Quiet Point between 550 and 750 kc	L-21 and L-22 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-19 and L-20 (1st I-F Trans.)
3	Antenna terminal in series with 47 mmfd.	15.2 mc	15.2 mc (149°) "C" band	C-24 (Osc.)* C-1 (R-F) Rock gang
4	Antenna terminal in series with 200 mmf. (link open)	2.44 mc	2.44 mc (97°) "B" band	C-27 (Osc.)
5	Antenna terminal in series with 200 mmf.	600 kc	600 kc (30.5°) "A" band	L-28 (Rock in)
6	Antenna terminal in series with 200 mmf.	1,500 kc	1,500 kc (158°) "A" band	C-28 (Osc.) C-11 (R-F)
7	Repeat steps 5 and 6.			



* Use minimum capacity peak if two can be obtained. Check to determine that C-24 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.





RCA MFG. CO., INC.

MODEL 17K
Tuner Data,Parts

Push Button Adjustment

The station push buttons connect to separate magnetite-core oscil-tor coils and separate antenna trimmers which must be adjusted for e desired stations. Use an insulated screwdriver or alignment tool ch as RCA Stock No. 31031. Allow at least five minutes warm- period before making adjustments.

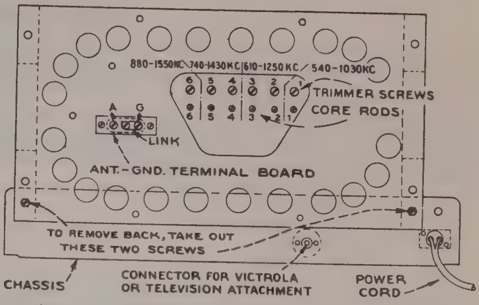
In the event that the receiver is to be used with an external an-nna use one or two feet of wire (as an antenna) to ensure sharp aking during the final adjustment procedure. For loop operation, the k should be strapped across terminals on back of set. In either case e procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-14) to receive the station.
4. After oscillator core is set correctly, adjust C-8 for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high r-f gain, it may be found that a en station can be tuned in at several different settings of the magnetite-core oscillator push-button coils. In such cases, it is advisable to unscrew the loop push-button trimmers to minimum capacity before adjusting the magnetite cores.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with L-9 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.



Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

TOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-512)	
34025	Board—"Antenna-Ground" board	.25
35795	Calibrator—Drive drum calibrator	.25
35792	Capacitor—Trimmer comprising 2 sections of 3-30 mmfd. each	.40
35791	Capacitor—Mica trimmer comprising 3 sections of 8-80 mmfd. each	.50
13200	Capacitor—10 mmfd.	.35
35804	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 2 sections of 50-400 mmfd., and 1 section of 100-540 mmfd.	1.15
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd.	.35
13003	Capacitor—180 mmfd.	.35
35877	Capacitor—720 mmfd	.45
13895	Capacitor—5,600 mmfd.	.70
34506	Capacitor—.0018 mfd.	.25
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 400 volts each and 1 section of 20 mfd., 25 volts	1.70
35965	Coil—Antenna coil—"C" band	.60
35876	Coil—Coil and resistor assembly	.30
36031	Coil—Loop loading coil	.50
35789	Coil—Oscillator coil	1.15
35803	Coil—Push button switch oscillator coil	.30
35960	Condenser—Variable tuning condenser	2.50
36249	Control—Tone control	1.15
36250	Control—Volume control and power switch	2.00
34662	Cord—Drive cord	.25
35788	Core—Adjusting core and stud for oscillator coil	.15
35871	Core—Adjusting core and stud for push button oscillator coils	.55
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35799	Frame—Dial frame complete with lamp bracket and pulleys—less dial	2.00
5798	Indicator—Station selector indicator and carriage	.20
6029	Loop—Antenna loop complete	3.00
6030	Loop—Loop winding only	.75
6009	Plug—2-contact male plug for loop cable	.25
5119	Plug—3-contact female plug for speaker cable	.25
5040	Plug—4-contact female plug for speaker cable	.30
5787	Plug—Phono. input plug	.15
5973	Pulley—Drive cord pulley	.08
0498	Resistor—390 ohms, ½ watt	.20
4720	Resistor—1,000 ohms, ¼ watt	.20
0654	Resistor—1,500 ohms, ½ watt	.20
5876	Resistor—10,000 ohms	.30
5875	Resistor—12,000 ohms, 3 watts	.35
3045	Resistor—18,000 ohms, ¼ watt	.20
3998	Resistor—22,000 ohms, ¼ watt	.20

STOCK No.	DESCRIPTION	Unit List Price
12454	Resistor—33,000 ohms, ¼ watt	.20
12412	Resistor—47,000 ohms, ¼ watt	.20
12264	Resistor—220,000 ohms, ¼ watt	.20
12285	Resistor—470,000 ohms, ¼ watt	.20
12679	Resistor—2.2 meg., ¼ watt	.20
13601	Resistor—10 meg., ¼ watt	.20
35797	Shaft—Tuning shaft and pulley	.30
35772	Shield—Bottom end shield for power transformer	.30
35709	Shield—Top end shield for power transformer	.30
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
36025	Switch—Push button selector switch	3.50
36024	Switch—Range switch	1.90
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35959	Transformer—Power transformer—110 volts, 60 cycle—less end shields	3.75
35969	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70L5)	
13867	Cap—Dust cap	.03
12079	Coil—Field coil—1,060 ohms	2.70
11469	Coil—Neutralizing coil	.30
36145	Cone—Cone complete with voice coil	1.50
5118	Plug—3-prong male speaker plug	.25
31301	Transformer—Output transformer	1.70
	MISCELLANEOUS ASSEMBLIES	
36027	Bezel—Push button bezel—less buttons	.75
35883	Button—Push button—dark brown	.15
36299	Button—Push button—light brown	.15
35914	Decalcomania—Control panel decal	.10
36028	Dial—Glass dial scale	1.20
36026	Escutcheon—Dial scale escutcheon—less dial	1.75
35814	Knob—Range switch or tone control knob—dark brown	.25
36297	Knob—Range switch or tone control knob—light brown	.25
35775	Knob—Tuning or volume control knob—dark brown	.25
36298	Knob—Tuning or volume control knob—light brown	.25
11765	Lamp—Dial lamp	.15
36149	Marker—Push button station marker	.35
36007	Mounting—Antenna loop mounting hardware	.10
33774	Mounting—Speaker mounting hardware comprising 1 eyelet and 1 grommet	.30
34053	Spring—Retaining spring for button Stock No. 35883 and 36299	.02
30900	Spring—Retaining spring for knob Stock No. 35775, 35814, 36297, 36298	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Push Button Adjustment

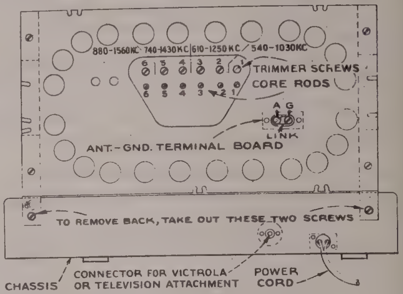
Six station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across "A" and "G" terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-14) to receive the station. It may be necessary to maintain approximate tracking between antenna and oscillator to receive weak stations. Approximate tracking will be indicated by noise, when tuned off a station, which will disappear when the station is correctly tuned.
4. After oscillator core is adjusted properly, adjust C-8 for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the five remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high RF gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases, it is advisable to unscrew the push-button loop trimmers to minimum capacity before adjusting the push-button magnetite cores.



Replacement Parts

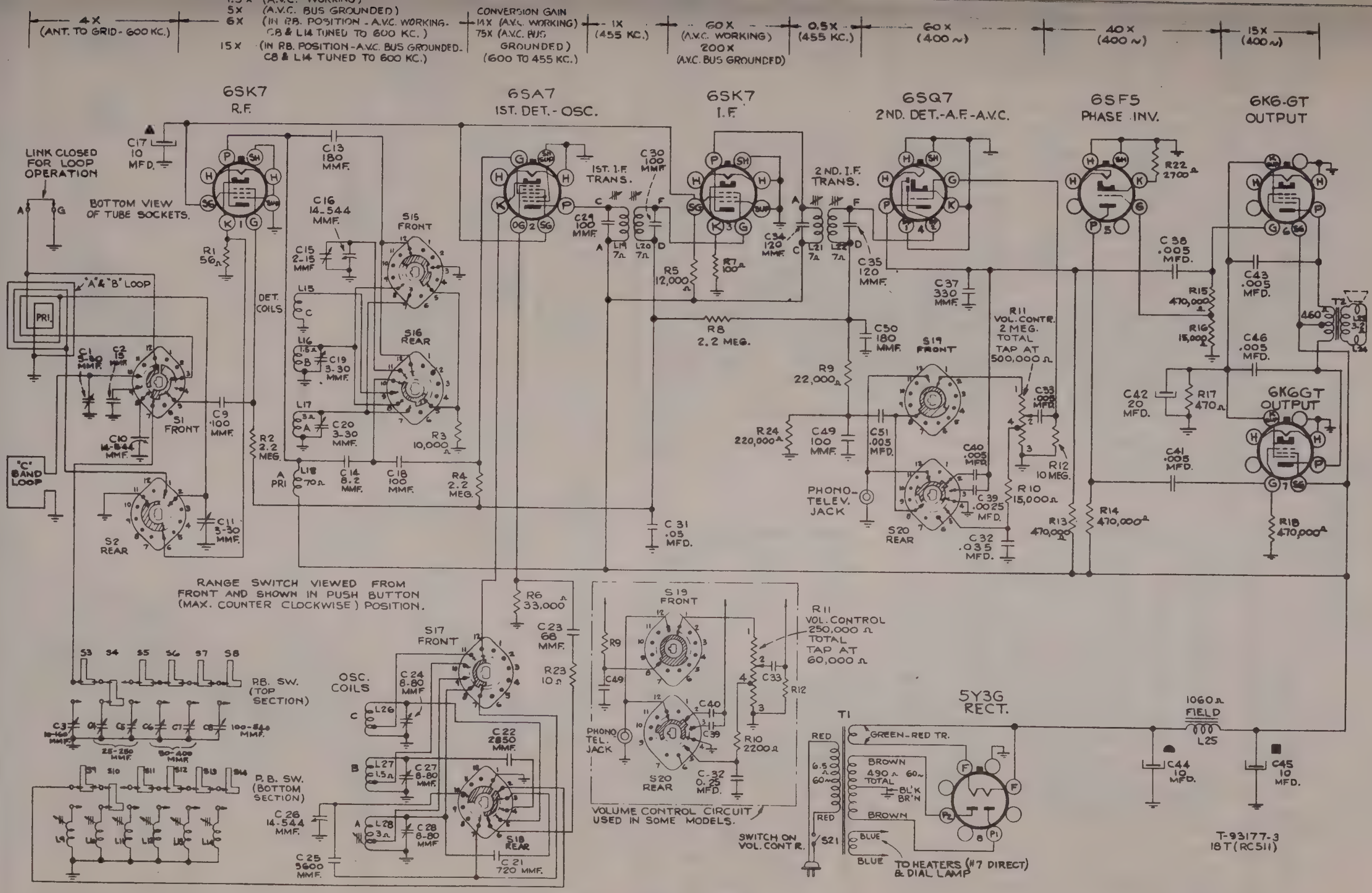
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-511)	
34785	Board—"Antenna-Ground" board	.20
31292	Capacitor—Mica trimmer for loop—comprising 2 sections of 3-30 mmfd.	.40
35792	Capacitor—Mica trimmer—comprising 2 sections of 3-30 mmfd.	.40
35791	Capacitor—Mica trimmer—comprising 3 sections of 8-80 mmfd.	.50
13001	Capacitor—8.2 mmfd.	.35
35804	Capacitor—Mica trimmer — comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 2 sections of 50-400 mmfd. and 1 section of 100-540 mmfd.	1.15
12896	Capacitor—15 mmfd.	.35
13057	Capacitor—68 mmfd.	.35
34699	Capacitor—100 mmfd. (in 1st I.F. can)	.30
12720	Capacitor—100 mmfd.	.35
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
34787	Capacitor—2,850 mmfd.	.50
13895	Capacitor—5,600 mmfd.	.70
34459	Capacitor—.0025 mfd.	.20
33584	Capacitor—.005 mfd.	.25
32787	Capacitor—.05 mfd.	.20
12484	Capacitor—0.25 mfd.	.30
33014	Capacitor—Electrolytic — comprising 3 sections of 10 mfd. and 1 section of 20 mfd.	1.90
35785	Coil—Loop primary (L1)	.50
35803	Coil—Push button oscillator coil	.30
35789	Coil—Oscillator coil	1.15
35805	Coil—R. F. coil	1.15
35796	Condenser—Variable tuning condenser	4.00
35807	Control—Volume control (¼ meg.) and power switch	2.00
36250	Control—Volume control (2 meg.) and power switch	XX
32634	Cord—Drive cord	.10
35788	Core—Core and stud for oscillator coil	.15
35795	Dial—Calibrator dial	.25
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35799	Frame—Dial frame complete—less dial scale	2.00
35798	Indicator—Station selector indicator	.20
35786	Loop—Antenna loop winding	.50
35784	Loop—Complete antenna loop with trimmer, coil and "Antenna-Ground" board	3.60
13988	Resistor—10 ohm, ¼ watt	.20
13220	Resistor—56 ohm, ¼ watt	.20
14439	Resistor—100 ohm, ¼ watt	.20
35885	Resistor—470 ohm, 2 watt	.25
13716	Resistor—2,200 ohm, ¼ watt	.20
14024	Resistor—2,700 ohm, ¼ watt	.20
14559	Resistor—10,000 ohm, ¼ watt	.20
35875	Resistor—12,000 ohm, 3 watt	.35
12695	Resistor—15,000 ohm, ¼ watt	.20
13998	Resistor—22,000 ohm, ¼ watt	.20
12454	Resistor—33,000 ohm, ¼ watt	.20
12264	Resistor—220,000 ohms, ¼ watt	.20
12285	Resistor—470,000 ohm, ¼ watt	.20
12679	Resistor—2.2 megohm, ¼ watt	.20
13601	Resistor—10 megohm, ¼ watt	.20
14350	Screw—No. 8-32 square-head set-screw for drum	.03
35797	Shaft—Tuning shaft and pulley	.30
31364	Socket—Dial lamp socket	.20
35787	Socket—Phonograph input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35802	Switch—Push button switch — less coils and trimmer	2.75
35793	Switch—Range switch	2.20
36249	Switch—Tone switch	XX
35636	Transformer—First I.F transformer	1.70
35790	Transformer—Second I.F. transformer	1.60
35588	Transformer—Power transformer, 110 volt, 25 cycle	6.30
35800	Transformer—Power transformer, 110 volt, 60 cycle	4.75
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL79A5)	
35849	Cap—Speaker cone dust cap	.03
35810	Coil—Field coil, 1,060 ohm	1.70
35441	Cone—Cone complete with voice coil	1.25
35809	Transformer—Output transformer	1.35
	MISCELLANEOUS ASSEMBLIES	
35813	Bezel—Push button bezel	1.10
35812	Button—Push button (dark brown)	.15
36300	Button—Push button (light brown)	XX
35914	Decalcomania—Control panel decal	.10
35392	Decalcomania—"RCA Victor" decal	.05
35811	Dial—Glass dial scale	1.75
35814	Knob—Range or tone switch knob (dark brown)	.25
36297	Knob—Range or tone switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
36298	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
36149	Marker—Push button marker	XX
30900	Spring—Retaining spring for knobs, Stock No. 35814	.05

XX—Price upon application to your RCA Distributor.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODEL 18T,Ch.RC-511
Schematic,Gain



Electrical Specifications

FREQUENCY RANGES

Broadcast	540-1,560 kc
Medium Wave	1.56-4.0 mc
Short Wave	5.8-18.0 mc
INTERMEDIATE FREQUENCY	455 kc

PUSH-BUTTON RANGES

One station between approximately	540-1,030 kc
Two stations between approximately	610-1,250 kc
Two stations between approximately	740-1,430 kc
One station between approximately	880-1,560 kc

PILOT LAMPS

(2)... Mazda No. 51, 6.3 volts, 0.20 amp.

POWER OUTPUT RATING

Undistorted	5.0 watts
Maximum	5.5 watts

LOUDSPEAKER (RL-79-A5)

Type	6-inch Electrodynamic
V.C. Impedance	8.4 ohms at 400 cycles

POWER SUPPLY RATINGS

105-125 volts, 50-60 cycles, 90 watts
105-125 volts, 25-60 cycles, 90 watts

First Edition

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

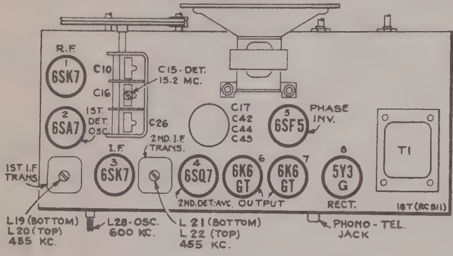
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration for Alignment.—The proper dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial slipped under the pointer so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

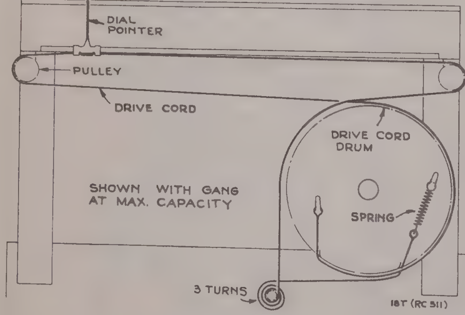


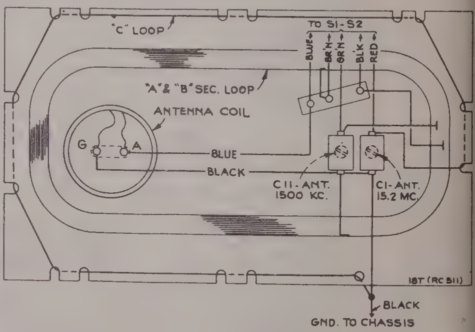
Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" band Quiet Point between 550 and 750 kc	L-21 and L-22 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-19 and L-20 (1st I-F Trans.)
3	Antenna terminal in series with 300 ohms ("A" antenna trimmer C-11, should be ¼ turn out)	15.2 mc	15.2 mc (149°) "C" band	C-24 (Osc.)* C-15 (Det.) Rock gang C-1 (R-F) Rock gang
4	Antenna terminal in series with 200 mmf.	2.44 mc	2.44 mc (91.5°) "B" band	C-27 (Osc.) C-19 (Det.)
5	Antenna terminal in series with 200 mmf. (Preset "A" osc. trimmer C-28 ¼ turn out)	600 kc	600 kc (33.2°) "A" band	L-28 Rock gang
6	Antenna terminal in series with 200 mmf.	1,500 kc	1,500 kc (163.4°) "A" band	C-28 (Osc.) C-20 (Det.) C-11 (R-F)
7	Repeat step 5, then 6			
8	Antenna terminal in series with 300 ohms	15.2 mc	15.2 mc (149°) "C" band	C-1 (R-F) Rock gang

* Use minimum capacity peak if two can be obtained. Check to determine that C-24 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.

To reduce sensitivity during RF Alignment connect a 15,000 ohm, ¼ watt resistor across secondary of 1st IF transformer.



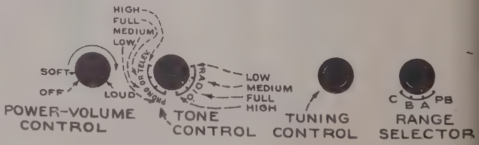


Tone Control

The tone control has four positions for radio, and four positions for Victrola or Television sound:

No. 1—Radio—maximum low—minimum high
No. 2—Radio—maximum low—reduced high
No. 3—Radio—maximum low—maximum high
No. 4—Radio—minimum low—maximum high
No. 5—Phono—maximum low—minimum high
No. 6—Phono—maximum low—reduced high
No. 7—Phono—maximum low—maximum high
No. 8—Phono—minimum low—maximum high

(No. 1 is full counter-clockwise, and No. 8 is full clockwise.)



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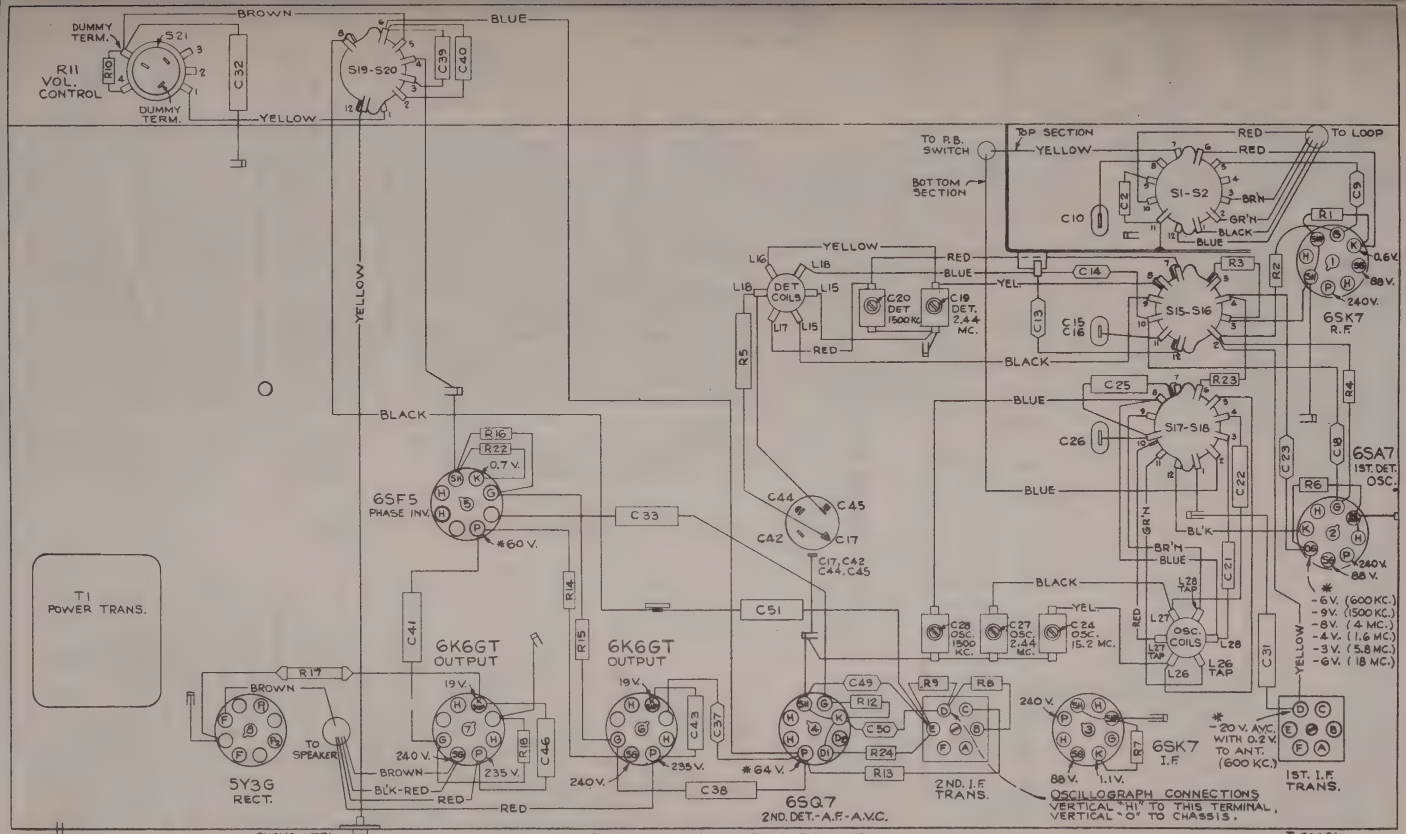


BOTTOM VIEW - REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

TUBE COMPLEMENT

(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector-Oscillator
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6SQ7	2nd Detector, A.V.C., and A-F Amplifier
(5)	RCA-6SF5	Phase Inverter
(6)	RCA-6K6GT	Power Output
(7)	RCA-6K6GT	Power Output
(8)	RCA-5Y3-G	Rectifier

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. AC. SUPPLY.
* MEASURED WITH CHANALYST, OR VOLTOHMYST.

CATHODE CURRENTS

(1)	6SK7	13.5 MA.
(2)	6SA7	8.6 MA.
(3)	6SK7	12.4 MA.
(4)	6SQ7	.3 MA.
(5)	6SF5	.3 MA.
(6)	6K6GT	22.5 MA.
(7)	6K6GT	22.5 MA.
(8)	TOTAL RECTIFIED	80.1 MA.

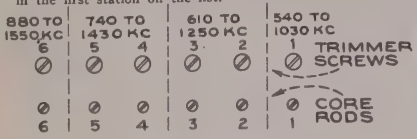
RCA MFG. CO., INC.

Adjustment for Electric Tuning

This model has six push buttons for electric tuning. The buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

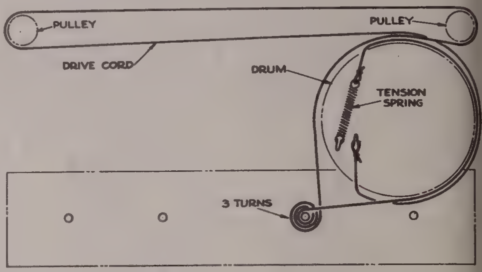
1. Make a list of the six desired stations, arranged in order from low to high frequencies.
2. Turn Range Control knob to "A" position, and manually tune in the first station on the list.



Push Button Adjustments

Turn the Loop Antenna to give minimum pickup of signal, no outside antenna should be used and link on antenna board should be closed.

3. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer for maximum output on this station.
   Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining five stations in the same manner.
6. After all six stations are tuned-in on the buttons, turn the Loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should now be reconnected if used.



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Replacement Parts

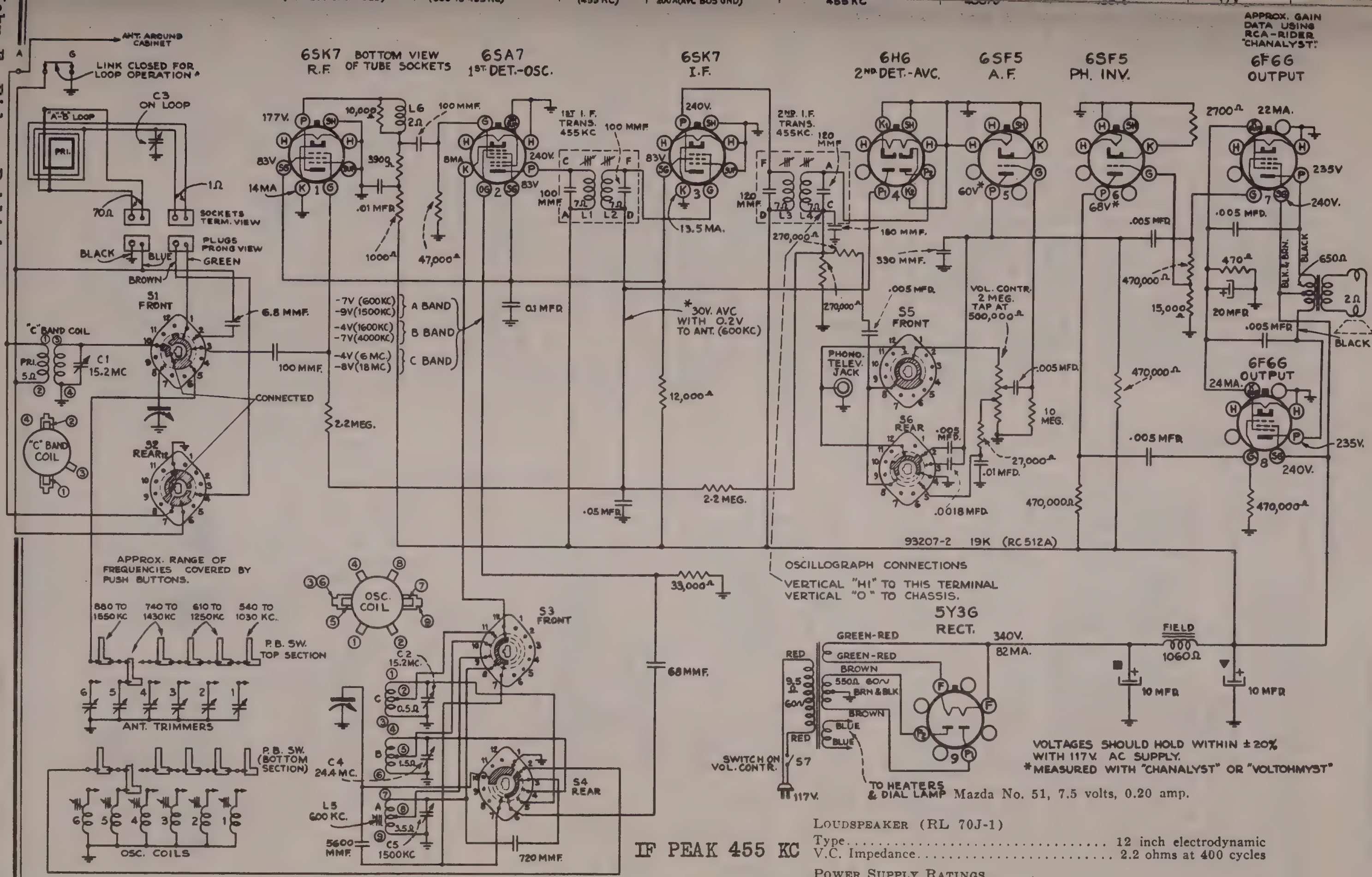
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-512A)	
35966	Board—"Antenna-Ground" board	.20
35795	Calibrator—Drive drum calibrator	.25
35961	Capacitor—Mica trimmer (C1)	.25
14079	Capacitor—6.8 mmfd.	.35
35791	Capacitor—Mica trimmer comprising 3 sections (C2, C4, C5)	.50
35804	Capacitor—Mica trimmer comprising 6 sections for push buttons 1, 2, 3, 4, 5, 6	1.15
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd., moulded	.35
34699	Capacitor—100 mmfd., mica	.30
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
13895	Capacitor—5,600 mmfd.	.70
34506	Capacitor—.0018 mfd.	.25
33584	Capacitor—.005 mfd.	.25
14393	Capacitor—.01 mfd.	.30
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 400 volts each and 1 section of 20 mfd., 25 volts	1.70
35965	Coil—Antenna coil—"C" band	.60
35876	Coil—Coil and resistor assembly L6	.30
35789	Coil—Oscillator coil (A, B, C)	1.15
35803	Coil—Push button switch oscillator coil	.30
35960	Condenser—Variable tuning condenser	2.50
35962	Control—Volume control and power switch	2.00
34662	Cord—Drive cord	.25
35788	Core—Adjusting core and stud for oscillator coil (L5)	.15
35871	Core—Adjusting core and stud for push button oscillator coils 1, 2, 3, 4, 5, 6	.55
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35970	Indicator—Station selector indicator and carriage	.30
35972	Plate—Dial plate complete with drive cord pulleys	1.10
36009	Plug—2-contact male plug for loop cable	.25
5040	Plug—4-contact female plug for speaker cable	.30
35973	Pulley—Drive cord pulley	.08
32165	Resistor—470 ohms, 2 watts	.25
14720	Resistor—1,000 ohms, ¼ watt	.20
14024	Resistor—2,700 ohms, ¼ watt	.20
30694	Resistor—3,900 ohms, ½ watt	.20
35875	Resistor—12,000 ohms, 3 watts	.35
12695	Resistor—15,000 ohms, ¼ watt	.20
12738	Resistor—27,000 ohms, ¼ watt	.20
12454	Resistor—33,000 ohms, ¼ watt	.20
12412	Resistor—47,000 ohms, ¼ watt	.20
12199	Resistor—270,000 ohms, ¼ watt	.20
12285	Resistor—470,000 ohms, ¼ watt	.20
12679	Resistor—2.2 meg., ¼ watt	.20
13601	Resistor—10 meg., ¼ watt	.20
35968	Shaft—Tuning shaft and pulley	.25
35772	Shield—Bottom shield for power transformer	.30
35709	Shield—Top shield for power transformer	.30
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35787	Socket—Phono. input socket	.15
35974	Support—Dial plate support	.65
35967	Switch—Push button selector switch	3.50
35964	Switch—Range switch (S1, S2, S3, S4)	1.90
35963	Switch—Tone switch (S5, S6)	1.00
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35959	Transformer—Power transformer—110 volts, 60 cycle—less end shields	3.75
35969	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70J1)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil, and dust cap	1.50
5039	Plug—4-prong male, for speaker	.30
33444	Transformer—Output transformer	2.00
	MISCELLANEOUS ASSEMBLIES	
36005	Button—Push button	.15
35998	Capacitor—Mica trimmer (C3) for loop	.25
36002	Coil—Loop primary coil	.40
35914	Decalcomania—Control panel decal	.10
36019	Dial—Glass dial scale	1.65
36006	Escutcheon—Dial scale escutcheon—less dial	2.75
36003	Knob—Tone or range switch knob	.25
36004	Knob—Tuning or volume control knob	.25
11765	Lamp—Dial lamp	.15
35997	Loop—Antenna loop	3.00
36149	Marker—Station selector push button markers	.35
36007	Mounting—Antenna loop mounting hardware	.10
35029	Mounting—Speaker mounting hardware	.35
35999	Socket—Two contact socket for antenna loop	.25
34053	Spring—Push button spring	.02
14270	Spring—Retaining spring for knobs	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODEL 19K,Ch.RC-512A
Schematic,Gain,Voltage

RCA MFG. CO., INC.



Mazda No. 51, 7.5 volts, 0.20 amp.

IF PEAK 455 KC

Loudspeaker (RL 70J-1)

Type.. 12 inch electrodynamic
V.C. Impedance............................ 2.2 ohms at 400 cycles

Power Supply Ratings

Rating A	105-125 volts, 50-60 cycles, 100 watts
Rating B	105-125 volts, 25-60 cycles, 100 watts

Power Output Rating

Undistorted	5 watts
Maximum	5.5 watts.

Frequency Ranges....

Standard Broadcast "A"	540-1,600 kc
Medium Wave "B"	1.5-4.0 mc
Short Wave "C"	5.8-18.0 mc

— 1940 No. 23 — First Edition

MODEL 19K
Alignment, Trimmers
Socket, Speaker, Lead Dress

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

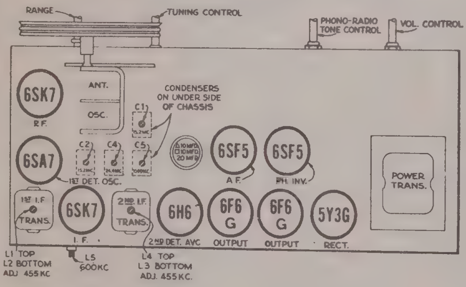
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Preacautionary Lead Dress.—

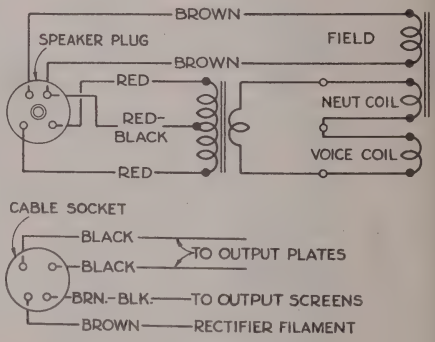
1. Dress 2nd I.F leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.
3. Dress .005 mfd. volume control condenser away from electrolytic.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A"	Quiet Point near 180°	L3 and L4 (2nd I-F Trans.)
2	6SA7 1st Detector in series with .01 mfd.				L1 and L2 (1st I-F Trans.)
3	Ant. terminal "A" in series with 47 mmf.	15.2 mc	"C"	148.5°	C1 (ant.) C2 (osc.)*
4	Ant. section of gang condenser in series with 300 ohms	2.44 mc	"B"	97°	C4 (osc.)*
5		1,500 kc	"A"	160°	C5 (osc.)*
6		600 kc		30°	L5 (osc.) (Rock gang)
7	Fasten chassis in cabinet. Connect loop, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 540 kc mark and gang at maximum capacity.				
8	Radiation loop consisting of two turns of wire 18 in. in diameter located 4 to 6 feet from receiver	1,500 kc	"A"	1,500 kc	C3 (ant.) (on loop)
9		600 kc	"	600 kc	L5 (osc.) (Rock gang)
10		Repeat steps 8 and 9			

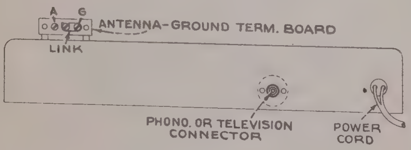
* Use minimum capacity peak of two peaks can be obtained.
Note: Oscillator tracks above signal on all bands.



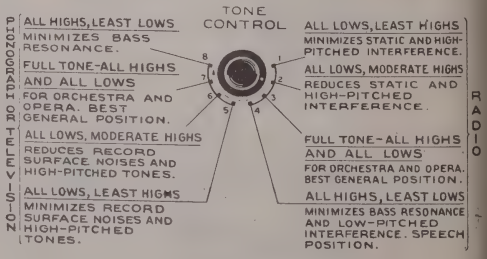
Tube and Trimmer Locations



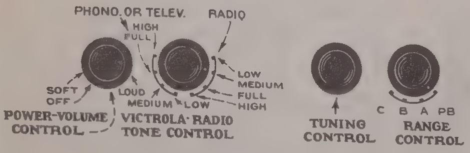
Connections and Colors of Loudspeaker and Cable



Back of Chassis


TONE CONTROL
PHONOGRAPH OR TELEVISION
ALL HIGHS, LEAST LOWS
MINIMIZES BASS RESONANCE.
FULL TONE-ALL HIGHS AND ALL LOWS
FOR ORCHESTRA AND OPERA. BEST GENERAL POSITION.
ALL LOWS, MODERATE HIGHS
REDUCES RECORD SURFACE NOISES AND HIGH-PITCHED TONES.
ALL LOWS, LEAST HIGHS
MINIMIZES RECORD SURFACE NOISES AND HIGH-PITCHED TONES.
8
7
6
5
4
3
2
1
ALL LOWS, LEAST HIGHS
MINIMIZES STATIC AND HIGH-PITCHED INTERFERENCE.
ALL LOWS, MODERATE HIGHS
REDUCES STATIC AND HIGH-PITCHED INTERFERENCE.
FULL TONE-ALL HIGHS AND ALL LOWS
FOR ORCHESTRA AND OPERA. BEST GENERAL POSITION.
ALL HIGHS, LEAST LOWS
MINIMIZES BASS RESONANCE AND LOW-PITCHED INTERFERENCE. SPEECH POSITION.
RADIO

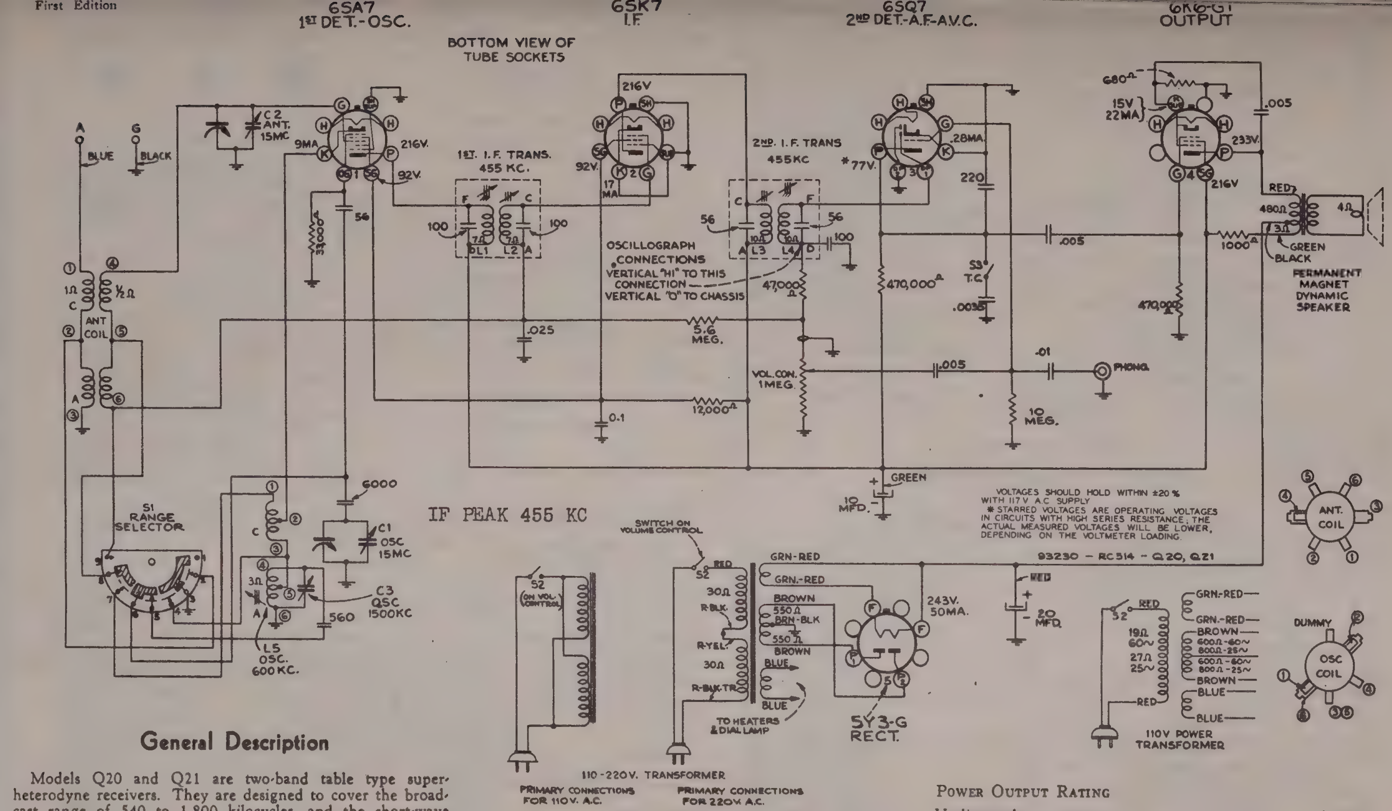
Tone Control and Phono-Radio Switch



Location of Controls

RCA MFG. CO., INC.

MODELS Q20,Q21
Chassis RC-514
Schematic,Voltage



General Description

Models Q20 and Q21 are two-band table type superheterodyne receivers. They are designed to cover the broadcast range of 540 to 1,800 kilocycles, and the short-wave range from 4.5 to 18 megacycles.

Features of design include: Magnetite-core I.F. transformers; magnetite-core "A" band oscillator coil; automatic volume control; tone control; illuminated dial; jack for phonograph attachment; 25 to 1 ratio vernier tuning, and dust-proofed permanent-magnet dynamic loudspeaker.

Phonograph Attachment.—A jack is provided on the rear of chassis for connection to a phonograph attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Electrical Specifications

Pilot Lamp	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 50 watts
Rating B	105-125 volts, 25-60 cycles, 50 watts
Rating C	105-125, 200-250 volts, 50-60 cycles, 50 watts

POWER OUTPUT RATING

Undistorted	1.5 watts
Maximum	2.3 watts

LOUDSPEAKER

Type (RL-81-A2)	5-inch permanent-magnet dynamic
Voice-coil Impedance	4.5 ohms at 400 cycles

FREQUENCY RANGES

Standard Broadcast (A)	540-1,800 kc (555-166 m)
Short Wave (C)	4.5-18 mc (66.7-16.6 m)
Intermediate Frequency	455 kc

MODELS Q20 and Q21

Chassis No. RC-514

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

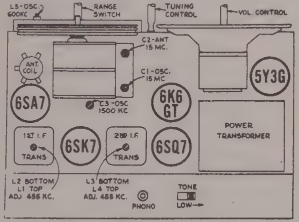
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

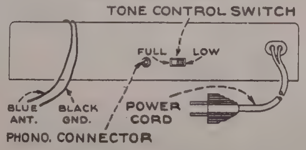
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Precautionary Lead Dress.—

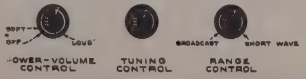
1. Green lead from oscillator section of var. condenser should be dressed away from antenna leads.
2. 6,000 mmfd. capacitor should bear against electrolytic capacitor.
3. Dress blue I.F. lead against chassis.
4. .005 volume control capacitor should be dressed away from output plate leads.



Tube and Trimmer Location



Back of Chassis



Controls

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	Quiet point between 550-750 kc	L-3 and L-4 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground	455 kc		L-1 and L-2 (1st I-F trans.)
3	Antenna Lead in series with 300 ohms	15 mc	15 mc "C" band	C-1 oscillator*
4		15 mc	Rock at 15 mc	C-2 antenna† while rocking
5	Antenna terminal in series with 200 mmfd.	1,500 kc	1,500 kc "A" band	C-3 oscillator
6		600 kc	Rock at 600 kc "A" band	L-5 oscillator while rocking
7		1,500 kc	1,500 kc "A" band	C-3 oscillator

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.

GAIN DATA

(as taken with the RCA-Rider Chanalyst)

(A) R.F.—I-F Gain (R.F.—I.F. Channel) Approximate Gain

1. Antenna to 6SA7 grid............ 8 at 600 kc
2. 6SA7 grid to plate (conversion 600 to 455 kc)........................ 4
3. 6SA7 plate to 6SK7 grid.......... 1 at 455 kc
4. 6SK7 grid to plate.................. 80 at 455 kc
5. 6SK7 plate to 6SQ7 diode.......... .7 at 455 kc

(B) A.F. Gain (A.F. Channel)

1. 6SQ7 grid to plate............... 50 at 400 cycles
2. 6K6GT grid to plate............... 10 at 400 cycles

(C) Oscillator Grid (OG-6SA7) Voltage (Electronic Volt. Meter)

1. Oscillator Voltage at 600 kc............... —12V
2. Oscillator Voltage at 1,500 kc............... —16V
3. Oscillator Voltage at 4.5 mc............... — 5V
4. Oscillator Voltage at 15 mc............... — 9V

(D) A.V.C. Voltage (Electronic Volt. Meter)

With 0.2V. input to antenna at 600 kc....... —15V

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-514)	
33817	Capacitor—Mica trimmer (C3)	.30
12723	Capacitor—56 mmfd.	.35
30949	Capacitor—56 mmfd. (2nd. I-F)	.25
34699	Capacitor—100 mmfd. (1st. I-F)	.30
12720	Capacitor—100 mmfd.	.35
12694	Capacitor—220 mmfd.	.35
12537	Capacitor—560 mmfd.	.35
31405	Capacitor—6,000 mmfd.	.75
30303	Capacitor—.0035 mfd.	.40
4838	Capacitor—.005 mfd.	.25
33584	Capacitor—.005 mfd.	.25
14393	Capacitor—.01 mfd.	.30
4870	Capacitor—.025 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35761	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 10 mfd.	.90
35762	Coil—Antenna coil	1.40
35763	Coil—Oscillator coil	.80
35760	Condenser—Variable tuning condenser	2.55
32713	Core—Adjusting core and stud for oscillator coil (L5)	.35
32634	Cord—Drive cord	.10
35770	Dial—Dial scale	.65
35768	Drum—Drive drum	.45
35668	Indicator—Station selector indicator	.25
11765	Lamp—Dial lamp—Mazda No. 51	.15
35769	Plate—Dial plate—less dial scale	.45
31024	Resistor—680 ohms, ½ watt	.20
30152	Resistor—1,000 ohms, 1 watt	.22
8073	Resistor—12,000 ohms, 2 watts	.25
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
11668	Resistor—5.6 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35771	Shaft—Tuning shaft	.20
35772	Shield—Bottom end shield for power transformer	.30
35709	Shield—Top end shield for power transformer	.30
35766	Socket—Dial lamp socket	.25
31251	Socket—Tube socket	.25
61319	Socket—Tube socket (6SA7)	.25
13638	Spring—Drive cord spring	.08
35767	Support—Tuning condenser support	.25
30953	Switch (S3)	.45
35765	Switch—Range switch (S1)	.85
35636	Transformer—First I-F transformer	1.70
35628	Transformer—Second I-F transformer	1.85
35758	Transformer—Power transformer—110 volts, 25 cycle—less end shields	5.25
35757	Transformer—Power transformer—110 volts, 60 cycle—less end shields	2.95
35759	Transformer—Power transformer — Univ. 60 cycle	4.00
35764	Volume control and power switch (S2)	1.50
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-81A2)	
32907	Cap—Cone dust cap	.02
35570	Cone—Cone complete with voice coil	1.35
35774	Transformer—Output transformer	1.45
	MISCELLANEOUS ASSEMBLIES	
35104	Crystal—Escutcheon and crystal for Model Q20	1.00
35105	Crystal—Escutcheon and crystal for Model Q21	1.00
35678	Fastener—Push on fastener for crystal, Stock No. 35104	.02
35679	Knob—Tuning, range switch or volume control knob for Model Q20	.15
35775	Knob—Tuning, range switch or volume control knob for Model Q21	.25
30900	Spring—Retaining spring for knobs, Stock Nos. 35679 and 35775	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Models 45X-16, 45X-17

Chassis No. RC-459M

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

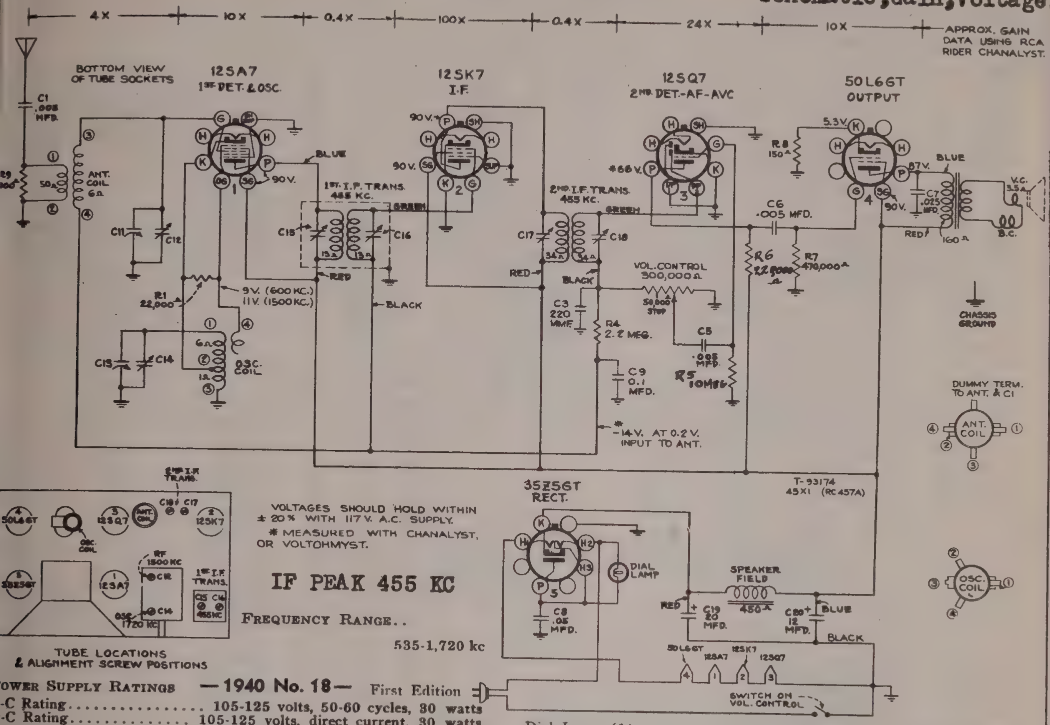
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-459M)	
35097	Can—Shield can for transformers—Stock Nos. 35346 and 35347	.30
12694	Capacitor—220 mmfd.	.35
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
11315	Capacitor—.015 mfd.	.20
32787	Capacitor—.05 mfd.	.20
12484	Capacitor—0.25 mfd.	.30
35348	Capacitor—Electrolytic, comprising 1 section of 30 mfd., and 1 section of 20 mfd.	.95
35571	Coil—Oscillator coil	.70
35534	Condenser—Variable tuning condenser	2.30
35344	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35992	Dial—Dial scale	.65
35063	Drum—Drive drum	.30
35993	Frame—Dial frame—less dial	.25
35062	Indicator—Station selector indicator	.20
11765	Lamp—Dial lamp	.15
35061	Loop—Antenna loop	1.95
30189	Resistor—120 ohms, ½ watt	.20
14561	Resistor—220 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35343	Shaft—Drive shaft	.10
34449	Socket—Dial lamp socket	.30
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35098	Spring—Retaining spring for transformers Stock Nos. 35346 and 35347	.08
35056	Transformer—Audio transformer	1.30
35346	Transformer—First I-F transformer—less shield can	1.40
35347	Transformer—Second I-F transformer	1.40
34373	Washer—"C" washer for drive shaft	.03
	SPEAKER ASSEMBLIES (39223-502)	
35065	Cone—Cone complete with voice coil	1.20
	SPEAKER ASSEMBLIES (RL-86-2)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	1.30
34450	Speaker—5 inch dynamic speaker complete with cone and voice coil—less output transformer	3.25
	MISCELLANEOUS ASSEMBLIES	
36041	Back—Cabinet back for Model 45X16	.25
36042	Back—Cabinet back for Model 45X17	.25
35996	Bushing—Bushing and wood screw for rotor discs	.05
35079	Crystal—Dial scale escutcheon and crystal	.65
35995	Disc—Rotor disc (cardboard)	.10
35994	Disc—Stationary disc (masonite) and rubber feet	.40
33006	Foot—Rubber foot	.03
30863	Knob—Tuning or volume control knob	.15
30900	Spring—Retaining spring for knob	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

lignment,Trimmers
ocket,Parts

RCA MFG. CO., INC.

MODELS 45X3,45X4
Chassis RC-457E
Schematic,Gain,Voltage



TUBE LOCATIONS
& ALIGNMENT SCREW POSITIONS

IF PEAK 455 KC

FREQUENCY RANGE.. 535-1,720 kc

—1940 No. 18— First Edition

OWER SUPPLY RATINGS
-C Rating................ 105-125 volts, 50-60 cycles, 30 watts
-C Rating............. 105-125 volts, direct current, 30 watts

OWER OUTPUT
17 volt, 60 cycle supply)............................ 1.0 watt

OUDSPEAKER
ype.................................. 4-inch Electrodynamic
oice-coil impedance at 400 cycles..................... 4 ohms

Dial Lamp (1).................. Mazda 51, 7.5 volts, 0.2 amp.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice oil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the eceiver chassis, through a .01 mfd. capacitor, and keep the output s low as possible.

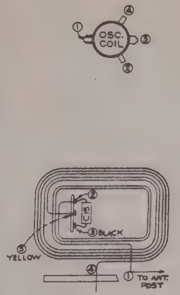
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with .001 mfd.	455 kc	QuietPoint at 1,600 kc end of dial	C17, C18 (2nd I-F Trans.)
2	12SA7 grid in series with .001 mfd.			C15, C16 (1st I-F Trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C14 (oscillator)
4		1,500 kc	Resonance on 1,500 kc signal	C12 (antenna)

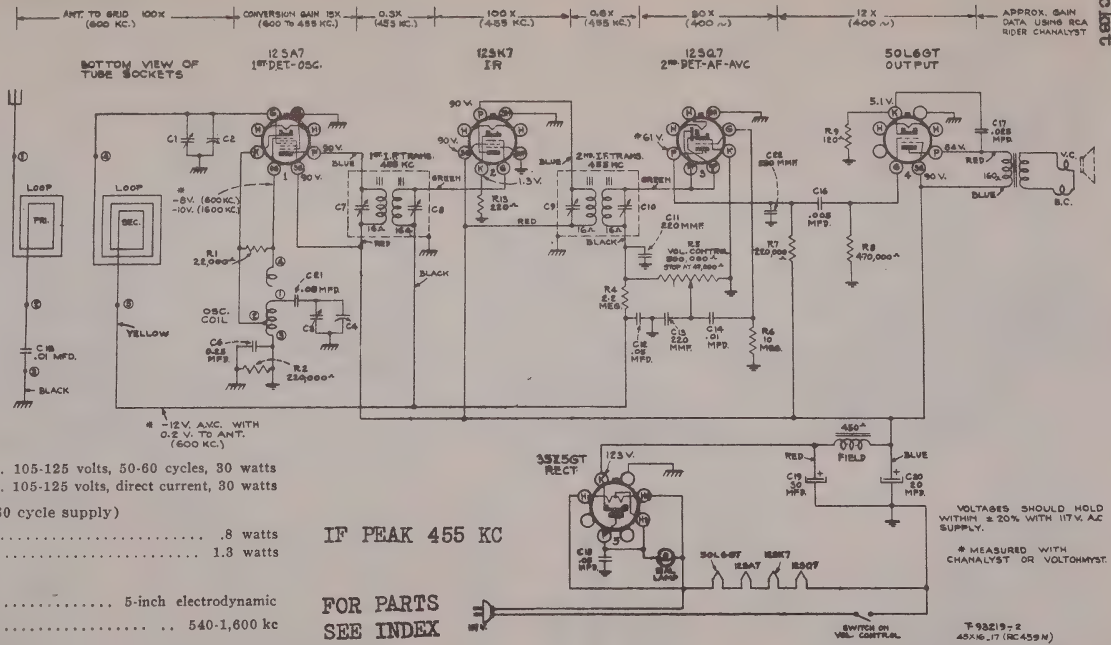
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-457E)	
12694	Capacitor—220 mmfd.	.35
33584	Capacitor—.005 mfd.	.25
4870	Capacitor—.025 mfd.	.20
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd., and 1 section of 12 mfd.	.75
35115	Coil—Antenna coil	.80
35333	Coil—Oscillator coil	.65
35977	Condenser—Variable tuning condenser	2.40
35979	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35982	Dial—Dial scale	.70
35980	Indicator—Station selector indicator	.25
11765	Lamp—Dial lamp	.15
31193	Lead—Antenna lead	.50
35981	Plate—Dial plate—less dial	.30
30880	Resistor—150 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ¼ watt	.20
12454	Resistor—33,000 ohms, ¼ watt	.20
12264	Resistor—220,000 ohms, ¼ watt	.20
12285	Resistor—470,000 ohms, ¼ watt	.20
12679	Resistor—2.2 meg., ¼ watt	.20
13601	Resistor—10 meg., ¼ watt	.20
35978	Shaft—Tuning shaft	.10
35332	Shield—Shield for first I-F transformer	.30
35345	Socket—Dial lamp socket	.25
31251	Socket—Tube socket	.25
30585	Spring—Drive cord spring	.06
35098	Spring—Spring to hold I-F transformer in shield can	.08
34846	Transformer—Audio transformer	1.25
35331	Transformer—First I-F transformer—less shield	1.10
33301	Transformer—Second I-F transformer	1.20
34373	Washer—"C" washer for tuning shaft	.03
	SPEAKER ASSEMBLIES (39105-505)	
35120	Cone—Cone complete with voice coil	1.15
35611	Speaker—Four inch dynamic speaker complete with cone and voice coil	3.10
	MISCELLANEOUS ASSEMBLIES	
36017	Back—Cabinet back—Model 45X3	.25
36018	Back—Cabinet back—Model 45X4	.25
35983	Bezel—Dial scale bezel and crystal	1.00
35121	Knob—Walnut volume control or tuning knob	.10
35126	Spring—Retaining spring for knob Stock No. 35121	.03

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS 45X16,45X17
Chassis RC-459M
Schematic,Gain,Voltage
Alignment,Trimmers
Socket

RCA MFG. CO., INC.





VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. AC SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST.

T-93219-2
45X16_17 (RC459M)

IF PEAK 455 KC

FOR PARTS
SEE INDEX

—1940 No. 22—

First Edition

POWER SUPPLY RATINGS	
A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts
POWER OUTPUT (125 volt, 60 cycle supply)	
Undistorted	.8 watts
Maximum	1.3 watts
LOUDSPEAKER	
Type	5-inch electrodynamic
FREQUENCY RANGE	540-1,600 kc
Dial Lamp (1)	Mazda 51, 7.5 volts, .20 amp.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

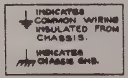
Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

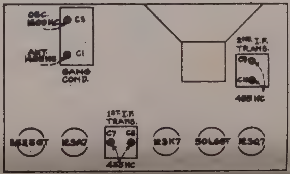
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc	C1 (antenna)





Introduction

Complete gain data is published in the Service Notes for RCA Victor 1941 radio receivers.

For speed and convenience, the gain data is printed on the schematic diagram of each model.

For the utmost utility in signal tracing, so that any trouble may be quickly narrowed down to a single point, the gain is given for each separate RF, IF and AF tube, and also for each RF and IF transformer. In addition, the AVC voltage is shown, and also the oscillator grid voltage on all frequency ranges.

Tube Gain Is Shown Both With and Without AVC

The gain data in RCA Victor Service Notes generally shows the gain of the RF, 1st-detector, and IF tubes both with and without automatic volume control.

In general, it is recommended that gain checks be made as outlined herein, first checking the gain with the AVC working, and then if there is any doubt with the AVC bus grounded.

The important thing in following this recommended procedure (where the signal is fed into the antenna circuit for all checks) is to keep the RF–IF channel at maximum sensitivity when establishing the level at the antenna terminal, at the grid of the RF tube, and at the grid of the detector tube, as shown at (1), (2), and (3) in the illustration.

This method is followed in obtaining the published RCA gain data on actual production samples.

On small sets, the gain is given only with the AVC working.

On certain models, the 1st-detector tube is not controlled by the AVC, and should therefore be measured with the AVC working.

In checking from primary to secondary on RF and IF transformers, the AVC should be left working to avoid possible grid current that would reduce the apparent gain of the transformers.

Gain Tolerance

Several variable factors influence the gain of sections in a receiver, including **tubes,** which may vary more than 25%, **AVC action, grid current** if the AVC is killed, **regeneration,** adjustment of the **tuned circuits, accuracy of tuning, line voltage,** and **experience** on the part of the operator.

Obviously it is impossible to specify definite receiver tolerances. Two-to-one variations may be regarded as normal.

Make Gain Checks With 600 kc Signal Fed into Antenna Terminal of Receiver

All gain checks throughout the entire receiver circuit (radio-frequency, intermediate-frequency, and audio-frequency sections) can be made with the signal generator connected to one point (the antenna terminal), and tuned to one frequency (600 kc).

This naturally simplifies the procedure and speeds up the work.

Preliminary Set-Up

Signal Generator Connections

Connect the output cable of the signal generator to the antenna and ground terminals of the receiver.

Dummy Antenna

Use the recommended dummy (usually 100, 200, or 300 mmfd.) in series with the antenna terminal.

Tune Signal Generator to 600 kc

Adjust the signal generator to 600 kc, or to some frequency near 600 kc that is free from local broadcast interference.

The **exact** frequency is **not important.** If the signal generator is **slightly off** calibration, set it to the 600 kc mark, because both the receiver and the Chanalyst will be tuned to the actual generator frequency even though this may be slightly above or below 600 kc. In other words, the generator frequency is the starting point, and both the receiver and the Chanalyst will be tuned to it.

Use 400 Cycle Audio Modulation (30%)

Set the signal generator to give 400 cycle internal audio modulation on the 600 kc signal. The percentage of modulation is not important in making gain checks, but the standard value of 30% is recommended.

Tune the Receiver to 600 kc

Tune the receiver carefully for peak output on the signal (assumed to be 600 kc) from the generator.

Connect Chanalyst Ground Lead to the Receiver Chassis

Connect the clip on the end of the Chanalyst ground lead (black) to the receiver chassis. (See note in reference to connection on a.c.-d.c. receivers.)

Tune RF-IF Channel to 600 kc

Place the Chanalyst RF-IF probe (red cable) on the receiver antenna terminal. Set the RF–IF controls as shown in step (1), and tune the RF–IF channel for peak output as indicated on the RF–IF magic eye.

Making Gain Checks

(Refer to drawing, which shows each step
in checking a typical radio receiver.)

Step (1). Antenna Input Gain

With the RF–IF channel tuned to the 600 kc signal, and with the **level** and **multiplier** controls set at 1 and 1, as shown at (1) in the drawing, adjust the output of the signal generator until the RF–IF Magic Eye just closes (or electronic voltmeter reads –5 volts). See note about using the electronic voltmeter in conjunction with the magic eye.

Move the RF–IF probe from the antenna terminal to the grid prong of the RF tube. If there is a gain, the RF–IF magic eye will overlap. Adjust the **level** control until the eye is just closed. In this example, the **level** control has been turned from 1 to 5, indicating a voltage step-up or gain of five times from the antenna terminal to the grid of the first tube. (This is the gain from the antenna coil to the tuned loop.)

The service note for this particular model (Model 16T3) specifies an approximate gain of five times from the antenna terminal to the RF control grid. If the gain is appreciably less than 5 times, the tracking should be checked. The simplest and most definite method for doing this is described later.

Step (2). RF Tube Gain

Place RF–IF probe on grid of RF tube. **Set RF–IF input** controls as shown in (2). Adjust signal generator output until RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of RF tube. Adjust **level** control until RF–IF eye just closes. If new **level** setting is 1.5, the gain from grid to plate is 1.5 times.

To check the RF tube gain without automatic volume control, ground the AVC bus as indicated in dotted lines. Repeat step (2) to establish a signal level on the grid. Then move the RF–IF probe to the plate of the RF tube, and adjust the **level** control until the RF–IF eye is just closed. In this example (2B) the **level** control is turned to 8, indicating an RF tube gain of eight times with the AVC killed.

Move the probe to the grid of the 1st-detector tube, which is resistance-coupled to the RF tube in this particular model. There should be only a slight drop through the coupling circuit.

Remove the AVC ground after this check.

With a receiver that has transformer coupling between the RF and 1st-detector tubes, check the gain from primary to secondary (with AVC working).

Step (3). 1st-Detector Conversion Gain

Place the RF–IF probe on 1st-detector control grid and turn RF–IF **level** and **multiplier** controls to 1 and 1. Adjust signal generator output so the RF–IF Magic Eye is just closed.

Move the RF–IF probe to the 1st-detector plate. Tune the RF–IF channel for peak output on the IF signal. Adjust **multiplier** and **level** controls so RF–IF Magic Eye is just closed.

In this example (3A) the **multiplier** is turned from 1 to 10 (10 times), and the **level** control is turned from 1 to 8 (8 times). The conversion gain is therefore 80 times.

The IF signal voltage across the plate circuit of the 1st-detector tube is 80 times greater than the 600 kc signal voltage across the 1st-detector grid circuit.

If the conversion gain is appreciably less than specified, it may be due to incorrect IF alignment, but first try retuning the set for peak output. (The voltmeter channel provides an excellent output meter for this purpose by using it to measure AVC voltage.)

Step (4). Checking 1st-IF Transformer

In this step, there is a decrease or loss, instead of a gain, from primary to secondary of the 1st-IF transformer.

Place the RF–IF probe on the primary of the 1st-IF transformer and adjust the signal generator output so the RF–IF Magic Eye just closes, or so the electronic voltmeter indicates –5 volts.

Move the probe to the secondary. In this example (4A), the eye opens slightly, and the meter drops to –4 volts, indicating a loss of 5 to 4 or 0.8 times.

Step (5). IF Tube Gain

Place RF–IF probe on the IF grid. Set **multiplier** at 10 and **level** at 1. Adjust signal generator output so that RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of the IF tube and adjust **multiplier** and **level** controls until eye is just closed.

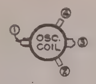
In this example (5A) the **multiplier** is turned from 10 to 100 (10 times) and the **level** control is turned from 1 to 6 (6 times). The gain is therefore 10 times 6, or 60.

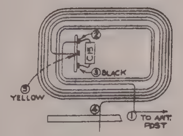
To check the IF gain with the AVC **killed,** connect the AVC bus to the chassis and repeat step (5) to establish a signal level on the IF grid.

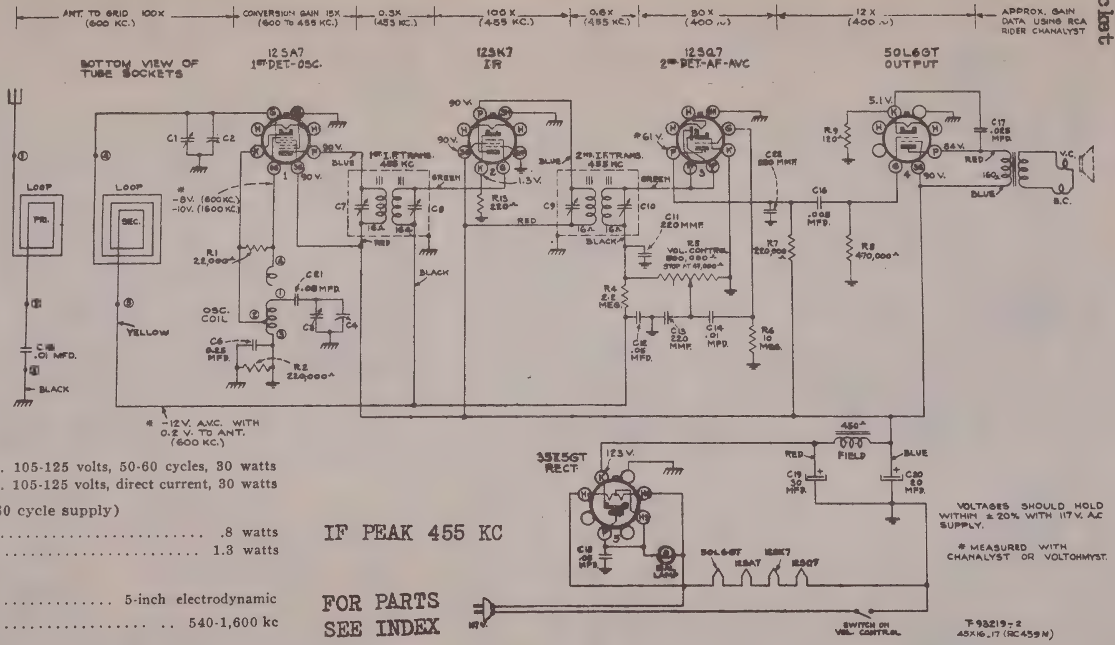
Move the RF–IF probe to the plate of the IF tube and adjust the **multiplier** and **level** controls until the RF–IF Magic Eye just closes. In this example (5B), the **multiplier** is turned from 10 to 1,000 (100 times) and the **level control**

MODELS 45X16,45X17
Chassis RC-459M
Schematic,Gain,Voltage
Alignment,Trimmers
Socket

RCA MFG. CO., INC.







IF PEAK 455 KC

FOR PARTS
SEE INDEX

POWER SUPPLY RATINGS

A-C Rating.................. 105-125 volts, 50-60 cycles, 30 watts
D-C Rating.................. 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted.................................... .8 watts
Maximum.................................... 1.3 watts

LOUDSPEAKER

Type................................ 5-inch electrodynamic

FREQUENCY RANGE.......................... 540-1,600 kc

Dial Lamp (1).................. Mazda 51, 7.5 volts, .20 amp.

—1940 No. 22—

First Edition

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

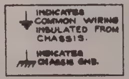
Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

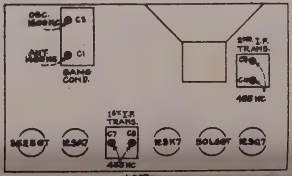
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

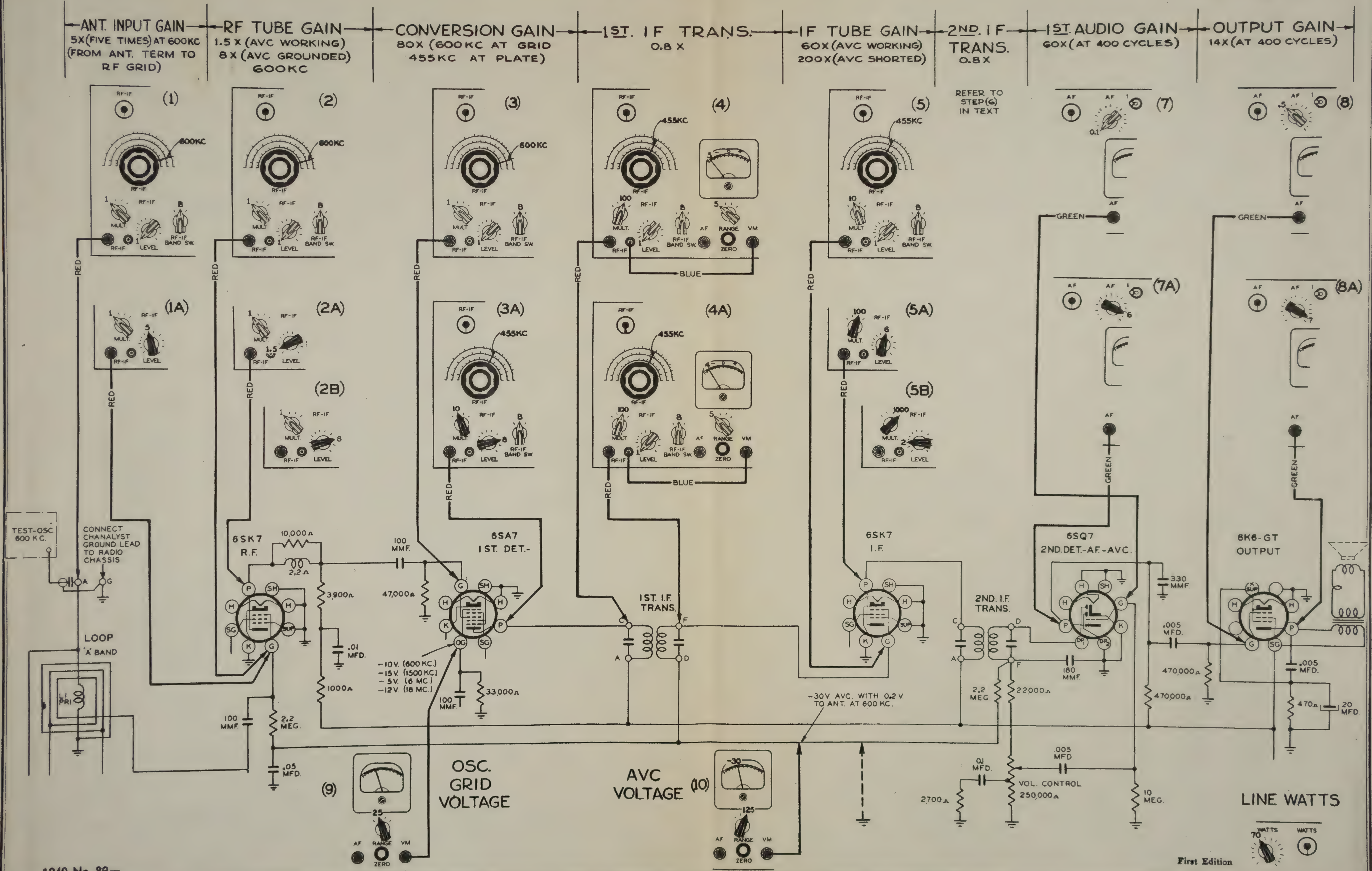
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc	C1 (antenna)





RCA MFG. CO., INC.

Gain Data Instructions
Test Schematic



—1940 No. 29—

First Edition

is turned from 1 to 2. Therefore the IF gain is 100 times 2, or 200, with the AVC killed.

Remove the AVC bus ground after this check.

Step (6). Checking 2nd-IF Transformer

In this particular set, the 2nd-IF transformer has the same loss as the 1st-IF transformer, and is checked as in step (4), except with **multiplier** at 1,000.

Step (7). 1st-Audio Gain

(In making audio gain checks, the tone controls should be set for maximum response.)

Turn Chanalyst AF control to 0.1 and set AF toggle switch to 1.

Place the AF channel probe (green cable) on the arm of the receiver volume control. Adjust the receiver volume control so the AF channel Magic Eye just closes.

Move the probe to the 1st-audio grid. There should be only a slight drop through the coupling condenser.

With the AF channel probe on the grid of the 1st-audio tube, reset the receiver volume control so the AF eye is just closed.

Move the AF probe to the plate of the 1st-audio tube. Adjust the AF channel control so the AF eye is just closed. In this example (7A) the control is turned from 0.1 to 6.0, indicating a voltage step-up or gain of 60 times (0.1 divided into 6.0 equals 60).

Move the AF probe to the grid of the output tube. There should be only a slight drop through the coupling capacitor.

If the receiver has a phase inverter tube, check its gain in the same way as described for the 1st-audio tube.

Step (8). Output Stage Gain

Turn Chanalyst AF control to 0.5 and place AF probe on the grid of the output tube. Adjust the receiver volume control so the AF Magic Eye is just closed.

Move the probe to the plate of the output tube. Adjust the AF channel control so the AF eye is just closed. In this example (8A), the control is turned from 0.5 to 7.0, indicating a voltage step-up or gain of 14 times (0.5 divided into 7.0 equals 14).

With a push-pull (or parallel push pull) output stage, check each tube separately, with the other output tube (or tubes) removed from the set. This gives a definite check on each output tube. The published data gives the gain with all of the output tubes in operation.

Step (9). Measuring Oscillator Grid Voltage

Checking the oscillator grid current (by measuring the rectified oscillator signal across the oscillator grid leak) is a valuable and quick method of determining whether the oscillator is working throughout the range on each band.

Connect the electronic voltmeter channel probe (blue cable) to the oscillator grid. Observe the voltage reading while tuning across each band.

The published RCA gain data gives the oscillator grid voltage at the high-frequency and low-frequency end of each band.

It will be observed that the oscillator grid voltage generally increases when tuning through stations. The published data is taken at quiet points on the dial.

"Dead spots" or points where the oscillator ceases to work may be caused by absorption due to resonance in adjacent coils through defects in shorting action of the range switch and will show up as dips in the oscillator grid voltages.

Step (10). Measuring AVC Voltage

Connect the voltmeter channel probe (blue cable) to the AVC bus. Turn the signal generator from low output up to high output and observe the AVC voltage. It will be found to increase rapidly at first, and then more slowly up to an approximate maximum (in this particular example) of –30 volts.

In the published RCA gain data, the AVC voltage is given for a large input to the antenna. This input voltage is stated as a matter of record. The specified AVC voltage may be regarded as the approximate maximum.

Checking Oscillator Frequency

Place the oscillator channel probe (brown cable) near the oscillator circuit in the receiver. Tune the oscillator channel for maximum indication on the oscillator channel Magic Eye.

The correct oscillator frequency should equal the sum of the input signal frequency plus the intermediate frequency. In this particular example, the input signal is 600 kc, and the intermediate frequency is 455 kc, so the correct oscillator frequency is 600 plus 455, or 1,055 kc.

Wattage Indicator

Plug the Chanalyst into a 110-volt a.c supply, and plug the receiver into the Chanalyst **test watts** receptacle. Turn "on" the power switches of both Chanalyst and receiver. After a brief warm-up period, adjust the **watts** control so the **watts** Magic Eye just closes. The setting of the **watts** control indicates the power consumption of the receiver.

The rated power consumption of radio receivers (as printed in service data and on the chassis or cabinet labels) is seldom accurate to within 10% of the actual consumption.

Quick Over-All Gain Checks on RF, IF, and AF Sections

The approximate over-all gain of any section (RF, IF, or AF) can be found by multiplying together the gain (with AVC killed) of the parts that comprise the particular section.

Using the accompanying diagram as an example:

The RF section extends from the antenna terminal to the 1st-detector grid. This includes the antenna transformer (which in this case has a primary coil and a loop secondary) with a gain of 5, and the RF tube, with a gain of 8. The overall RF gain is 5 times 8, or 40.

The 1st-detector conversion gain, and the 1st-IF transformer should be checked separately.

The IF tube and the 2nd-IF transformer may be checked as one section, feeding IF signal from the generator into the IF grid, with the multiplier and level controls at 1 and 1 to establish the lowest possible level on the IF grid.

The AF section extends from the 1st-AF grid to the output plate, and includes the 1st-AF tube and the output tube. The over-all AF gain is 60 times 14, or approximately 800.

Miscellaneous Data

Electronic Voltmeter May Be Used in Conjunction With the Magic Eye

When tuning the RF–IF channel, the electronic voltmeter may be used as an auxiliary resonance indicator, and for level checks as shown in step (4).

Connect the voltmeter cable (blue) between the VM jack and the RF–IF tip jack.

Set the **meter range** to 5, and, with no signal input to the RF–IF channel, adjust the **zero control** so the meter needle is at center zero.

When connected in this way, the meter indicates the rectified signal voltage at the grid of the RF–IF Magic Eye. Approximately –5 volts are required to just close the eye.

Tracking at 600 kc

In using the published gain data it is advisable to check, and if necessary adjust, the tracking between the RF tuned circuits and the oscillator circuit.

The following method is unequalled for speed and accuracy because no "rocking" of the gang condenser is necessary.

(a) Align the IF to the correct IF frequency.

(b) Feed a 600 kc signal into the antenna circuit of receiver through the specified dummy antenna.

(c) Place RF–IF probe (red cable) on grid of first tube in receiver, and tune the RF–IF channel to the 600 kc signal.

(d) Carefully turn the receiver gang condenser for maximum output on the RF–IF Magic Eye (not for maximum output on the receiver).

(e) Leave the receiver gang in this position even though the receiver dial may indicate 10 or 20 kc off, because this is the correct setting of the gang to tune the receiver's antenna circuit to 600 kc.

(f) Connect the electronic voltmeter probe (blue cable) to the AVC circuit of the receiver.

(g) Adjust the oscillator magnetite core or low-frequency padder for maximum AVC voltage as indicated on the electronic voltmeter.

Input to Loop Receivers

Some loop receivers have a link that must be opened when feeding the signal generator into the antenna terminal.

On console loop receivers, such as RCA Model 110K, if only the chassis has been brought in for service, and the loop is not available, connect the signal generator through an .01 mfd. capacitor to the control grid of the first tube. Tune the receiver for maximum AVC voltage on the 600 kc signal.

Chanalyst Ground Connection to AC-DC Receivers

On a.c.-d.c. receivers where one side of the 110-volt line is connected to the chassis, attach the Chanalyst ground lead to the receiver chassis.

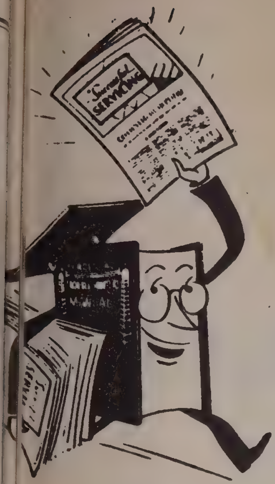
If the 110-volt line is isolated from the receiver chassis, connect the Chanalyst ground lead to the common negative wiring in the chassis.

In either of these cases it must be remembered that the receiver and the Chanalyst may be "hot," and **due care must be taken to prevent grounding of either. The best method is** to use an isolating power transformer as described below.

Isolating Power Transformer

When working on a.c.-d.c. receivers, it is becoming general practice to use a one-to-one ratio power transformer between the a.c. power supply and the receiver. This avoids grounding difficulties and certain hum conditions.

The isolation power transformer may be used in conjuction with the Chanalyst when testing a.c.-d.c. receivers by plugging one winding of the transformer into the Chanalyst **test-watts** receptacle, and connecting the a.c.-d.c. receiver to the other winding.



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Obviously it is impossible to specify definite receiver tolerances. Two-to-one variations may be regarded as normal.

Make Gain Checks With 600 kc Signal Fed into Antenna Terminal of Receiver

All gain checks throughout the entire receiver circuit (radio-frequency, intermediate-frequency, and audio-frequency sections) can be made with the signal generator connected to one point (the antenna terminal), and tuned to one frequency (600 kc).

This naturally simplifies the procedure and speeds up the work.

Preliminary Set-Up

Signal Generator Connections

Connect the output cable of the signal generator to the antenna and ground terminals of the receiver.

Dummy Antenna

Use the recommended dummy (usually 100, 200, or 300 mmfd.) in series with the antenna terminal.

Tune Signal Generator to 600 kc

Adjust the signal generator to 600 kc, or to some frequency near 600 kc that is free from local broadcast interference.

The exact frequency is not important. If the signal generator is slightly off calibration, set it to the 600 kc mark, because both the receiver and the Chanalyst will be tuned to the actual generator frequency even though this may be slightly above or below 600 kc. In other words, the generator frequency is the starting point, and both the receiver and the Chanalyst will be tuned to it.

Use 400 Cycle Audio Modulation (30%)

Set the signal generator to give 400 cycle internal audio modulation on the 600 kc signal. The percentage of modulation is not important in making gain checks, but the standard value of 30% is recommended.

Tune the Receiver to 600 kc

Tune the receiver carefully for peak output on the signal (assumed to be 600 kc) from the generator.

Connect Chanalyst Ground Lead to the Receiver Chassis

Connect the clip on the end of the Chanalyst ground lead (black) to the receiver chassis. (See note in reference to connection on a.c.-d.c. receivers.)

Tune RF-IF Channel to 600 kc

Place the Chanalyst RF-IF probe (red cable) on the receiver antenna terminal. Set the RF–IF controls as shown in step (1), and tune the RF–IF channel for peak output as indicated on the RF–IF magic eye.

Making Gain Checks

(Refer to drawing, which shows each step
in checking a typical radio receiver.)

Step (1). Antenna Input Gain

With the RF–IF channel tuned to the 600 kc signal, and with the **level** and **multiplier** controls set at 1 and 1, as shown at (1) in the drawing, adjust the output of the signal generator until the RF–IF Magic Eye just closes (or electronic voltmeter reads –5 volts). See note about using the electronic voltmeter in conjunction with the magic eye.

Move the RF–IF probe from the antenna terminal to the grid prong of the RF tube. If there is a gain, the RF–IF magic eye will overlap. Adjust the **level** control until the eye is just closed. In this example, the **level** control has been turned from 1 to 5, indicating a voltage step-up or gain of five times from the antenna terminal to the grid of the first tube. (This is the gain from the antenna coil to the tuned loop.)

The service note for this particular model (Model 16T3) specifies an approximate gain of five times from the antenna terminal to the RF control grid. If the gain is appreciably less than 5 times, the tracking should be checked. The simplest and most definite method for doing this is described later.

Step (2). RF Tube Gain

Place RF–IF probe on grid of RF tube. **Set RF–IF input** controls as shown in (2). Adjust signal generator output until RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of RF tube. Adjust **level** control until RF–IF eye just closes. If new **level** setting is 1.5, the gain from grid to plate is 1.5 times.

To check the RF tube gain without automatic volume control, ground the AVC bus as indicated in dotted lines. Repeat step (2) to establish a signal level on the grid. Then move the RF–IF probe to the plate of the RF tube, and adjust the **level** control until the RF–IF eye is just closed. In this example (2B) the **level** control is turned to 8, indicating an RF tube gain of eight times with the AVC killed.

Move the probe to the grid of the 1st-detector tube, which is resistance-coupled to the RF tube in this particular model. There should be only a slight drop through the coupling circuit.

Remove the AVC ground after this check.

With a receiver that has transformer coupling between the RF and 1st-detector tubes, check the gain from primary to secondary (with AVC working).

Step (3). 1st-Detector Conversion Gain

Place the RF–IF probe on 1st-detector control grid and turn RF–IF **level** and **multiplier** controls to 1 and 1. Adjust signal generator output so the RF–IF Magic Eye is just closed.

Move the RF–IF probe to the 1st-detector plate. Tune the RF–IF channel for peak output on the IF signal. Adjust **multiplier** and **level** controls so RF–IF Magic Eye is just closed.

In this example (3A) the **multiplier** is turned from 1 to 10 (10 times), and the **level** control is turned from 1 to 8 (8 times). The conversion gain is therefore 80 times.

The IF signal voltage across the plate circuit of the 1st-detector tube is 80 times greater than the 600 kc signal voltage across the 1st-detector grid circuit.

If the conversion gain is appreciably less than specified, it may be due to incorrect IF alignment, but first try retuning the set for peak output. (The voltmeter channel provides an excellent output meter for this purpose by using it to measure AVC voltage.)

Step (4). Checking 1st-IF Transformer

In this step, there is a decrease or loss, instead of a **gain,** from primary to secondary of the 1st-IF transformer.

Place the RF–IF probe on the primary of the 1st-IF transformer and adjust the signal generator output so the RF–IF Magic Eye just closes, or so the electronic voltmeter indicates –5 volts.

Move the probe to the secondary. In this example (4A), the eye opens slightly, and the meter drops to –4 volts, indicating a loss of 5 to 4 or 0.8 times.

Step (5). IF Tube Gain

Place RF–IF probe on the IF grid. Set **multiplier at** 10 and **level** at 1. Adjust signal generator output so that RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of the IF tube and adjust **multiplier** and **level** controls until eye is just closed.

In this example (5A) the **multiplier** is turned from 10 to 100 (10 times) and the **level** control is turned from 1 to 6 (6 times). The gain is therefore 10 times 6, or 60.

To check the IF gain with the AVC killed, connect the AVC bus to the chassis and repeat step (5) to establish a signal level on the IF grid.

Move the RF–IF probe to the plate of the IF tube and adjust the **multiplier** and **level** controls until the RF–IF Magic Eye just closes. In this example (5B), the **multiplier** is turned from 10 to 1,000 (100 times) and the **level control**

is turned from 1 to 2. Therefore the IF gain is 100 times 2, or 200, with the AVC killed.

Remove the AVC bus ground after this check.

Step (6). Checking 2nd-IF Transformer

In this particular set, the 2nd-IF transformer has the **same** loss as the 1st-IF transformer, and is checked as in step (4), except with **multiplier** at 1,000.

Step (7). 1st-Audio Gain

(In making audio gain checks, the tone controls should be set for maximum response.)

Turn Chanalyst AF control to 0.1 and set AF toggle switch to 1.

Place the AF channel probe (green cable) on the arm of the receiver volume control. Adjust the receiver volume control so the AF channel Magic Eye just closes.

Move the probe to the 1st-audio grid. There should be only a slight drop through the coupling condenser.

With the AF channel probe on the grid of the 1st-audio tube, reset the receiver volume control so the AF eye is just closed.

Move the AF probe to the plate of the 1st-audio tube. Adjust the AF channel control so the AF eye is just closed. In this example (7A) the control is turned from 0.1 to 6.0, indicating a voltage step-up or gain of 60 times (0.1 divided into 6.0 equals 60).

Move the AF probe to the grid of the output tube. There should be only a slight drop through the coupling capacitor.

If the receiver has a phase inverter tube, check its gain in the same way as described for the 1st-audio tube.

Step (8). Output Stage Gain

Turn Chanalyst AF control to 0.5 and place AF probe on the grid of the output tube. Adjust the receiver volume control so the AF Magic Eye is just closed.

Move the probe to the plate of the output tube. Adjust the AF channel control so the AF eye is just closed. In this example (8A), the control is turned from 0.5 to 7.0, indicating a voltage step-up or gain of 14 times (0.5 divided into 7.0 equals 14).

With a push-pull (or parallel push pull) output stage, check each tube separately, with the other output tube (or tubes) removed from the set. This gives a definite check on each output tube. The published data gives the gain with all of the output tubes in operation.

Step (9). Measuring Oscillator Grid Voltage

Checking the oscillator grid current (by measuring the rectified oscillator signal across the oscillator grid leak) is a valuable and quick method of determining whether the oscillator is working throughout the range on each band.

Connect the electronic voltmeter channel probe (blue cable) to the oscillator grid. Observe the voltage reading while tuning across each band.

The published RCA gain data gives the oscillator grid voltage at the high-frequency and low-frequency end of each band.

It will be observed that the oscillator grid voltage generally increases when tuning through stations. The published data is taken at quiet points on the dial.

"Dead spots" or points where the oscillator ceases to work may be caused by absorption due to resonance in adjacent coils through defects in shorting action of the range switch and will show up as dips in the oscillator grid voltages.

Step (10). Measuring AVC Voltage

Connect the voltmeter channel probe (blue cable) to the AVC bus. Turn the signal generator from low output up to high output and observe the AVC voltage. It will be found to increase rapidly at first, and then more slowly up to an approximate maximum (in this particular example) of –30 volts.

In the published RCA gain data, the AVC voltage is given for a large input to the antenna. This input voltage is stated as a matter of record. The specified AVC voltage may be regarded as the approximate maximum.

Checking Oscillator Frequency

Place the oscillator channel probe (**brown cable**) near the oscillator circuit in the receiver. Tune the oscillator channel for maximum indication on the oscillator channel Magic Eye.

The correct oscillator frequency should equal the sum of the input signal frequency plus the intermediate frequency. In this particular example, the input signal is 600 kc, and the intermediate frequency is 455 kc, so the correct oscillator frequency is 600 plus 455, or 1,055 kc.

Wattage Indicator

Plug the Chanalyst into a 110-volt a.c supply, and plug the receiver into the Chanalyst **test watts** receptacle. Turn "on" the power switches of both Chanalyst and receiver. After a brief warm-up period, adjust the **watts** control so the **watts** Magic Eye just closes. The setting of the **watts** control indicates the power consumption of the receiver.

The rated power consumption of radio receivers (as printed in service data and on the chassis or cabinet labels) is seldom accurate to within 10% of the actual consumption.

Quick Over-All Gain Checks on RF, IF, and AF Sections

The approximate over-all gain of any section (RF, IF, or AF) can be found by multiplying together the gain (with AVC killed) of the parts that comprise the particular section.

Using the accompanying diagram as an example:

The RF section extends from the antenna terminal to the 1st-detector grid. This includes the antenna transformer (which in this case has a primary coil and a loop secondary) with a gain of 5, and the RF tube, with a gain of 8. The over-all RF gain is 5 times 8, or 40.

The 1st-detector conversion gain, and the 1st-IF transformer should be checked separately.

The IF tube and the 2nd-IF transformer may be checked as one section, feeding IF signal from the generator into the IF grid, with the multiplier and level controls at 1 and 1 to establish the lowest possible level on the IF grid.

The AF section extends from the 1st-AF grid to the output plate, and includes the 1st-AF tube and the output tube. The over-all AF gain is 60 times 14, or approximately 800.

Miscellaneous Data

Electronic Voltmeter May Be Used in Conjunction With the Magic Eye

When tuning the RF–IF channel, the electronic voltmeter may be used as an auxiliary resonance indicator, and for level checks as shown in step (4).

Connect the voltmeter cable (blue) between the VM jack and the RF–IF tip jack.

Set the **meter range** to 5, and, with no signal input to the RF–IF channel, adjust the **zero** control so the meter needle is at center zero.

When connected in this way, the meter indicates the rectified signal voltage at the grid of the RF–IF Magic Eye. Approximately –5 volts are required to just close the eye.

Tracking at 600 kc

In using the published gain data it is advisable to check, and if necessary adjust, the tracking between the RF tuned circuits and the oscillator circuit.

The following method is unequalled for speed and accuracy because no "rocking" of the gang condenser is necessary.

(a) Align the IF to the correct IF frequency.
(b) Feed a 600 kc signal into the antenna circuit of receiver through the specified dummy antenna.
(c) Place RF–IF probe (red cable) on grid of first tube in receiver, and tune the RF–IF channel to the 600 kc signal.
(d) Carefully turn the receiver gang condenser for maximum output on the RF–IF Magic Eye (not for maximum output on the receiver).
(e) Leave the receiver gang in this position even though the receiver dial may indicate 10 or 20 kc off, because this is the correct setting of the gang to tune the receiver's antenna circuit to 600 kc.
(f) Connect the electronic voltmeter probe (blue cable) to the AVC circuit of the receiver.

(g) Adjust the oscillator magnetite core or low-frequency padder for maximum AVC voltage as indicated on the electronic voltmeter.

Input to Loop Receivers

Some loop receivers have a link that must be opened when feeding the signal generator into the antenna terminal.

On console loop receivers, such as RCA Model 110K, if only the chassis has been brought in for service, and the loop is not available, connect the signal generator through an .01 mfd. capacitor to the control grid of the first tube. Tune the receiver for maximum AVC voltage on the 600 kc signal.

Chanalyst Ground Connection to AC-DC Receivers

On a.c.-d.c. receivers where one side of the 110-volt line is connected to the chassis, attach the Chanalyst ground lead to the receiver chassis.

If the 110-volt line is isolated from the receiver chassis, connect the Chanalyst ground lead to the common negative wiring in the chassis.

In either of these cases it must be remembered that the receiver and the Chanalyst may be "hot," and due care must be taken to prevent grounding of either. The best method is to use an isolating power transformer as described below.

Isolating Power Transformer

When working on a.c.-d.c. receivers, it is becoming general practice to use a one-to-one ratio power transformer between the a.c. power supply and the receiver. This avoids grounding difficulties and certain hum conditions.

The isolation power transformer may be used in conjuction with the Chanalyst when testing a.c.-d.c. receivers by plugging one winding of the transformer into the Chanalyst **test-watts** receptacle, and connecting the a.c.-d.c. receiver to the other winding.

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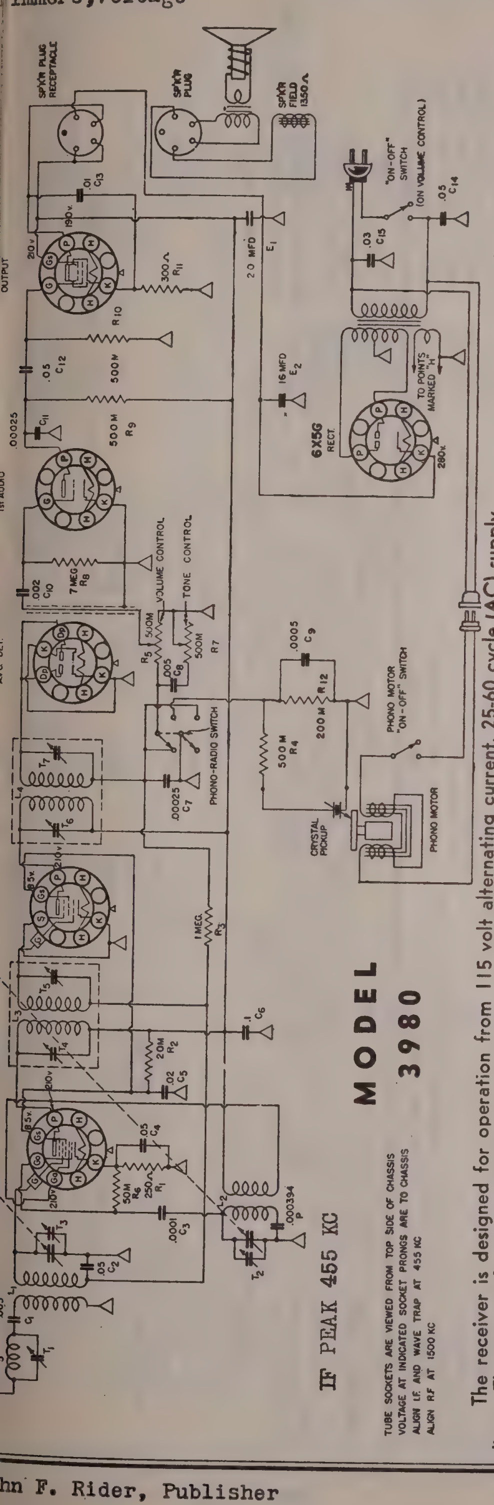
AIR KING PRODUCTS CORP.

MODELS 4,23X,9722, 9822,9822A,9823,9922



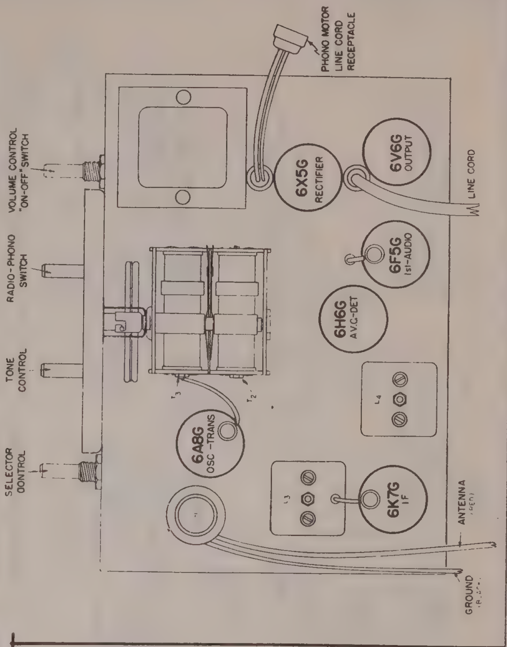
IF PEAK 455 KC

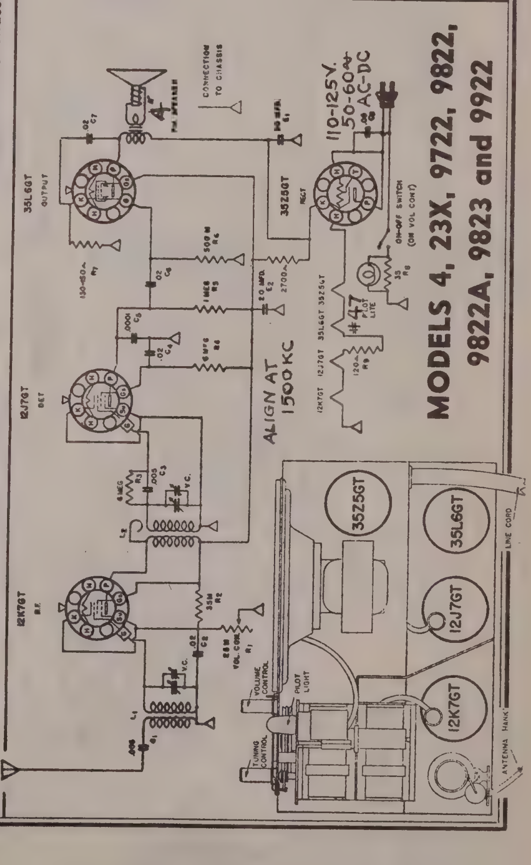
MODEL 3980

TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS
ALIGN I.F. AND WAVE TRAP AT 455 KC
ALIGN RF AT 1500 KC

The receiver is designed for operation from 115 volt alternating current, 25-60 cycle (AC) supply lines. The proper frequency (cycles) is specified on the label at the rear of the chassis.

8" Electro Dynamic Speaker

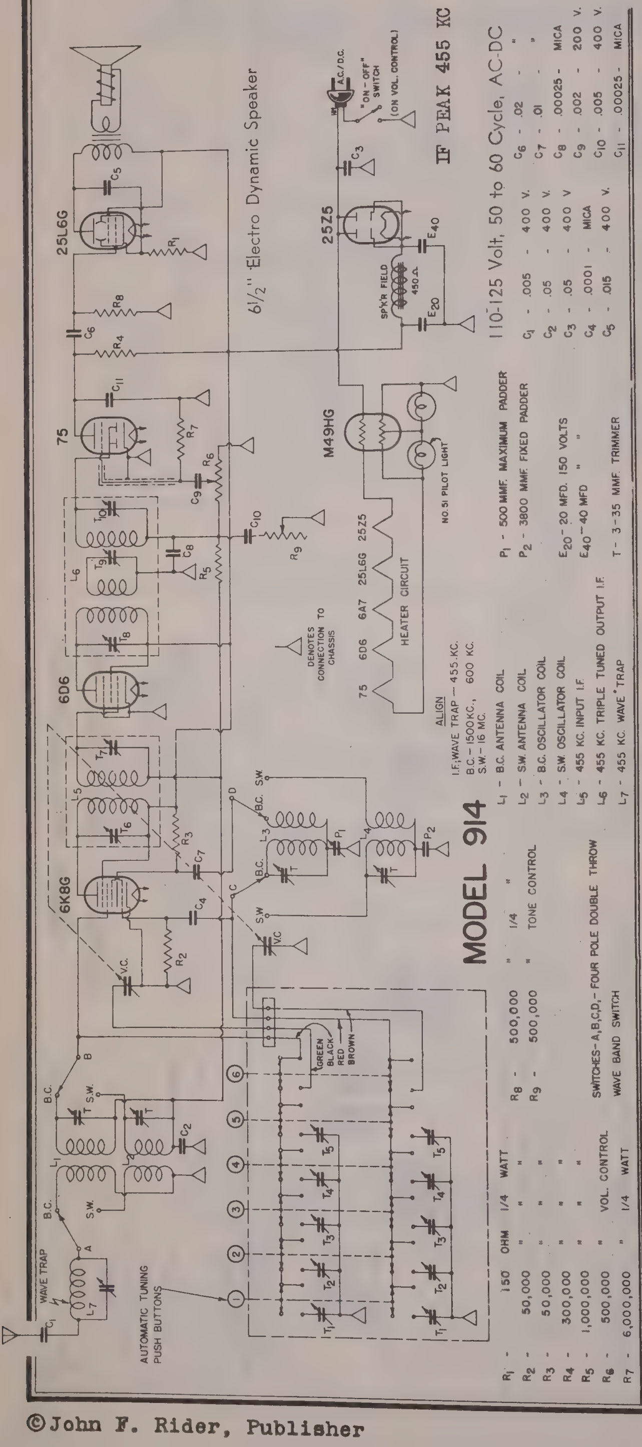




MODELS 4, 23X, 9722, 9822, 9822A, 9823 and 9922

MODEL 914
MODEL 920
Schematics

AIR KING PRODUCTS CORP.



IF PEAK 455 KC

110-125 Volt, 50 to 60 Cycle, AC-DC

ALIGN
I.F.; WAVE TRAP — 455 KC.
B.C. - 1500 KC., 600 KC.
S.W. - 16 MC.

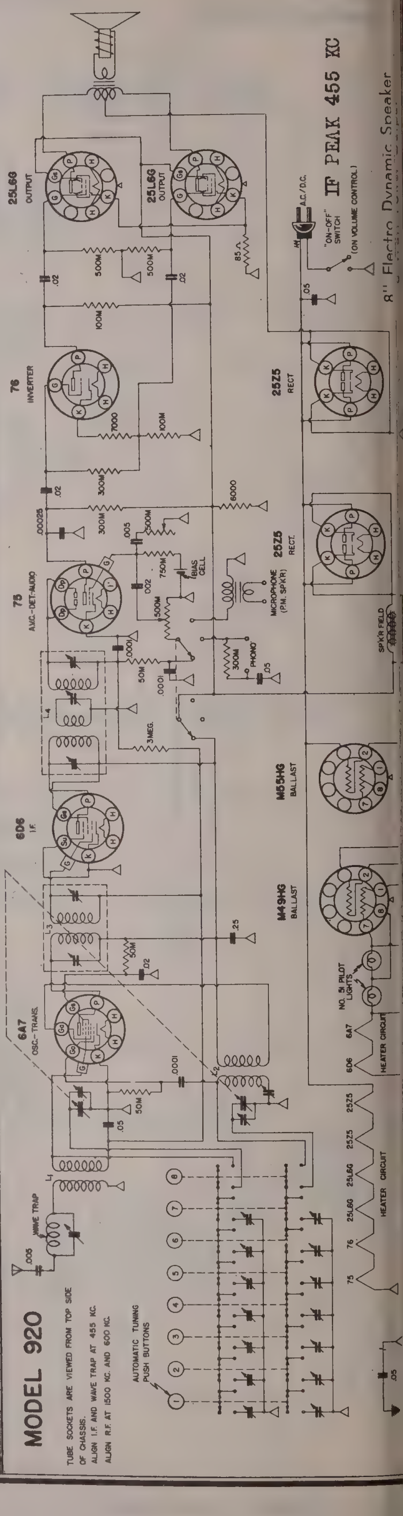
R1 - 150 OHM 1/4 WATT
R2 - 50,000 " "
R3 - 50,000 " "
R4 - 300,000 " "
R5 - 1,000,000 " "
R6 - 500,000 " VOL. CONTROL
R7 - 6,000,000 " 1/4 WATT
R8 - 500,000 " 1/4 "
R9 - 500,000 " TONE CONTROL

SWITCHES - A, B, C, D, - FOUR POLE DOUBLE THROW WAVE BAND SWITCH

L1 - B.C. ANTENNA COIL
L2 - S.W. ANTENNA COIL
L3 - B.C. OSCILLATOR COIL
L4 - S.W. OSCILLATOR COIL
L5 - 455 KC. INPUT I.F.
L6 - 455 KC. TRIPLE TUNED OUTPUT I.F.
L7 - 455 KC. WAVE TRAP

P1 - 500 MMF. MAXIMUM PADDER
P2 - 3800 MMF. FIXED PADDER
E20 - 20 MFD. 150 VOLTS
E40 - 40 MFD " "
T - 3-35 MMF. TRIMMER

C1 - .005 - 400 V.
C2 - .05 - 400 V.
C3 - .05 - 400 V
C4 - .0001 - MICA
C5 - .015 - 400 V.
C6 - .02 - "
C7 - .01 - "
C8 - .00025 - MICA
C9 - .002 - 200 V.
C10 - .005 - 400 V.
C11 - .00025 - MICA

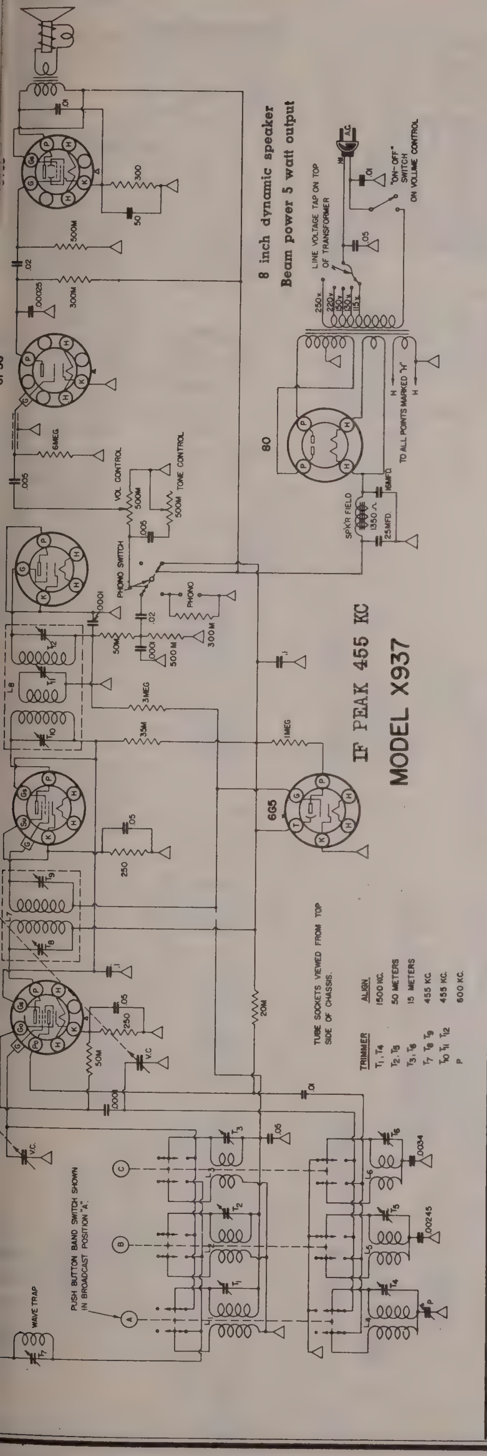


IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS.
ALIGN I.F. AND WAVE TRAP AT 455 KC.
ALIGN R.F. AT 1500 KC. AND 600 KC.

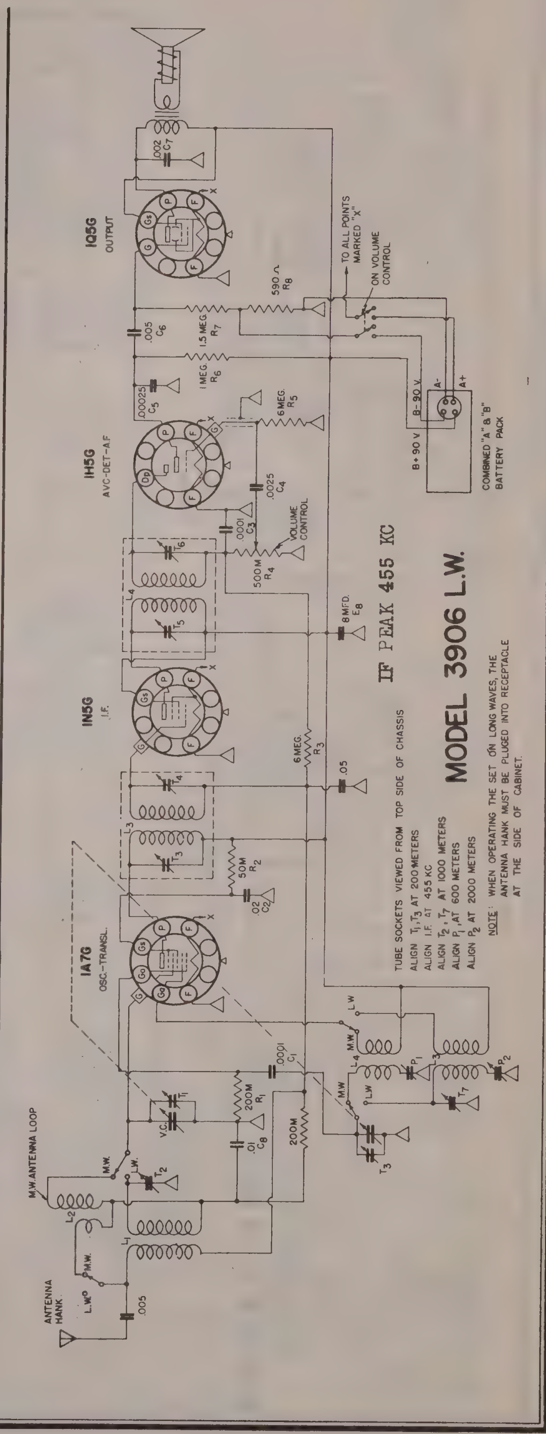
MODEL X937
MODEL 3906 LW
Schematics

AIR-KING PRODUCTS CORP.



TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS.

TRIMMER	ALIGN
T_1, T_4	1500 KC.
T_2, T_5	50 METERS
T_3, T_6	15 METERS
T_7 T_8 T_9	455 KC.
T_{10} T_{11} T_{12}	455 KC.
P	600 KC.



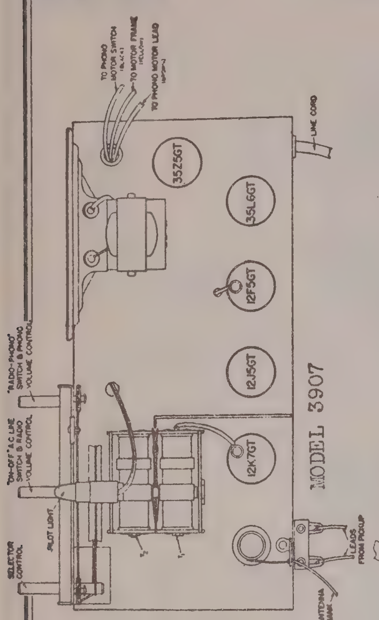
TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN T_1, T_3 AT 200 METERS
ALIGN I.F. AT 455 KC
ALIGN T_2, T_7 AT 1000 METERS
ALIGN P_1, AT 600 METERS
ALIGN P_2 AT 2000 METERS

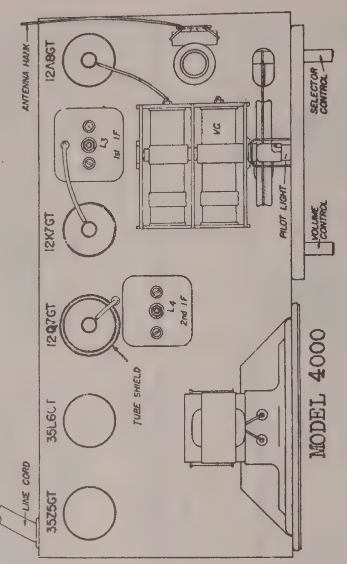
NOTE: WHEN OPERATING THE SET ON LONG WAVES, THE ANTENNA HANK MUST BE PLUGED INTO RECEPTACLE AT THE SIDE OF CABINET.

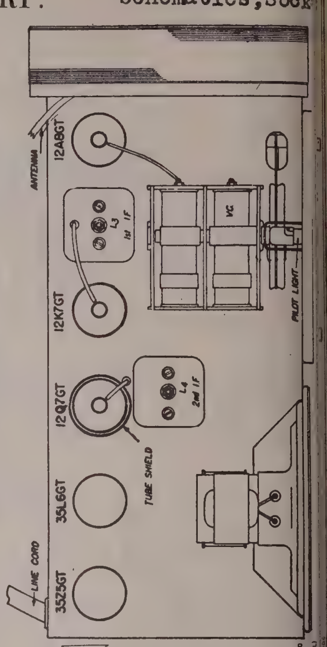
MODEL 3907
MODEL 4000

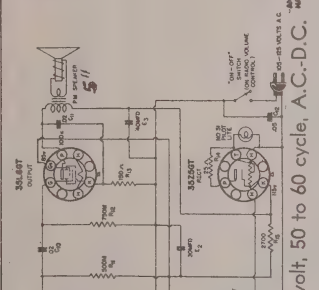
AIR KING PRODUCTS CORP.

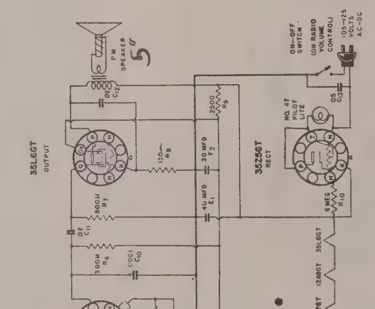
MODEL 4000A
Schematics,Sock

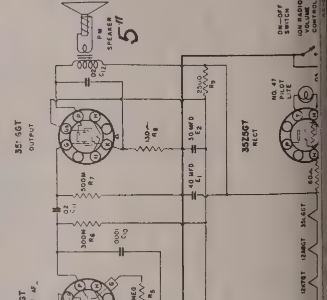







MODEL 3907
12K7GT R.F.
12J5GT DET
12F5GT 1st AUDIO
35L6GT OUTPUT
35Z5GT RECT
PM SPEAKER 5"
NO. 51 PILOT LITE
"ON-OFF" SWITCH (ON RADIO VOLUME CONTROL)
105-125 VOLTS A.C.
110-125 volt, 50 to 60 cycle, A.C.-D.C.
RADIO-PHONO SWITCH
HEATER CIRCUIT
PHONO MOTOR SWITCH (ON PHONO MOTOR BOARD)
CRYSTAL PICKUP
PHONO MOTOR
DENOTES CONNECTION TO CHASSIS
TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
VOLTAGE AT INDICATED SOCKET PRONGS IS TO B- LEAD
ALIGN RF AND ANTENNA CIRCUITS AT 1500 KC
RADIO VOL





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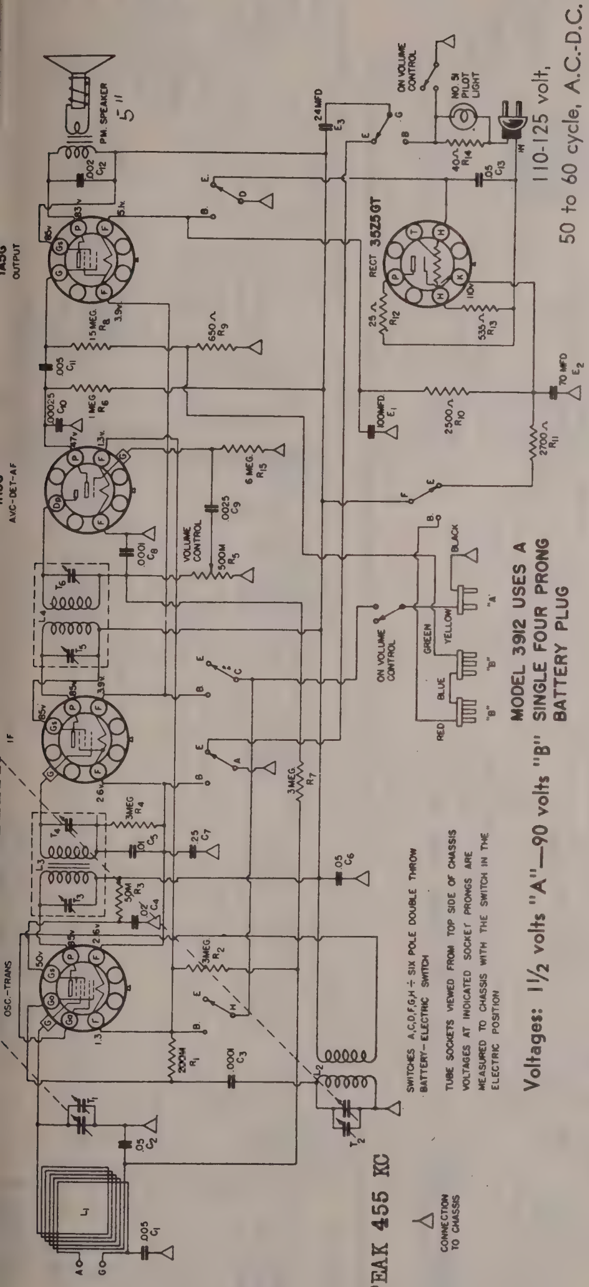
MODELS 3912,3916
Schematic,Socket
Voltage



SWITCHES A,C,D,F,G,H = SIX POLE DOUBLE THROW BATTERY-ELECTRIC SWITCH

TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS VOLTAGES AT INDICATED SOCKET PRONGS ARE MEASURED TO CHASSIS WITH THE SWITCH IN THE ELECTRIC POSITION

CONNECTION TO CHASSIS

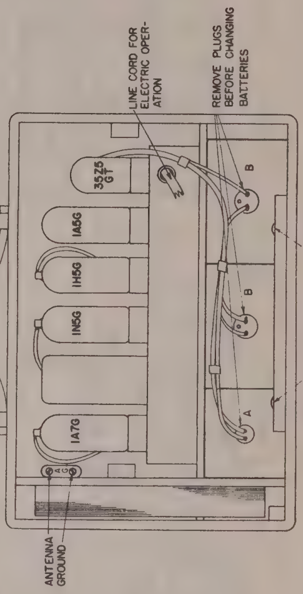
IF PEAK 455 KC

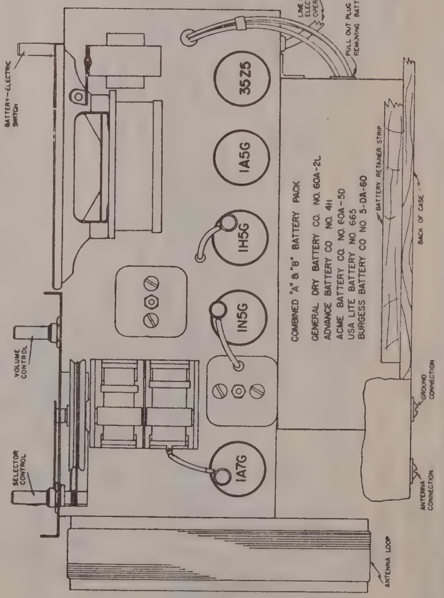
Voltages: 1½ volts "A"—90 volts "B"

MODEL 3912 USES A SINGLE FOUR PRONG BATTERY PLUG

110-125 volt,
50 to 60 cycle, A.C.-D.C.

LOCATION OF TUBES & BATTERIES


1A7G
1N5G
1H5G
1A5G
35Z5 GT
A
B
B
A
G
ANTENNA
GROUND
LINE CORD FOR ELECTRIC OPERATION
REMOVE PLUGS BEFORE CHANGING BATTERIES
REMOVE 2 SCREWS & STRIP TO INSTALL OR REMOVE BATTERIES

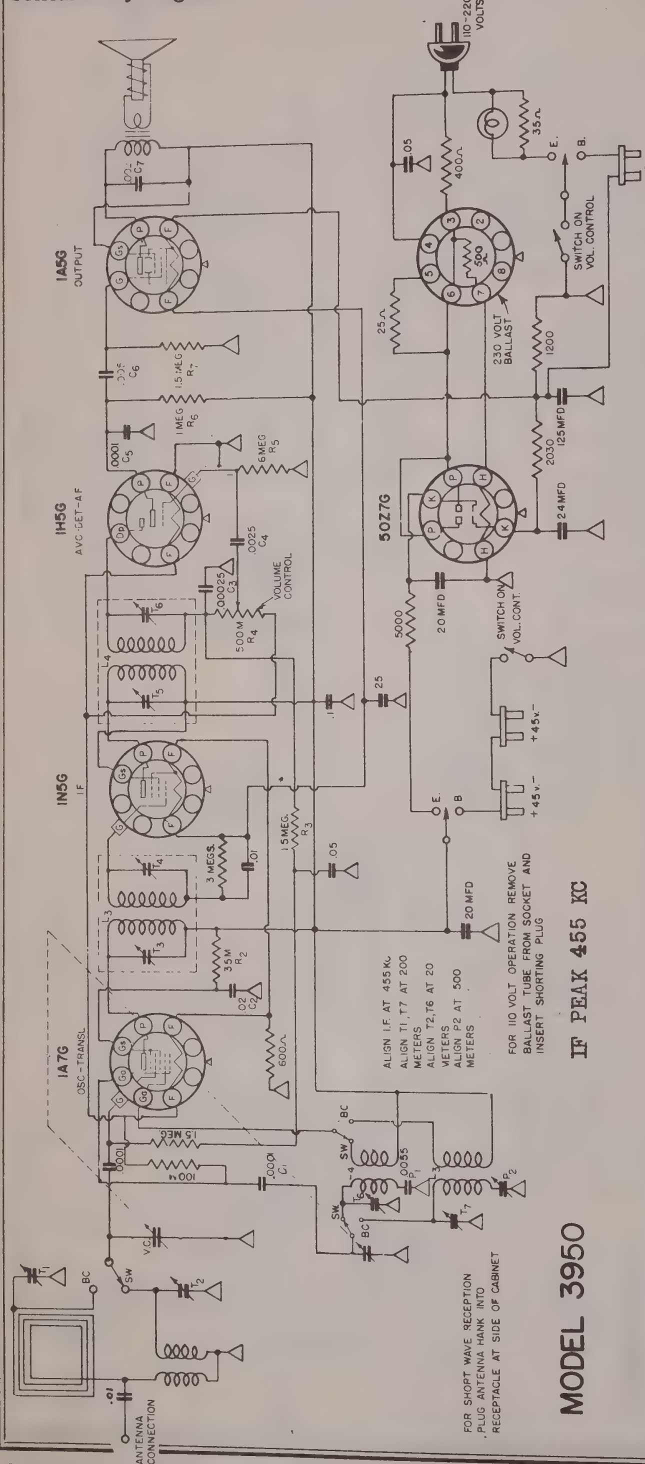


COMBINED "A" & "B" BATTERY PACK
GENERAL DRY BATTERY CO. NO. 60A-2L
ADVANCE BATTERY CO NO. 411
ACME BATTERY CO. NO. 60A-5D
USA LITE BATTERY NO. 665
BURGESS BATTERY CO NO. 5-DA-60

MODEL 3950
Schematic, Alignment

AIR KING PRODUCTS CORP.

MODEL 4001
Schematic, Socke
Alignment



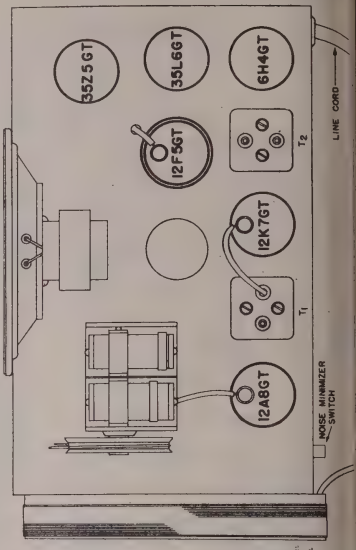
ALIGN I.F. AT 455 KC
ALIGN T1, T7 AT 200 METERS
ALIGN T2, T6 AT 20 METERS
ALIGN P2 AT 500 METERS

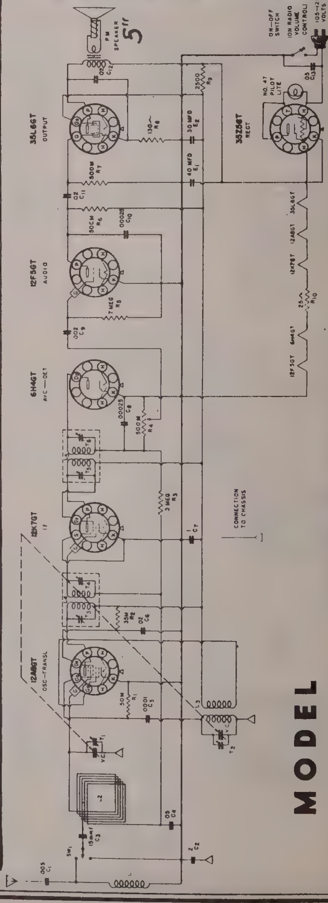
FOR 110 VOLT OPERATION REMOVE BALLAST TUBE FROM SOCKET AND INSERT SHORTING PLUG

IF PEAK 455 KC

FOR SHORT WAVE RECEPTION PLUG ANTENNA HANK INTO RECEPTACLE AT SIDE OF CABINET

MODEL 3950



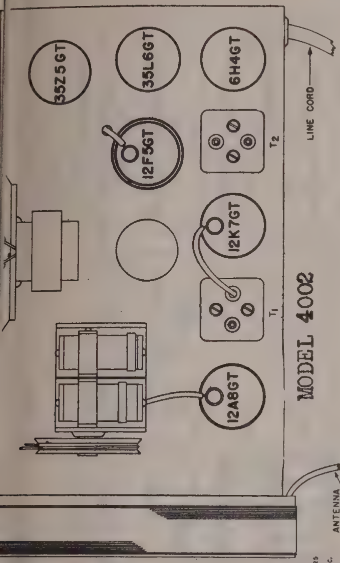


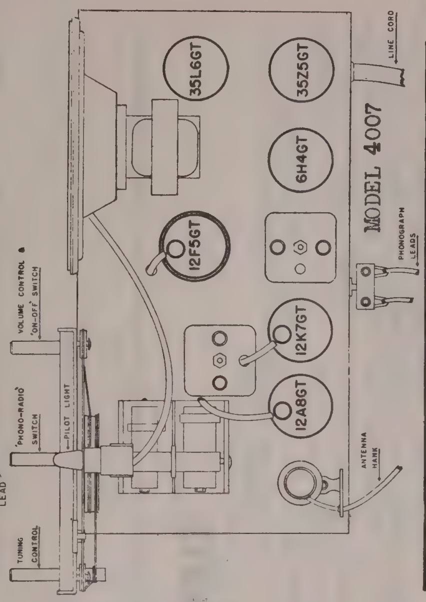
ALIGN IF AT 455 KC.
ALIGN RF AT 1550 KC.

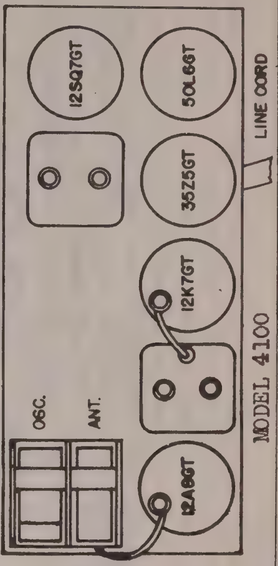
MODEL 4001

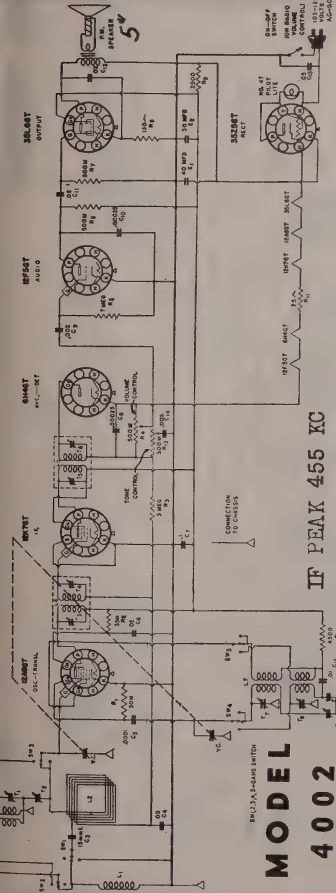
AIR KING PRODUCTS CORP.

MODEL 4002
MODEL 4007
MODEL 4100
Schematics, Socket

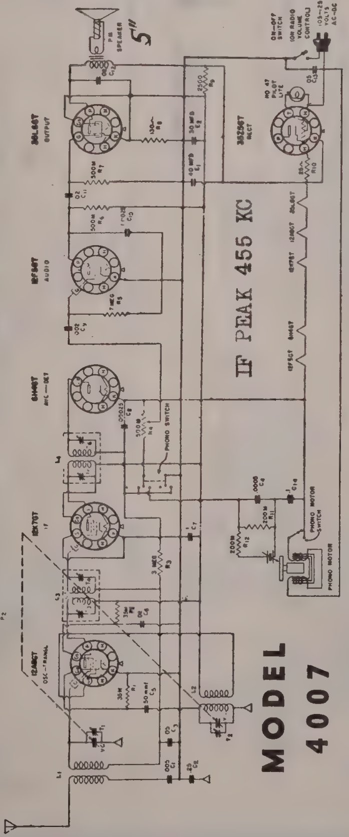

MODEL 4002


MODEL 4007

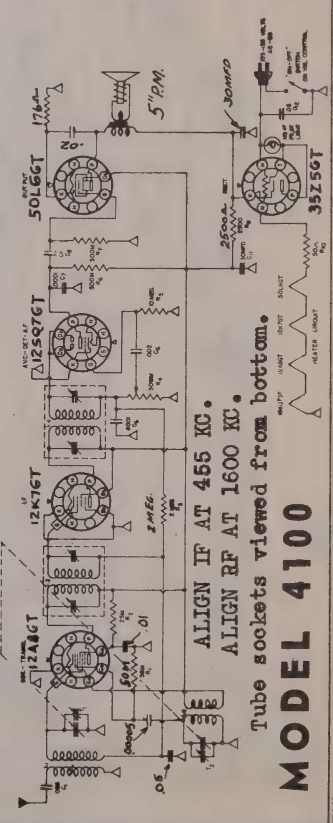

MODEL 4100


IF PEAK 455 KC

MODEL 4002


IF PEAK 455 KC

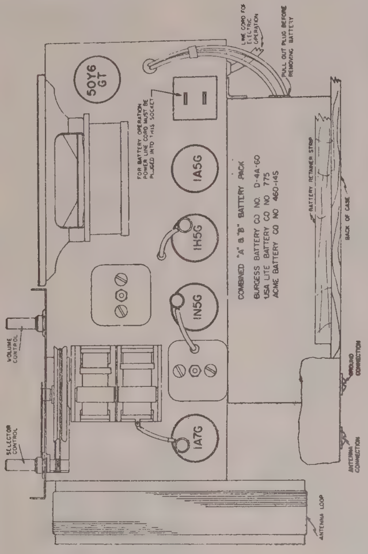
MODEL 4007

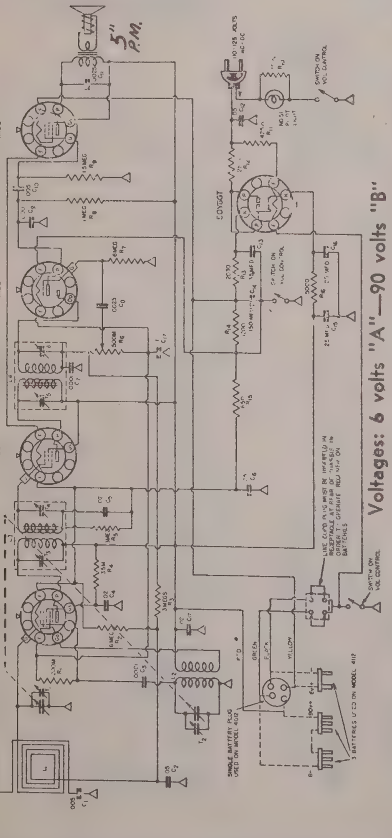

ALIGN IF AT 455 KC.
ALIGN RF AT 1600 KC.
Tube sockets viewed from bottom.

MODEL 4100

MODEL 4012
MODEL 4200
Schematics, Socket

AIR KING PRODUCTS CORP.

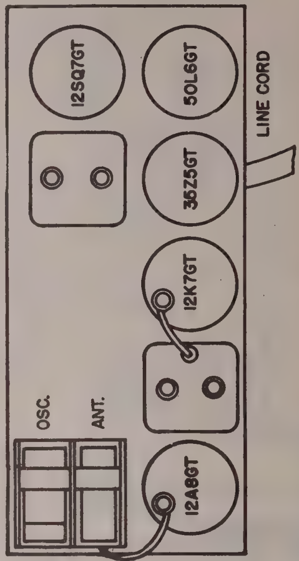

50Y6 GT
FOR BATTERY OPERATION POWER LINE CORD MUST BE PLUGGED INTO THIS SOCKET
LINE CORD FOR ELECTRIC OPERATION
PULL OUT PLUG BEFORE REMOVING BATTERY
1A5G
1H5G
1N5G
1A7G
COMBINED "A" & "B" BATTERY PACK
BURGESS BATTERY CO NO. D-4A-60
USA LITE BATTERY CO NO. 775
ACME BATTERY CO NO. 460-145
BATTERY RETAINER STRIP
BACK OF CASE
GROUND CONNECTION
ANTENNA CONNECTION
ANTENNA LOOP
VOLUME CONTROL
SELECTOR CONTROL

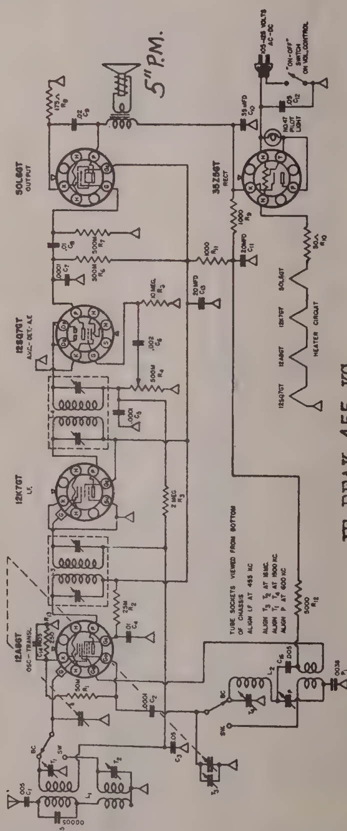

1A5G
1H5G
1N5G
1A7G
50Y6GT
5" P.M.
110-125 VOLTS AC-DC
SWITCH ON VOL. CONTROL
NO. 51 PILOT LIGHT
LINE CORD PLUG MUST BE INSERTED IN RECEPTACLE AT REAR OF CHASSIS IN ORDER TO OPERATE RECEIVER ON BATTERIES
SINGLE BATTERY PLUG USED ON MODEL 4012
3 BATTERIES USED ON MODEL 4112
GREEN
BLACK
YELLOW
RED
90V+
B-
ANTENNA CONNECTION

MODEL 4012

Voltages: 6 volts "A"—90 volts "B"

IF PEAK 455 KC





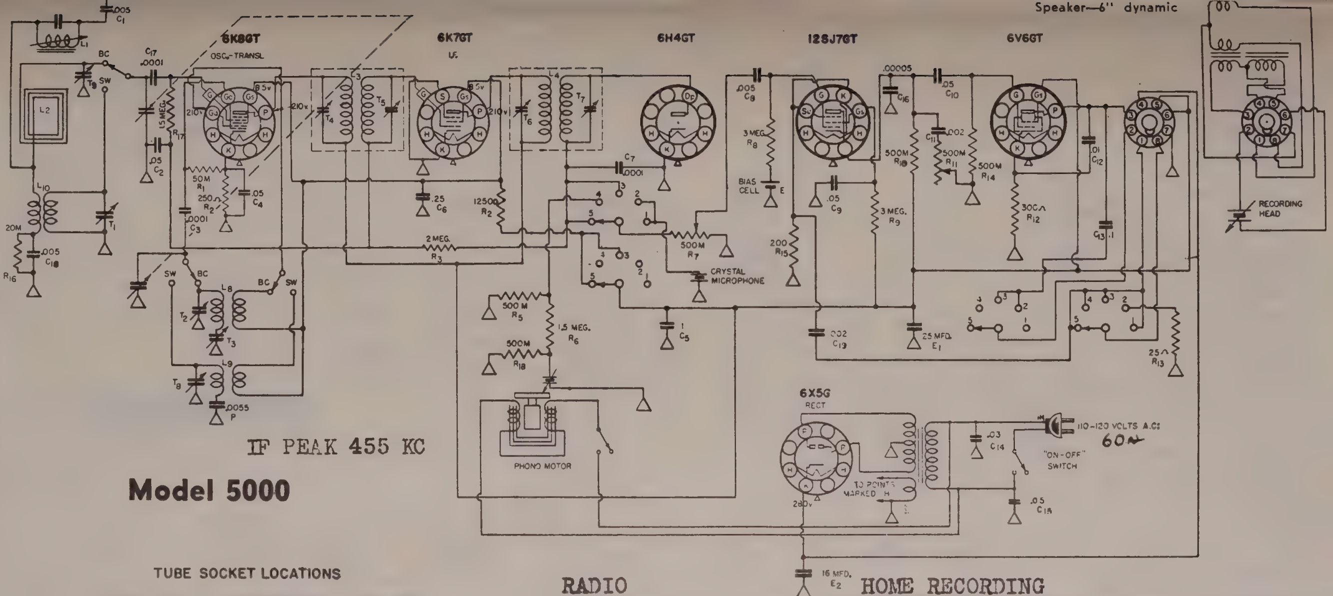
MODEL 4200

IF PEAK 455 KC

ocket, Trimmers
ecording Data

AIR KING PRODUCTS CORP.

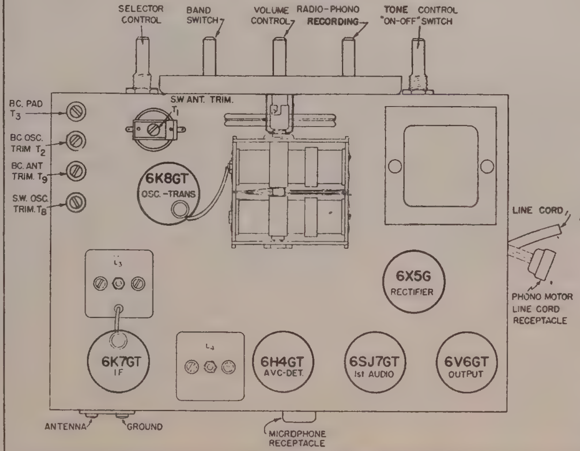
MODEL 5000
Schematic, Voltage



IF PEAK 455 KC

Model 5000

TUBE SOCKET LOCATIONS



HOME RECORDING

RADIO

To record radio programs set "PhonoRadio Switch" so that number "5" is opposite brass marker above the knob. Set volume control for loud and clear reception. Then set switch so that number "3" is opposite the marker and record the program. Do not allow needle to cut disc when it reaches the inner label. Do not allow the fine threads which form to collect under the needle, brush lightly with a soft cloth or brush towards the center of the disc.

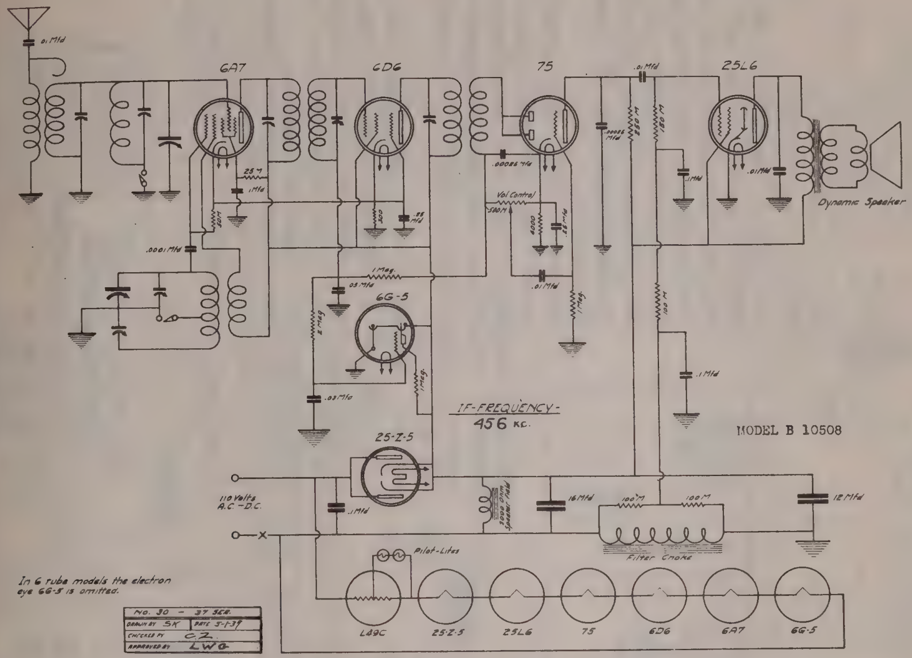
MICROPHONE

For microphone recording set switch so that number 1 is opposite marker and test for operation. Then turn switch so that number "2" is opposite the marker. Turn volume control fully to the right. In speaking use normal voice with microphone at least six inches from the mouth.

NOTE:-Be sure needle is firmly in place and that the flat side points towards the rear of the cabinet. Check that the small pin projects through one of the three holes on the blank to prevent the disc from slipping.

ALLIED RADIO CORP.

MODEL B10501
MODEL B10508
Schematics

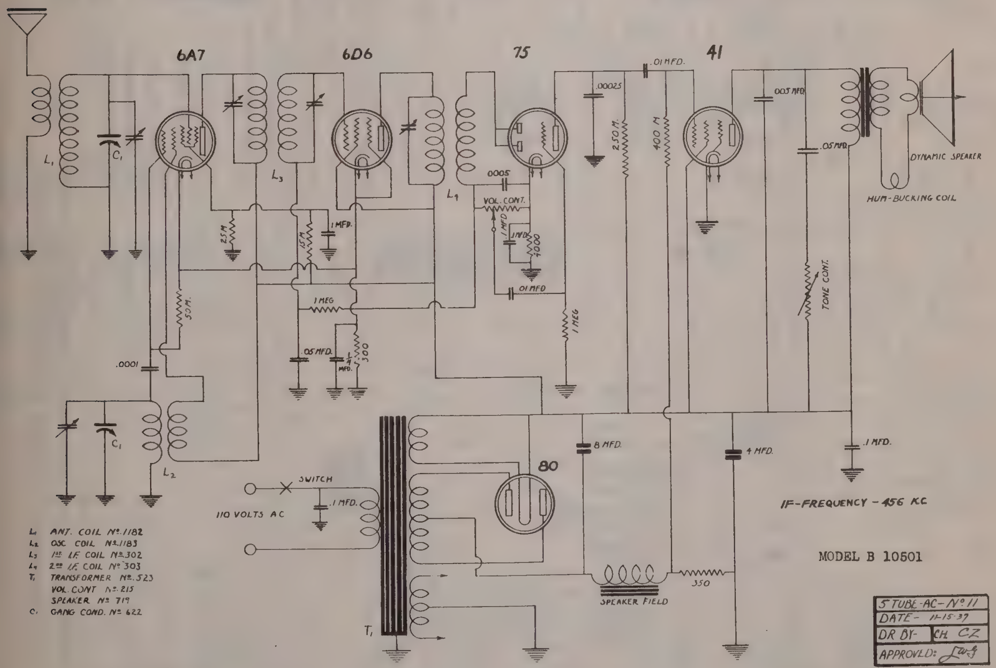


IF-FREQUENCY-
456 KC.

MODEL B 10508

In 6 tube models the electron eye 6G-5 is omitted.

No. 30 - 37 Ser.
Drawn by SK Date 5-1-37
Checked by C.Z.
Approved by LWG



IF-FREQUENCY - 456 KC

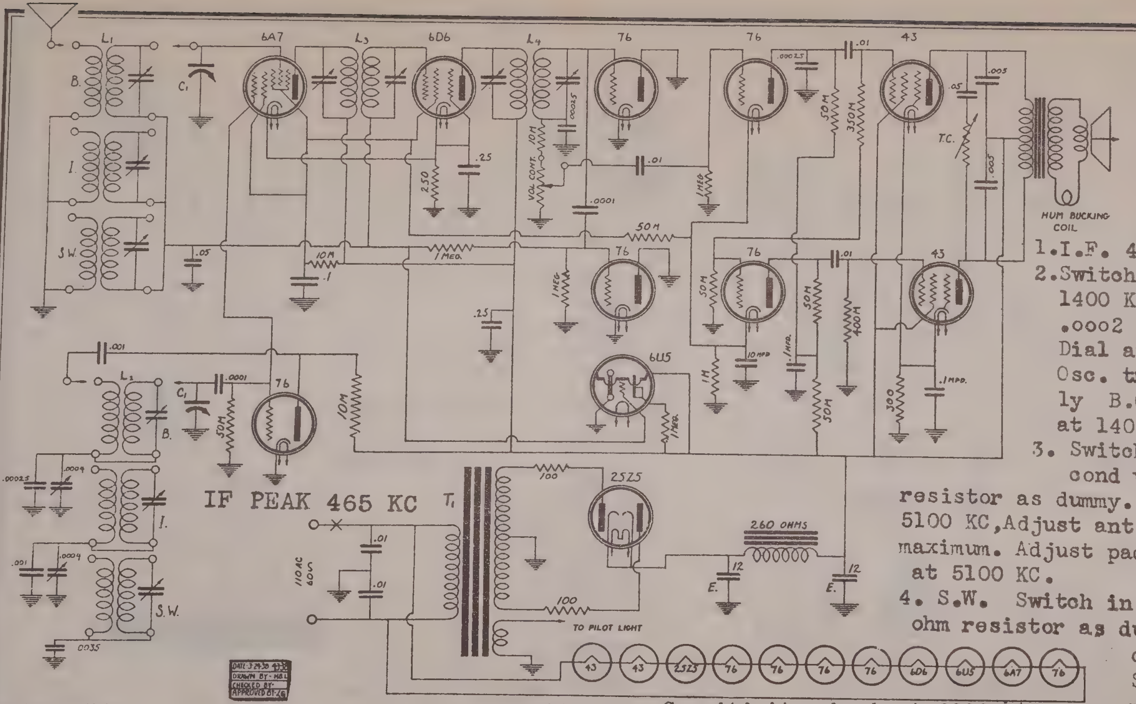
MODEL B 10501

L1 ANT. COIL No.1182
L2 OSC COIL No.1183
L3 1st I.F. COIL No.302
L4 2nd I.F. COIL No.303
T1 TRANSFORMER No.523
VOL. CONT No.215
SPEAKER No.719
C1 GANG COND. No.622

5 TUBE-AC-No.11
DATE- 11-15-37
DR BY- CH. CZ
APPROVED: LWG

MODELS B10718,B10719
Schematic,Alignment
Socket, Trimmers

ALLIED RADIO CORP.



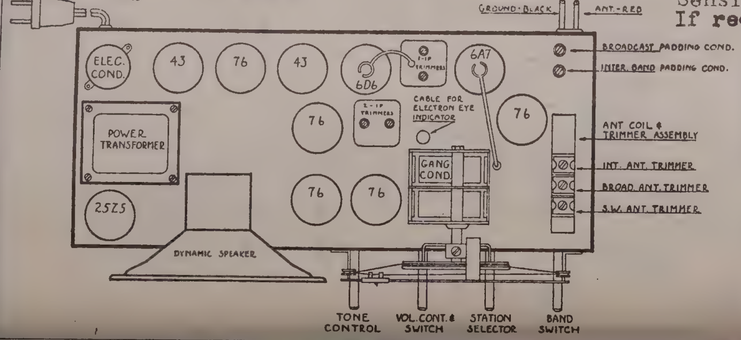
IF PEAK 465 KC

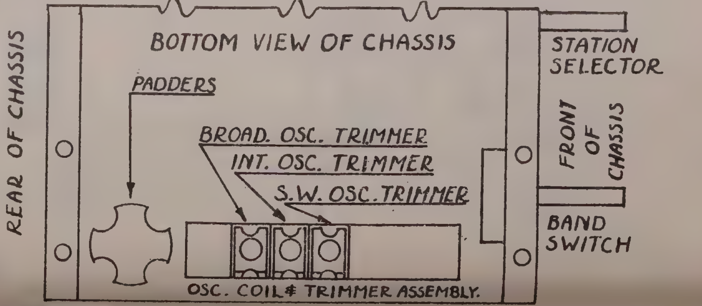
L1-ANT. COIL ASSEMBLY No. 1194.
L2-OSC COIL ASSEMBLY No. 1195.
L3-1st IF TRANSFORMER No. 309.
L4-2nd IF TRANSFORMER No. 310.
T1-POWER TRANSFORMER No. 528.
DYNAMIC SPEAKER 6" No 741 8" No. 742.
VOL. CONT. & SWITCH No. 221.
TONE CONTROL No. 305.
C1-VARIABLE COND. No. 624.
E-ELECTROLYTIC FILTER COND. No. 1729.
BAND SWITCH No. 123.
PADDER COND. No. 10112.

ALIGNMENT

1. I.F. 465 KC to grid of 6A7.
2. Switch in B.C. , Osc. at 1400 KC to antenna post, use .0002 dummy, Vol.Cont. Max. Dial at 1400KC Adjust B.C. Osc. trimmer to max. Similarly B.C.Pad at 600 KC. Recheck at 1400 KC.
3. Switch in INT. use .0002 mfd cond with 400 ohm series resistor as dummy. Dial and oscillator at 5100 KC, Adjust ant. and osc. trimmers to maximum. Adjust pad at 1800 KC. Recheck at 5100 KC.
4. S.W. Switch in S.W. position. Use 400 ohm resistor as dummy, Oscillator and dial at 15.M.C. Adjust S.W. ant. and osc. trimmers to maximum.

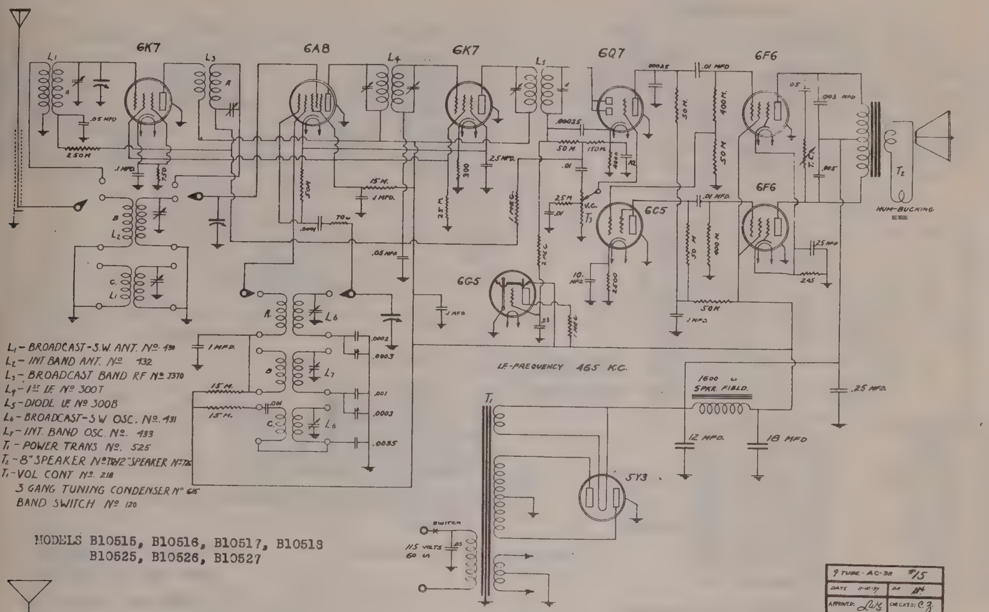
Sensitivity check at 6000 KC
If receiver lacks sensitivity check .0035 cond for short.





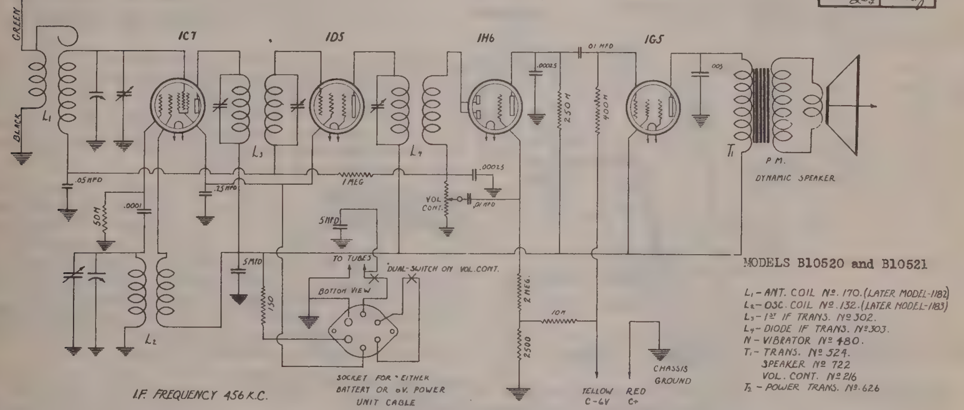
ALLIED RADIO CORP.

MODELS B10515 to B10518,
B10525 to B10527
MODELS B10520,B10521
Schematics



L₁ - BROADCAST-S.W. ANT. Nº. 430
L₂ - INT BAND ANT. Nº 432
L₃ - BROADCAST BAND RF Nº 7370
L₄ - 1ST I.F. Nº 300T
L₅ - DIODE I.F. Nº 300B
L₆ - BROADCAST-S W OSC. Nº. 431
L₇ - INT. BAND OSC. Nº. 433
T₁ - POWER TRANS Nº. 525
T₂ - 8" SPEAKER Nº 7[illegible] 12" SPEAKER Nº 7[illegible]
T₁ - VOL CONT Nº. 218
3 GANG TUNING CONDENSER Nº 615
BAND SWITCH Nº 120

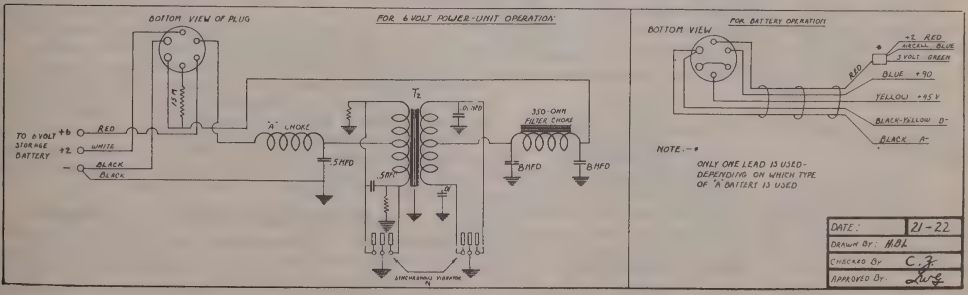
MODELS B10515, B10516, B10517, B10518
B10525, B10526, B10527



I.F. FREQUENCY 456 K.C.

MODELS B10520 and B10521

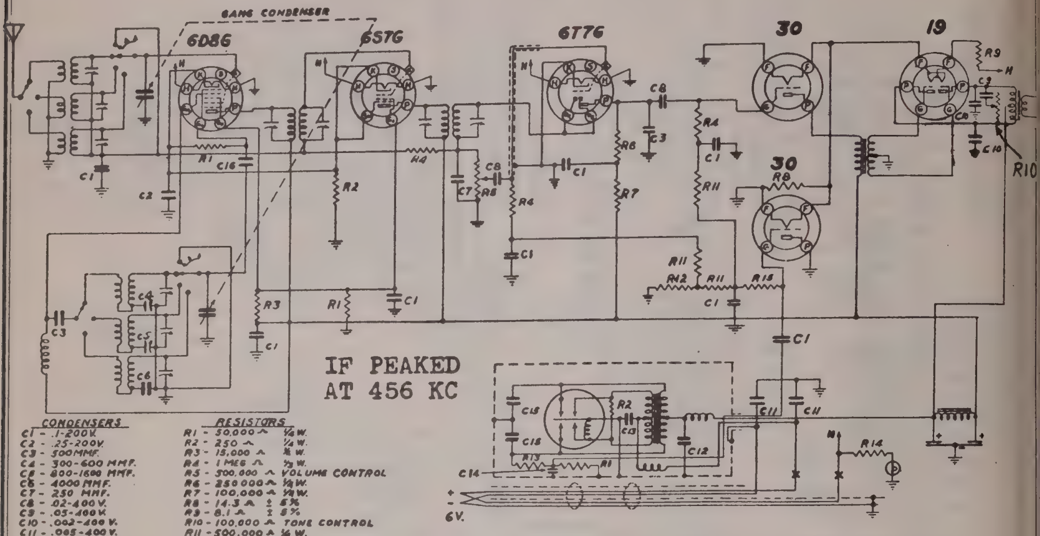
L₁ - ANT. COIL Nº. 170. (LATER MODEL-1182)
L₂ - OSC. COIL Nº. 132. (LATER MODEL-1183)
L₃ - 1ST IF TRANS. Nº 302.
L₄ - DIODE IF TRANS. Nº 303.
N - VIBRATOR Nº 480.
T₁ - TRANS. Nº 524.
SPEAKER Nº 722
VOL. CONT. Nº 216
T₂ - POWER TRANS. Nº. 626



NOTE.—*
ONLY ONE LEAD IS USED-
DEPENDING ON WHICH TYPE
OF "A" BATTERY IS USED

MODELS B10545 to B10549,
B10553
Schematic, Socket, Trimmers
Alignment

ALLIED RADIO CORP.

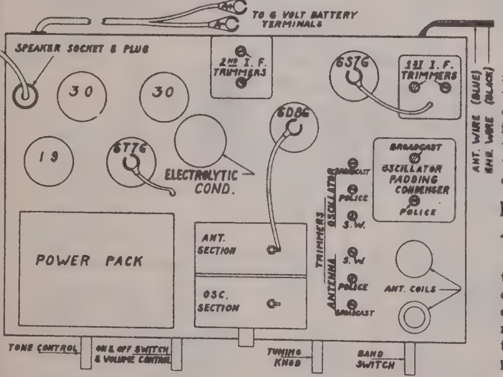


IF PEAKED
AT 456 KC

CONDENSERS
C1 - .1-200V.
C2 - .25-200V.
C3 - 500MMF.
C4 - 300-600 MMF.
C5 - 800-1600 MMF.
C6 - 4000 MMF.
C7 - 250 MMF.
C8 - .02-400V.
C9 - .05-400V.
C10 - .002-400 V.
C11 - .005-400 V.
C12 - .01 - 600 V.
C13 - .5-10 V.
C14 - .05-200 V.
C15 - .01-1000 V.
C16 - 100 MMF.

RESISTORS
R1 - 50,000 Ω ¼ W.
R2 - 250 Ω ¼ W.
R3 - 15,000 Ω ½ W.
R4 - 1 MEG Ω ½ W.
R5 - 500,000 Ω VOLUME CONTROL
R6 - 250 000 Ω ¼ W.
R7 - 100,000 Ω ¼ W.
R8 - 14.3 Ω ± 5%
R9 - 8.1 Ω ± 5%
R10 - 100,000 Ω TONE CONTROL
R11 - 500,000 Ω ¼ W.
R12 - 70,000 Ω ¼ W.
R13 - 200,000 Ω ¼ W.
R14 - 70. Ω ± 10%
R15 - 600,000 Ω ½ W.

FREQUENCY RANGE-
550 to 1700 KC
1700 to 5400 KC
5600 to 18100 KC



I.F. ALIGNMENT

With the wave switch in the broadcast band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6D8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the antenna. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT

The police band is adjusted by first replacing the .0002 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit at this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT

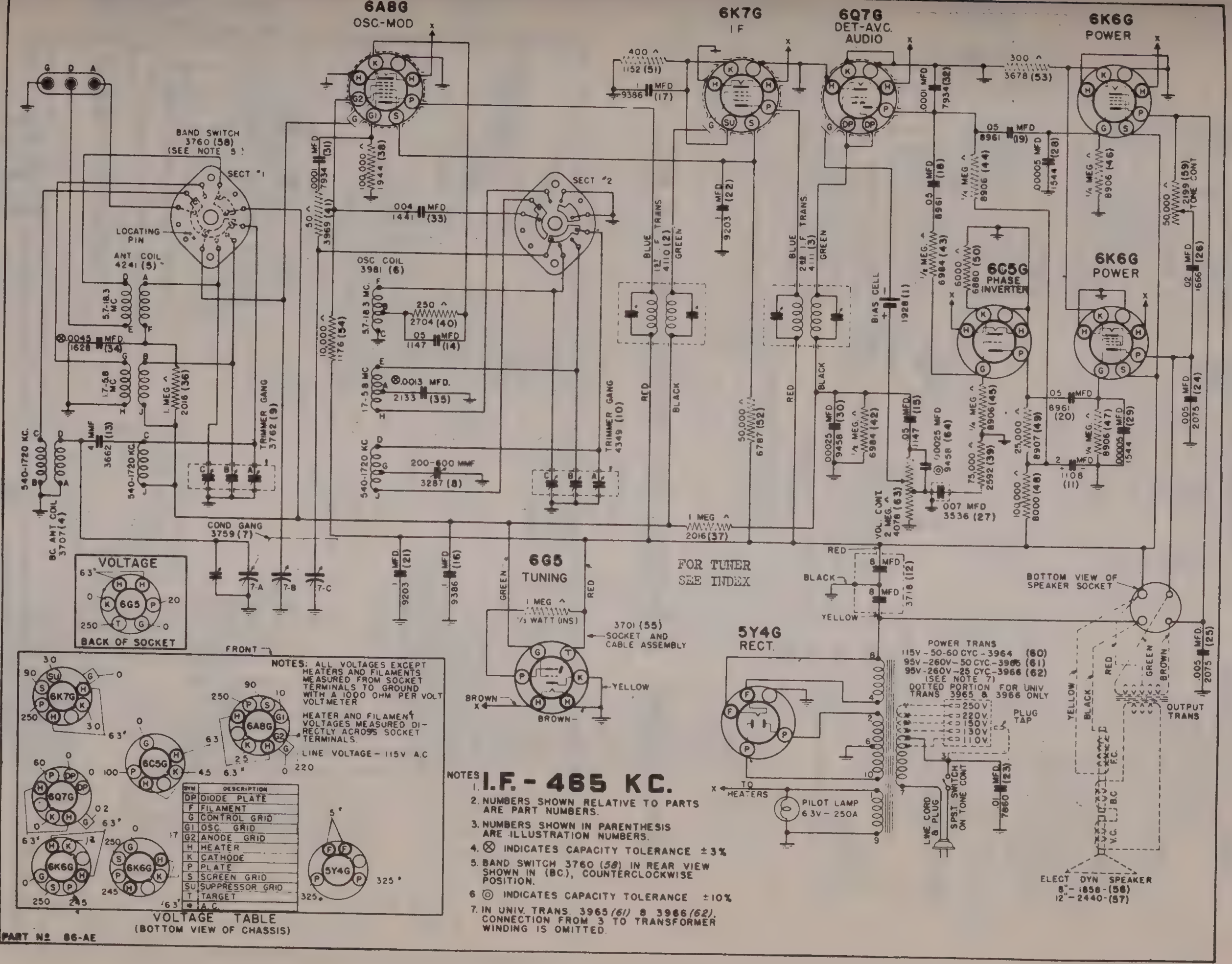
The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC and adjust the "short wave antenna" to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6D8G (short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage.

ALLIED RADIO CORP.

MODELS B10565 to B10568
Schematic ,Voltage
Socket



NOTES: ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER

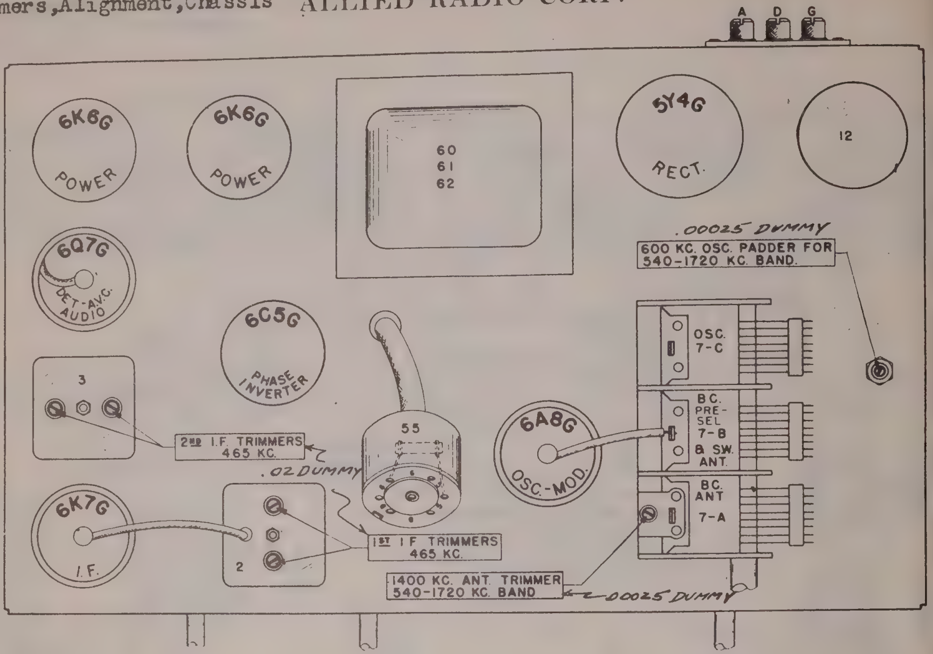
HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

LINE VOLTAGE - 115V A.C

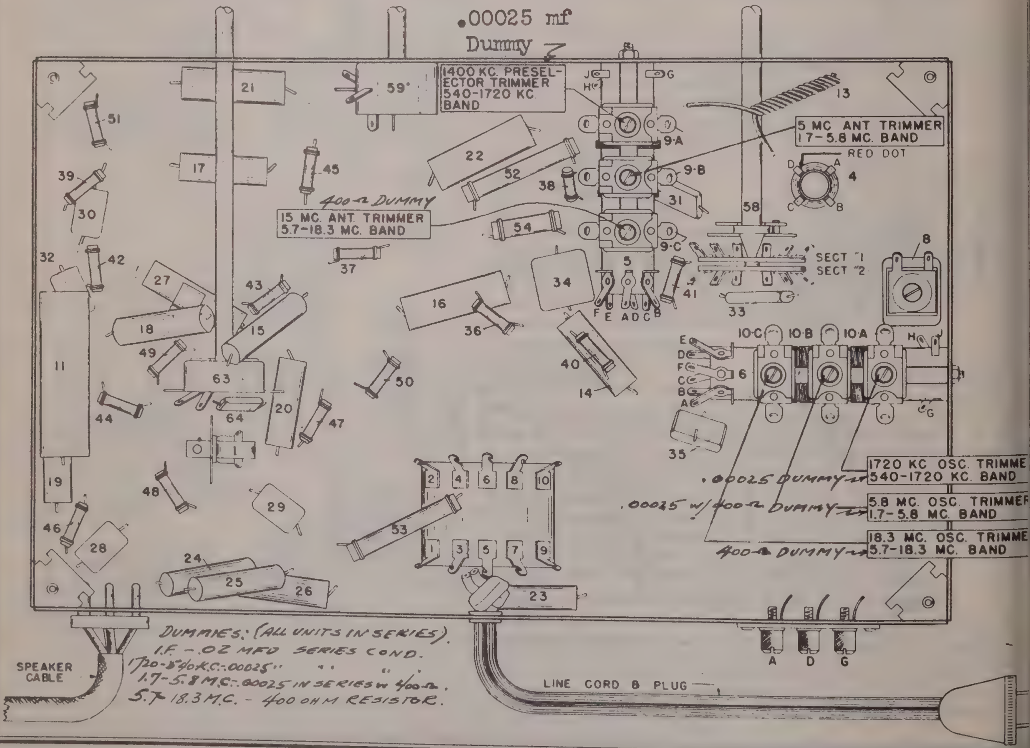
SYM	DESCRIPTION
DP	DIODE PLATE
F	FILAMENT
G	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
H	HEATER
K	CATHODE
P	PLATE
S	SCREEN GRID
SU	SUPPRESSOR GRID
T	TARGET
•	A.C.

NOTES

1. I.F. - 465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%
5. BAND SWITCH 3760 *(58)* IN REAR VIEW SHOWN IN (BC.), COUNTERCLOCKWISE POSITION.
6. ◎ INDICATES CAPACITY TOLERANCE ±10%
7. IN UNIV. TRANS. 3965 *(61)* & 3966 *(62)*. CONNECTION FROM 3 TO TRANSFORMER WINDING IS OMITTED.



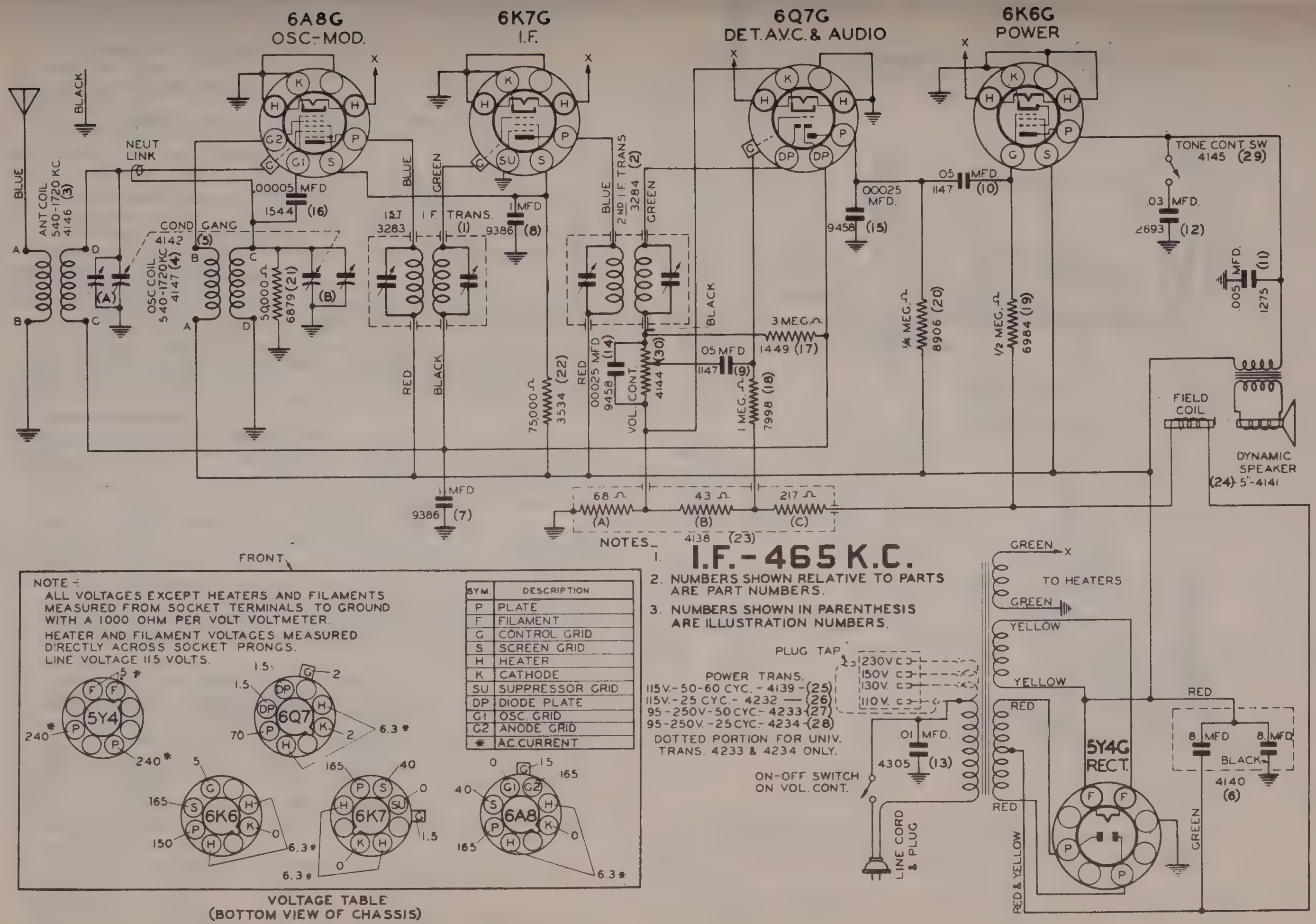
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.



DUMMIES: (ALL UNITS IN SERIES).
I.F. - .02 MFD SERIES COND.
1720-540 KC:- .00025 " " "
1.7-5.8 MC:- .00025 IN SERIES w 400Ω.
5.7-18.3 M.C. - 400 OHM RESISTOR.

ALLIED RADIO CORP.

MODELS B10577,B10578
Schematic,Voltage
Socket



NOTES

1. I.F.-465 K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

POWER TRANS.
115V.-50-60 CYC. - 4139 -(25)
115V.-25 CYC.- 4232 —(26)
95-250V-50 CYC.- 4233 (27)
95-250V.-25 CYC.- 4234 (28)
DOTTED PORTION FOR UNIV. TRANS. 4233 & 4234 ONLY.

NOTE :-
ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER.
HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET PRONGS.
LINE VOLTAGE 115 VOLTS.

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
H	HEATER
K	CATHODE
SU	SUPPRESSOR GRID
DP	DIODE PLATE
G1	OSC. GRID
G2	ANODE GRID
*	A.C. CURRENT

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

MODELS B10577,B10578
Chassis,Trimmers
Alignment

ALLIED RADIO CORP.

THIS RADIO IS DESIGNED SO THAT IT MAY BE PLACED IN A HORIZONTAL OR UPRIGHT POSITION. AS THE OPERATION AND PERFORMANCE OF THE RECEIVER IS THE SAME IN EITHER POSITION, IT IS A MATTER OF PERSONAL PREFERENCE AS TO WHICH POSITION TO USE.

The approximate position on the dial that any nine stations will be tuned in may be quickly determined—by pressing a paper tab having the station call letters into the round depressions on the front of the cabinet.

THE STATIONS SELECTED MUST OPERATE ON A FREQUENCY 40 KILOCYCLES OR MORE APART. OTHERWISE IT WILL BE IMPOSSIBLE TO PLACE THE CALL LETTER TABS IN THEIR PROPER POSITION IN CABINET DEPRESSIONS.

While it will be found that only the approximate location will be indicated, the station call tabs properly located will be an extremely helpful tuning aid.

To set the proper station call letter tabs into the cabinet depressions proceed as follows:

(a) Determine which nine stations call letters you wish to have on the cabinet—press call letter tabs out of the call letter sheets provided.

(b) Carefully tune in the selected station that broadcasts on the lowest frequency—the least number of kilocycles.

(c) Place a little mucilage or celluloid on back of paper tab. Press the paper call letter tab—so that the printed call letters of the station tuned in are at the same angle as the printing on the dial—into the round depression on the cabinet front that is nearest to the dial pointer. By placing call letter tab on angle the call letter can easily be read with cabinet in either a horizontal or upright position.

(d) Tune in the next selected station having the next lowest station frequency, pressing the call letter for this station into the round cabinet depression nearest to the dial pointer needle—continuing on in this way until station call letters have been placed into all nine cabinet depressions.

After the station call letters are set it will be a simple matter to determine the approximate dial position of any of these stations—just rotate tuning knob until dial pointer needle points to station call letter of desired station. It must be remembered that only the approximate tuning location will be indicated by the dial pointer needle—each station must be correctly tuned in by ROTATING THE TUNING CONTROL KNOB UNTIL A STATION IS TUNED IN WITH GREATEST CLARITY.

ALIGNMENT PROCEDURE:

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A8G tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.

(c) Peak each of the second I.F transformer trimmers.

(d) Peak each of the first I.F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Remove test oscillator lead from grid of 6A8G tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.

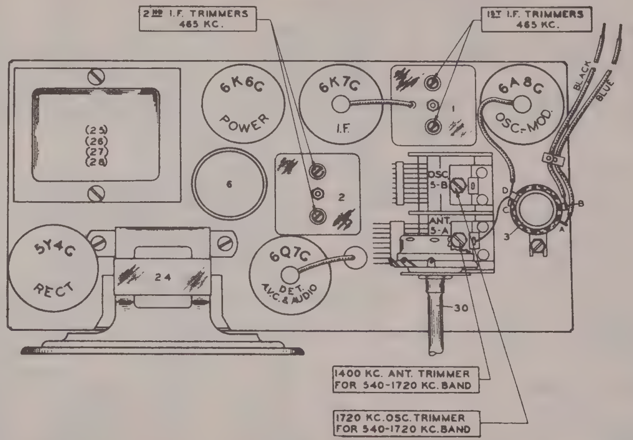
(b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.

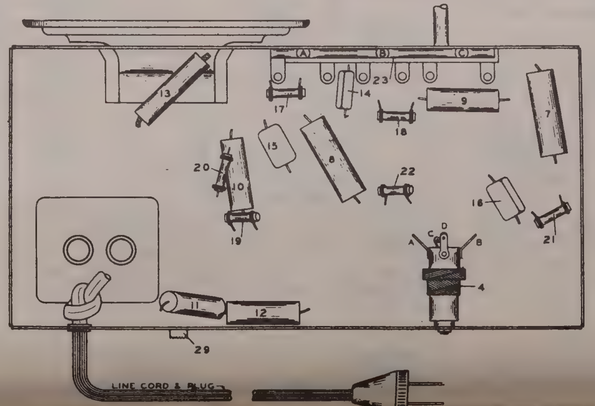
(c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.

(d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.

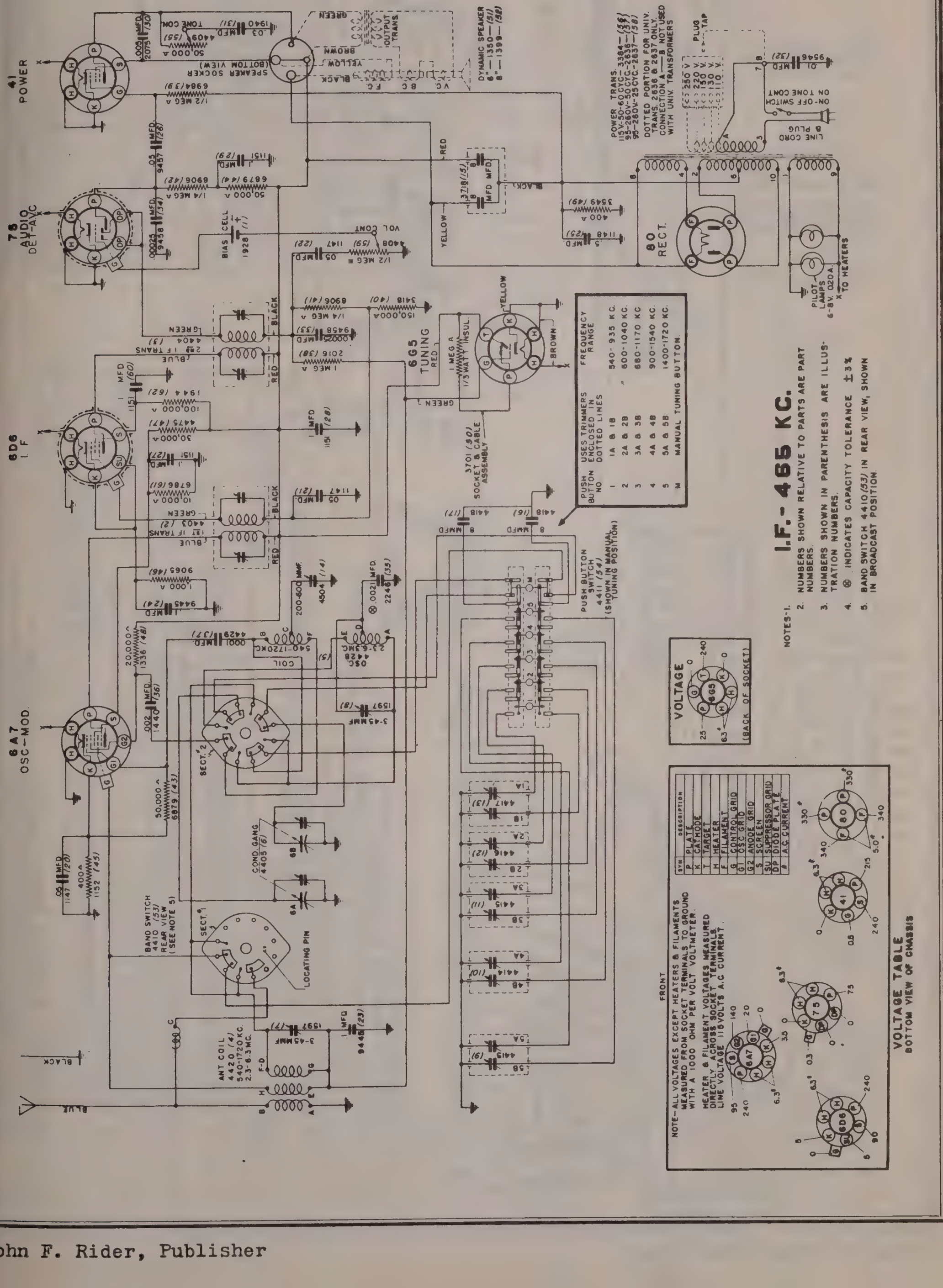
(f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.


2ND I.F. TRIMMERS 465 KC.
1ST I.F. TRIMMERS 465 KC.
BLACK
BLUE
(25)
(26)
(27)
(28)
6K6C
POWER
6K7C
I.F.
1
6A8C
OSC-MOD.
6
2
OSC 5-B
ANT. 5-A
D
C
B
A
3
5Y4C
RECT
24
6Q7C
DET. A.V.C.&AUDIO
30
1400 KC. ANT. TRIMMER FOR 540-1720 KC. BAND
1720 KC.OSC.TRIMMER FOR 540-1720 KC.BAND



ALLIED RADIO CORP.

MODEL B10579
Schematic, Voltage
Socket


41 POWER
75 AUDIO DET-AVC
6D6 I.F.
6A7 OSC-MOD.
6G5 TUNING
80 RECT.
SPEAKER SOCKET (BOTTOM VIEW)
OUTPUT TRANS.
DYNAMIC SPEAKER 6" — 1350 — (91) 8" — 1399 — (92)
POWER TRANS. 115V-50-60CYC-3384—(38) 95-260V-50CYC-2838—(37) 95-260V-25CYC-2637—(58)
DOTTED PORTION FOR UNIV. TRANS. 2838 & 2637 ONLY. CONNECTION A—B NOT USED WITH UNIV. TRANSFORMERS
PLUG TAP
250 V 220 V 150 V 130 V 110 V
ON-OFF SWITCH ON TONE CONT
LINE CORD & PLUG
PILOT LAMPS 6-8V. .020A.
TO HEATERS
TONE CON
VOL CONT
BIAS CELL 1928 (1)
1ST IF TRANS 4403 (2)
2ND IF TRANS 4404 (3)
3701 (90) SOCKET & CABLE ASSEMBLY
PUSH BUTTON SWITCH 4411 (54) (SHOWN IN MANUAL TUNING POSITION)
COND. GANG 4405 (6)
BAND SWITCH 4410 (53) REAR VIEW (SEE NOTE 5)
SECT. 1
SECT. 2
LOCATING PIN
ANT COIL 4420 (4) 540-1720 KC. 2.3-6.3 MC.
OSC. COIL 4428 (5) 540-1720 KC. 2.3-6.3 MC.
FRONT

PUSH BUTTON NO	USES TRIMMERS ENCLOSED IN DOTTED LINES	FREQUENCY RANGE
1	1A & 1B	540-935 KC.
2	2A & 2B	600-1040 KC.
3	3A & 3B	680-1170 KC
4	4A & 4B	900-1540 KC.
5	5A & 5B	1400-1720 KC.
M	MANUAL TUNING BUTTON.	

I.F. - 465 KC.

NOTES-1.

2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%
5. BAND SWITCH 4410 (53) IN REAR VIEW, SHOWN IN BROADCAST POSITION.

VOLTAGE (BACK OF SOCKET)

NOTE—ALL VOLTAGES EXCEPT HEATERS & FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER.

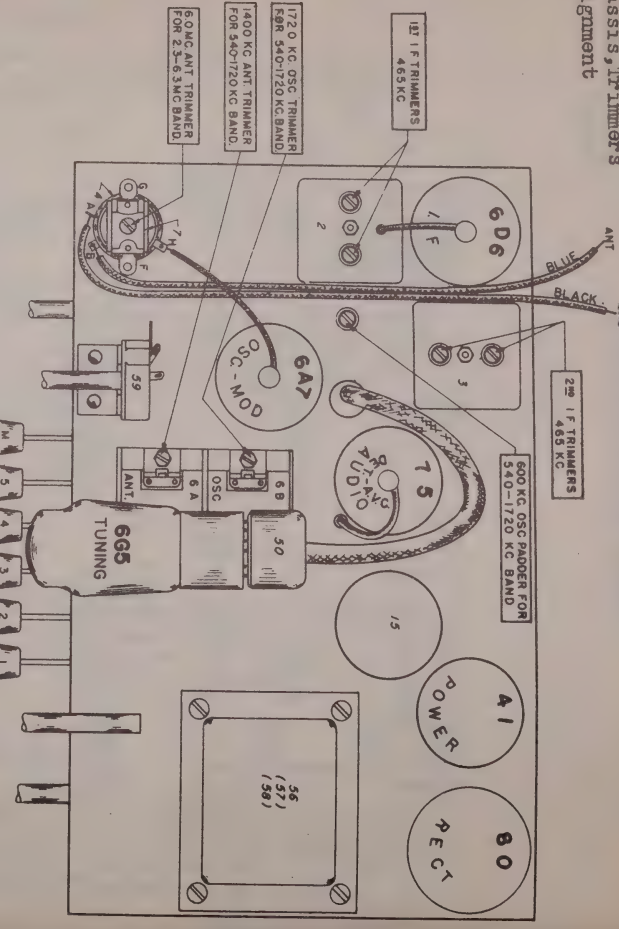
HEATER & FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS. LINE VOLTAGE 115 VOLTS A.C CURRENT.

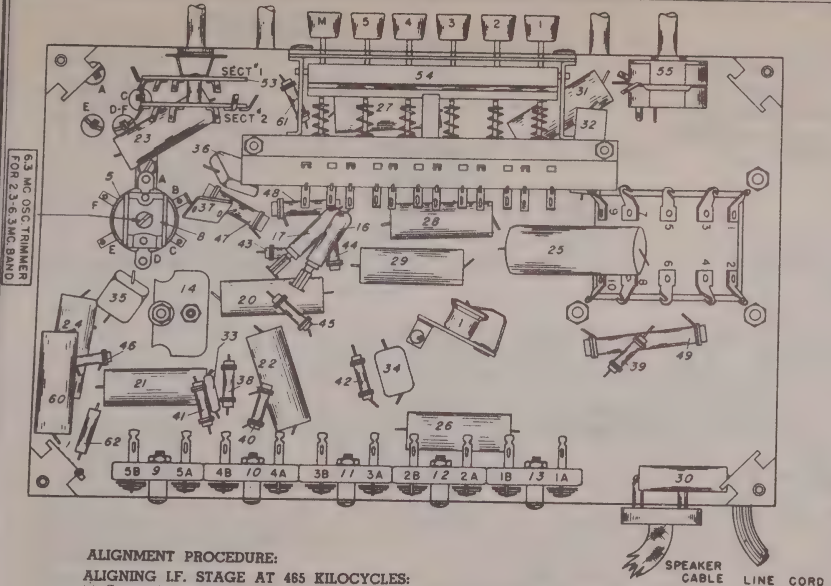
SYM	DESCRIPTION
P	PLATE
K	CATHODE
T	TARGET
H	HEATER
F	FILAMENT
G	CONTROL GRID
G1	OSC GRID
G2	ANODE GRID
S	SCREEN
SU	SUPPRESSOR GRID
DP	DIODE PLATE
#	A.C CURRENT

VOLTAGE TABLE
BOTTOM VIEW OF CHASSIS

MODEL B10579
Chassis,Trimmers
Alignment

ALLIED RADIO CORP.


ANT
GND
BLUE
BLACK
2ND I F TRIMMERS 465 KC
600 KC. OSC PADDER FOR 540-1720 KC BAND
1ST I F TRIMMERS 465KC
1720 KC. OSC TRIMMER FOR 540-1720 KC. BAND.
1400 KC ANT. TRIMMER FOR 540-1720 KC BAND.
6.0 MC. ANT TRIMMER FOR 2.3-6.3 MC BAND.
6D6
I.F
2
3
6A7
OSC-MOD
75
DET-AVC AUDIO
41
POWER
80
RECT
15
56 (57) (58)
50
6 B
OSC
6 A
ANT.
6G5
TUNING
59
G
H
F
A
B
M
5
4
3
2
1



ALIGNMENT PROCEDURE:

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
(c) Peak each of the second I.F. transformer trimmers.
(d) Peak each of the first I.F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.
(b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
(c) PLACE BAND SELECTOR SWITCH FOR 1720-540 K.C. OPERATION. PRESS IN MANUAL PUSH-BUTTON AND set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.
(d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
(f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.
(g) Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.
(h) While rocking the tuning condenser back and forth adjust 600 KC oscillator padder condenser which is accessible through the hole in the top of chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

(a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.
(b) Adjust band selector switch for 2.3-6.3 megacycle band operation, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.
(c) Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer.
(d) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles, and adjust 6 M.C. antenna trimmer for maximum sensitivity.

ALLIED RADIO CORP. MODEL B10579
MODELS B10750,B10760,B10761, B10762,B10770,B10771
Tuner Data

1. Using the manual selector knob, tune in station No. 1, the station near the left hand end of the dial—the 170 K.C. end. Make certain that the station is properly tuned in.

2. From the back of the receiver loosen thumb screw No. 1 (See Figure 2) just enough to allow it to slide freely in the groove.
3. Now adjust the thumb screw until the contact is resting directly on the fibre dead spot.

4. Tighten thumb screw securely, making sure that in tightening you do not move the contact off the fibre dead spot.
5. Check the above operation by pressing button No. 1 and note if there is any pointer movement. If there is no pointer movement, the contact is properly set. If the pointer moves, the contact was not set directly on fibre dead spot. In this case, the station should be re-tuned manually, and procedure No. 3 should be repeated.
6. Using the same procedure, set up the remaining five stations, in each case using the station of the next highest frequency and the thumb screw having the same number as the corresponding button. Never skip buttons, always set up in numerical order from button 1 to 6 from left to right.

7. After all the stations have been set up, insert the proper station call tabs (found with the instructions) into the recesses of their respective buttons.

8. To receive any of the six stations set up as described above turn receiver "ON" by rotating the left hand knob to the right until the switch clicks. Allow the tubes to heat up, press the buttons designated by the call letter of the station desired and hold the button in until the pointer stops moving and the station comes in. Adjust tone and volume. IMPORTANT: Be sure the band switch is in the position for Standard Broadcast Reception.

B10760, B10761, B10762.

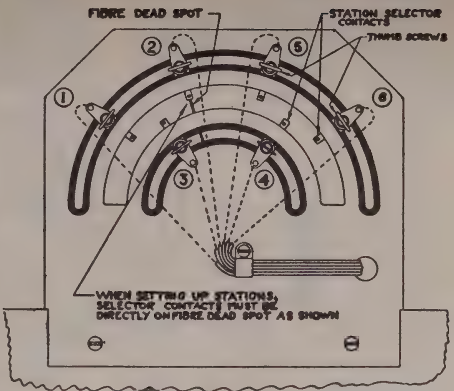

FIBRE DEAD SPOT
STATION SELECTOR CONTACTS
THUMB SCREWS
①
②
③
④
⑤
⑥
WHEN SETTING UP STATIONS, SELECTOR CONTACTS MUST BE DIRECTLY ON FIBRE DEAD SPOT AS SHOWN

Fig. 2

MODEL B10579

INSTRUCTIONS
FOR INSTALLING AND OPERATING "AUTOMATIC PUSH BUTTON"

Five stations operating in the 1720-540 kilocycle broadcast band may be "AUTOMATIC PUSH-BUTTON" tuned by properly setting the ten trimmer screws accessible through holes in the back of the chassis.

AS THE PUSH-BUTTONS ARE NOT PRE-SET AT THE FACTORY FOR ANY DEFINITE STATION BE SURE TO SET THEM BY:

(a) It is important to have the aerial, which will be used with the set, attached to the radio when adjusting the trimmers.

HOUR BEFORE ADJUSTING TRIMMERS. If set is not thoroughly warmed up when trimmers are adjusted, the trimmers may shift position after they become warm resulting in poor tone, weak signal, and excessive background noise.

(c) FOR BEST RESULTS SET PUSH-BUTTONS FOR LOCAL OR STRONG, NEARBY STATIONS ONLY. Obtain the transmitter frequency—number of kilocycles—and call letters of the stations you wish to "Push-Button" tune.

(d) Place band selector switch for operation on 1720-540 kilocycle band.

(e) Press in "MANUAL" tuning button—see diagram.

(f) It is advisable that if a station is selected whose transmitter frequency is somewhere between 540-935 kilocycles that the two trimmers marked "540-935 K.C." on paper label attached to back of chassis be adjusted first.

(g) Using "MANUAL" tuning knob carefully tune in selected station whose transmitter frequency is between 540-935 kilocycles.

(h) Press in push-button marked "540-935 K.C."—see diagram.
NOTE: STATION SIGNAL WILL DISAPPEAR, OR MAY BE DISTORTED, AND IN SOME INSTANCES ANOTHER STATION MAY BE HEARD.

(i) With a small screw driver carefully tune in the selected 540-935 kilocycle station by slowly adjusting trimmer 1A—then adjust trimmer 1B for maximum volume. BE SURE TO WATCH TUNING EYE AND ADJUST TRIMMERS SO THAT THE TWO OPEN ENDS OF THE GREEN INVERTED "V" ON THE TUNING EYE ARE CLOSEST TOGETHER. AT THIS POINT THE SIGNAL WILL BE HEARD WITH GREATEST VOLUME AND CLEAREST TONE.

(j) Moisten gummed back of selected 540-935 KC stations paper tab and press into round depression in 540-935 KC push-button.

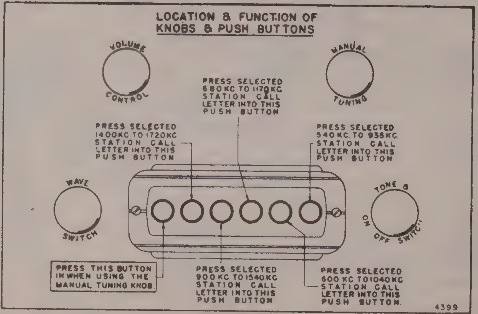
(k) After trimmers 1A and 1B have been properly set for the selected station operating between 540-935 kilocycles, adjust other trimmers in the same manner and in the following order.

(l) Set trimmers 2A and 2B for selected station operating between 600-1040 kilocycles.

(m) Adjust trimmers 3A and 3B for the selected station operating between 680-1170 kilocycles.

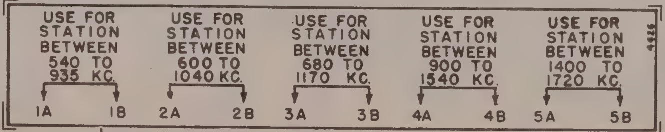
(n) Set trimmers 4A and 4B for selected station operating between 900-1540 kilocycles.

(o) Adjust trimmers 5A and 5B for selected station operating between 1400-1720 kilocycles.


LOCATION & FUNCTION OF KNOBS & PUSH BUTTONS
VOLUME CONTROL
MANUAL TUNING
PRESS SELECTED 680 KC TO 1170 KC STATION CALL LETTER INTO THIS PUSH BUTTON
PRESS SELECTED 1400 KC TO 1720 KC STATION CALL LETTER INTO THIS PUSH BUTTON
PRESS SELECTED 540 KC. TO 935 KC. STATION CALL LETTER INTO THIS PUSH BUTTON
WAVE SWITCH
TONE & ON OFF SWITCH
PRESS THIS BUTTON IN WHEN USING THE MANUAL TUNING KNOB.
PRESS SELECTED 900 KC TO 1540 KC STATION CALL LETTER INTO THIS PUSH BUTTON
PRESS SELECTED 600 KC TO 1040 KC STATION CALL LETTER INTO THIS PUSH BUTTON.
4399

'AS THE TRIMMERS SHOULD NEVER BE TOO LOOSELY OR TOO TIGHTLY ADJUSTED IT IS IMPORTANT THAT THE PROPER TRIMMERS BE USED.

In some instances it may be necessary after the set is operated for a period of time to reset the trimmers as they may drift due to heat, humidity, etc.

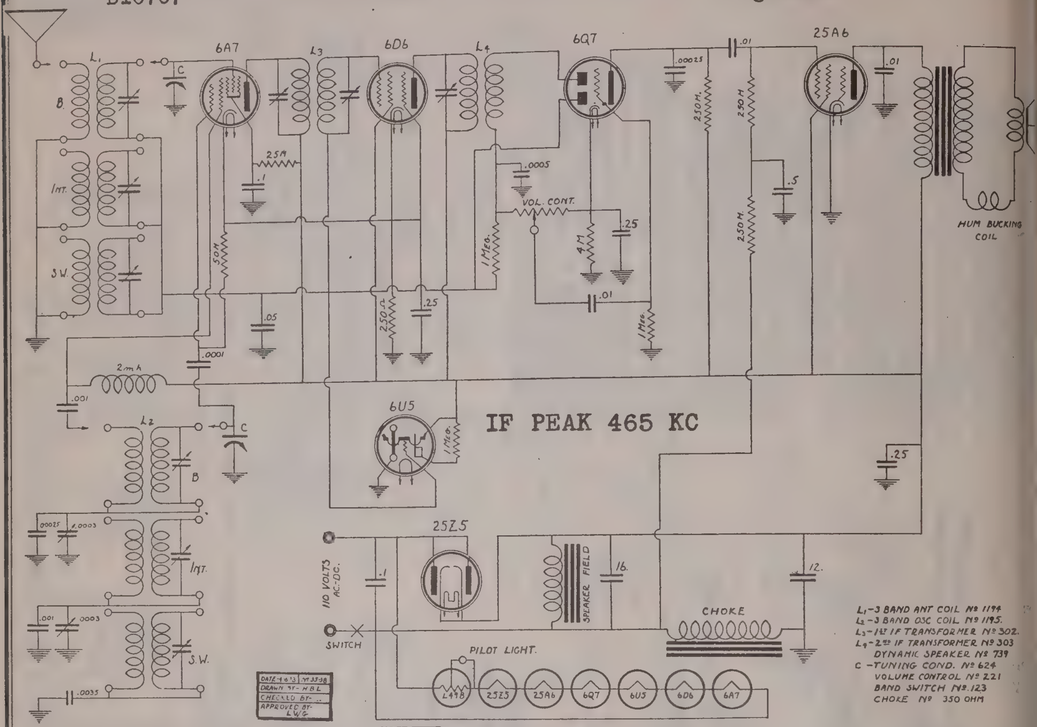

USE FOR STATION BETWEEN 540 TO 935 KC.
USE FOR STATION BETWEEN 600 TO 1040 KC.
USE FOR STATION BETWEEN 680 TO 1170 KC.
USE FOR STATION BETWEEN 900 TO 1540 KC.
USE FOR STATION BETWEEN 1400 TO 1720 KC.
1A
1B
2A
2B
3A
3B
4A
4B
5A
5B
4398

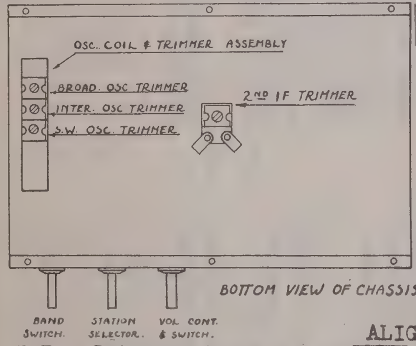
This diagram, which is similar to the one attached to the back of chassis over trimmer holes, shows the minimum-maximum range of the five groups of trimmers.

MODELS B10702,B10706,
B10707

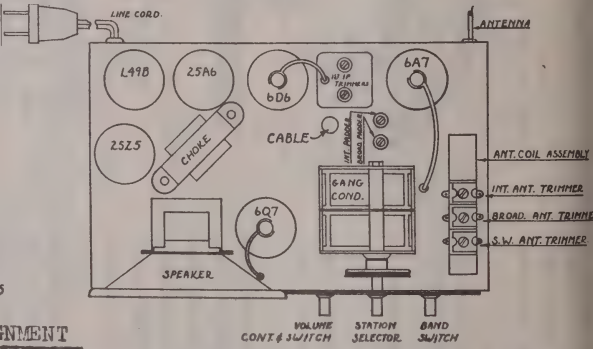
ALLIED RADIO CORP.

Schematic,Socket,Trimmers
Alignment





BOTTOM VIEW OF CHASSIS



ALIGNMENT

I.F. Set oscillator at 465 KC. Feed signal to grid of the 6A7 tube. Adjust trimmers on the intermediate frequency transformers for peak readings.

B.C. Turn switch to B.C. position. Set oscillator and receiver dial to 1400 KC. Use a .0002 mfd. condenser in the signal lead. Set volume control at maximum. Adjust B.C. OSC trimmer to maximum. Reset dial and oscillator to 600 KC and adjust B.C. Pad. Recheck at 1400 KC.

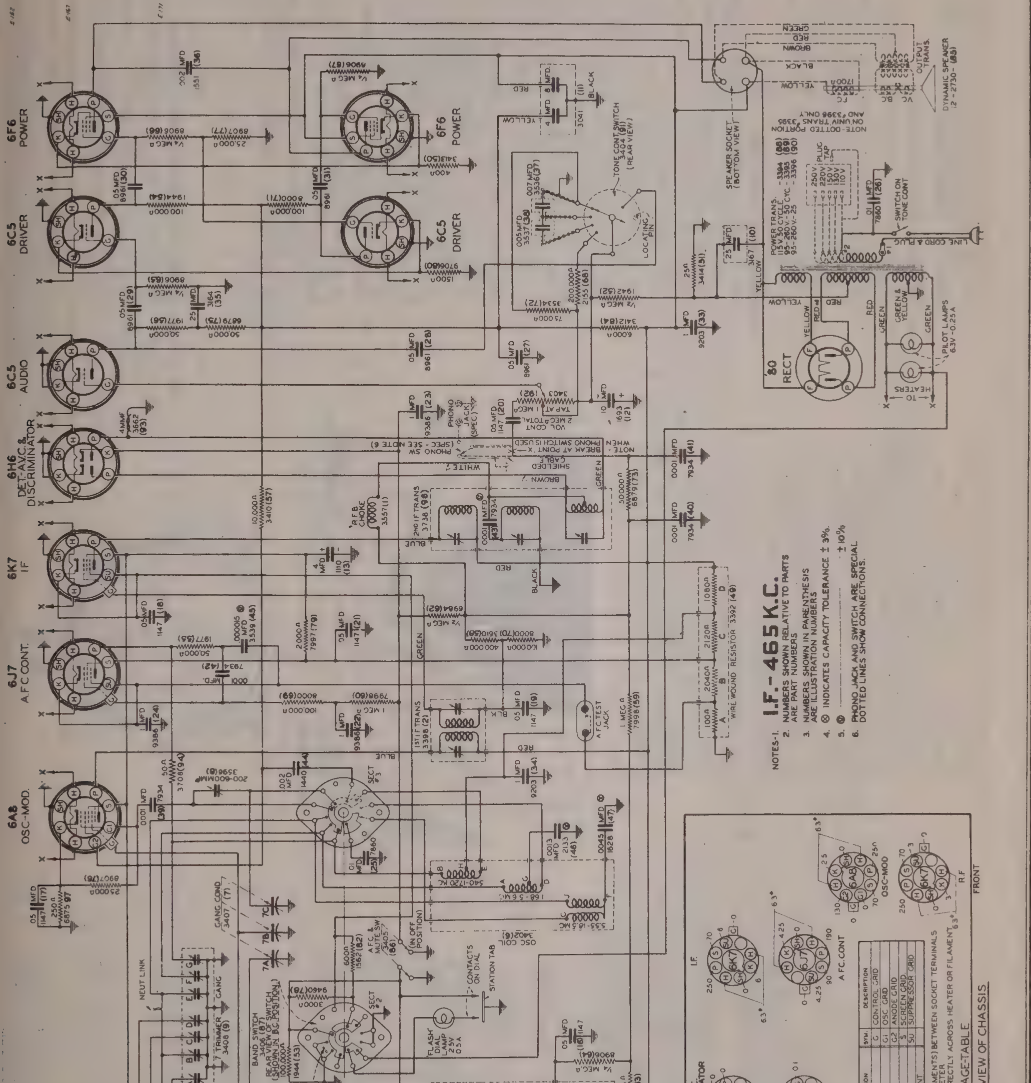
INT. Turn switch to INT. position. Use .0002 mfd. condenser with 400 ohm series resistor as dummy antenna. Set dial and oscillator at 5100 KC, Adjust antenna and oscillator trimmers to maximum. Reset dial and oscillator to 1800 KC and adjust padder. Recheck alignment at 5100 KC.

S.W. With switch in S.W. position, using a 400 ohm resistor as a dummy with-oscillator and dial set to 15 MC.,adjust S.W. antenna and oscillator trimmers to maximum

Check sensitivity at 6000 KC. If receiver lacks sensitivity check the .0035 mica condenser for short circuit.

ALLIED RADIO CORP.

MODELS B10580,B10581
B10582
Schematic,Voltage
Socket



I.F. - 465 K.C.

NOTES-1. NUMBERS SHOWN RELATIVE TO PARTS
2. ARE PART NUMBERS
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%.
5. ⊘ ———— ± 10%
6. PHONO JACK AND SWITCH ARE SPECIAL DOTTED LINES SHOW CONNECTIONS.

SYM.	DESCRIPTION	SYM.	DESCRIPTION
K	CATHODE	G	CONTROL GRID
H	HEATER	G1	OSC GRID
F	FILAMENT	G2	ANODE GRID
P	PLATE	S	SCREEN GRID
SH	SHIELD	SU	SUPPRESSOR GRID
●	A.C. CURRENT		

NOTE-1. MEASURE ALL VOLTAGES (EXCEPT HEATERS & FILAMENTS) BETWEEN SOCKET TERMINALS AND GROUND WITH A 1000 OHM PER VOLT VOLTMETER
2 MEASURE HEATER OR FILAMENT VOLTAGES DIRECTLY ACROSS HEATER OR FILAMENT SOCKET TERMINALS

VOLTAGE-TABLE

BOTTOM VIEW OF CHASSIS

ART Nº 70-A

ALLIED RADIO CORP.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Place automatic frequency control in the maximum left hand A.F.C. "off" position.

(b) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A8 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(c) Set test oscillator to EXACTLY 465 kilocycles and turn volume control on full.

(d) Remove shields held in position by snap fasteners over A.F.C. test jack and over trimmer screw holes in the first and second I.F. transformer shield cans.

(e) Peak second I.F. transformer trimmers for maximum 465 kilocycle output by adjusting the two trimmers accessible through the two top holes in the second I.F. transformer shield can. DO NOT TOUCH DISCRIMINATOR (BOTTOM) SCREW.

(f) Peak each of the first I.F. transformer trimmers for maximum 465 kilocycle signal output.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line, move needle to correct position.

(b) Remove test oscillator lead from grid of 6A8 tube and connect to receiver "A" antenna post through a .00025 Mfd. condenser.

(c) Adjust A.F.C. control to maximum left hand A.F.C. "off" position and band selector switch for operation on the 1720-540 kilocycle band.

(d) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles, and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. R.F. and antenna trimmers for maximum sensitivity.

(f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum signal response.

ALIGNING DISCRIMINATOR CIRCUIT:

(a) After completing 1720-540 kilocycle adjustment, set test oscillator to EXACTLY 465 KILOCYCLES and connect to grid of 6A8 tube through a .02 Mfd. Condenser—insert lead of double scale 0 to 1 and 0 to 5 milliammeter into A.F.C. test jack located on top of chassis adjacent to the 6L7 tube. To avoid possibility of damaging the meter should one of the milliammeter leads short to the metal chassis, ALWAYS TURN OFF RECEIVER WHEN INSERTING OR REMOVING MILLIAMMETER LEADS FROM A.F.C. TEST JACK.

(b) Short out A.F.C. mute switch by grounding the second from the left (looking at the front of the chassis) of the four lugs mounted on top of the dial assembly. The proper lug to ground is indicated in the "Note X" on chassis top parts view.

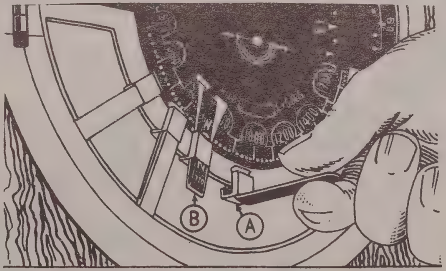
(c) Turn receiver on, place A.F.C. switch knob in A.F.C. "on" position and if meter needle jumps off scale adjust output of test oscillator until an approximate 2 M.A. deflection is obtained on the 0 to 5 milliammeter scale.

(d) Place band selector switch for operation on 1720-540 K.C. broadcast band—and set receiver dial somewhere near 1000 kilocycles at a point where no station is heard.

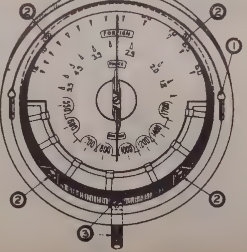
(e) Rotate A.F.C. switch knob from A.F.C. "on" to A.F.C. "off" position and note whether the milliammeter reading changes as the position of the A.F.C. switch is changed. No change in reading indicates probable proper discriminator trimmer adjustment, while a noticeable change indicates improper discriminator trimmer adjustment.

(f) IMPORTANT: DO NOT ADJUST DISCRIMINATOR TRIMMER UNLESS IT IS ABSOLUTELY NECESSARY. Place A.F.C. switch in A.F.C. "off" position and note milliammeter reading, then place A.F.C. switch in A.F.C. "on" position and CAREFULLY ADJUST DISCRIMINATOR TRIMMER UNTIL MILLIAMMETER READING IS EXACTLY THE SAME AS IT WAS WITH THE A.F.C. SWITCH IN THE "OFF" POSITION.

NOTE: As the discriminator trimmer screw is screwed in (increasing capacity) the milliammeter reading should decrease and as the discriminator trimmer is unscrewed (decreasing capacity) the milliammeter reading should increase. IF WHEN ADJUSTING THE DISCRIMINATOR TRIMMER THE MILLIAMMETER READING DOES NOT SHARPLY INCREASE OR DECREASE AS THE TRIMMER IS ADJUSTED EVEN AFTER SEVERAL TURNS OF THE TRIMMER SCREW, THIS DOES NOT INDICATE PROPER BALANCING BUT DOES INDICATE INCORRECT ADJUSTMENT AND THE DISCRIMINATOR TRIMMER SHOULD BE SET TO ABOUT ½ CAPACITY AND THE ADJUSTMENT OF THE DISCRIMINATOR TRIMMER MADE ALL OVER AGAIN.



Above Diagram shows method of inserting and setting tabs.



ALIGNING 1.68-5.6 MEGACYCLE BAND:

(a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.

(b) Adjust band selector switch to 1.68-5.6 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.6 megacycles. Bring in 5.6 megacycle test signal to maximum output by adjusting 5.6 M. C. oscillator trimmer.

(c) Tune receiver dial and test oscillator frequency to EXACTLY 5 Megacycles and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.55-18.5 MEGACYCLE BAND:

(a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.55-18.5 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18.5 megacycles.

(b) Adjust 18.5 M.C. oscillator trimmer to bring in 18.5 megacycle test signal to maximum output.

NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.5 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18.5 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 18.5 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17.5 megacycles. Then vary the receiver dial slightly to the right and left of 17.5 megacycles, and if the fundamental peak was used in aligning at 18.5 megacycles the test oscillator signal will be heard at approximately 17.5 megacycles on the receiver dial.

(c) Tune receiver dial and set test oscillator frequency to EXACTLY 15 megacycles.

(c) Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycle test signal response.

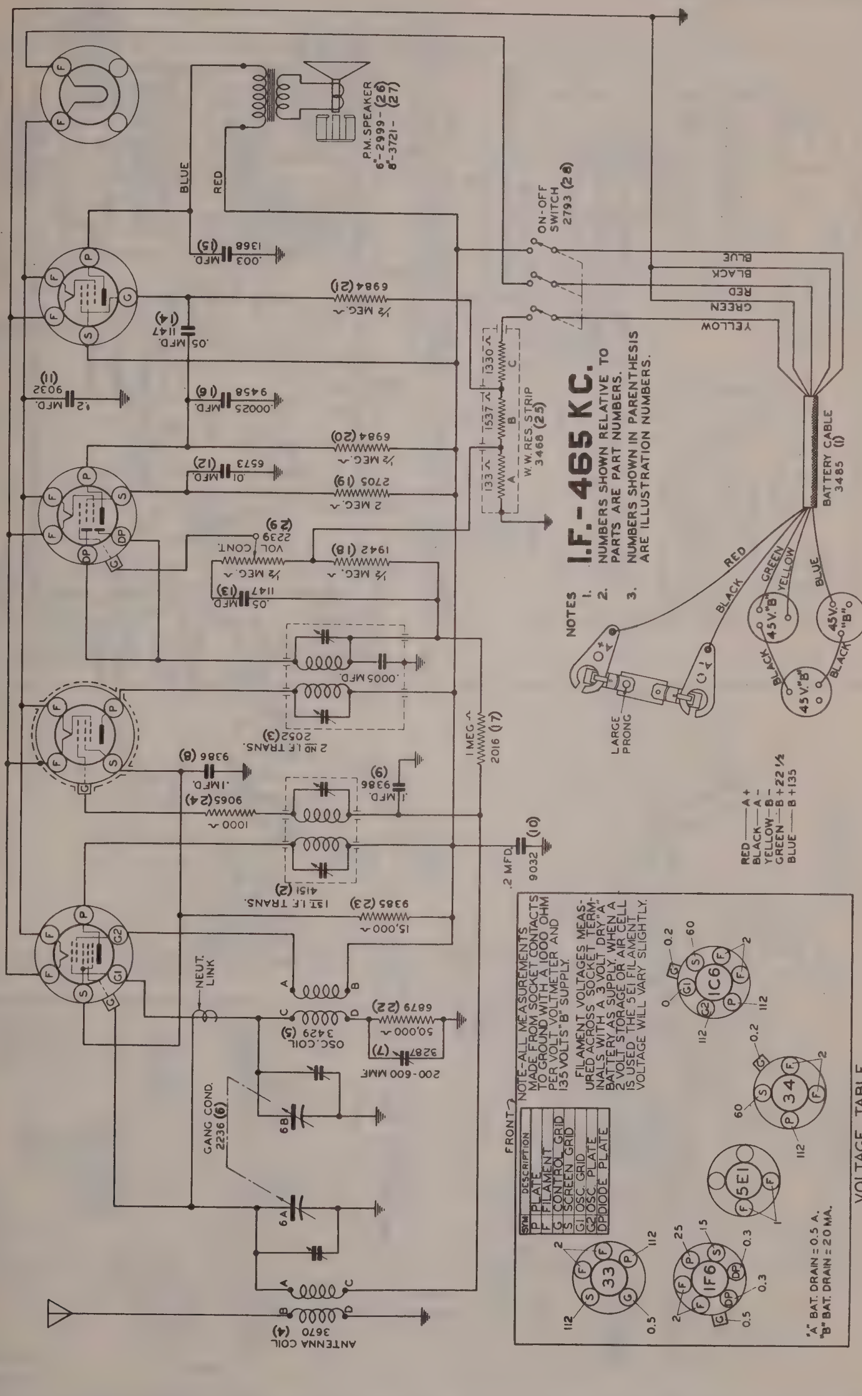
To assure more accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

PROCEDURE FOR REMOVING RECEIVER FROM CABINET.

1. Unscrew the two knurled head screws mounted on front of the glass frame and then holding onto the screws pull dial glass away from the cabinet.
2. Swing 'rapid tuning' lever to center position as shown, loosen (do not remove) screw thru hole in bottom center, and remove lever knob.
3. Loosen set screws on all five tuning knobs, and remove knobs from shafts. (Not shown in sketch).
4. Remove four bolts at bottom side of chassis mtg. shelf (not shown in sketch.)
5. Remove wood screws on the pressure brackets at rear of chassis (not shown in sketch) and then slide receiver out of cabinet.
6. When replacing receiver in cabinet, reverse entire procedure given above.

ALLIED RADIO CORP.

MODELS B10588,B10589
Schematic,Voltage
Socket



I.F. - 465 KC.

NOTES
1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
2.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

RED —— A +
BLACK —— A -
YELLOW —— B -
GREEN —— B + 22½
BLUE —— B + 135

NOTE-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 135 VOLTS "B" SUPPLY.

FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY "A" BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR CELL IS USED THE 5EI FILAMENT VOLTAGE WILL VARY SLIGHTLY.

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE

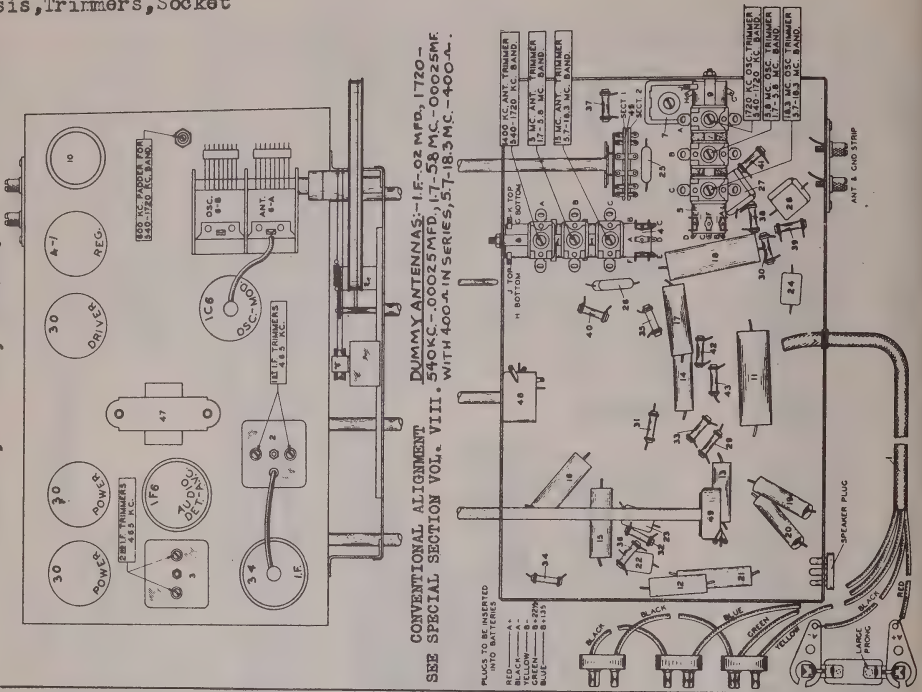
"A" BAT. DRAIN = 0.5 A.
"B" BAT. DRAIN = 20 MA.

PART No 80-B

MODELS B10588,B10589
MODELS B10590 to B10593,
B10595,B10596
Chassis,Trimmers,Socket

ALLIED RADIO CORP.

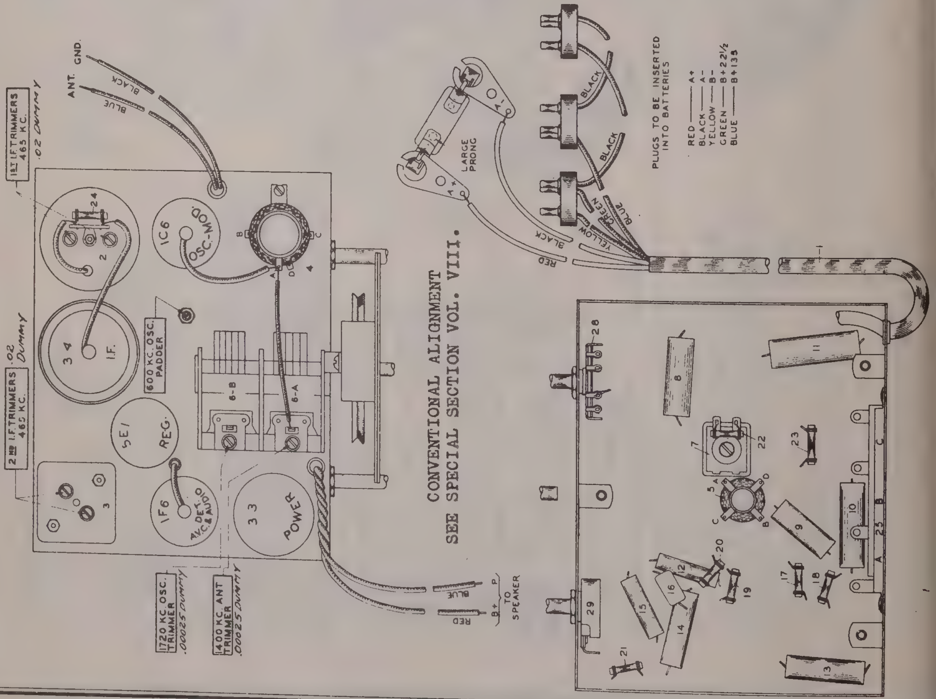
MODELS B10590, B10591, B10592
B10593, B10595, B10596.


10
4-1
REG.
30
DRIVER
1C6
OSC.-MOD.
47
30
POWER
1F6
AUDIO DET.-AVC.
30
POWER
3
2
34
I.F.
600 KC. PADDER FOR 540-1720 KC. BAND.
OSC. 6-B
ANT. 6-A
1ST I.F. TRIMMERS 465 KC.
2ND I.F. TRIMMERS 465 KC.
400 KC. ANT. TRIMMER 540-1720 KC. BAND.
5 MC. ANT. TRIMMER 1.7-5.8 MC. BAND.
15 MC. ANT. TRIMMER 5.7-18.3 MC. BAND.
1720 KC OSC. TRIMMER 540-1720 KC. BAND.
5.8 MC. OSC. TRIMMER 1.7-5.8 MC. BAND.
18.3 MC. OSC TRIMMER 5.7-18.3 MC. BAND.
K TOP
C BOTTOM
J TOP
H BOTTOM
SECT 1
SECT. 2
ANT & GND STRIP
SPEAKER PLUG
PLUGS TO BE INSERTED INTO BATTERIES
RED — A+
BLACK — A-
YELLOW — B-
GREEN — B+22½
BLUE — B+135
BLACK
BLACK
BLUE
GREEN
YELLOW
BLACK
RED
LARGE PRONG

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

DUMMY ANTENNAS:—I.F.-.02 MFD., 1720-540KC.-.00025MFD., 1.7-5.8 M.C.-.00025MF. WITH 400Ω IN SERIES, 5.7-18.3 M.C.-400Ω.

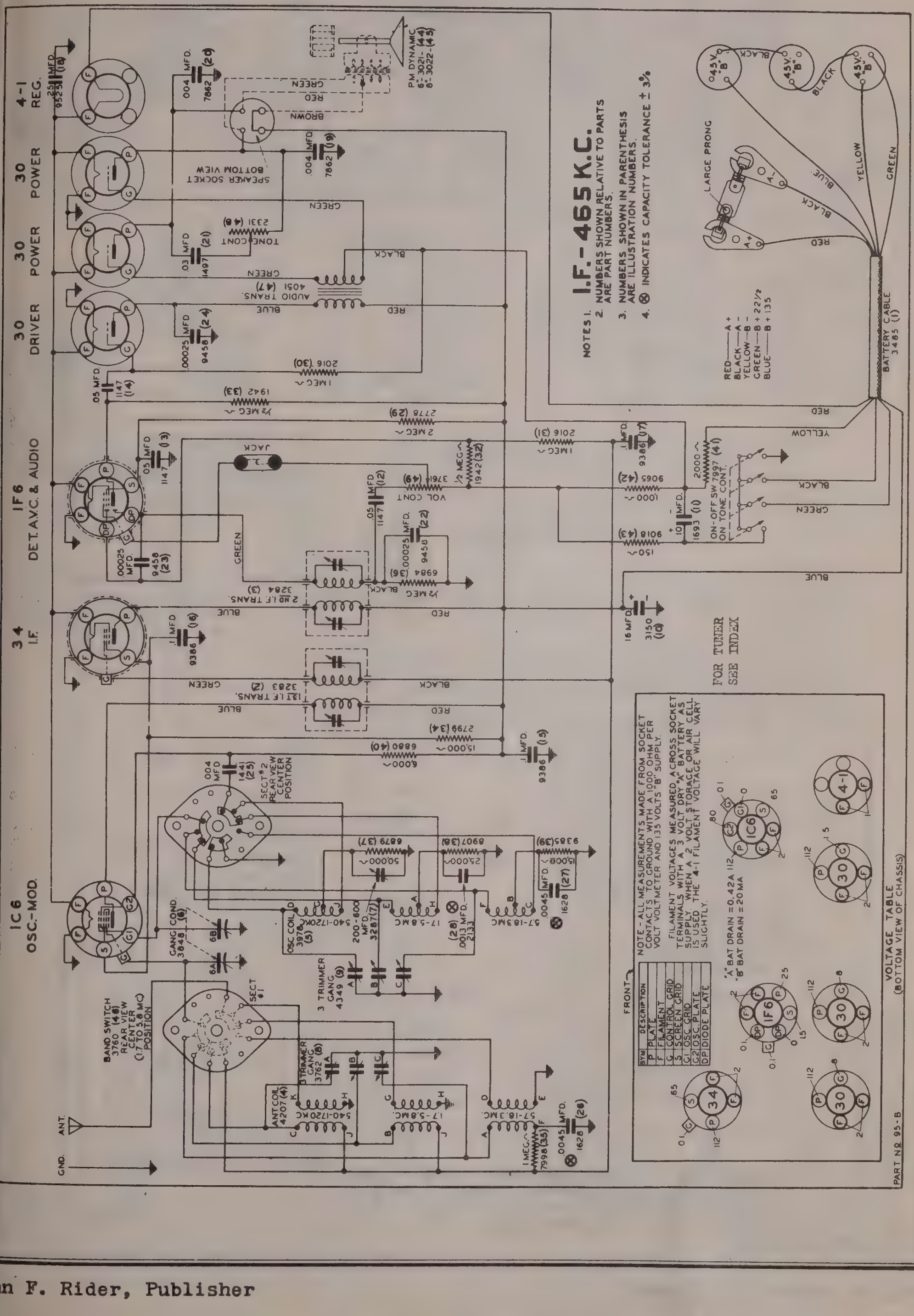
MODELS B10588 and B10589.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

ALLIED RADIO CORP.

MODELS B10590 to B10593
B10595,B10596
Schematic,Voltage,Socket



NOTES 1. I.F.-465K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%

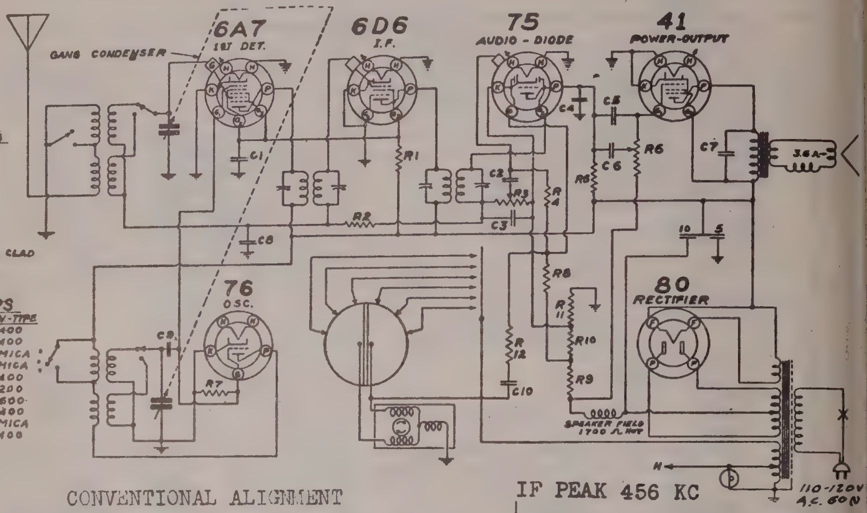
SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE

NOTE - ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 135 VOLTS "B" SUPPLY.

FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY "A" BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR CELL IS USED THE 4-1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.

MODELS B10750,B10760,B10761,
B10762,B10770,B10771
Schematic,Trimmers,Socket
Alignment

ALLIED RADIO CORP.



RESISTORS

Nº	OHMS	WATTS
1	10.000	¼
2	1 MEG.	¼
3	500.000	V.C.
4	2 MEG.	¼
5	200.000	¼
6	500.000	T.C.
7	50,000	¼
8	1 MEG.	¼
9	200	METAL CLAD
10	33	
11	100	
12	1 MEG.	¼

CONDENSERS

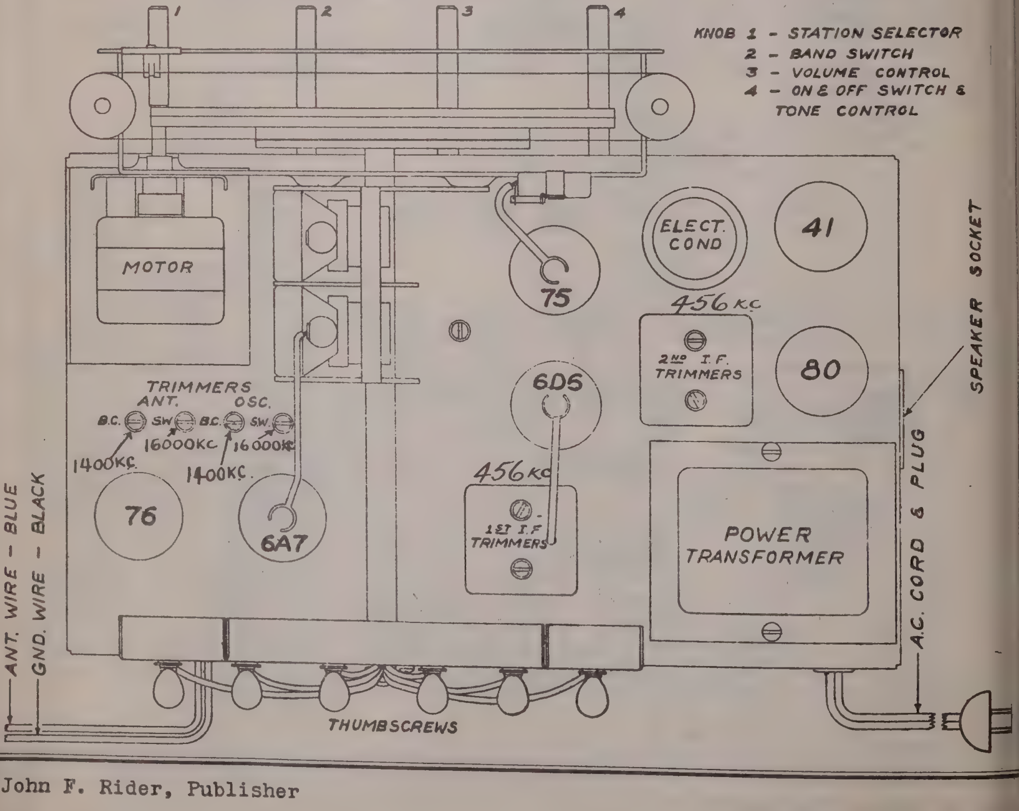
Nº	CAP.-MFD.	W.V.-TYPE
1	.05	400
2	.01	400
3	.00025	MICA
4	.00025	MICA
5	.01	400
6	.05	200
7	.005	600
8	.05	400
9	.0001	MICA
10	.002	400

IF PEAK 456 KC

BAND SWITCH IN BROADCAST POSITION
I.F. - 456 K.C.
V.C. - VOLUME CONTROL
T.C. - TONE CONTROL

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

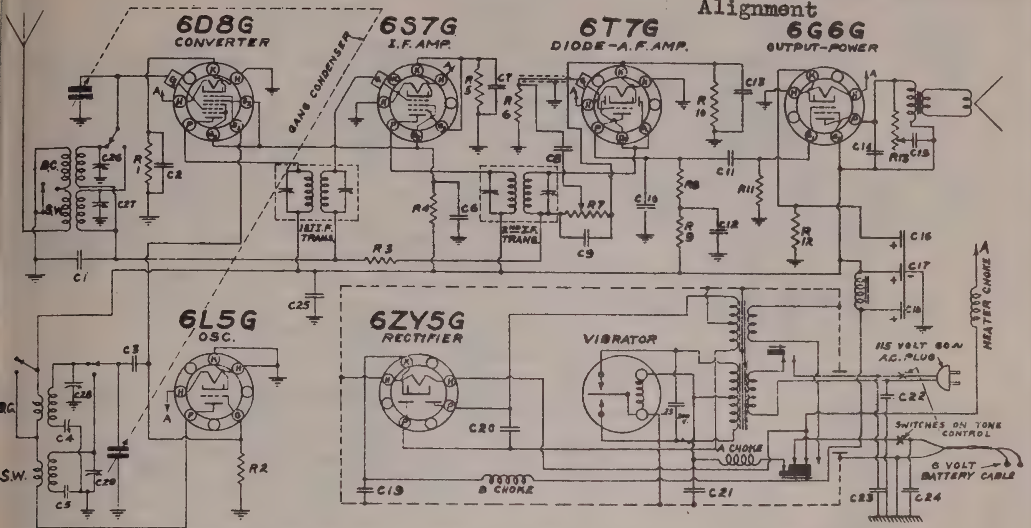
535 to 1730 Kilocycles
5650 to 18,100 Kilocycles



KNOB 1 - STATION SELECTOR
2 - BAND SWITCH
3 - VOLUME CONTROL
4 - ON & OFF SWITCH & TONE CONTROL

MODELS B10782,B10784
B10786
Schematic,Socket,Trimmers
Alignment

ALLIED RADIO CORP.



CONDENSERS

Nº	CAPACITY	TYPE	Nº	CAPACITY	TYPE
1	.05 Mfd.	200 V.	13	.5 Mfd.	200 V.
2	.05 Mfd.	200 V.	14	.005 "	600 V.
3	100 mmf.	MICA	15	.05 "	400 V.
4	300-600 mmf	"	16	6. "	25 V.
5	4000 mmf	M. ± 5%	17	8. "	200 V.
6	.1 Mfd	200V.	18	8. "	200 V.
7	.05 "	200 V.	19	.01 "	600 V.
8	.01 "	400 V.	20	.015 "	1000 V. OIL TYPE
9	250 mmf.	MICA	21	.5 "	10 V.
10	250 "	"	22	.05 "	400 V.
11	.01 Mfd.	400 V.	23	.01 "	600 V.
12	.1 "	200 V.	24	.5 "	10 V.
			25	.1 "	200 V.

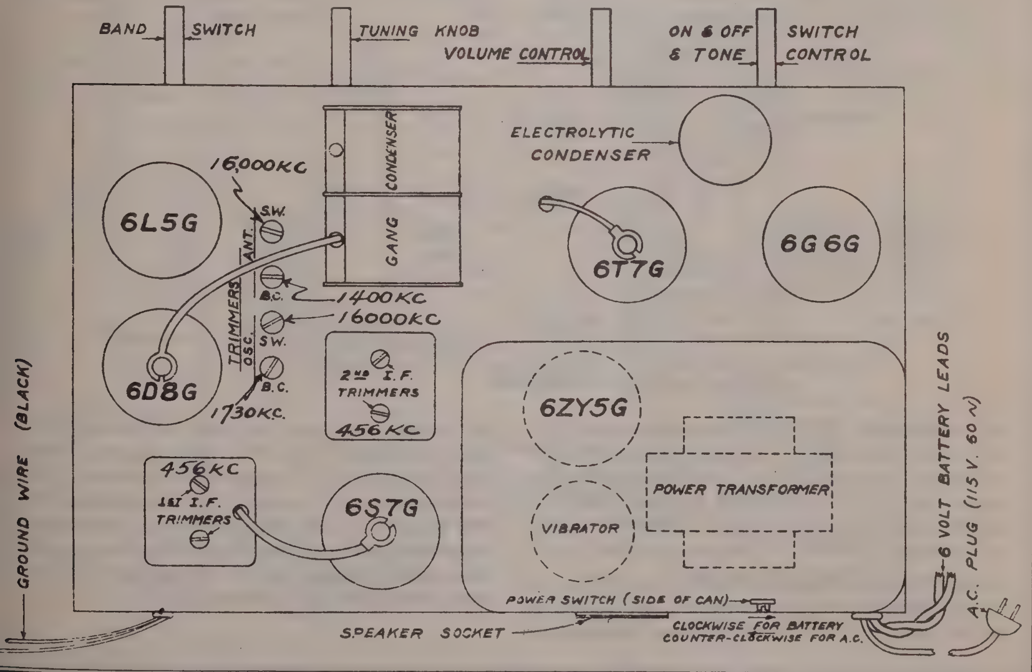
RESISTORS

Nº	OHMS	WATTS	SPL. TOL.
1	1500	1/4	± 10%
2	50,000	1/4	
3	1,000,000	1/4	
4	30,000	1/4	
5	1,000	1/4	± 10%
6	1,000,000	1/4	
7	500,000	1/4	(VOL. CONT)
8	500,000	1/4	
9	200,000	1/4	
10	10,000	1/4	± 10%
11	500,000	1/4	
12	450	1/4	± 10%
13	100,000	1/4	(TONE CONT.)

IF PEAK 456 KC

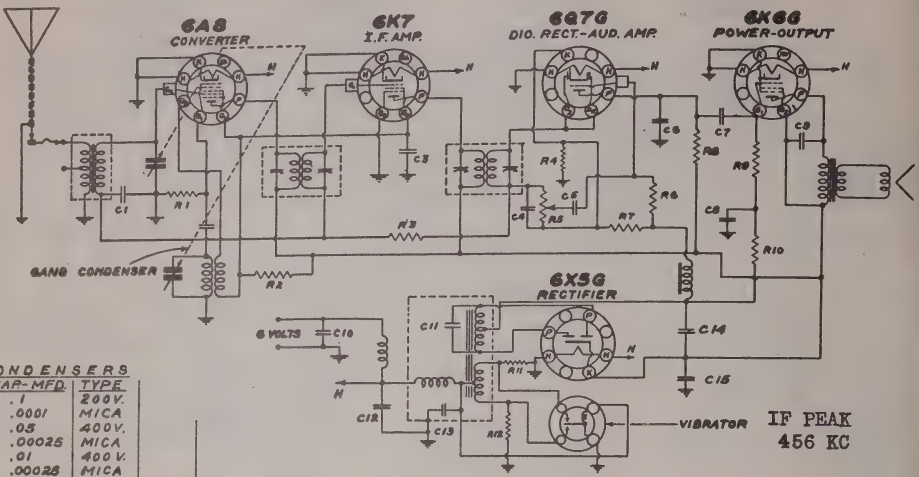
BAND SWITCH IN BROADCAST POSITION.
POWER SWITCH IN BATTERY POSITION.
I.F. - 456 K.C.
C26 TO C29 - 2 TO 20 mmf. TRIMMERS

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII



MODELS B10790,E10890
Schematic,Alignment
Socket,Trimmers

ALLIED RADIO CORP.



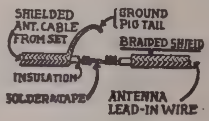
IF PEAK
456 KC

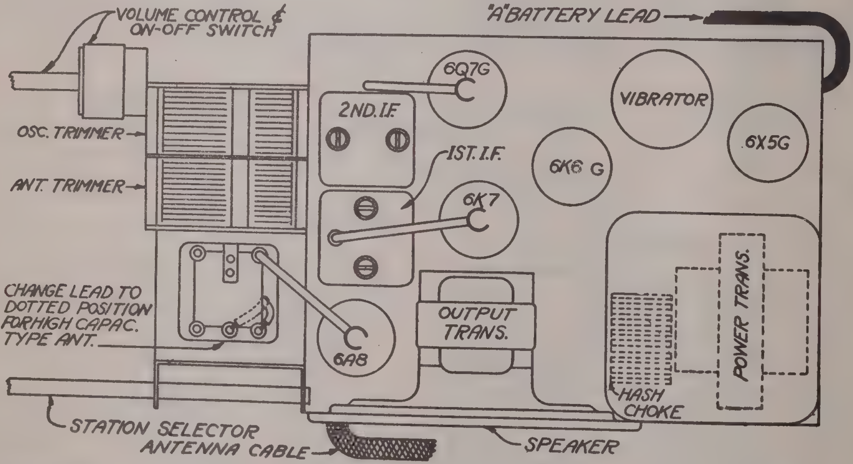
CONDENSERS

Nº	CAP.-MFD.	TYPE
1	.1	200V.
2	.0001	MICA
3	.05	400V.
4	.00025	MICA
5	.01	400V.
6	.00025	MICA
7	.01	400V.
8	.1	200V.
9	.01	400V.
10	.25	120V.
11	.006	1500V.
12	.5	120V.
13	.5	120V.
14	8. } ELECT	400
15	8.	W.V.

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
1	50,000	¼	7	(W.W.) 40	½
2	15,000	1	8	200,000	¼
3	1,000,000	¼	9	500,000	¼
4	(W.W.) 60	½	10	100,000	¼
5	500,000	V. C.	11	100	½
6	2,000,000	¼	12	100	½





I.F. ALIGNMENT. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tubes (6A8) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the output of the oscillator to the antenna lead of the receiver through a 50 mmfd· condenser. This antenna lead should be a two foot length of standard low capacity shielded loom fitted with the proper bayonet type plug to accomodate the antenna input receptacle on the receiver. Set the oscillator to 1550 KC and with the gang condenser at minimum, adjust the oscillator trimmer to receive this signal. Then set the oscillator to 1400 KC and adjust the antenna trimmer to give maximum output.

ALLIED RADIO CORP.

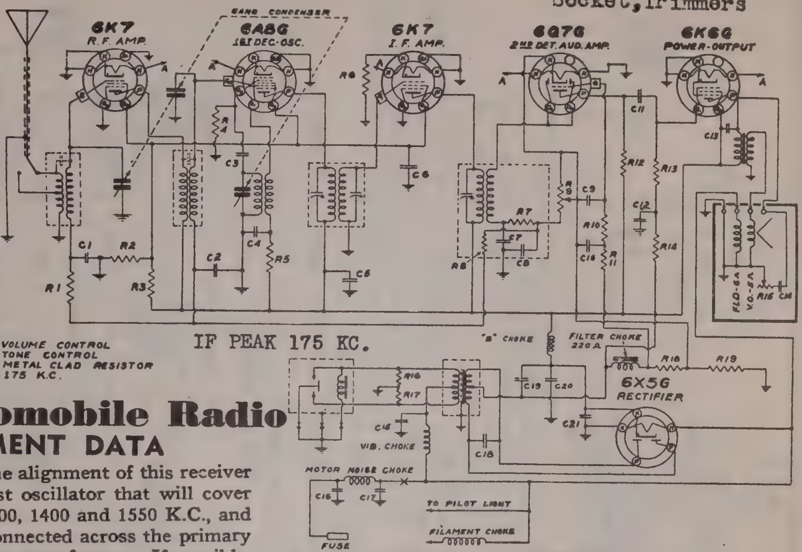
MODELS B10791,E10891
Schematic,Alignment
Socket,Trimmers

CONDENSERS

NO	CAP-MFD	WKG V.
1	.05	200
2	.05	200
3	.0001	MICA
4	.1	400
5	.1	400
6	1	200
7	.00025	MICA
8	.00025	MICA
9	.01	400
10	.1	200
11	.01	400
12	.25	200
13	.005	600
14	.05	400
15	.5	50
16	.002	MICA
17	.002	MICA
18	.0075	1600
19	6.0 (ELECT)	350
20	8.0 (ELECT)	350
21	.01	400

RESISTORS

NO	OHMS	WATTS
1	200,000	1/4
2	25,000	1/2
3	25,000	1
4	50,000	1/4
5	15,000	1/4
6	1,000	1/4
7	50,000	1/4
8	1,000,000	1/4
9	500,000	V.C.
10	2,000,000	1/4
11	500,000	1/4
12	200,000	1/4
13	500,000	1/4
14	100,000	1/4
15	100,000	T.C
16	50	1
17	50	1
18	30	MCR
19	50	MCR



V.C. - VOLUME CONTROL
T.C - TONE CONTROL
MCR - METAL CLAD RESISTOR
I.F. - 175 K.C.

IF PEAK 175 KC.

6 Tube Automobile Radio

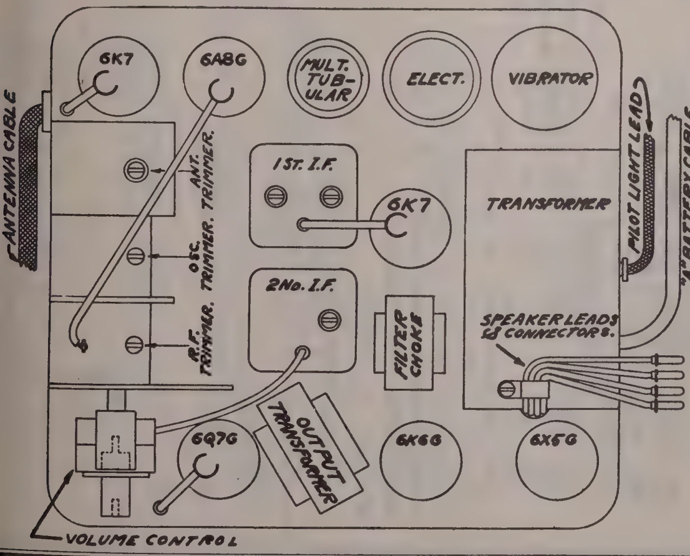
ALIGNMENT DATA

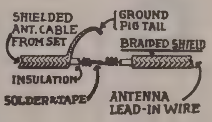
GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 175, 600, 1400 and 1550 K.C., and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignment should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the A.V.C. from operating and giving false readings.

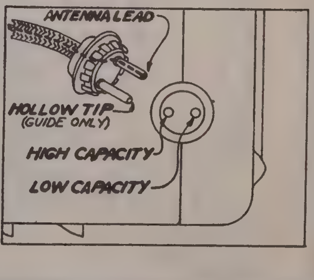
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) transformers should be aligned properly as the first step.

I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output to the grid of the first detector tube, 6A8G, through a .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

R.F. ALIGNMENT. Adjust the test oscillator to 1550 K.C. and connect the output to the antenna through a .00005 mfd. mica condenser to give the equivalent of a low capacity average auto antenna. When this adjustment is made, the signal must be introduced into the receiver through the shielded lead supplied with the receiver. The plug should be inserted to conform with the "Low Capacity" position. (See Figure 18). Set the gang condenser to minimum and adjust the ascillator trimmer to peak. (Center section of gang condenser). The next step is to set the test oscillator and receiver to 1400 K.C. and adjust the front and rear trimmers of the gang condenser to peak. The rear section of the gang condenser tunes the antenna amplifier stage (6K7 tube), and the front condenser section tunes the detector grid coil of the 6A8G tube.



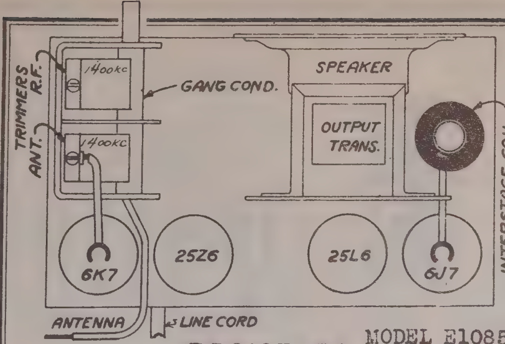




MODEL E10855
MODEL E10865

ALLIED RADIO CORP.

Schematics, Socket
Alignment, Trimmers



MODEL E10855

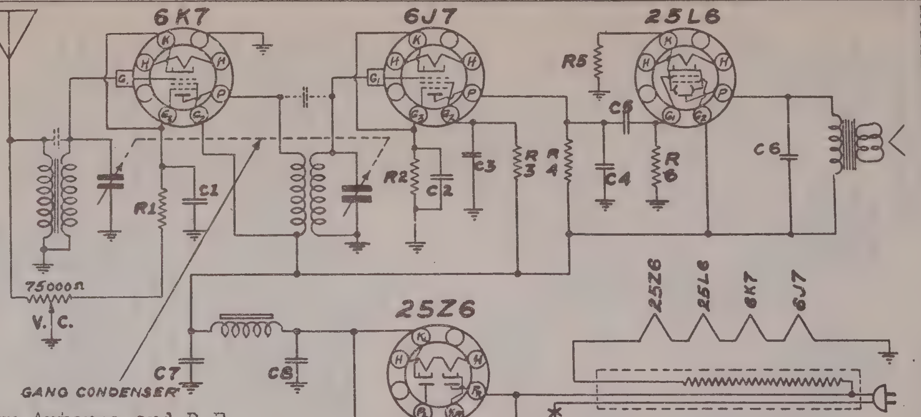
RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	250	¼	R4	500,000	¼
R2	25,000	¼	R5	110	½
R3	2,000,000	¼	R6	500,000	¼

CAPACITORS

Nº	MFD.	TYPE	Nº	MFD.	TYPE
C1	.1	200V.	C5	.01	400V.
C2	.25	200V.	C6	.02	400V.
C3	.1	200V.	C7	10.0	ELECT.
C4	.00025	MICA	C8	30.0	ELECT.

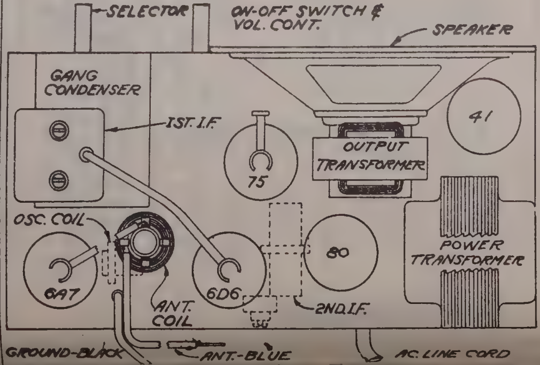
Align Antenna and R.F. trimmers at 1400 KC through a 100 mmf. condenser.

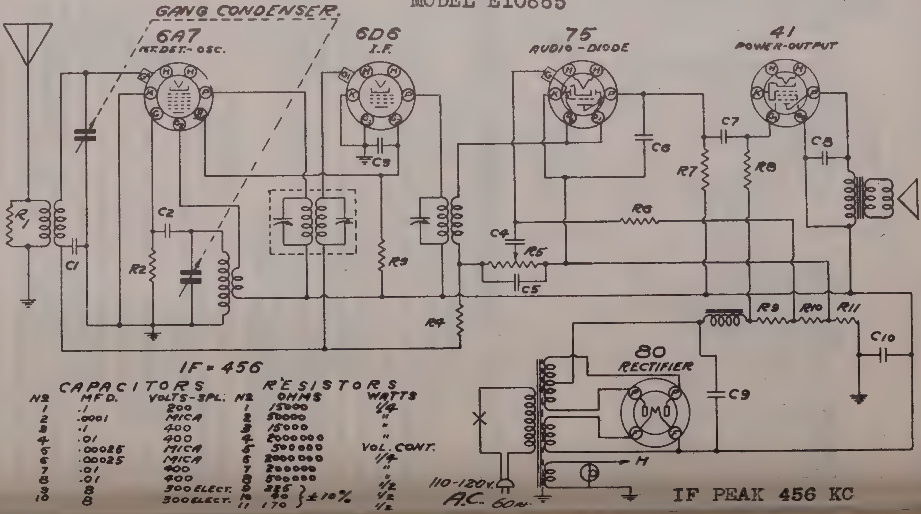


RESISTANCE OF LINE CORD 173 OHMS

MODEL E10865

I.F. Align at 456 KC through .05 mfd. condenser. B.C. Osc, trimmer at 1730 KC using .0002 mfd. condenser. B.C. Ant. trimmer at 1400 KC.





IF = 456

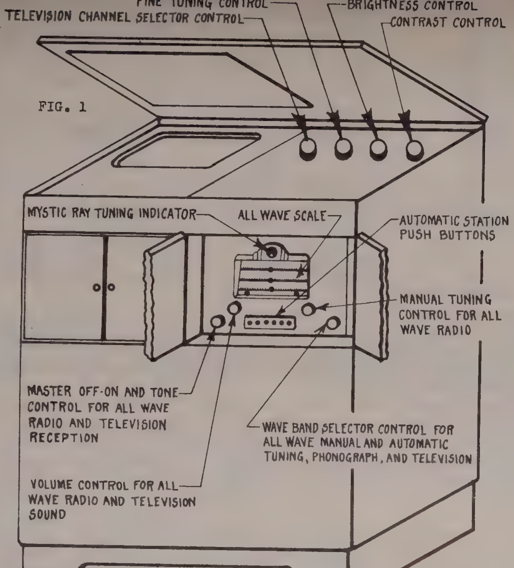
CAPACITORS Nº	MFD.	VOLTS-SPL.	RESISTORS Nº	OHMS	WATTS
1	.1	200	1	15000	1/4
2	.0001	MICA	2	50000	"
3	.1	400	3	15000	"
4	.01	400	4	2000000	"
5	.00025	MICA	5	500000	VOL. CONT.
6	.00025	MICA	6	2000000	1/4
7	.01	400	7	200000	"
8	.01	400	8	500000	"
9	8	300 ELECT.	9	285 } ±10%	1/2
10	8	300 ELECT.	10	40 } ±10%	1/2
			11	170 } ±10%	1/2

IF PEAK 456 KC

ANDREA RADIO CORP.

MODELS 2F12,8F12
Controls,Assembly Chassis Wiring

FIG. 1


FINE TUNING CONTROL
BRIGHTNESS CONTROL
TELEVISION CHANNEL SELECTOR CONTROL
CONTRAST CONTROL
MYSTIC RAY TUNING INDICATOR
ALL WAVE SCALE
AUTOMATIC STATION PUSH BUTTONS
MANUAL TUNING CONTROL FOR ALL WAVE RADIO
MASTER OFF-ON AND TONE CONTROL FOR ALL WAVE RADIO AND TELEVISION RECEPTION
WAVE BAND SELECTOR CONTROL FOR ALL WAVE MANUAL AND AUTOMATIC TUNING, PHONOGRAPH, AND TELEVISION
VOLUME CONTROL FOR ALL WAVE RADIO AND TELEVISION SOUND

LOCATION OF CONTROLS

FIG. 2

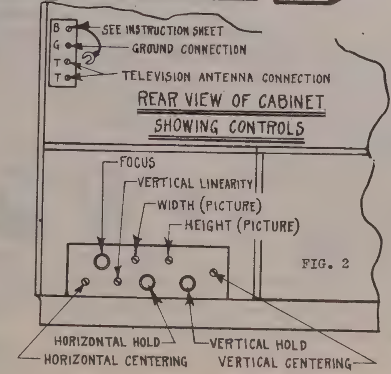
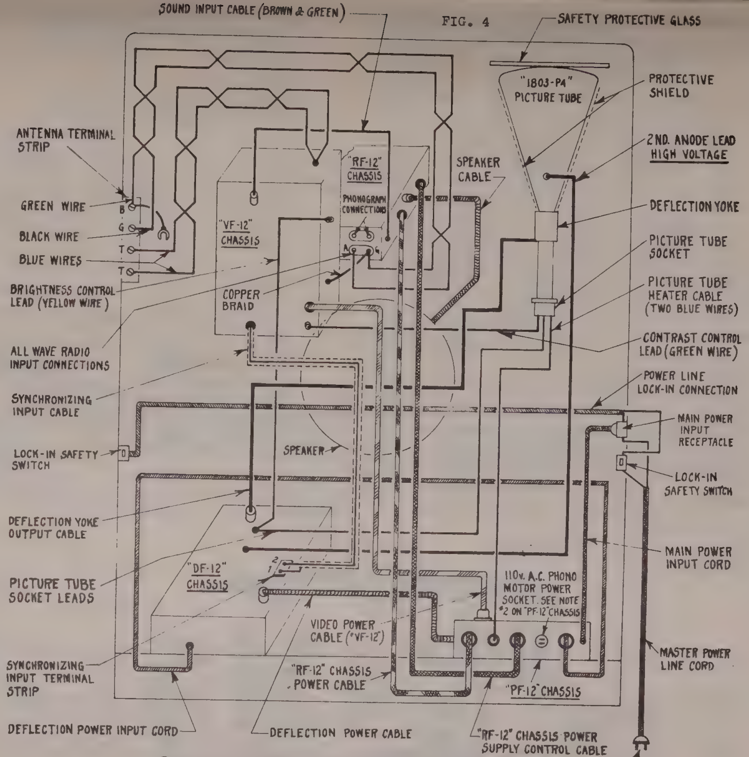
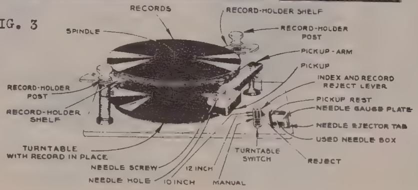


FIG. 4


SOUND INPUT CABLE (BROWN & GREEN)
SAFETY PROTECTIVE GLASS
"1803-P4" PICTURE TUBE
PROTECTIVE SHIELD
2ND. ANODE LEAD HIGH VOLTAGE
DEFLECTION YOKE
PICTURE TUBE SOCKET
PICTURE TUBE HEATER CABLE (TWO BLUE WIRES)
CONTRAST CONTROL LEAD (GREEN WIRE)
POWER LINE LOCK-IN CONNECTION
MAIN POWER INPUT RECEPTACLE
LOCK-IN SAFETY SWITCH
MAIN POWER INPUT CORD
MASTER POWER LINE CORD
110-125v. 60~ LINE ONLY
ANTENNA TERMINAL STRIP
GREEN WIRE
BLACK WIRE
BLUE WIRES
B
G
T
T
BRIGHTNESS CONTROL LEAD (YELLOW WIRE)
ALL WAVE RADIO INPUT CONNECTIONS
SYNCHRONIZING INPUT CABLE
LOCK-IN SAFETY SWITCH
DEFLECTION YOKE OUTPUT CABLE
PICTURE TUBE SOCKET LEADS
SYNCHRONIZING INPUT TERMINAL STRIP
DEFLECTION POWER INPUT CORD
DEFLECTION POWER CABLE
"RF-12" CHASSIS POWER SUPPLY CONTROL CABLE
"RF-12" CHASSIS
PHONOGRAPH CONNECTIONS
"VF-12" CHASSIS
COPPER BRAID
SPEAKER CABLE
SPEAKER
"DF-12" CHASSIS
1
2
110v. A.C. PHONO MOTOR POWER SOCKET. SEE NOTE #2 ON "PF-12" CHASSIS
VIDEO POWER CABLE ("VF-12")
"RF-12" CHASSIS POWER CABLE
"PF-12" CHASSIS

REAR VIEW OF CABINET CHASSIS ASSEMBLY- MODELS "2F12" AND "8F12"

FIG. 3



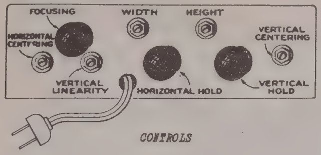
TOP VIEW OF AUTOMATIC RECORD CHANGER

MODELS 2F12,8F12
Socket Layouts
Deflection Chassis DF-12
Notes,Layout,Controls

ANDREA RADIO CORP.

DEFLECTION CHASSIS - "DF-12"

CONTROLS - There are eight controls on the end of the Deflection Chassis. Three of these are knobs and five are screwdriver adjustments.



CONTROLS

1. Horizontal Centering - This is a screwdriver adjustment on the extreme left of the control pane'. It serves to center the picture horizontally on the Kinescope screen and is made at the time of installation of the complete receiver. It will require resetting due primarily to the earth's magnetic field whenever the receiver location is changed, the cabinet turned around, or the Kinescope replaced.

2. Focusing Control - The next control is a knob for adjustment of the first anode voltage to properly focus the picture. Make this adjustment carefully when the receiver is first placed in operation and it should then remain permanent but may be occasionally checked to insure continuous best focusing.

3. Vertical Linearity - This is controlled by means of a screwdriver adjustment. It is operated in conjunction with the Height Control to give the correct vertical proportions to the picture. It may require readjustment if the Vertical Centering Control is reset.

4. Width - This screwdriver control determines the width of the picture and should be adjusted when the receiver is installed. Further adjustment will occasionally be necessary in order to compensate for the gradual reduction in horizontal deflection with tube life.

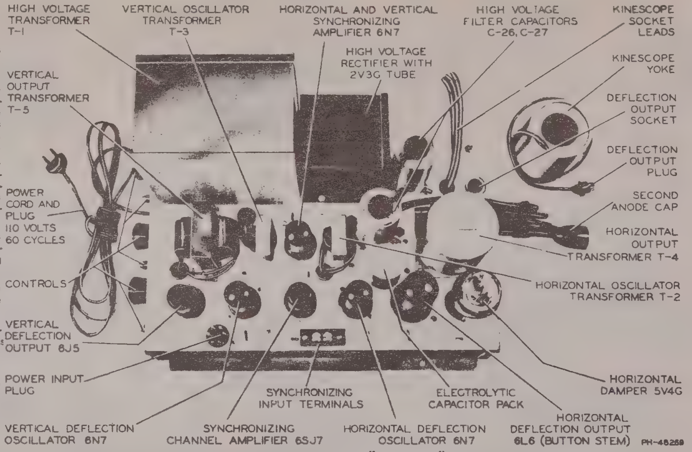
5. Horizontal Hold - This is a knob which controls the free running speed of the horizontal oscillator. It is adjusted to a point approximately at the center of the range in which the picture "locks in" horizontally. Synchronizing voltage, when properly applied, will hold the horizontal oscillator in step, and then correct setting will be indicated by the horizontal stability of the picture.

6. Height - This screwdriver control determines the height of the picture and should be adjusted in conjunction with vertical linearity when the receiver is installed. Further adjustment will occasionally be necessary in order to compensate for the gradual reduction in vertical deflection with tube life.

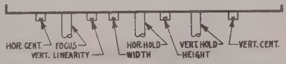
7. Vertical Hold - This is a knob which controls the free running speed of the vertical oscillator. It is adjusted to a point approximately in the center of the range in which the picture "locks in" vertically. Synchronizing voltage, when properly applied, will hold the vertical oscillator interlaced in step and the correct setting will be indicated by the vertical stability of the picture.

8. Vertical Centering - This is a screwdriver adjustment on the extreme right of the control panel. It serves to center the picture vertically on the Kinescope screen and is made at the time of installation of the complete receiver. It will require resetting whenever the receiver location is changed, the cabinet turned around or the Kinescope replaced. Some readjustment of linearity may be required if the centering is shifted appreciably.

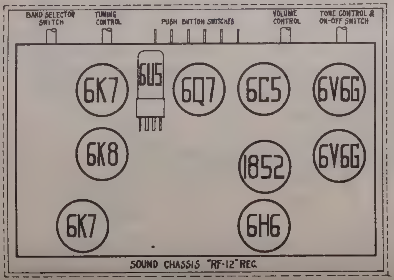
CAUTION - THE POWER SUPPLY TO THE DEFLECTION CHASSIS SHOULD NEVER BE CUT OFF WHILE THE HIGH VOLTAGE SUPPLY IS TURNED ON. A BURNED SPOT MAY APPEAR ON THE KINESCOPE SCREEN IF THIS WARNING IS DISREGARDED. AN INTENSE BRIGHT SPOT THAT MAY CAUSE A BURN WILL ALSO APPEAR IF THE KINESCOPE YOKE IS REMOVED, THE YOKE PLUG PULLED OUT, OR BOTH DEFLECTION CIRCUITS RENDERED INACTIVE BY TUBE REMOVAL OR OTHER MEANS.


HIGH VOLTAGE TRANSFORMER T-1
VERTICAL OSCILLATOR TRANSFORMER T-3
HORIZONTAL AND VERTICAL SYNCHRONIZING AMPLIFIER 6N7
HIGH VOLTAGE RECTIFIER WITH 2V3G TUBE
HIGH VOLTAGE FILTER CAPACITORS C-26, C-27
KINESCOPE SOCKET LEADS
KINESCOPE YOKE
DEFLECTION OUTPUT SOCKET
DEFLECTION OUTPUT PLUG
SECOND ANODE CAP
HORIZONTAL OUTPUT TRANSFORMER T-4
HORIZONTAL OSCILLATOR TRANSFORMER T-2
HORIZONTAL DAMPER 5V4G
HORIZONTAL DEFLECTION OUTPUT 6L6 (BUTTON STEM)
PH-48289
ELECTROLYTIC CAPACITOR PACK
HORIZONTAL DEFLECTION OSCILLATOR 6N7
SYNCHRONIZING INPUT TERMINALS
SYNCHRONIZING CHANNEL AMPLIFIER 6SJ7
VERTICAL DEFLECTION OSCILLATOR 6N7
POWER INPUT PLUG
VERTICAL DEFLECTION OUTPUT 6J5
CONTROLS
POWER CORD AND PLUG 110 VOLTS 60 CYCLES
VERTICAL OUTPUT TRANSFORMER T-5

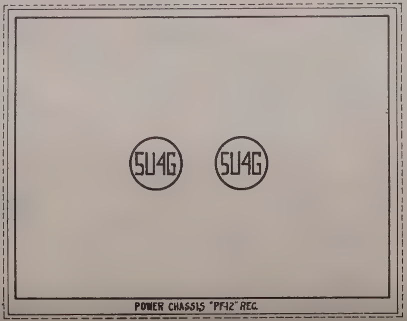
DEFLECTION CHASSIS "DF - 12" REC.



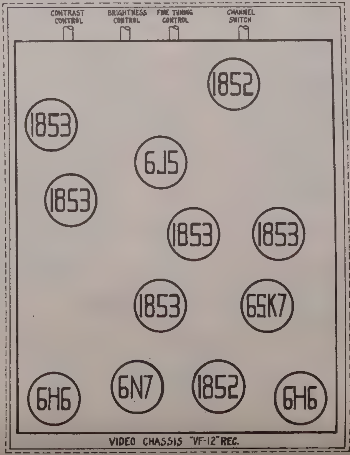
CONTROLS
DEFLECTION CHASSIS



SOUND CHASSIS "RF-12" REC.



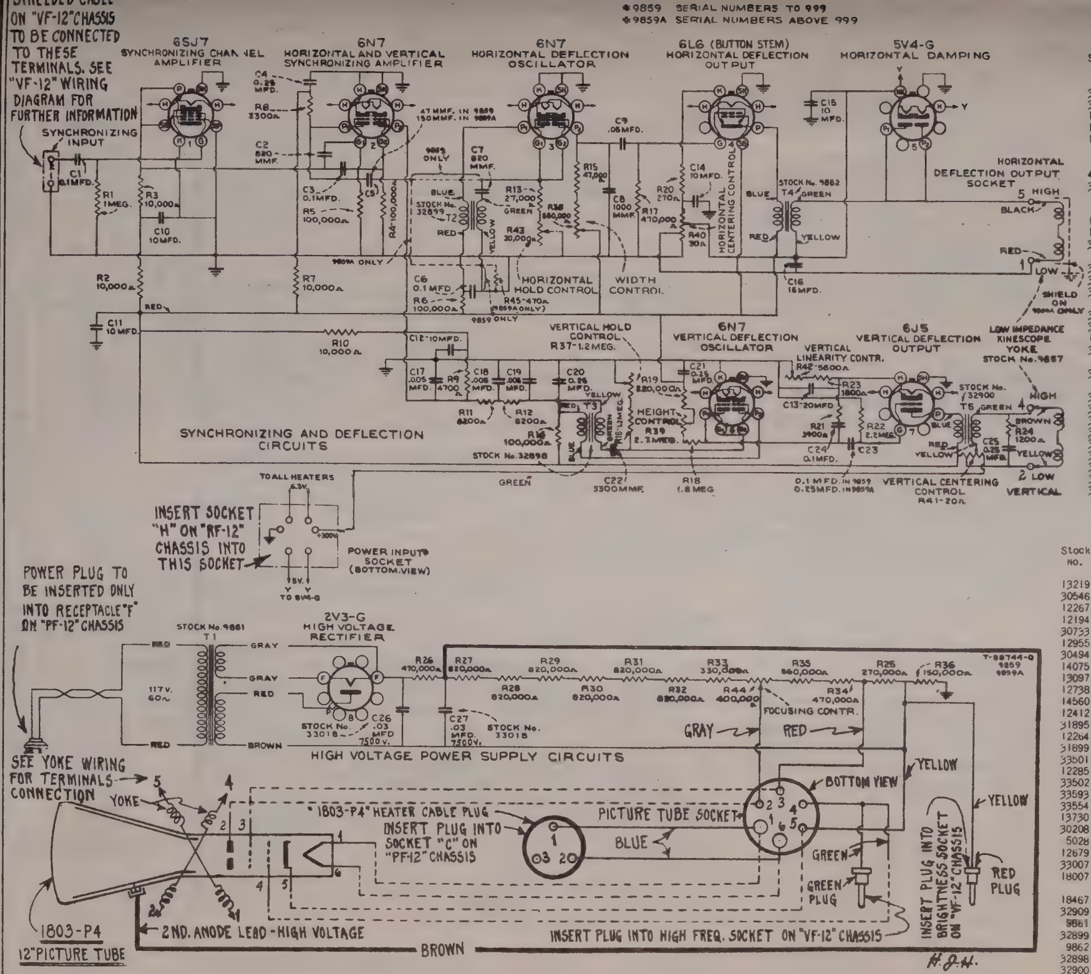
POWER CHASSIS "PF-12" REC.



VIDEO CHASSIS "VF-12" REC.

ANDREA RADIO CORP.

MODELS 2F12,8F12
Deflection Chassis DF-12
Schematic

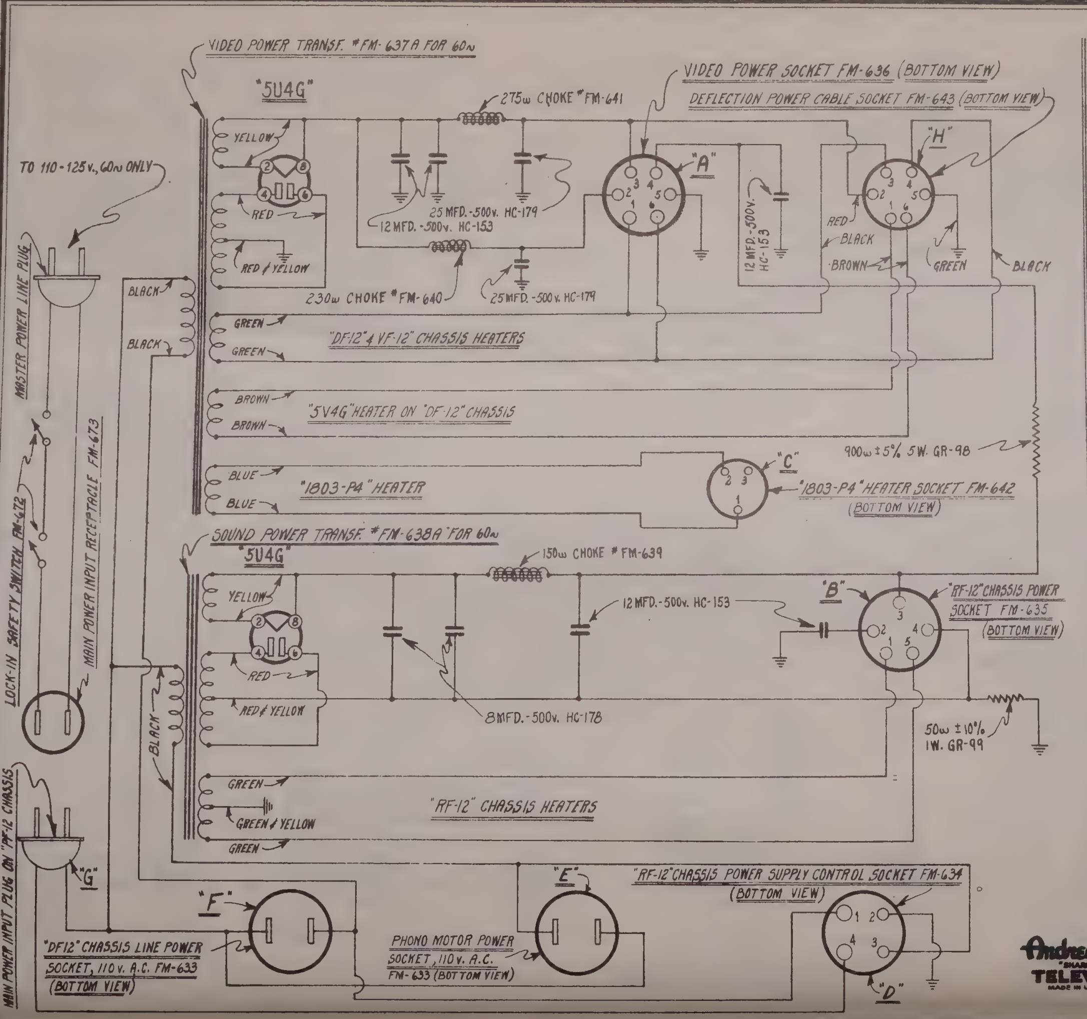


Stock No.	Description
31579	Board - 2-contact terminal board for synchronizing input
33016	Bushing - Porcelain bushing and spring
12725	Capacitor - 150 mmfd (C5)
12536	Capacitor - 820 mmfd (C2, C7)
12635	Capacitor - 1000 mmfd (C8)
4881	Capacitor - 3300 mmfd (C22)
4838	Capacitor - 0.005 mfd (C17, C18, C19)
4870	Capacitor - 0.025 mfd (C25)
33018	Capacitor - 0.03 mfd, 7500 volts (C26, C27)
4886	Capacitor - 0.05 mfd (C9)
4839	Capacitor - 0.1 mfd (C1, C3, C6, C24)
12484	Capacitor - 0.25 mfd (C4, C20, C21, C23)
14902	Capacitor - 10-10 mfd, 25 volts (C14, C15)
33014	Capacitor - 10-10-10 mfd, 450 volts (C10, C11, C12) 20 mfd, 25 volts (C13)
32045	Capacitor - 15 mfd, 25 volts (C16)
30314	Clip - Grid cap connector for RCA-2V3G Radiotron
33288	Connector - Insulated connector complete with lead for Kinescope 2nd anode
33002	Coupling - Flexible bronze spring connector
33015	Insulator - Stand-off insulator only, less hardware
11455	Knob - Control knob
33012	Plug - 6-prong female plug for filament and plate supply input cable
33008	Plug - 6-prong male plug for filament and plate voltage input supply
33037	Potentiometer - Focus control 400,000 ohms (R44)
33036	Potentiometer - Horizontal centering control 30 ohms (R40)
33030	Potentiometer - Width control 560,000 ohms (R38)
33027	Potentiometer - Horizontal speed control 30,000 ohms (R43)
33034	Potentiomeser - Linearity control 5600 ohms (R42)
33035	Potentiometer - Vertical centering control 20 ohms (R41)
33032	Potentiometer - Height control 2.7 megohms (R39)
33031	Potentiometer - Vertical speed control 1.2 megohms (R37)
33011	Receptacle - 4-prong female socket for deflecting yoke

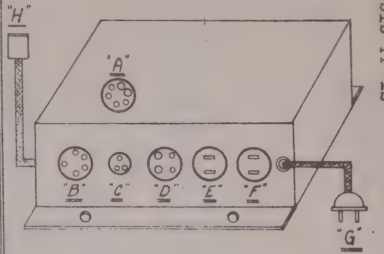
Stock No.	Description
13219	Resistor - 270 ohms, 2 watts (R20)
30546	Resistor - 470 ohms, 1/2 watt (R45)
12267	Resistor - 1200 ohms, 1/4 watt (R24)
12194	Resistor - 1800 ohms, 1/4 watt (R23)
30733	Resistor - 3300 ohms, 1/2 watt (R8)
12955	Resistor - 3900 ohms, 1/4 watt (R21)
30494	Resistor - 4700 ohms, 1/2 watt (R9)
14075	Resistor - 8200 ohms, 1/4 watt (R11, R12)
13097	Resistor - 10,000 ohms, 1 watt (R2, R3, R7, R10)
12738	Resistor - 27,000 ohms, 1/4 watt (R13)
14560	Resistor - 100,000 ohms, 1/4 watt (R4, R5, R6, R14)
12412	Resistor - 47,000 ohms, 1/4 watt (R15)
31895	Resistor - 150,000 ohms, 1 watt (R36)
12264	Resistor - 220,000 ohms, 1/4 watt (R19)
31899	Resistor - 270,000 ohms, 1 watt (R25)
33501	Resistor - 330,000 ohms, 1 watt (R33)
12285	Resistor - 470,000 ohms, 1/4 watt (R17)
33502	Resistor - 470,000 ohms, 1 watt (R26, R34)
33593	Resistor - 560,000 ohms, 1 watt (R35)
33554	Resistor - 820,000 ohms, 1 watt (R27, R28, R29, R30, R31, R32)
13730	Resistor - 1 megohm, 1/4 watt (R1)
30208	Resistor - 1.2 megohm, 1/4 watt (R16)
5028	Resistor - 1.8 megohm, 1/4 watt (R18)
12679	Resistor - 2.2 megohms, 1/4 watt (R22)
33007	Shaft - Steel and bakelite shaft assembly for focus control
18007	Socket - Octal base socket and retaining ring for 6L6 and 2V3G Radiotrons
18467	Socket - Octal base wafer type socket
32909	Support - Rectifier socket, plate and stand-off insulator assembly
9861	Transformer - High voltage power transformer (T1)
32899	Transformer - Horizontal oscillation transformer (T2)
9862	Transformer - Horizontal output transformer (T4)
32898	Transformer - Vertical oscillation transformer (T3)
32900	Transformer - Vertical output transformer (T5)
9857	Yoke - Deflection yoke complete with cable and plug

MODELS 2F12,8F12
Power Chassis PF-12

ANDREA RADIO CORP.


VIDEO POWER TRANSF. #FM-637A FOR 60~
"5U4G"
YELLOW
RED
RED & YELLOW
275ω CHOKE #FM-641
25 MFD.-500v. HC-179
12 MFD.-500v. HC-153
230ω CHOKE #FM-640
25 MFD.-500v. HC-179
VIDEO POWER SOCKET FM-636 (BOTTOM VIEW)
DEFLECTION POWER CABLE SOCKET FM-643 (BOTTOM VIEW)
"A"
"H"
12 MFD.-500v. HC-153
RED
BLACK
BROWN
GREEN
BLACK
GREEN
GREEN
"DF-12" & "VF-12" CHASSIS HEATERS
BROWN
BROWN
"5V4G" HEATER ON "DF-12" CHASSIS
900ω ±5% 5W. GR-98
BLUE
BLUE
"1803-P4" HEATER
"C"
"1803-P4" HEATER SOCKET FM-642 (BOTTOM VIEW)
TO 110-125v., 60~ ONLY
BLACK
BLACK
MASTER POWER LINE PLUG
LOCK-IN SAFETY SWITCH FM-672
MAIN POWER INPUT RECEPTACLE FM-673
SOUND POWER TRANSF. #FM-638A FOR 60~
"5U4G"
YELLOW
RED
RED & YELLOW
150ω CHOKE #FM-639
12 MFD.-500v. HC-153
8 MFD.-500v. HC-178
"B"
"RF-12" CHASSIS POWER SOCKET FM-635 (BOTTOM VIEW)
50ω ±10% 1W. GR-99
BLACK
GREEN
GREEN & YELLOW
GREEN
"RF-12" CHASSIS HEATERS
MAIN POWER INPUT PLUG ON "PF-12" CHASSIS
"G"
"F"
"DF12" CHASSIS LINE POWER SOCKET, 110v. A.C. FM-633 (BOTTOM VIEW)
"E"
PHONO MOTOR POWER SOCKET, 110v. A.C. FM-633 (BOTTOM VIEW)
"RF-12" CHASSIS POWER SUPPLY CONTROL SOCKET FM-634 (BOTTOM VIEW)
"D"

LOCATION OF RECEPTACLES ON "PF-12" CHASSIS



"A" - RECEPTACLE FOR VIDEO POWER CABLE PLUG FROM "VF-12" CHASSIS.

"B" - RECEPTACLE FOR "RF-12" CHASSIS POWER CABLE PLUG FROM "RF-12" CHASSIS.

"C" - RECEPTACLE FOR "1803-P4" HEATER CABLE PLUG FROM SOCKET ASSY. CABLE FOR "1803-P4" TUBE ON "DF-12" CHASSIS.

"D" - RECEPTACLE FOR "RF-12" CHASSIS POWER SUPPLY CONTROL CABLE PLUG FROM "RF-12" CHASSIS.

"E" - RECEPTACLE FOR PHONO MOTOR POWER PLUG FROM MOTOR OF RECORD CHANGER. SEE NOTE 2 BELOW.

"F" - RECEPTACLE FOR DEFLECTION LINE POWER PLUG FROM "DF-12" CHASSIS. SEE NOTE 1 BELOW.

"G" - PLUG TO BE INSERTED INTO MAIN POWER INPUT RECEPTACLE LOCATED ON SIDE OF CABINET.

"H" - DEFLECTION POWER CABLE SOCKET TO BE INSERTED INTO DEFLECTION POWER INPUT PLUG ON "DF-12" CHASSIS.

IMPORTANT:

1- POWER PLUG FROM "DF-12" CHASSIS MUST ONLY BE INSERTED INTO RECEPTACLE "F". IF INSERTED IN RECEPTACLE "E", THE POWER OF "DF-12" CHASSIS WILL NOT BE CONTROLLED.

2- RECEPTACLE "E" TO BE USED ONLY FOR 110v. A.C. PHONO MOTOR POWER.

Andrea Radio
"SHARP-FOCUS"
TELEVISION
MADE IN U.S. AMERICA

ANDREA RADIO CORP. WOODSIDE, N.Y.		
POWER CHASSIS "PF-12" REC		
MODELS "2F12" & "8F12"		
DR: J.R.	DATE: 9-16-39	APP:

ANDREA RADIO CORP.

MODELS 2F12,8F12
Operating Notes

POWER RATING The ANDREA 2F12 and 8F12 receivers operate only on 110 to 125 volt, 60 cycle AC current. Make sure your current supply is correct for the instrument before you plug it into the house outlet or socket.

This receiver is equipped with two safety lock-in switch devices and when the back is removed, power is cut off from all apparatus. The two switches are on the inside of the two side panels. No danger is possible from the high voltage television apparatus unless these two switches are simultaneously pushed in. Under no circumstances should these switches be tampered with.

ANTENNA A television receiving antenna and its installation must conform to much higher standards than an antenna for reception of international short wave and standard broadcast signals because:

1. At the ultra short wave lengths employed in television, intervening obstacles have a pronounced shielding effect, causing low intensity signals, and often severe trouble with multi-path transmissions. These produce blurring and multi-image pictures. See picture chart - figure 20 - for effect.
2. The picture signal is comprised of a very wide band or range of frequencies, all of which must be received with good efficiency.
3. The discernment of the eye is much more critical than that of the ear.

The receiver antenna should preferably be at a good height, without interuption in direct "line of sight" of the transmitter antenna, of the correct type, and correctly installed. Buildings and other structures may obstruct and reflect the television waves. Automobile ignition systems, diathermy apparatus in hospitals and airplanes flying low may all have an adverse effect.

Television pictures may be compared in certain ways with motion pictures. The illumination in the room should be dimmed - no light close to or falling on the screen. During the day it will usually suffice to draw the curtains.

The special ANDREA Teleceptor - picture and sound antenna - Model 66 - is available.

TELEVISION OPERATION

CAUTION Before the reveiver is turned on at any time, turn wave band Selector control knob (Fig.1) to either the S, I, M, A or P position, and rotate counter-clockwise contrast and brightness controls (Fig.1) all the way.

HOW TO TURN RECEIVER ON AND OFF AND CONTROL TONE Turn master Off-on Tone Control knob clockwise (Fig.1) to switch power "on". Further rotation varies the tone of the television sound - full tone reproduction being with the knob turned fully counter-clockwise. This knob is the master control knob for turning the entire instrument "off" or "on". After about 30 seconds, turn the Wave Band Selector knob (Fig.1) to position "T". This turns the television section of the instrument "on" and automatically removes the dial illumination. Allow sufficient time for the tubes to heat before proceeding further.

HOW TO CONTROL TELEVISION SOUND VOLUME Turning Volume Control knob (Fig.1) clockwise increases the television sound volume; counter-clockwise decreases volume.

TELEVISION CHANNEL SELECTOR CONTROL SWITCH The television Channel Selector Control (Fig.1) selects automatically, the desired station and accompanying sound from which it is desired to receive television programs. This knob is marked 1,2,3,4,5 - representingthe first,second, third, etc. television channel:

CHANNEL 1 - 44-50 MC
" 2 - 50-56 MC
" 3 - 66-72 MC
4 - 78-84 MC
5 - 84-90 MC

Set the knob to the channel corresponding to the television station desired.

FINE TUNING CONTROL This control is used to obtain best picture reception by eliminating possible distortion from interfering signals which show a moving ripple in the picture. Should the control be incorrectly set, picture distortion will result. In most cases this control should be adjusted for each television channel by listening to the accompanying sound until maximum volume is obtained, using a medium or low level and noting that the picture is not distorted at this setting. See picture chart - (Fig.5) illustrates the test chart picture when all controls are correctly adjusted. (Fig.9) shows the effect on the picture of extraneous interference that in some cases can be eliminated by a slight readjustment of the fine tuning control. (Fig.10) shows what also may occur when the fine tuning control is incorrectly set.

CONTRAST CONTROL The contrast knob, located in the top panel (Fig.1), regulates the contrast level of the picture. Turning this control slowly clockwise increases the picture contrast from grays to black and white. Excessive contrast gives blurred or feathered outline to the images which lack half tones, while too little contrast results in an extremely gray image without character or depth. The correct adjustment is to set the controls (both Contrast and Brightness) where black objects appear on the screen as a very dark gray. See picture chart - (Fig.5) shows the received test chart picture with the controls set correctly. (Fig.6) illustrates the picture with the contrast advanced too far.

BRIGHTNESS CONTROL For controlling brightness level of picture, observe the difference between operating this control and the Contrast control. Both controls should be operated together. For example, if the contrast is adjusted correctly and the picture illumination is too low or too bright, and the Brightness control readjusted for more or less illumination, the picture contrast will change. Hence, the Contrast control must be readjusted. Therefore, whenever the Contrast control is turned clockwise, the Brightness control must be turned counter-clockwise. (See picture chart - (Fig.7 and Fig.8).

NOTE FIG.8 If the Brightness control is operated too high and the Contrast control too low, white diagonal lines will be seen across the picture, which indicates that the Brightness control must be reduced. In some cases, if the antenna pickup is insufficient, the same results will occur.

Always remember to turn the Brightness and Contrast controls completely counter-clockwise when viewing is over.

(Fig.7) indicates what occurs to the picture when the Brightness control is advanced too far. The picture is thin and lacks blacks.

HOW TO RECEIVE THE PICTURE Before turning the receiver on, proceed as follows:

1. Turn Brightness and Contrast controls (Fig.1) completely counter-clockwise.
2. Open doors of radio panels (Fig.1). Turn wave band Selector knob marked S-I-M-A-P-T to any position but "T".
3. Turn master OFF-ON Control (Fig.1) clockwise until click is heard.
4. Turn Volume Control (Fig.1) 1/4 turn clockwise.
5. Turn Wave Band Selector knob S-I-M-A-P-T to position "T".
6. Turn Television Selector switch to correct position.
7. Turn Contrast control fully counter-clockwise and then turn Brightness Control clockwise slowly until a slight illumination appears on the screen. Then turn counter-clockwise until illumination just disappears.
8. Advance the Contrast Control until the picture appears at its best. Then advance Brightness Control clockwise slowly, if necessary, and readjust both controls for most suitable picture. A little practice of these adjustments will enable you to easily obtain the correct setting. Incorrect control settings give similar results to under or over exposed photograph prints.
9. If an interfering ripple is observed in the picture, adjustment of the fine tuning knob (Fig.1) may reduce or eliminate the trouble.
10. Readjust the sound volume and tone controls (Fig.1) to your liking.
11. Always turn wave band Selector knob (Fig.1) to any position but that marked "T" before turning receiver "off".

RADIO OPERATION

THE DIAL AND CONTROLS In Fig.1 is shown the cabinet front, incorporating the controls necessary for correct operation.

Turn Master Power OFF-ON Tone Control clockwise to apply power to receiver. Should tuning scale fail to light, then the Wave Band Selector knob is in position "T". Turning to another position will light the scale.

WAVE RANGE SELECTOR CONTROL The Wave Range Selector controls the type of service. The knob is marked S-I-M-A-P-T.

"S" position - short wave reception.
"I" position - intermediate short wave reception.
"M" position - manual tuning of standard broadcast.
"A" position - automatic push-button tuning of your six ~~favorite~~ Standard Broadcast stations.
"P" position - phonograph operation.
"T" position - television and accompanying sound.

PHONOGRAPH Model 8F12 contains an Automatic Record Changer which plays either eight 10" records or seven 12" records automatically. In Figure 3 is illustrated the method of operation.

Model 2F12 can be used with an external phonograph pickup of 4000 ohms or more by plugging into the phono jacks provided on the rear of the radio chassis.

EXTERNAL INTERCONNECTING OF COMPONENTS Figure 4 illustrates the interconnecting of the parts in the cabinet chassis assembly.

MODELS 2F12,8F12
Operating Notes,Cont'd.
Tuner Data

ANDREA RADIO CORP.

SERVICE NOTES

ANTENNA-GROUND Connect the ANDREA Teleceptor transmission cable to the terminals marked "T" - "T".

Attach well-grounded insulated wire to terminal marked "G". Note that a wire from the rear of terminal marked "B" is connected to one side of screw terminal "T". This connection utilizes the Teleceptor antenna for all-wave radio reception.

Should a separate all-wave noise reducing antenna, such as the ANDREA No.50, be used for broadcast reception, remove above wire connection from terminal "T" and connect to terminal "B". Connect all-wave coupler to terminal "B" and "G".

HORIZONTAL CENTERING The horizontal centering control is a screw driven adjustment located as shown in Fig.2 and made at the time of installation. It serves to center the picture horizontally on the picture screen. It may require slight resetting if the receiver location is changed, tubes replaced or power line conditions varied. See picture chart - Figure 11 indicates what occurs when this control is incorrectly set. Figure 5 is the correct position.

VERTICAL CENTERING The Vertical Centering control is a screw driver adjustment shown in Fig.2 and is used to center the picture vertically with respect to the screen opening. Resetting may be necessary for the same conditions outlined under "Horizontal Centering". See picture chart - Figure 12 indicates what occurs when this control is incorrectly adjusted. Figure 5 is the correct position.

PICTURE HEIGHT This control varies the height of the picture and is a screw driver adjustment made when the receiver is installed. See picture chart - Figure 13 shows what occurs when this control is incorrectly adjusted. Figure 5 is the correct position.

PICTURE WIDTH This control increases or decreases the width of the picture and is a screw driver adjustment made at the time of installation. See picture chart - Figure 14 shows what occurs when this control is incorrectly set. Figure 5 is the correct picture.

FOCUS CONTROL Located as shown in Fig.2, this control is designed to bring the television images into sharp focus or definition. This control, once adjusted, should not be tampered with. When correctly focused the lines of which the picture is composed are sharply defined. A slight rotation one or other direction will indicate defocusing. See picture chart - Figure 15 illustrates what happens when the focus control is incorrectly set. Figure 5 when correctly set.

At times during a given program, scenes may be out of focus while others are sharp. This condition arises at the transmitter and cannot be corrected at the receiver.

HORIZONTAL HOLD CONTROL The purpose of this control is to reconstruct the receiver picture lines in exact synchronization with the transmitter. If they are not, the scan will be affected as follows:

(a) Distortion in shape.
(b) Several images will be seen.
(c) Numerous black dashes over screen.

A slight adjustment of this control in the one or the other direction will eliminate the above effects. See picture chart - Figures 16 and 17 shows what the picture looks like when this control is incorrectly set. Figure 5 shows the correct setting.

VERTICAL HOLD CONTROL This control synchronizes the pictures at the receiver vertically with the transmitter. When out of adjustment, the picture may slip or revolve upwards or downwards at either a slow or fast rate. Turn the control in one direction. If the revolving motion is faster, then turn in other direction until the picture "locks in" as a single complete scene. See picture chart - Figure 18 illustrates the effect on the picture when this control is incorrectly set. Figure 5 shows the correct picture setting.

VERTICAL LINEARITY This is controlled by means of a screw driver adjustment. The adjustment must be correct and in conjunction with the Height control to give the correct Vertical proportions to the picture. It may require readjustment if the Vertical Centering control is reset. See picture chart - Figure 19 indicates the unbalance in Vertical Height of the picture when this control is incorrectly set. Figure 5 shows the correct setting.

SETTING RADIO STATION BUTTON CONTROLS The simplicity of the ANDREA RADIO push-button controls, requiring only the use of a thin-blade screw driver, makes it easy to set them accurately. This essential, for unless the controls are set exactly, the tone quality will be destroyed.

CHOOSING YOUR STATIONS Make a list of the desired six stations to operate on the push-buttons. Set down their call letters and put them in the order of their kilocycle rating, the highest at the left to correspond to station 1 selecting button at the left. The kilocycle tuning ranges of the button controls are as follows:

Extreme Left	Station 1 -	1100 to 1600 KC.
	Station 2 -	800 to 1450 KC.
	Station 3 -	700 to 1250 KC.
	Station 4 -	700 to 1250 KC.
	Station 5 -	580 to 1050 KC.
Extreme Right	Station 6 -	530 to 1000 KC.

It is necessary to choose stations whose kilocycle ratings come within these push-button tuning ranges. The ranges given in the list above are conservative. Consequently, it may be possible to tune in a station which is just outside the range of any particular push-button control. For example, on Station 3, although the range is shown as 700-1250 KC., it may be possible to tune in a station on 660 KC., or one on 1300 KC. Select the proper markers for the stations on your list, insert the markers in the same order as your kilocycle list, starting with Station 1 on the first button on the left. Do not attempt to glue the markers in place. In the event you want to change a marker, you can pry it out with the point of a pin.

ADJUSTING THE PUSH-BUTTON STATION CONTROLS Remove push-button escutsheon cover plate (Fig.1). All station adjustment screws and switch are now accessible for station adjustment from the front of the cabinet.

Remember to set the push-button adjusting switch: Located in the right hand corner of the push-button opening is a small lever. When adjusting the station controls, and only at that time, the lever should be turned to upper position, designated by red dot. Put wave band Selector switch in the "M" position for dial tuning.

Tune in the station manually, using call letters you have put on the first push-button. Then turn the Band switch to position "A". Push in the push-button you are going to adjust, and turn the volume control to maximum. When the set has been turned "ON" for at least 10 minutes so that it has become thoroughly warm, you will be ready to make the push-button adjustments. The adjusting screws can be reached easily. Each push-button has two adjustment controls marked "ANT" and "OSC", in pairs. The pair corresponding to Station 1 on your list at the extreme left. This set is so designed that the tuning indicator operates with the push-buttons as well as with manual tuning. Therefore, you can adjust the controls with absolute accuracy by watching the opening and closing of the indicator.

The exact setting for each adjustment is obtained when the Mystic Ray indicator is closed as far as possible.

Use a thin-blade screw driver to adjust the screws: Do not force a thick blade into the slots. First adjust the oscillator screw for Station 1, turning it until you hear the station you tuned in previously on the dial. If the speaker breaks into a howl during this adjustment, turn the Station 1 antenna screw to the right or left until the howl stops.

After you have an accurate setting of the oscillator screw, adjust the corresponding antenna screw for maximum volume. The final adjustment should be made by turning the oscillator screw while you watch the opening of the Mystic Ray indicator. Then, in the same way, get a final adjustment for the antenna screw.

Repeat the same routine adjustments for Station 2 by tuning the station on the dial first with Wave Selector switch in "M" position, then changing "OSC" screws. Continue this method for each station and button.

To check the accuracy of the settings, turn the Wave Band switch to position "M". The station should sound practically the same whether the switch is in the "A" or "M" position. If there is considerable difference, the station is not tuned accurately with the dial, or else the corresponding push-button controls were not set correctly.

To change any button to another station, if the station's kilocycle rating is within the range of the corresponding controls, it is only necessary to put in a new button marker, and to reset the controls in accordance with the preceding instructions.

CAUTION This is very important: When all adjustments have been made, it is necessary to touch up each one again, to assure absolute accuracy. After this has been done, turn the push-button adjusting lever down to black dot marked normal operation. Otherwise, loss of efficiency and quality will result. Replace push-button escutscheon cover plate, taking care that the holes in cover align with buttons.

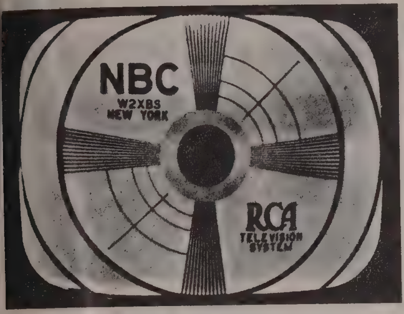


Figure 5—

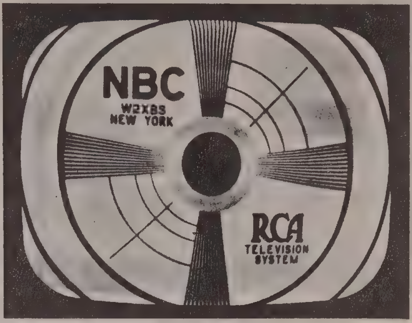


Figure 6—

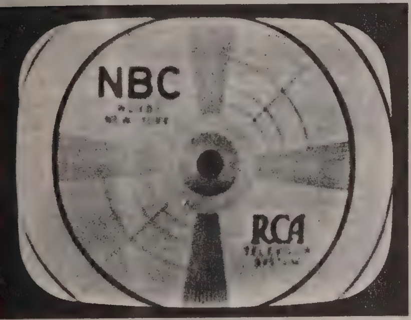


Figure 7—

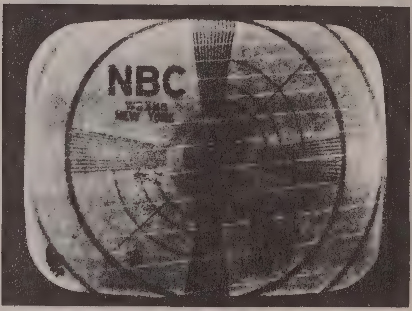


Figure 8—

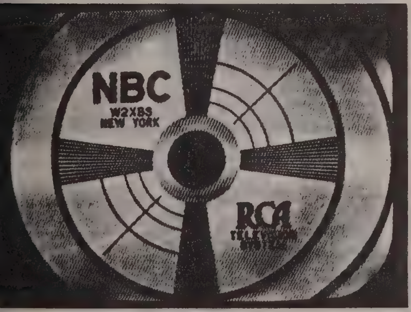


Figure 9—

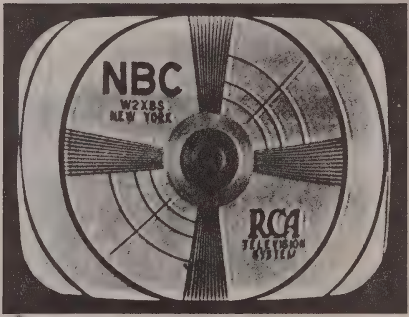


Figure 10—

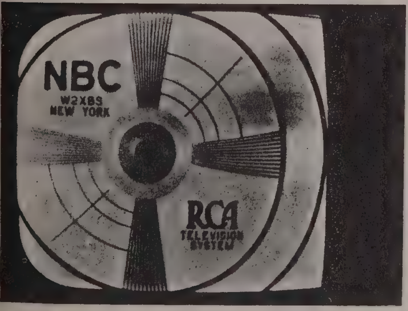


Figure 11—

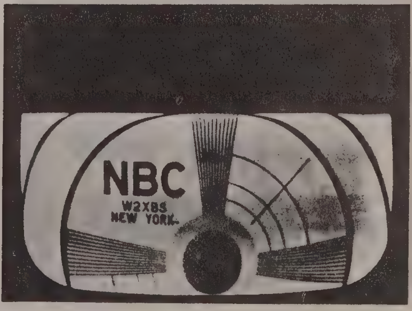


Figure 12—

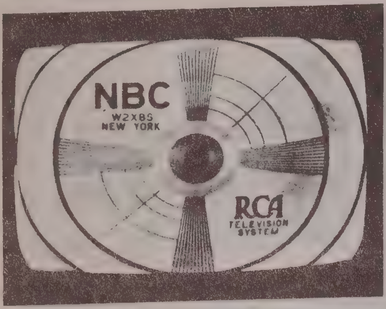


Figure 13—

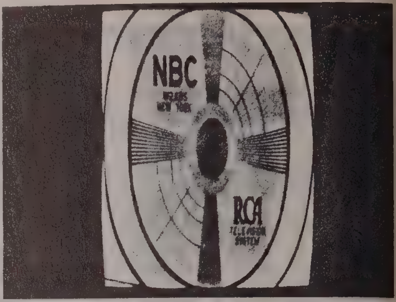


Figure 14—

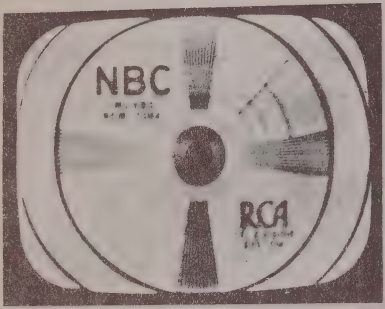


Figure 15—

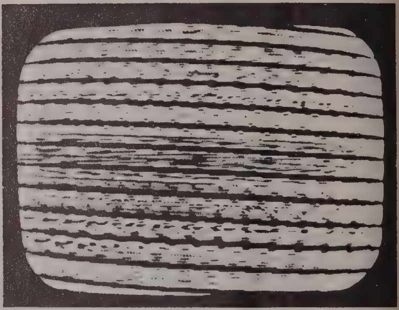


Figure 16—

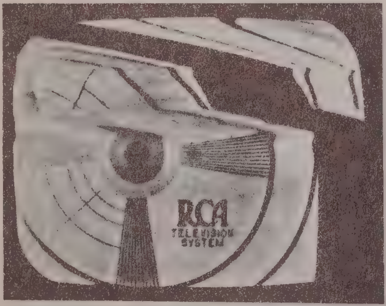


Figure 17—

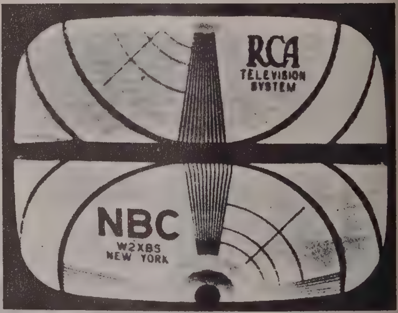


Figure 18—

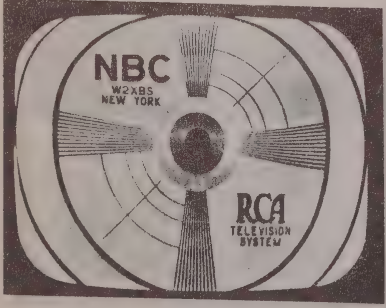


Figure 19—

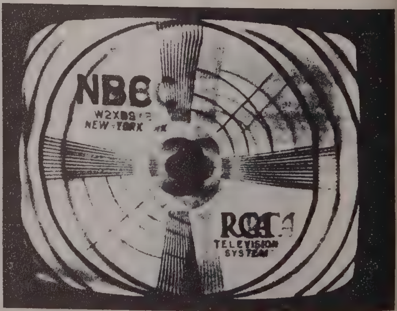
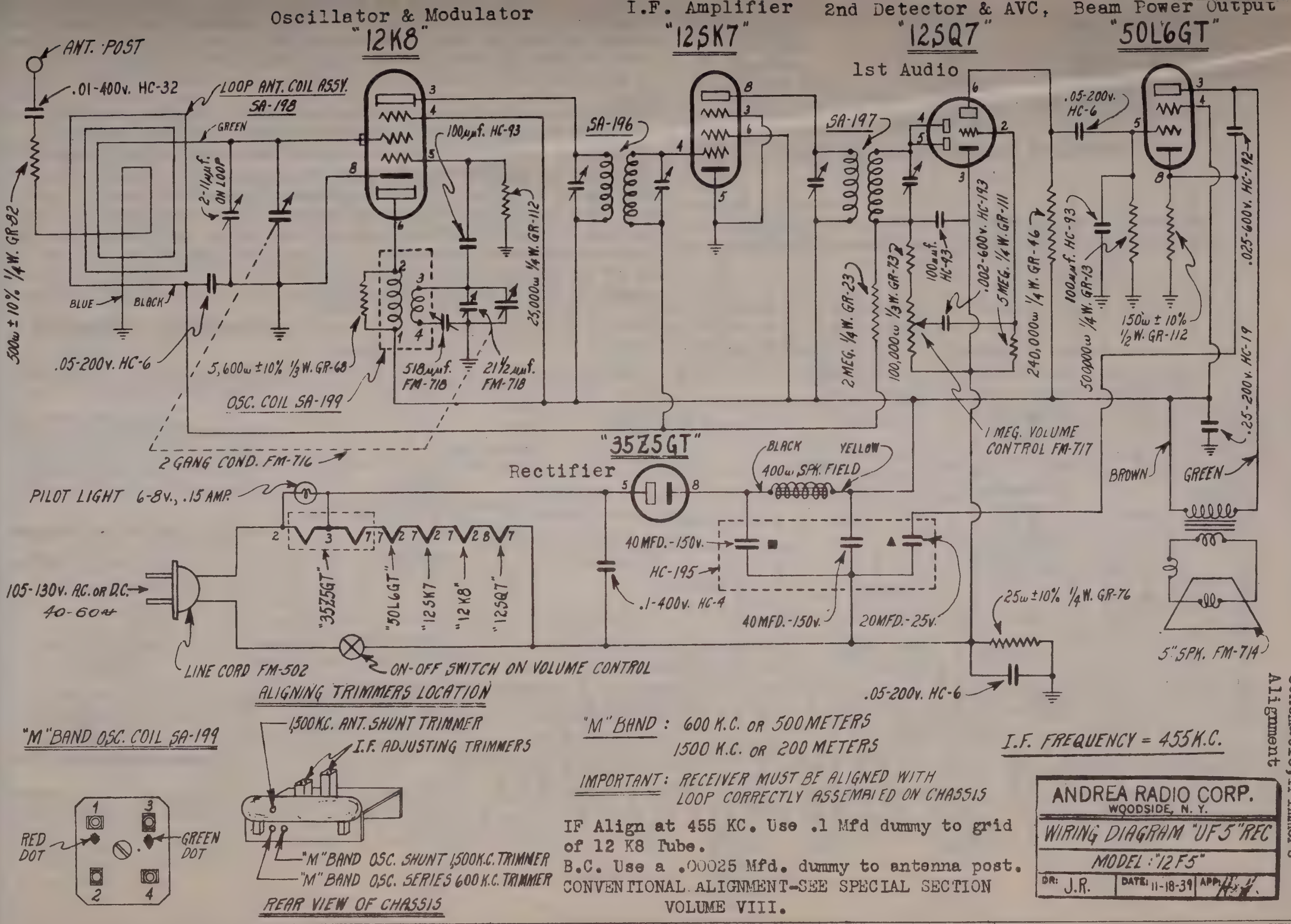


Figure 20—

ANDREA RADIO CORP.

MODEL 12F5
Chassis UF-5
Schematic,Trimmers
Alignment



"M" BAND : 600 K.C. OR 500 METERS
1500 K.C. OR 200 METERS

IMPORTANT: RECEIVER MUST BE ALIGNED WITH LOOP CORRECTLY ASSEMBLED ON CHASSIS

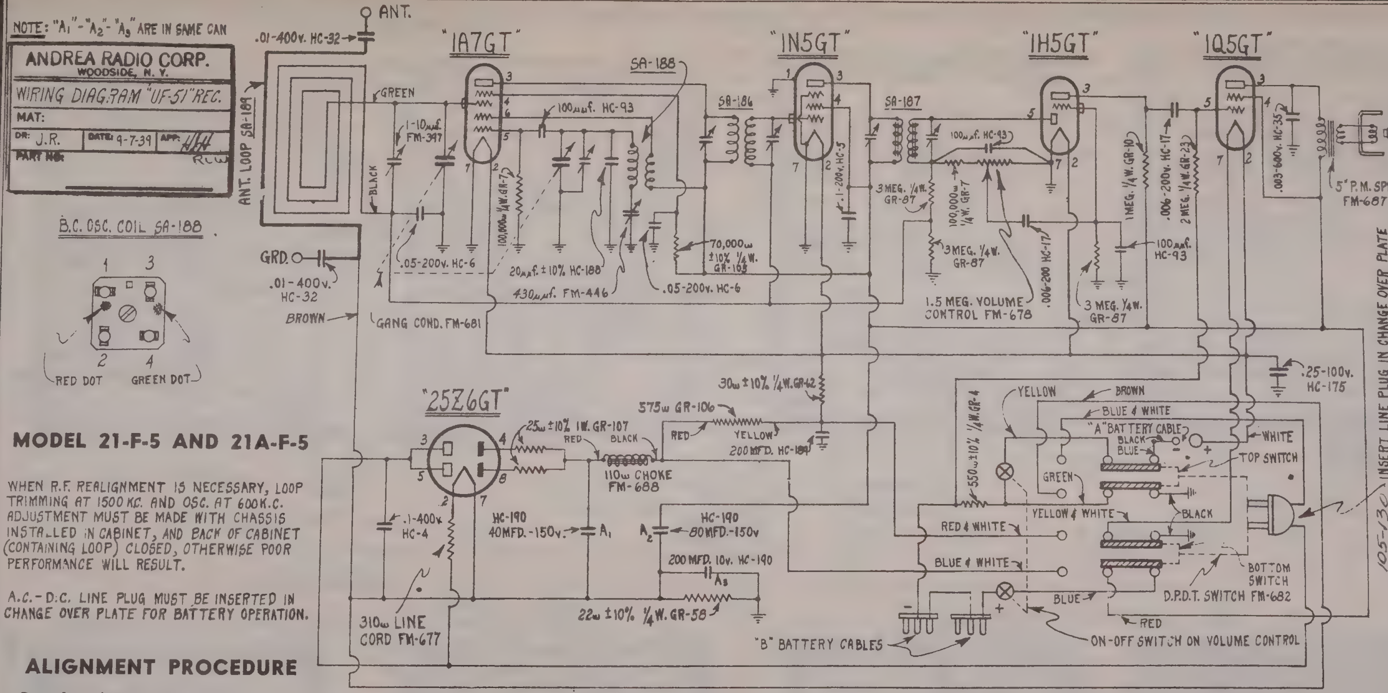
I.F. FREQUENCY = 455 K.C.

IF Align at 455 KC. Use .1 Mfd dummy to grid of 12 K8 Tube.
B.C. Use a .00025 Mfd. dummy to antenna post.
CONVENTIONAL ALIGNMENT-SEE SPECIAL SECTION VOLUME VIII.

ANDREA RADIO CORP.
WOODSIDE, N. Y.
WIRING DIAGRAM "UF5" REC
MODEL: "12F5"
DR: J.R. DATE: 11-18-39 APP:

MODELS 21F5,21AF5
Chassis UF-51
Schematic,Alignment

ANDREA RADIO CORP.



MODEL 21-F-5 AND 21A-F-5

WHEN R.F. REALIGNMENT IS NECESSARY, LOOP TRIMMING AT 1500 KC. AND OSC. AT 600 K.C. ADJUSTMENT MUST BE MADE WITH CHASSIS INSTALLED IN CABINET, AND BACK OF CABINET (CONTAINING LOOP) CLOSED, OTHERWISE POOR PERFORMANCE WILL RESULT.

A.C.-D.C. LINE PLUG MUST BE INSERTED IN CHANGE OVER PLATE FOR BATTERY OPERATION.

ALIGNMENT PROCEDURE

Set the signal generator at 455 kc., and connect the high side to the grid of the 1A7GT, through a .1 mfd. condenser. Align the two trimmers on the 1st and 2nd I.F. transformers, indicated in the illustration, for maximum output.

Connect the high side of the signal generator through a 200 mmfd. condenser to the ANT post of the receiver, and the ground side to the GND post of the receiver. Connect a copper-oxide meter across the voice coil of the loudspeaker.

Set the signal generator at 1500 kc., the dial pointer at 1500 kc., and adjust the oscillator trimmer on the gang condenser for maximum output.

With the back of the set closed, remove the plug button at the rear of the case and adjust the loop shunt condenser through the hole for maximum output at 1500 kc.

Set the signal generator at 600 kc., and the dial pointer on the set at 600 kc. Remove the plug button at the back of the case, and adjust the oscillator series condenser through the hole for maximum output. While you make this adjustment, rock the tuning condenser control knob slightly for each small adjustment of the oscillator series condenser. Otherwise, the alignment will not be accurate.

I.F. = 455 K.C.

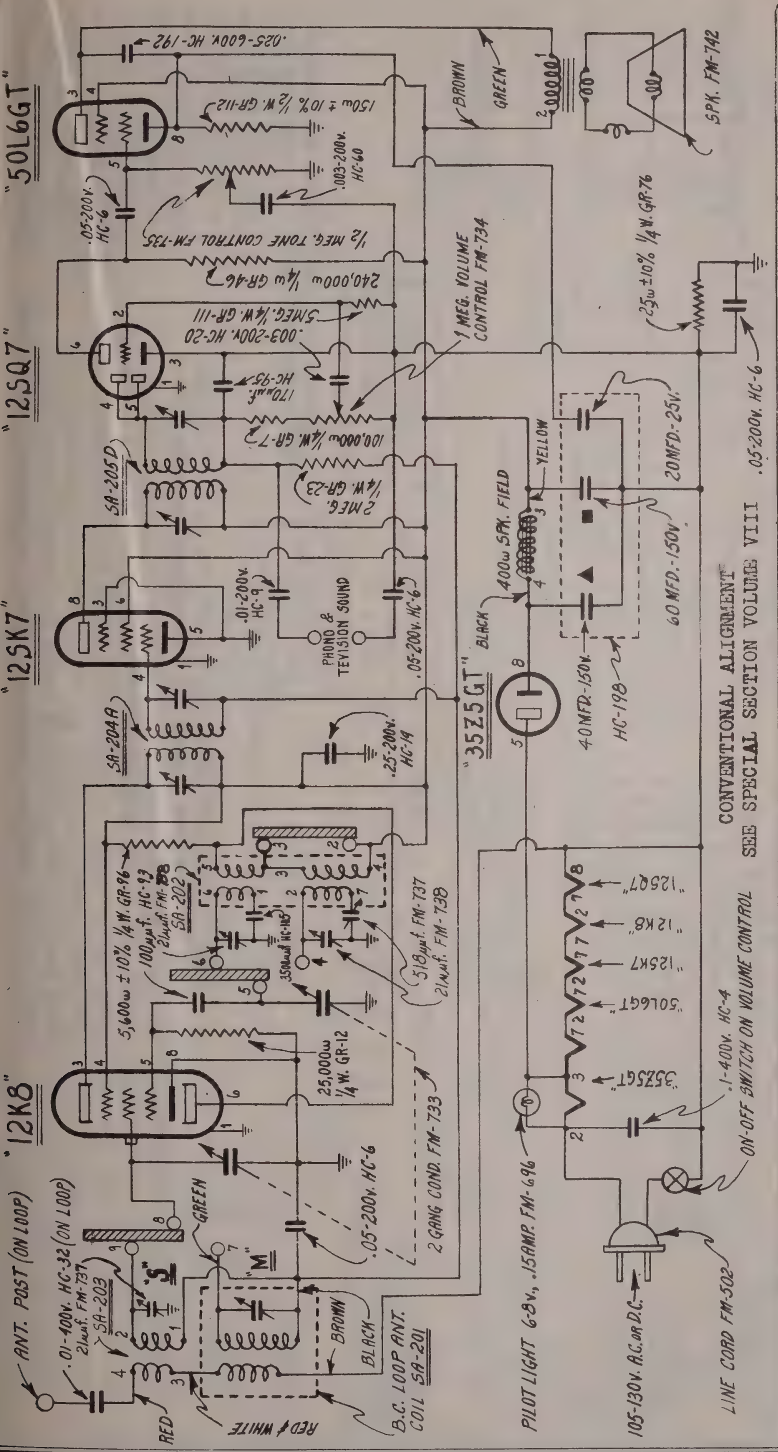
Set the signal generator at 1500 kc., and check the dial calibration. If the calibration is off, readjust the oscillator shunt trimmer on the gang condenser.

TABLE OF REPLACEMENT BATTERIES

NAME	TYPE NO. OF "A" BATTERY	TYPE NO. OF "B" BATTERIES
Bright Star	No. 860	30-30
Burgess	No. 8F	B30
Eveready	No. 741	762
Usalite	No. 635	624

MODEL 25G5
Chassis UG5S
Schematic,Coils
Trimmers,Alignment

ANDREA RADIO CORP.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

NOTE:
BAND SELECTOR SWITCH SHOWN ON "S" BAND POSITION, TO THE EXTREME CLOCKWISE POSITION.

ANDREA RADIO CORP.
WOODSIDE, N. Y.
WIRING DIAGRAM "UG5S" REC.
MODEL: "25G5"
DR: J.R. | DATE: 2-2-40 | APP:
PART NO.

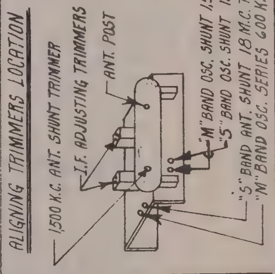
I.F. FREQUENCY = 455 K.C.

"M" BAND: 600 K.C. OR 500 METERS
1,500 K.C. OR 200 METERS

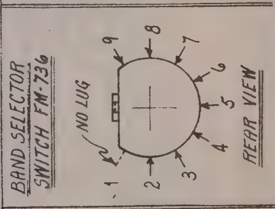
"S" BAND: 18 M.C. OR 16.67 METERS

IMPORTANT: RECEIVER MUST BE ALIGNED WITH LOOP CORRECTLY ASSEMBLED ON CHASSIS

ALIGNING TRIMMERS LOCATION

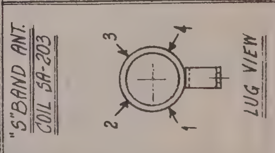

1,500 K.C. ANT. SHUNT TRIMMER
I.F. ADJUSTING TRIMMERS
ANT. POST
"M" BAND OSC. SHUNT 1,500 K.C TRIMMER
"S" BAND OSC. SHUNT 18 M.C. TRIMMER
"S" BAND ANT. SHUNT 18 M.C. TRIMMER
"M" BAND OSC. SERIES 600 K.C. TRIMMER

BAND SELECTOR SWITCH FM-736



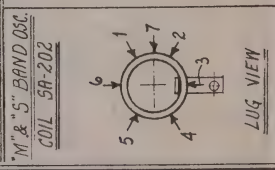
REAR VIEW

"S" BAND ANT. COIL SA-203



LUG VIEW

"M" & "S" BAND OSC. COIL SA-202

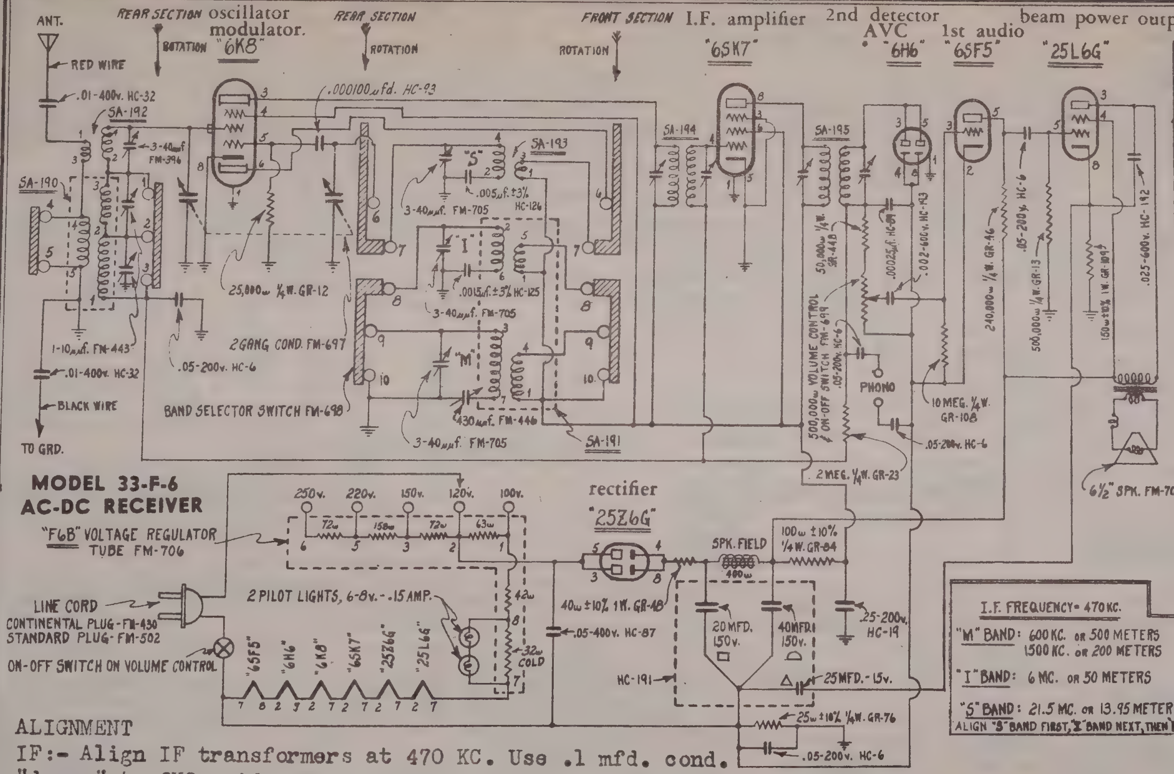


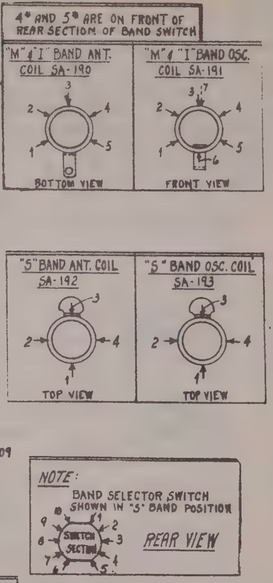
LUG VIEW

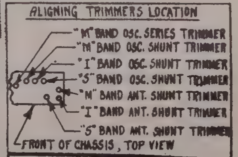
MODEL 33F6
Chassis UF6

ANDREA RADIO CORP.

Schematic, Trimmers
Alignment




4* AND 5* ARE ON FRONT OF REAR SECTION OF BAND SWITCH
"M" & "I" BAND ANT. COIL SA-190
BOTTOM VIEW
"M" & "I" BAND OSC. COIL SA-191
FRONT VIEW
"S" BAND ANT. COIL SA-192
TOP VIEW
"S" BAND OSC. COIL SA-193
TOP VIEW
NOTE:
BAND SELECTOR SWITCH SHOWN IN "S" BAND POSITION
SWITCH SECTION
REAR VIEW


ALIGNING TRIMMERS LOCATION
"M" BAND OSC. SERIES TRIMMER
"M" BAND OSC. SHUNT TRIMMER
"I" BAND OSC. SHUNT TRIMMER
"S" BAND OSC. SHUNT TRIMMER
"M" BAND ANT. SHUNT TRIMMER
"I" BAND ANT. SHUNT TRIMMER
"S" BAND ANT. SHUNT TRIMMER
FRONT OF CHASSIS, TOP VIEW

ANDREA RADIO CORP. - WOODSIDE, N. Y.		
WIRING DIAGRAM "UF6" REC.		
MAT:		
DR. J.R.	DATE 9-19-39	APP.
PART NO:		

ALIGNMENT

IF:- Align IF transformers at 470 KC. Use .1 mfd. cond. "dummy" to 6K8 grid.

"S" Band:- Use 400 ohm series "dummy" to antenna (red) lead, switch at "S". Align Osc. Shunt Trimmer at 21.5 mc. Peak at minimum capacity. Now adjust antenna shunt Trimmer while rocking condenser, to maximum signal response.

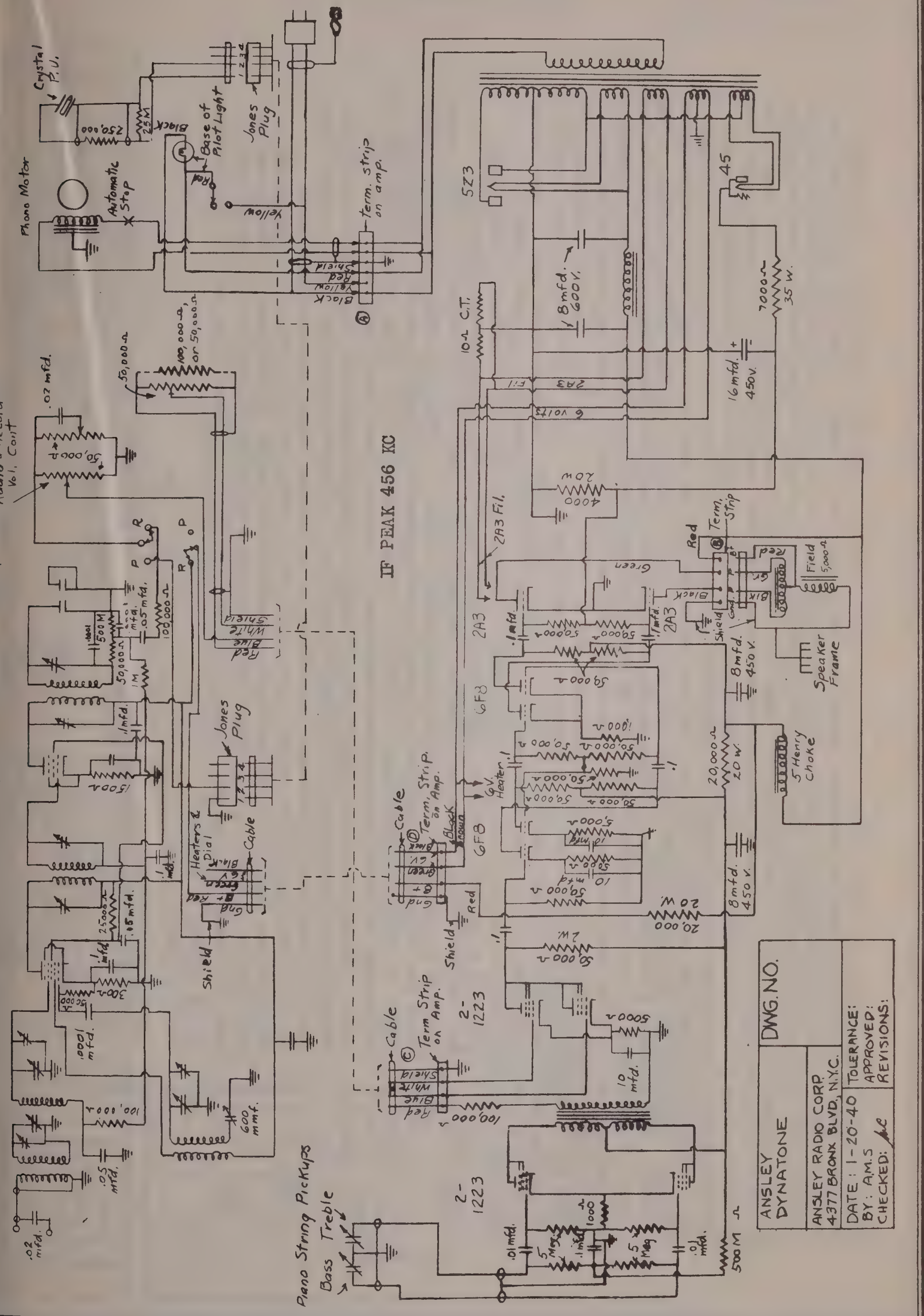
"I" Band:- With connections as for "S" band, switch at "I", dial and generator at 6 mc. align "I" Osc. Shunt Trimmer to maximum signal while rocking condenser.

"M" Band:-Use .00025 mfd. cond. as "dummy". Switch at "M", dial and generator at 1500 KC, adjust "M" Osc. Shunt, then "M" Ant. Shunt trimmer to maximum response. Adjust "M" Series trimmer at 600 KC for maximum response. Check adjustment at 1500 KC

PHONOGRAPH RECORDS: Use a pick-up of 2,000 to 8,000 ohms. Lower resistance requires a matching transformer

ANSLEY RADIO CORP.

MODEL Dynatone
Schematic



DWG. NO.

ANSLEY
DYNATONE

ANSLEY RADIO CORP.
4377 BRONX BLVD. N.Y.C.

DATE: 1-20-40
BY: A.M.S
CHECKED:

TOLERANCE:
APPROVED:
REVISIONS:

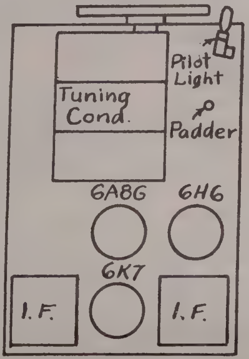
]

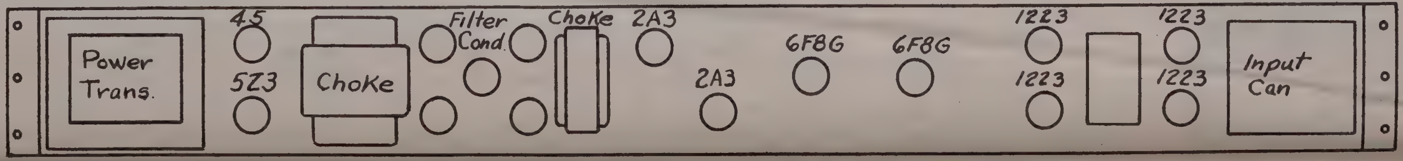
MODEL Dynatone
Socket,Notes

ANSLEY RADIO CORP.

SERVICE: ELECTRICAL SYSTEM. The most common cause of trouble is dirt falling bet. strings and pick-up heads causing noise. To elim. this shut off current, press down sustaining pedal, and bang on keys up and down the keyboard. If not dislodged take off back panel and blow out obstruction with hand bellows. Another source of trouble might be tube with microphonic characteristics, which would show up as high-pitched whistle or singing noise in speaker. If any note is too loud or soft take off back panel, trace strings to lower end, loosen lock nut and turn screw back a bit to soften, or in a bit to louden the note, being careful that pick-up head never touches strings at their extreme of vibration. Tighten lock nut after this operation. Amplifier is located under top cover. For tuning strings remove the 2 large screws holding amplifier brackets to back frame. Amp. can then be tilted back and held in raised pos. by 2 hinged wooden strips designed to hold it up for tuning or service. INSTALLATION (AC only). Ground spring clip. If pilot light does not indicate current flowing, a fuse in cable plug may have blown out. Use a five-ampere fuse - never more than 10-ampere. Connect lead-in wire from aerial to upper binding post marked "ANT." Gnd.conn. in cable usually suffices, but may be improved if cable clip is conn. to plate of wall socket, extra gnd.wire run from lower bind. post to clamp on radiator or pipe. CONTROLS: RADIO DIAL. Covers standard American bc band, 550 to 1,600 kc. TUNING KNOB. Operating pointer on radio dial. TONE CONTROL KNOB. For records and radio - variable. Turned to left, high freq. reduced, static and needle scratch reduced; to right for high fidelity. VOL. CONTROL KNOB. For records and radio, increasing to right. Should be turned to "off" pos. when neither is in use, or when switching from one to the other. DYNAPHONE TURNTABLE. Motor speed regulator set for correct 78 r.p.m. with pointer in center of scale. MAIN SWITCH & PILOT LIGHT. Pilot light glows if power is on. VOL. CONTROL FOR DYNATONE. Turned to extreme left there is no amplification and harpsichord quality is produced; to right, piano quality; in median pos., to 6-ft. grand piano. Should be turned off when Dynaphone or Radio is in use, unless to accompany a record at the keyboard. SOFT PEDAL, at left. SUSTAINING PEDAL, at right. Keyboard and action are standard in every way. Pedals are regular soft and sustaining or "loud", having usual functions in correct location of the lyre of the grand piano. There is nothing unusual about playing the ANSLEY DYNATONE. The pianist simply has the privilege of altering the general volume level and character of the tone by means of the controls provided; an advantage the earlier or acoustical piano cannot offer.

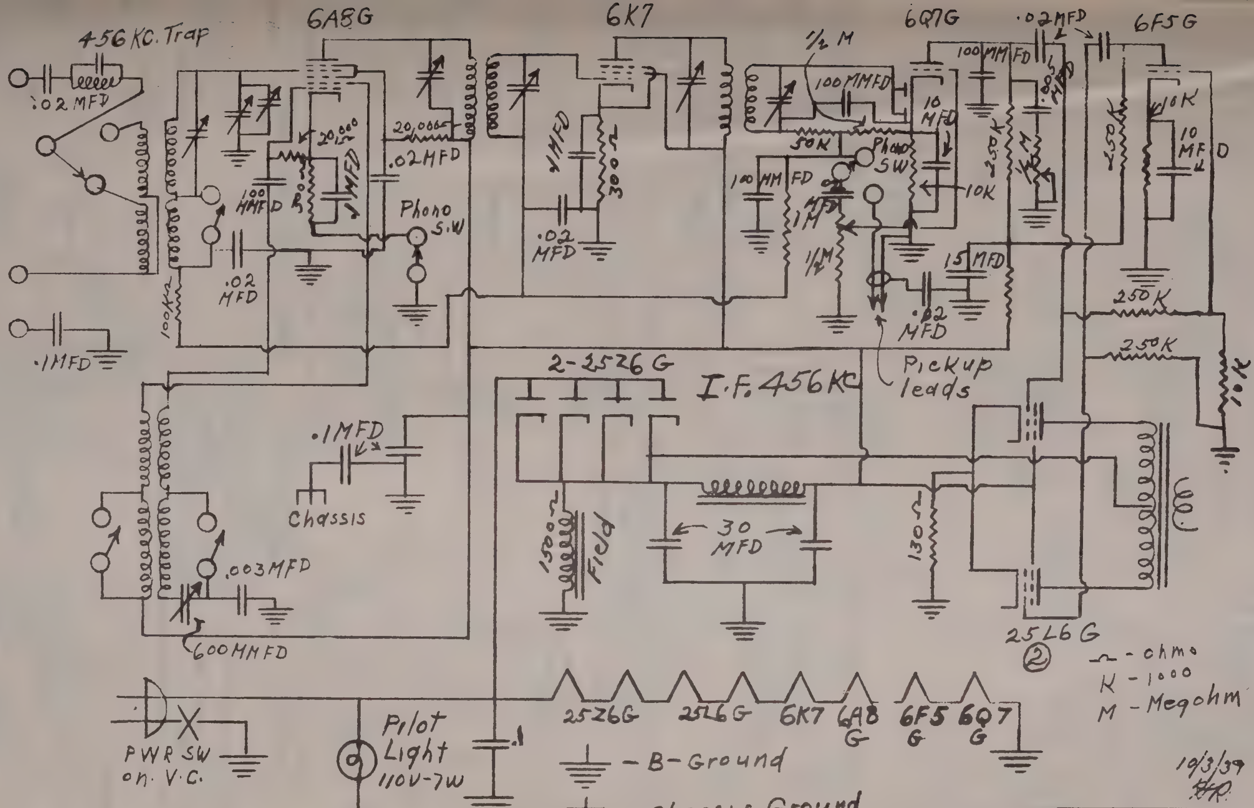
Below the keyboard at the right, back of the small door, are the customary controls for Dynaphone and Radio. In case of serious trouble with amplifier and power units, it may be necessary to disconnect and return to the factory. All connections to these parts are made with detachable plugs. RADIO-DYNAPHONE SELECTOR KNOB. Turn to the left to play records, to the right for radio.

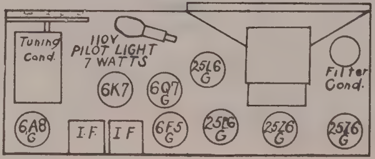




ANSLEY RADIO CORP.

MODELS D-9-A, D-10-A
Part 2.20
Schematic, Socket



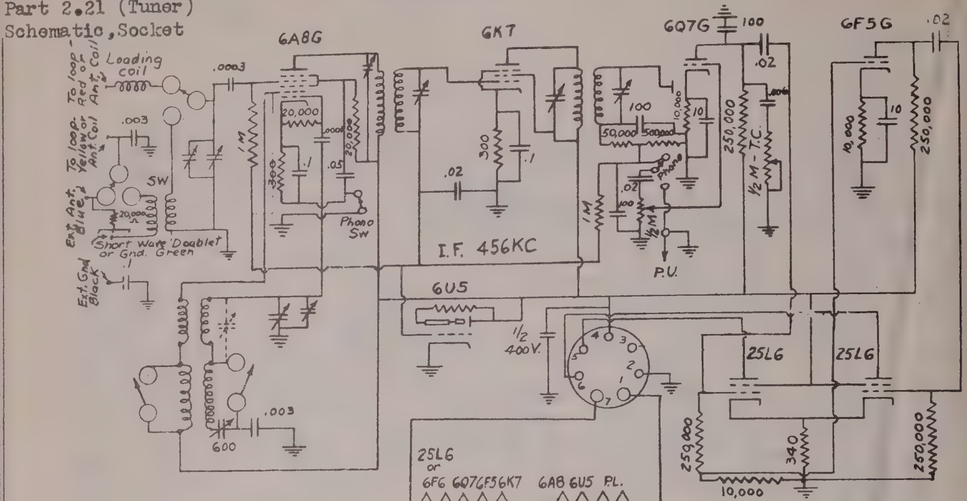


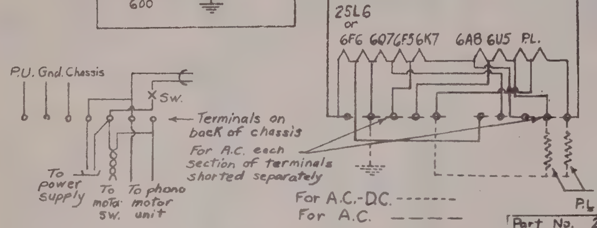
AERIAL. Three wires are brought out from the chassis. Green, Blue and Black. For the usual indoor aerial or single outside aerial, the Green and Black wires are connected together and the aerial connected to the Blue wire. Sometimes a ground connected to the Black and Green wires improves reception. If a special noise reducing aerial is used, the two leads from this aerial are connected to the Blue and Green wires and the Black wire is connected to a ground.

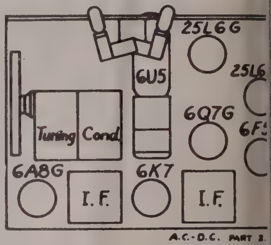
MODELS D-17A, D-18A, D-23A
D29, D30
Part 2.21 (Tuner)
Schematic, Socket

ANSLEY RADIO CORP.

Parts No. 1.10, 1.
S.P.U. Schematics





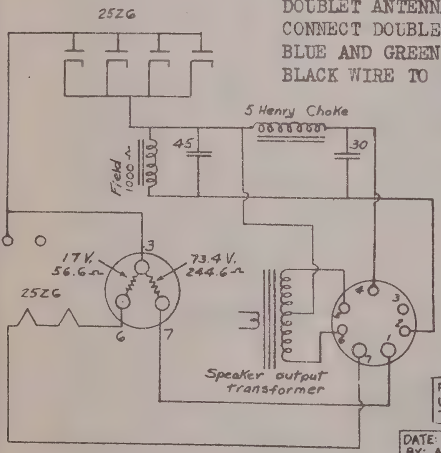


Part No. 2.21
A.C.- D.C. or A.C.
Tuner

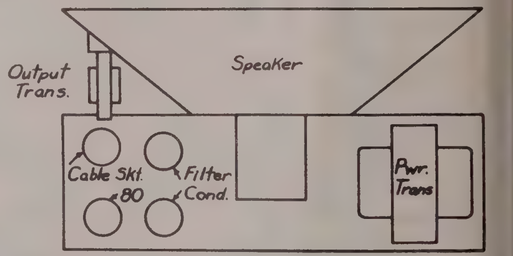
Date: 11-10-39
By: A.M.S.
Checked:

Used on Models - D-17-A, D-18-A, D-23-A, D-29, D-30.

DOUBLET ANTENNA
CONNECT DOUBLET LEADS TO BLUE AND GREEN LEADS, BLACK WIRE TO GROUND.



PART No. 1.11 A.C.-D.C. POWER SUPPLY
Used with 2.21 Tuner



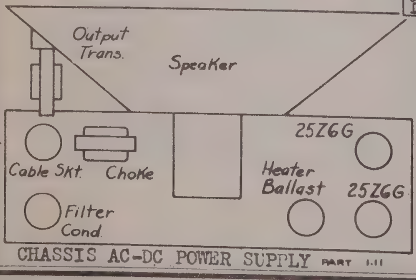
CHASSIS AC POWER SUPPLY

PART 1.

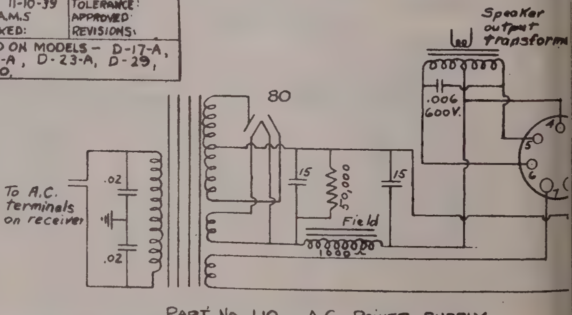
POWER SUPPLIES USED WITH 2.21 TUNER

DATE: 11-10-39 BY: A.M.S CHECKED:	TOLERANCE: APPROVED: REVISIONS:

USED ON MODELS - D-17-A, D-18-A, D-23-A, D-29, D-30.



CHASSIS AC-DC POWER SUPPLY PART 1.11

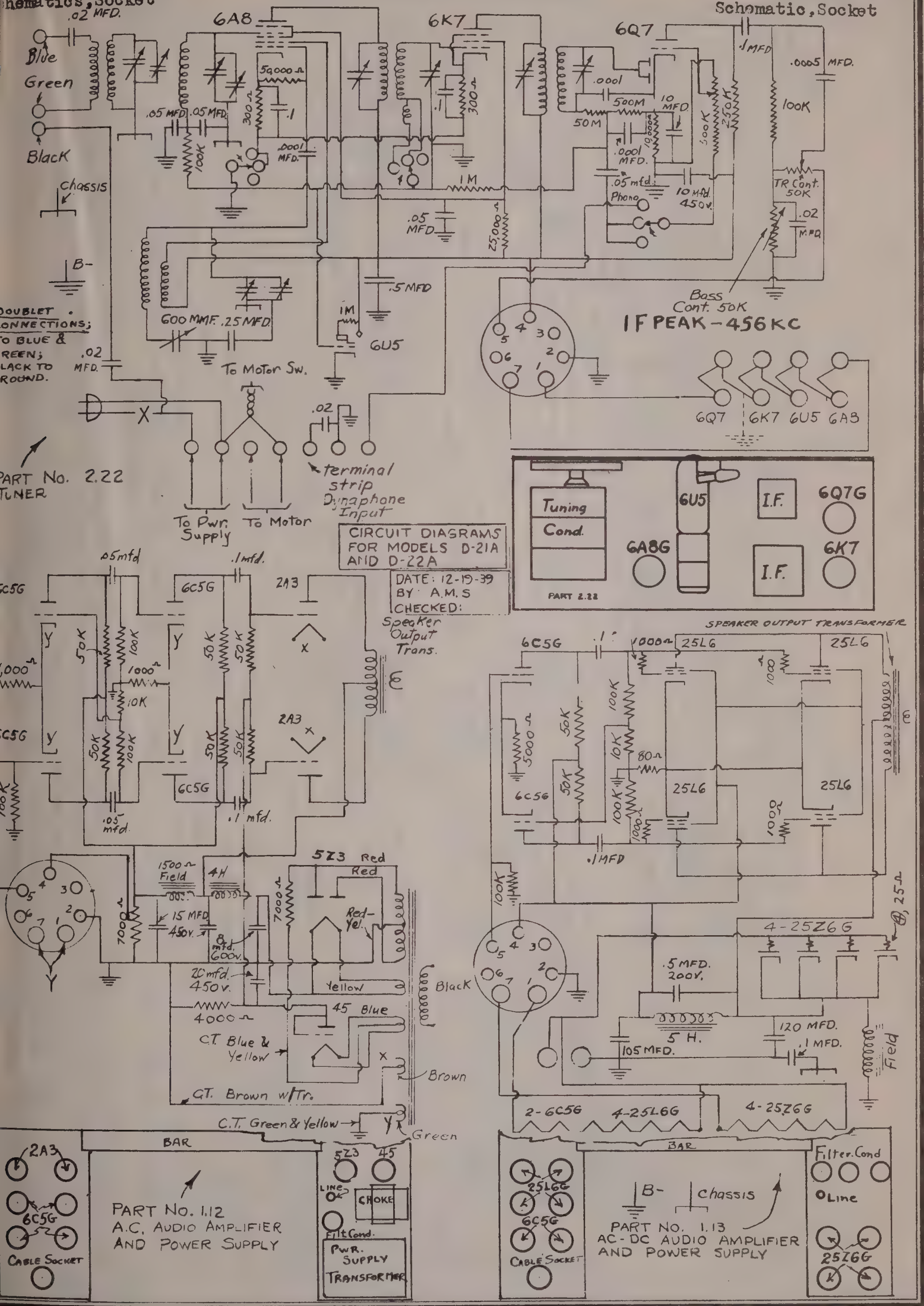


PART No. 1.10 A.C. POWER SUPPLY
Used with 2.21 Tuner

plifier-S.P.U.
rt Nos.1.12, 1.13
hematics,Socket

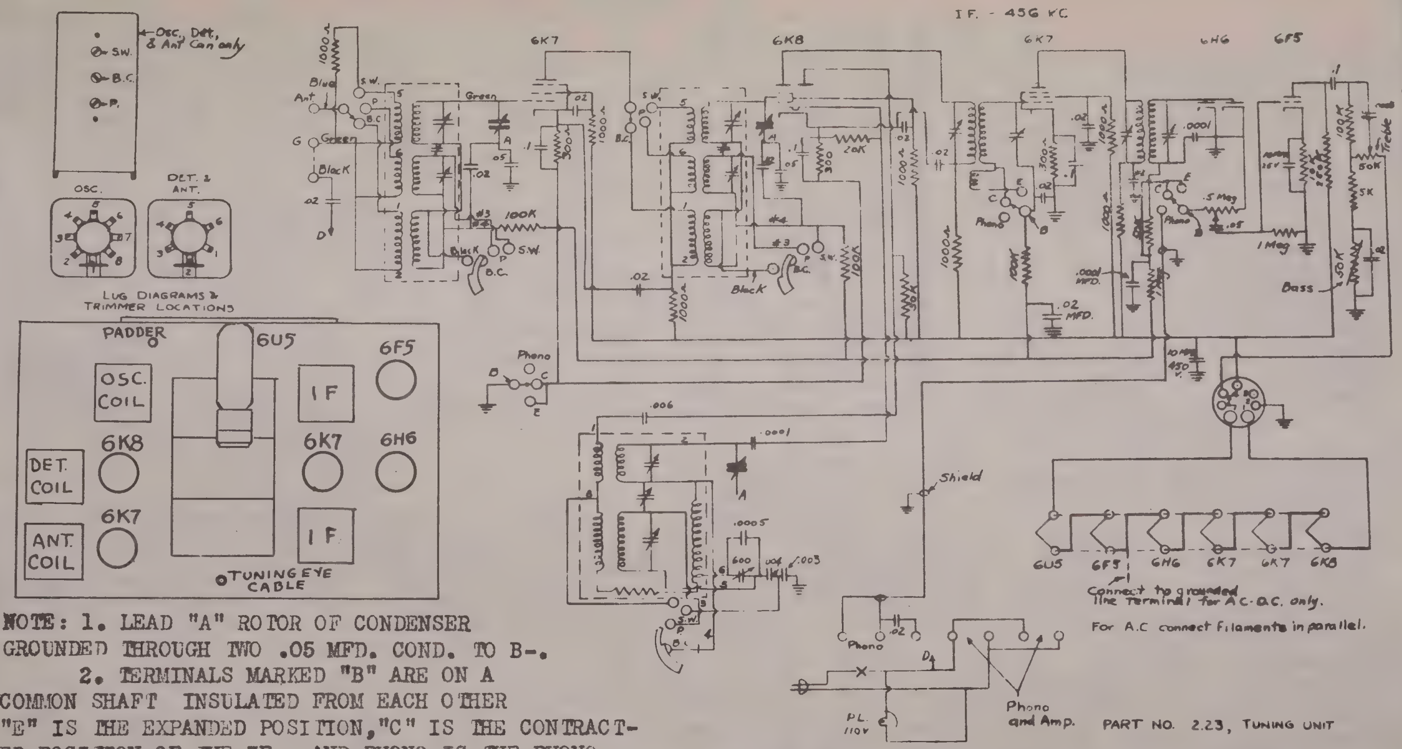
ANSLEY RADIO CORP.

MODELS D-21A,D-22A
Tuner Part No. 2.22
Schematic,Socket



MODELS D-24A, D-25A
Part No. 2.23
Schematic,Socket,Notes

ANSLEY RADIO CORP.



NOTE: 1. LEAD "A" ROTOR OF CONDENSER GROUNDED THROUGH TWO .05 MFD. COND. TO B-.

2. TERMINALS MARKED "B" ARE ON A COMMON SHAFT INSULATED FROM EACH OTHER "E" IS THE EXPANDED POSITION, "C" IS THE CONTRACTED POSITION OF THE IF, AND PHONO IS THE PHONOGRAPH POSITION

3. LEADS MARKED "D" ARE CONNECTED TOGETHER.

FOR AC AND AC-DC AMPLIFIERS AND POWER SUPPLIES (PARTS 1.12 AND 1.13) USED WITH THESE MODELS SEE INDEX.

AERIAL AND GROUND CONNECTIONS. If a regular indoor or outside aerial is used, connect it to the Blue wire and connect the Green and Black wires together to a ground connection --(a water pipe or radiator). If a special "doublet" aerial is used, connect the two leads from this to the Blue and Green wires and connect the Black wire to the ground.

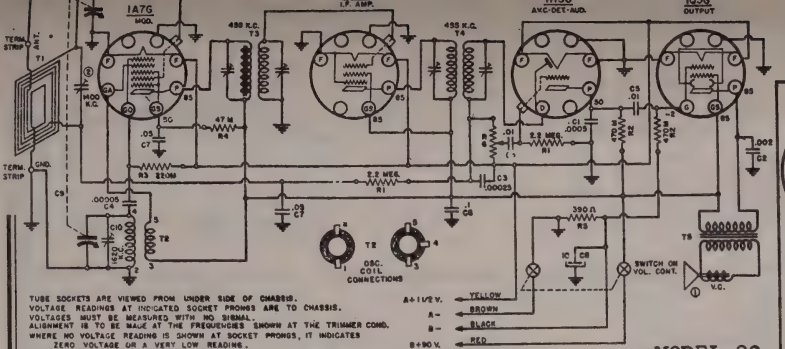
CIRCUIT DIAGRAM / FOR MODELS D-24A AND D-25A

DATE: 1-8-40
BY A.M.S.
CHECKED

hematics,Socket,Voltage
immers,Alignment

AUTOCRAT RADIO CO.

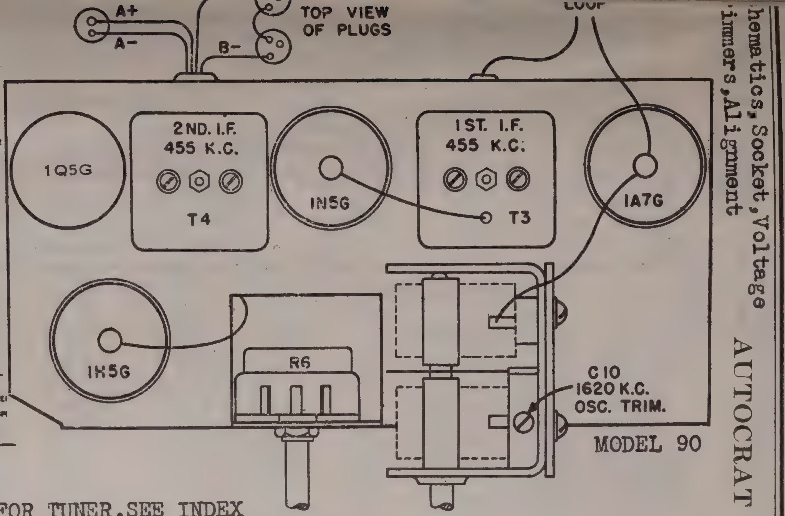
MODEL 90
MODEL 106



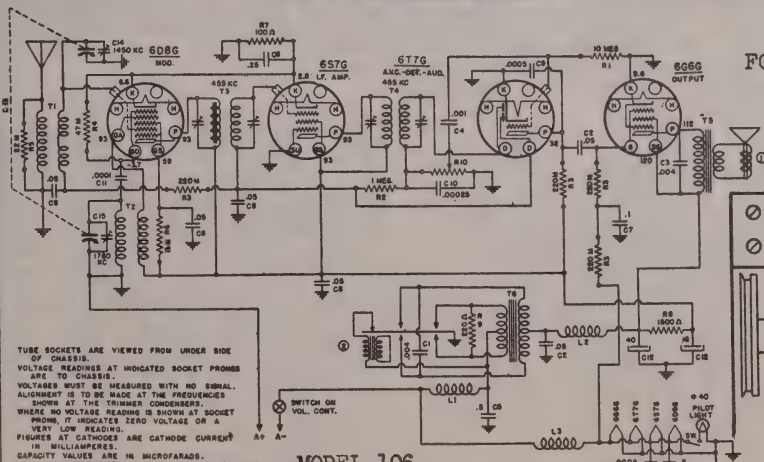
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS

MODEL 90

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R2	60-178	470 M OHM " " "
R3	60-180	220 M " " " "
R4	60-177	47 M " " " "
R5	60-221	390 Ω " " " "
R6	24-130	VOLUME CONTROL 1 MEGOHM
C1	15-112	.0005 MFD. MICA CONDENSER
C2	15-114	.002 " " "
C3	1504	.00025 " " "
C4	1503	.00005 " " "
C5	16-119	.01 MFD. 400 V. TUBULAR CONDENSER
C6	16-115	.1 " 200 V. " "
C7	1622	.05 " " " "
C8	18-243	10 " 25 V. ELECTROLYTIC
C9	19-137	2 GANG VARIABLE CONDENSER ALSO C10
T1		ANTENNA LOOP
T2	10-257	OSCILLATOR TRANS.
T3	10-251	1 ST. I.F. TRANSFORMER
T4	10-261	2 ND. " "
T5		OUTPUT TRANS. ON SP
1	79-262	5" P.M. SPEAKER
2	20-123	ANT. LOOP TRIMMER



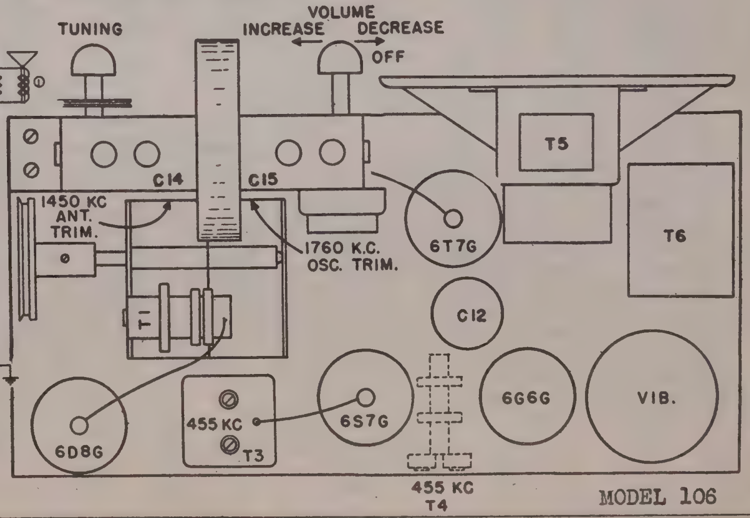
FOR TUNER, SEE INDEX



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.

MODEL 106

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/3 W RESISTOR
R2	60-195	1 " " "
R3	60-180	220 M OHM " "
R4	60-177	47 M " " "
R5	60-185	22 M " " "
R6	60-202	15 M " " "
R7	60-197	100 " " "
R8	60-203	1500 " 1/2 W "
R9	60-199	220 " " "
R10	24-124	VOLUME CONTROL 500M Ω
C1	16-127	.004 MFD. 1000 V. BUFFER COND
C2	1607	.05 " 400 V TUB. CONDENSER
C3	16-125	.004 " " " "
C4	16-124	.001 " " " "
C5	16-112	.5 " 200 V. " "
C6	16-120	.25 " " " "
C7	16-115	.1 " " " "
C8	1622	.05 " " " "
C9	15-112	.0005 " MICA CONDENSER
C10	1504	.00025 " " "
C11	1501	.0001 " " "
C12	18-236	40 X 16 MFD ELECTROLYTIC
C13	19-132	2 GANG VARIABLE CONDENSER C14 & C15
T1	10-239	ANTENNA TRANSFORMER
T2	10-240	OSCILLATOR "
T3	10-253	1ST. I.F. "
T4	10-252	2 ND. I.F. "
T5		OUTPUT TRANS. (ON SPKR.)
T6	80-160	VIBRATOR TRANSFORMER
L1	33-217	VIBRATOR CHOKE
L2	10-246	R.F. "B" "
L3	33-218	FILAMENT "
1	79-236	SPEAKER 5" P.M.
2	34-103	VIBRATOR



MODEL 106
Tuner Data
MODEL 148
MODEL 148-2

AUTOCRAT RADIO CO.

MODEL 168
Tuner,Alignment,Socket,Trimmer
MODEL 213 Phono-Oscillator
Schematic
MODEL 359 Tuner Data

SETTING PUSH BUTTONS MODELS 106,148,148-2,168,359.

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme rignt of the Call Letter Holder.

ALIGNMENT PROCEDURE MODELS 148,148-2,168.

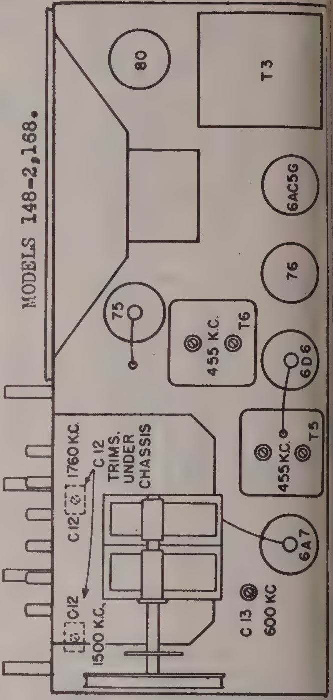
All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

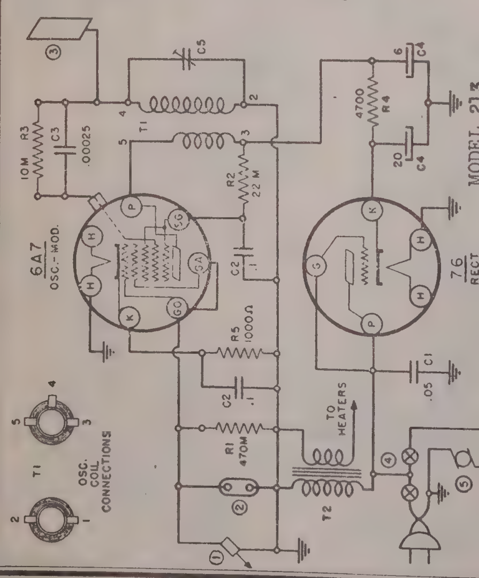
Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to plate of output tube and B+, or a low voltage A. C. meter may be used connected across speaker voice coil. The output meter remains connected during the entire alignment procedure.

Connect the signal generator to the grid cap of the 6A7 tube through a .1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. Set the dial to about 1000 K.C., feed in a 455 K.C. signal. Adjust first and second I.F. trimmers for maximum output. Refer to chassis lay-out for location of trimmers.

Turn the dial to the extreme high frequency end. Feed a 1760 KC signal to the receiver antenna lead through a .00025 MF mica condenser. Adjust the 1760 KC oscillator trimmer until maximum output is shown. Set the generator to 1500 KC and tune in this signal on the receiver. Then adjust the 1500 KC antenna trimmer to the maximum output. Then impress a 600 KC signal into the receiver antenna lead and tune in this signal on the receiver. Adjust oscillator padding condenser to the maximum output. Follow through with this procedure several times in order to obtain the best alignment adjustment possible. This completes the alignment.

MODELS 148-2,168.



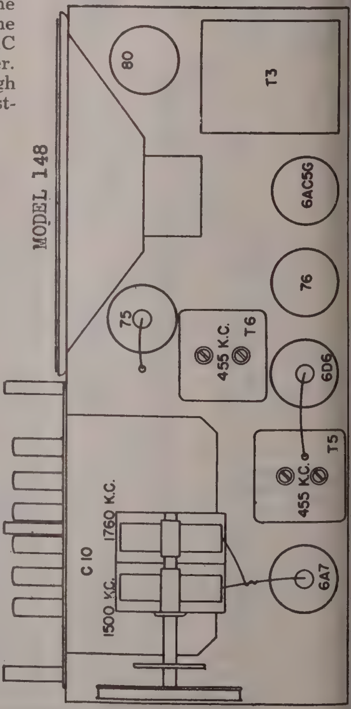


MODEL 213
Two Tube Phono-Oscillator.

9-21

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION
R1	60-178	470M. OHM 1/3 W. RES.	C1	1607	.05 MFD. 400V. TUB. COND.
R2	60-185	22 M " " "	C2	15-115	.1 " 200V. "
R3	60-215	10 M. " " "	C3	1504	.00025 MFD. MICA "
R4	60-189	4700 " " "	C4	18-241	20 X 6 MFD. 150V. ELECT.
R5	60-217	1000 " " "	C5	20-119	3 PLATE TRIMMER
1	83-130	PICKUP	T1	10-240	OSCILLATOR TRANS
2	12-1	MICROPHONE TERMINAL	T2	80-170	FILAMENT TRANS.
3	82-1	ANTENNA PLATE	5	59-1	PHONOGRAPH MOTOR
4	69-129	SWITCH (DUAL)			

MODEL 148



AUTOCRAT RADIO CO.

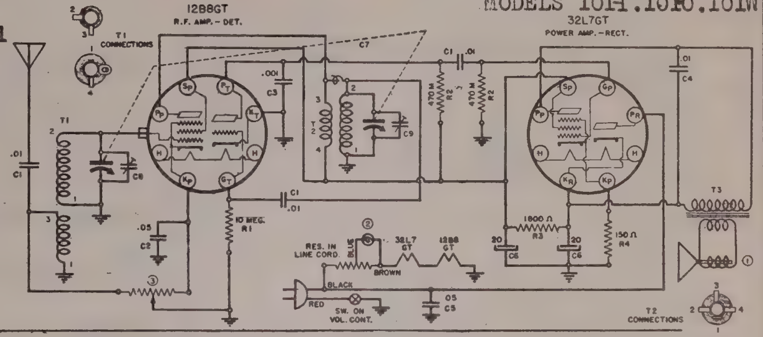
MODEL 91
MODEL 95
MODEL 98
MODELS 101-I.101-O.101W

MODEL 91

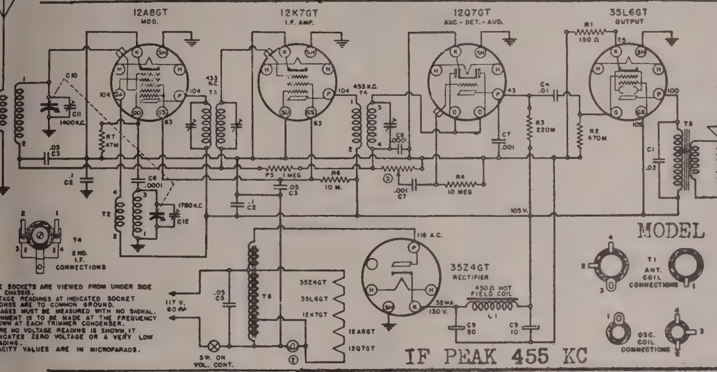
ODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/3 W RESISTOR
R2	60-178	470 M OHMS " "
R3	60-229	1800 " " "
R4	60-184	150 " " "

ODE	PART NO.	DESCRIPTION
C1	16-121	.01 MFD. 200V. TUBULAR COND.
C2	1622	.05 " " " "
C3	16-124	.001 " 400V. " "
C4	16-119	.01 " " " "
C5	1607	.05 " " " "
C6	18-249	20 X 20 MFD. 150V. ELECTROLYTIC
C7	19-147	2 GANG VAR. COND. (ALSO C8 & C9)

ODE	PART NO.	DESCRIPTION 9-22
T1	10-288	ANTENNA COIL
T2	10-289	R.F. COIL "
T3	80-176	OUTPUT TRANSFORMER
1	79-270	P. M. SPEAKER
2	-89-4	#47 PILOT LIGHT 150 MA.
3	24-136	VOLUME CONTROL WITH SWITCH



MODEL 95



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE
CHASSIS.
TAGE READINGS AT INDICATED SOCKET
ONGS ARE TO COMMON GROUND.
AGES MUST BE MEASURED WITH NO SIGNAL.
NMENT IS TO BE MADE AT THE FREQUENCY
OWN AT EACH TRIMMER CONDENSER.
RE NO VOLTAGE READING IS SHOWN IT
NCATES ZERO VOLTAGE OR A VERY LOW
ADING.
ACITY VALUES ARE IN MICROFARADS.

IF PEAK 455 KC

CODE	PART NO.	DESCRIPTION
C1	16-123	.02 MFD. 200 V. TUBULAR CONDENSER
C2	16-115	.1 " " " "
C3	1622	.05 " " " "
C4	16-121	.01 " " " "
C5	1607	.05 " 400 V. " "
C7	16-124	.001 " 200 V. "
C8	1501	.0001 " MICA CONDENSER
C9	18-241	20 X 10 MFD. ELECTROLYTIC COND. 150 V.
C10	19-144	2 GANG VARIABLE CONDENSER. ALSO C11 & C12

CODE	PART NO.	DESCRIPTION
R1	60-184	150 OHM 1/3 W. RESISTOR
R2	60-178	470 M " " "
R3	60-180	220 M " " "
R4	60-193	10 MEG " " "
R5	60-195	1 " " " "
R6	60-215	10 M. " " "
R7	60-177	47 M. " " "
L1		FIELD COIL (ON SPEAKER)

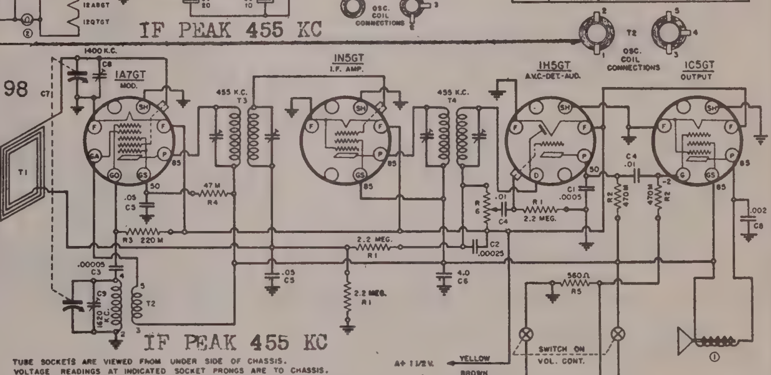
CODE	PART NO.	DESCRIPTION 9-55
T1	10-270	ANTENNA TRANSFORMER
T2	10-272	OSCILLATOR "
T3	10-269	1 ST. I.F. "
T4	10-271	2 ND. I.F. "
T5		OUTPUT TRANS. (ON SPKR.)
T6	80-172	POWER TRANSFORMER
1	79-266	5" DYNAMIC SPEAKER
2	89-4	PILOT LIGHT #47
3	24-132	VOLUME CONTROL & SWITCH

MODEL 98

	PART NO.	DESCRIPTION
	15-112	.0005 MFD. MICA CONDENSER
	1504	.00025 " " "
	1503	.00005 " " "
	16-121	.01 MFD. 200 V. TUBULAR CONDENSER
	1622	.05 " 200 V. " "
	18-250	4.0 " 150 W.V. " "
	19-149	2 GANG VARIABLE COND. ALSO C8 & C9
	1609	.002 MFD. 400 V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R2	60-178	470 M OHM " " "
R3	60-180	220 M " " " "
R4	60-177	47 M " " " "
R5	60-201	560 Ω " " " "
R6	24-138	1 MEGOHM VOLUME CONTROL

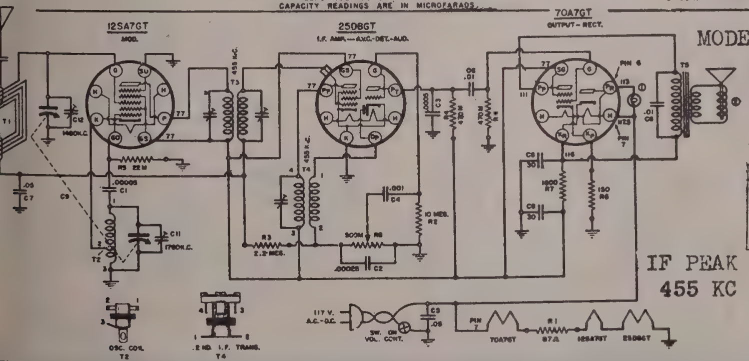
CODE	PART NO.	DESCRIPTION 0-40
T1	82-2	ANTENNA LOOP
T2	10-294	OSCILLATOR COIL
T3	10-293	1 ST. I.F. TRANSFORMER
T4	10-291	2 ND. "
1	79-272	5" SPEAKER



IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES
ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS.

MODELS 101-I, 101-O, 101W.



IF PEAK 455 KC

CODE	PART NO	DESCRIPTION
C1	1503	.00005 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	15-113	.005 " " "
C4	15-111	.001 " " "
C5	1607	.05 " 400 V. TUBULAR CONDENSER
C6	16-121	.01 " 200 V. " "
C7	1622	.05 " " " "
C8	18-251	30 X 30 " 150 W.V. ELECTROLYTIC COND.
C9	19-150	2 GANG VARIABLE COND. ALSO C12 & C11

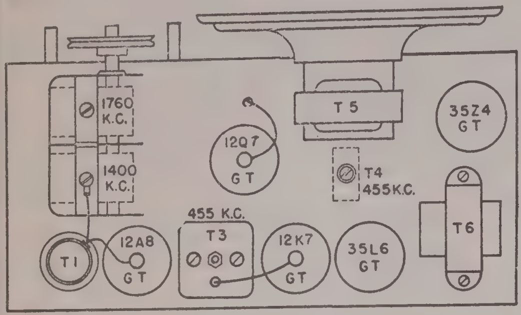
CODE	PART NO.	DESCRIPTION
R1	60-236	87 OHMS 2 W. WIRE WOUND RESISTOR
R2	60-225	10 MEGOHM 1/2 W. CARBON RESISTOR
R3	60-208	2.2 " " " "
R4	60-206	470 M OHM " " "
R5	60-223	22 M " " " "
R6	60-240	150 " " " "
R7	60-241	1800 " 1 W. " "
R8	24-139	500 M - VOLUME CONTROL

CODE	PART NO.	DESCRIPTION 0-30
T1	82-4	ANTENNA LOOP
T2	10-299	OSCILLATOR COIL
T3	10-296	1 ST. I.F. TRANSFORMER
T4	10-297	2 ND. " "
T5	80-176	OUTPUT "
1	89-4	PILOT LIGHT #47
2	79-270	SPEAKER

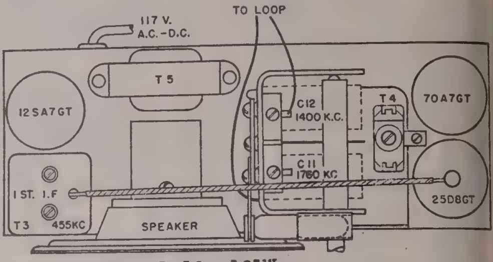
MODEL 91
MODEL 95
MODEL 98
MODELS 101I,1010,101W
MODELS 102I,1020,102W

AUTOCRAT RADIO CO.

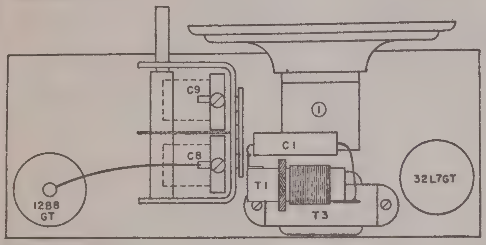
MODELS 103I,1030,103W
MODELS 107I,107W
MODELS 109,110
Socket,Trimmers,Alignment



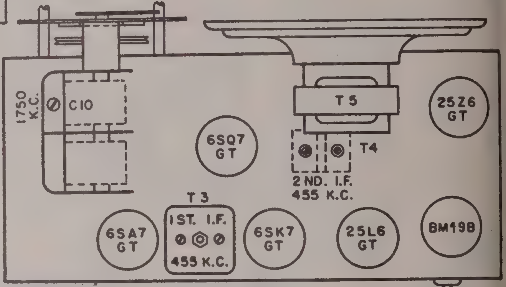
MODEL 95



MODELS 101I, 1010, 101W.

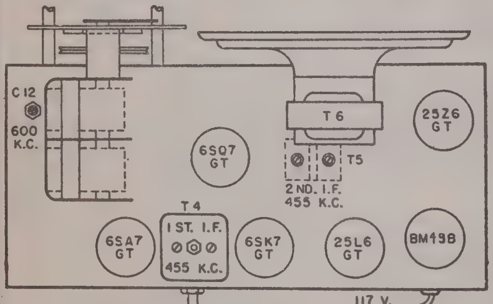


MODEL 91



MODELS 103I, 1030, 103W.

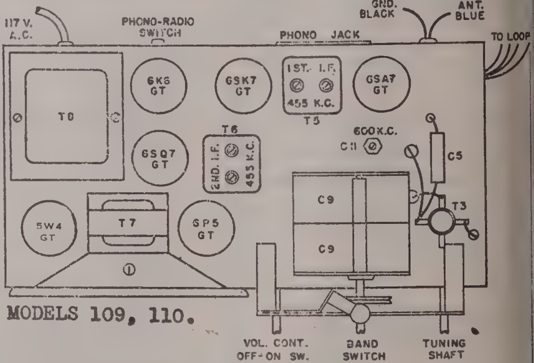
117V. A.C.-D.C.



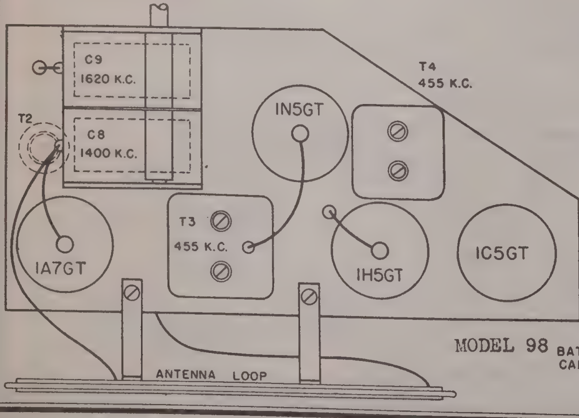
MODELS 102I, 1020, 102W

BAND SW.

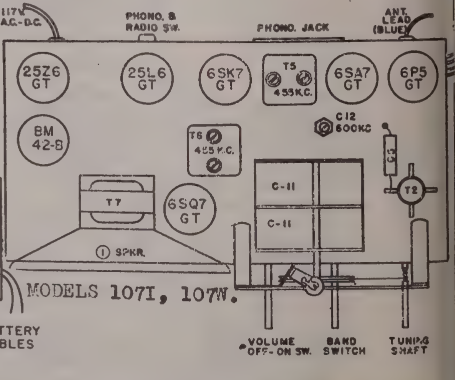
117 V. A.C.-D.C.



MODELS 109, 110.



MODEL 98 BATTERY CABLES

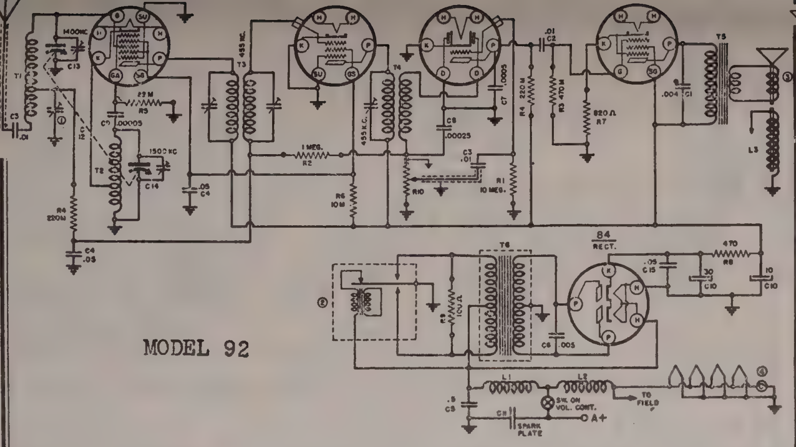


MODELS 107I, 107W.

AUTOCRAT RADIO CO.

DEL 104
hematic,Socket,Trimmers

MODEL 92
Schematic,Socket,Trimmers,
Assembly

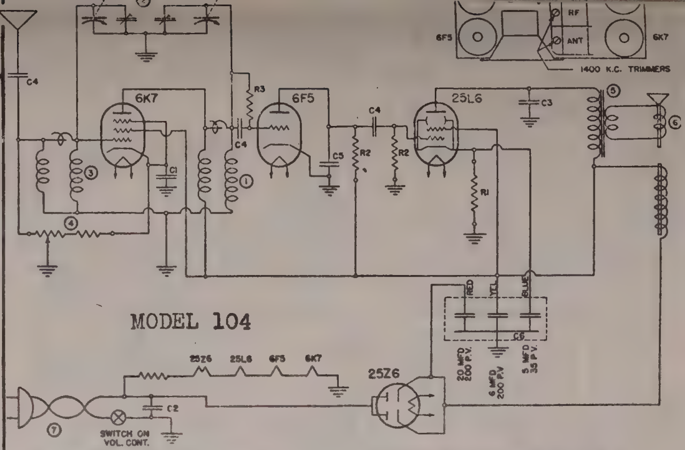


MODEL 92

CODE	PART NO.	DESCRIPTION
C1	16-125	.004 MFD. 400V. TUBULAR CONDENSER
C2	16-119	.01 " " " "
C3	16-121	.01 " 200V. " "
C4	1622	.05 " " " "
C5	16-112	.5 " " " "
C6	16-131	.005 " 1600V. " "
C7	15-112	.0005 MFD. MICA CONDENSER
C8	1504	.00025 " " "
C9	1503	.00005 " " "
C10	18-246	30 X 10 " 250 W.V. ELECTROLYTIC COND.
C11	99-1	SPARK PLATE
C12	19-146	2 GANG VARIABLE CONDENSER (ALSO C13 & C14)
C15	1607	.05 MFD. 400 V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R1	60-225	10 MEGOHM 1/2 W. RESISTOR
R2	60-167	1 " " "
R3	60-206	470M OHM " "
R4	60-207	220M " " "
R5	60-223	22 M " " "
R6	60-224	10 M " " "
R7	60-226	820 " " "
R8	60-227	470 " " "
R9	60-162	100 " " "
R10	24-135	500M VOLUME CONTROL WITH SWITCH
L1	33-211	VIBRATOR CHOKE
L2	33-210	FILAMENT "
L3	------	SPEAKER FIELD

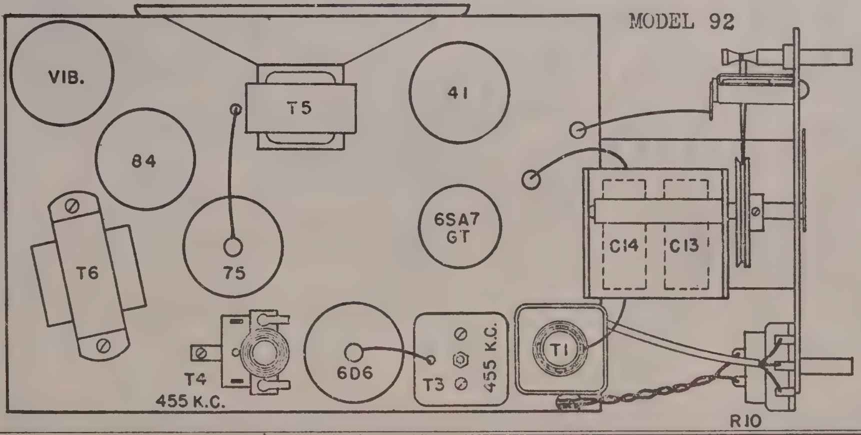
CODE	PART NO.	DESCRIPTION
T1	10-266	ANTENNA COIL
T2	10-255	OSCILLATOR COIL
T3	10-280	1 ST. I.F. TRANSFORMER
T4	10-284	2 ND. "
T5	------	OUTPUT "
T6	80-175	POWER "
1	20-117	PADDING CONDENSER
2	34-102	VIBRATOR "
3	79-259	5" DYNAMIC SPEAKER
4	89-4	#47 - PILOT LIGHT 150 MA.



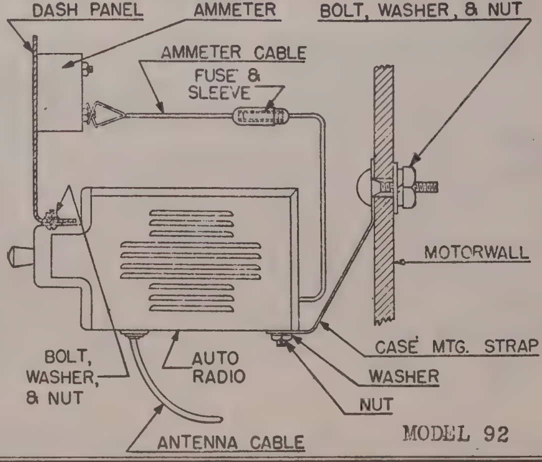
MODEL 104

CODE	PART NO	DESCRIPTION
R1	60-184	150 OHM 1/2 WATT RESISTOR
R2	60-157	1 MEGOHM 1/2 WATT "
R3	60-183	6.9 MEGOHM 1/2 WATT "
C1	16-109	.05 MFD 200 V TUBULAR CONDENSER
C2	16-107	.05 MFD 400 V " "
C3	16-108	.02 MFD 600 V " "
C4	16-110	.01 " " " "
C5	1504	.00025 MFD MICA CONDENSER
C6	18-230	FILTER CONDENSER

CODE	PART NO	DESCRIPTION 404
1	10-234	RF COIL
2	19-124	2 GANG CONDENSER
3	10-233	ANTENNA COIL
4	24-117	VOLUME CONTROL & SWITCH
5	80-148	OUTPUT TRANSFORMER
6	79-244	SPEAKER
7	23-117	LINE CORD



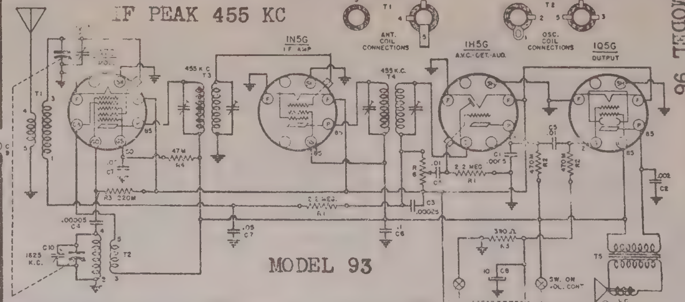
MODEL 92



MODEL 92

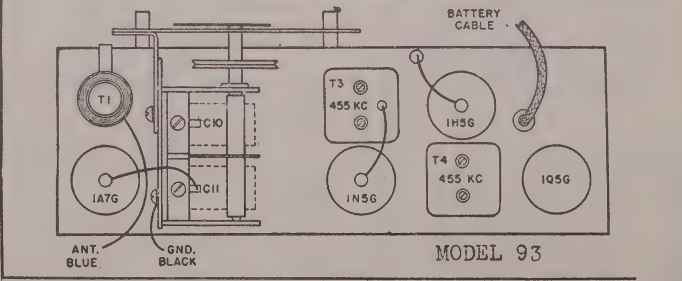
MODEL 93
MODEL 94
MODEL 96

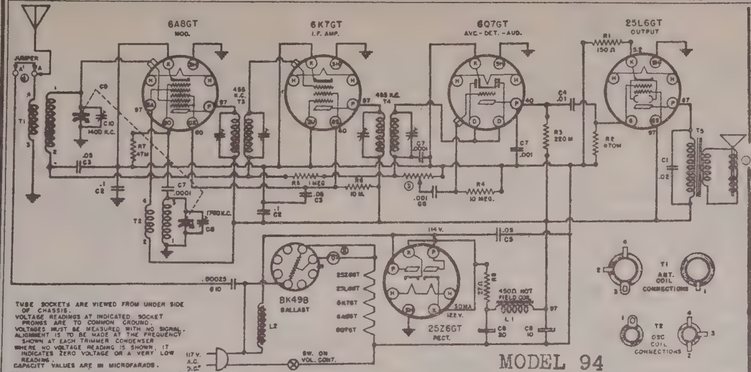
AUTOCRAT RADIO CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION 9-46
R 1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR	C 1	13-112	.0005 MFD MICA CONDENSER	T 1	10-235	ANTENNA COIL
R 2	60-178	470 M OHM " " "	C 2	13-114	.002 " " "	T 2	10-292	OSCILLATOR COIL
R 3	60-180	220 M " " " "	C 3	1504	.00025 " " "	T 3	10-251	1 ST. I.F. TRANS.
R 4	60-177	47 M " " " "	C 4	1503	.00005 " " "	T 4	10-261	2 ND. " "
R 5	60-221	390 " " " "	C 5	16-121	.01 MFD. 200 V. TUBULAR COND.	T 5	------	OUTPUT TRANS. ON SPKR.
R 6	24-130	VOLUME CONTROL 1 MEGOHM	C 6	16-115	.1 " " " "			
			C 7	1622	.05 " " " "	1	79-271	5" P.M. SPEAKER
			C 8	18-243	10 " 25 V. ELECTROLYTIC			
			C 9	19-137	2 GANG VAR. COND ALSO C10 & C11			

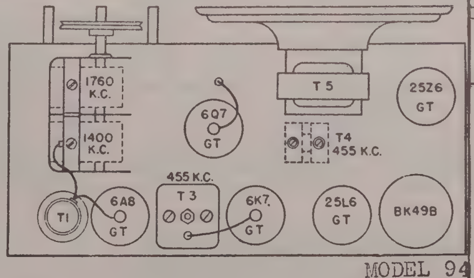


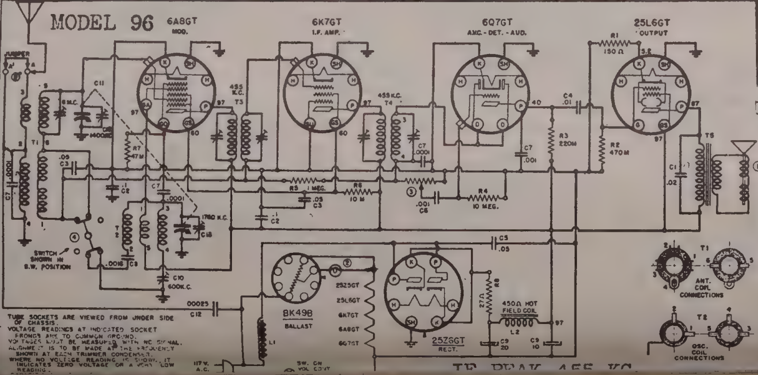


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY VALUES ARE IN MICROFARADS.

IF PEAK 455 KC

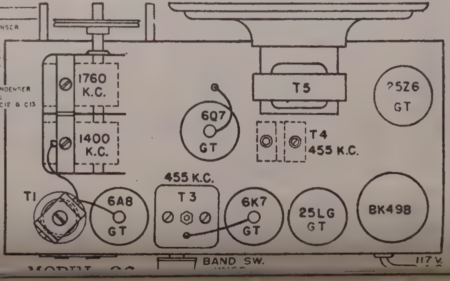
CODE	PART NO.	DESCRIPTION
R 1	60-184	150 OHM 1/3 W. RESISTOR
R 2	60-178	470 M. " " "
R 3	60-180	220 M. " " "
R 4	60-193	10 MEG. " " "
R 5	60-195	1 " " " "
R 6	60-215	10 M. " " "
R 7	60-177	47 M. " " "
R 8	60-220	27 " " "
L 1	------	FIELD COIL (ON SPEAKER)
L 2	33-220	R.F. CHOKE
T 1	10-270	ANTENNA TRANSFORMER
T 2	10-272	OSCILLATOR "
T 3	10-269	1 ST. I.F. "
T 4	10-281	2 ND. I.F. "
T 5	-----	OUTPUT TRANS. (ON SPKR.)
1	79-266	5" DYNAMIC SPEAKER
2	89-4	PILOT LIGHT #47
3	24-132	VOLUME CONTROL & SWITCH
4	22-117	ANT. TERMINAL
C 1	16-123	.02 MFD. 200 V. TUBULAR CONDENSER
C 2	16-115	.1 " " " "
C 3	1622	.05 " " " "
C 4	16-121	.01 " " " "
C 5	1607	.05 " 400 V. " "
C 6	16-124	.001 " 200 V. " "
C 7	1501	.0001 " MICA CONDENSER "
C 8	18-241	20 X 10 MFD. 150 V. ELECTROLYTIC COND.
C 9	19-144	2 GANG VARIABLE CONDENSER. ALSO C10 & C11
C 10	1504	.00025 MFD. MICA CONDENSER





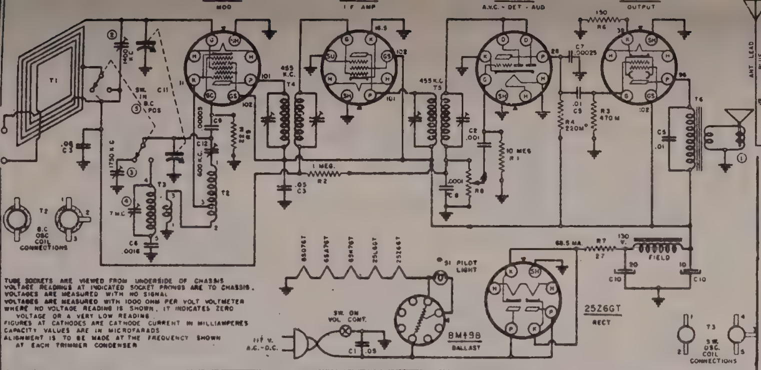
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.

CODE	PART NO	DESCRIPTION
C 1	16-123	.02 MFD 200 V. TUBULAR CONDENSER
C 2	16-115	.1 " " " "
C 3	1622	.05 " " " "
C 4	16-121	.01 " " " "
C 5	1607	.05 " 400 V " "
C 6	16-124	.001 " 200 V. " "
C 7	1501	.0001 " MICA CONDENSER
C 8	15-118	.0016 " " "
C 9	18-241	20 X 10 MFD 150 V ELECTROLYTIC CONDENSER
C 10	20-117	PADDING CONDENSER 300-600 MFD
C 11	19-145	2 GANG VARIABLE CONDENSER ALSO C12 & C13
R 1	60-184	150 OHM 1/3W. RESISTOR
R 2	60-178	470 M. " " "
R 3	60-180	220 M. " " "
R 4	60-193	10 MEG. " " "
R 5	60-195	1 " " "
R 6	60-215	10 M. " " "
R 7	60-177	47 M. " " "
R 8	60-220	27 " " "
L 1	33-220	R.F. CHOKE
L 2	-----	FIELD COIL (ON SPKR.)
C 12	1504	.00025 MFD. MICA CONDENSER
T 1	10-268	ANTENNA TRANSFORMER
T 2	10-267	OSCILLATOR "
T 3	10-269	1 ST. I.F. "
T 4	10-281	2 ND. I.F. "
T 5	-------	OUTPUT TRANS. (ON SPKR.)
1	79-266	5" DYNAMIC SPEAKER
2	89-4	PILOT LIGHT #47
3	24-132	VOLUME CONTROL & SWITCH
4	69-133	BAND SWITCH



AUTOCRAT RADIO CO.

MODELS 102I,0,W
MODELS 103I,0,W
MODELS 107I,W
MODELS 109,110

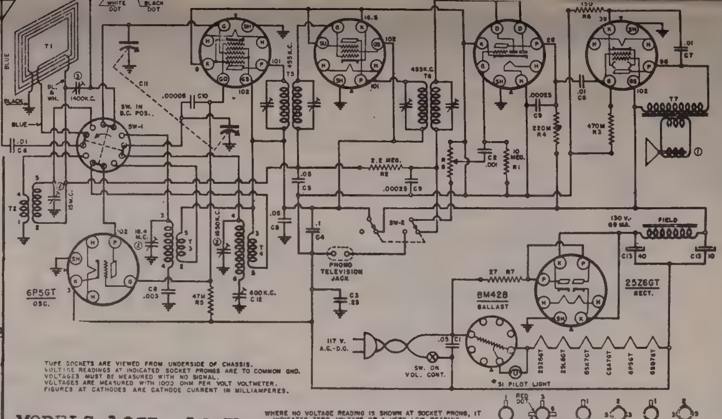


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER

CODE	PART NO	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W RESISTOR
R 2	60-195	1 " " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " " "
R 5	60-185	22M " " "
R 6	60-184	150 " " "
R 7	60-220	27 " " "
R 8	24 142	500M " VOLUME CONTROL (WITH SW)

CODE	PART NO.	DESCRIPTION
C 1	1607	05 MFD. 400 V TUBULAR COND
C 2	16-124	001 " " " "
C 3	1622	.05 " 200 V " "
C 5	16-121	01 " " " "
C 6	15-116	0016 MFD MICA CONDENSER
C 7	1504	00025 " " "
C 8	1501	0001 " " "
C 9	1503	00005 " " "
C 10	18-241	20 X 10 " 150 W.V. ELECTROLYTIC
C 11	19-155	2 GANG VARIABLE CONDENSER
C 12	20-126	PADDING CONDENSER

CODE	PART NO	DESCRIPTION 0-62
T 1	82-9	LOOP ANTENNA
T 2	10-330	B.C OSCILLATOR COIL
T 3	10-331	S W. " "
T 4	10-333	1 ST I.F. TRANSFORMER
T 5	10-281	2 ND. " " "
T 6	------	OUTPUT TRANSFORMER (ON SPKR.)
1	79-203	5" DYNAMIC SPEAKER
2	20-128	TRIMMER (ON LOOP)
3	2050	2 PLATE TRIMMER
4	20-128	1 1/2 PLATE TRIMMER
5	69-139	BAND SWITCH



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

MODELS 107I, 107W.

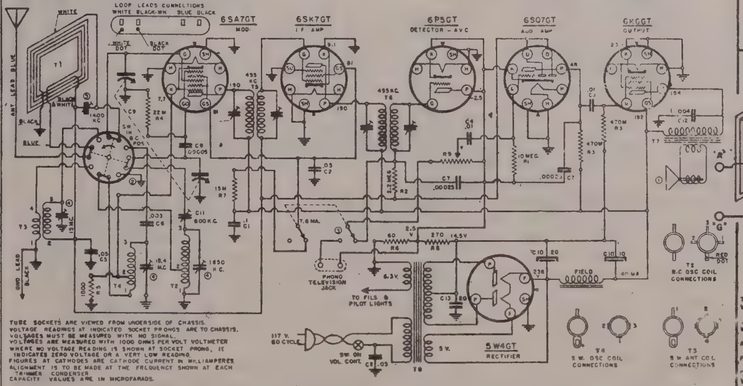
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C 2	16-124	.001 " " " "
C 3	16-120	.25 " 200 V. " "
C 4	16-115	.1 " " " "
C 5	1622	.05 " " " "
C 6	16-121	.01 " " " "
C 7	16-119	.01 " 400 V " "
C 8	15-118	.003 MFD. MICA CONDENSER
C 9	1504	.00025 " " "
C 10	1503	.00005 " " "
C 11	19-160	2 GANG VARIABLE CONDENSER
C 12	20-130	PADDING CONDENSER
C 13	18-255	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " " "
R 5	60-177	47M " " "
R 6	60-184	150 " " "
R 7	60-220	27 " " "
R 8	24-146	500M " VOLUME CONTROL
SW1	69-145	BAND SWITCH.
SW2	69-140	PHONO "

CODE	PART NO.	DESCRIPTION 0-71
T 1	82-11	LOOP ANTENNA (B.C.)
T 2	10-323	S.W. ANTENNA COIL
T 3	10-328	S.W. OSCILLATOR COIL
T 4	10-318	B.C. " "
T 5	10-317	1 ST. I.F. TRANSFORMER
T 6	10-312	2 ND. " "
T 7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

MODELS 109. 110.



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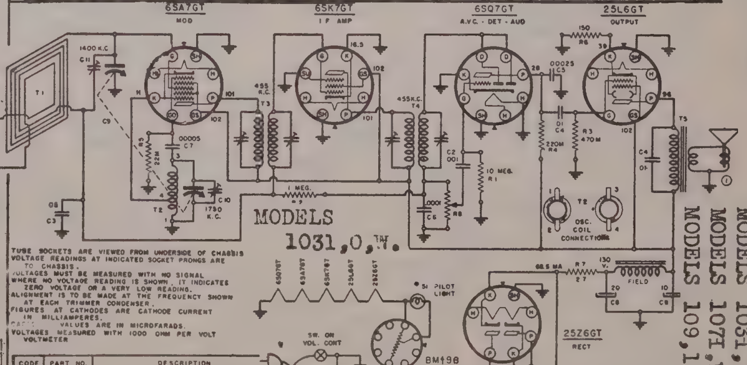
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO	DESCRIPTION
C 1	16-116	.1 MFD 400 V TUBULAR CONDENSER
C 2	1607	.05 " " " "
C 3	16-119	.01 " " " "
C 4	16-121	.01 " 200 V " "
C 5	1622	.05 " 200 V " "
C 6	15-118	.003 MFD MICA CONDENSER
C 7	1504	.00025 " " "
C 8	1503	.00005 " " "
C 9	19-160	2 GANG VARIABLE CONDENSER
C 10	18-254	20 X 10 MFD 350 W.V. ELECTROLYTIC
C 11	20-130	PADDING CONDENSER
C 12	1651	.004 MFD 600 V TUBULAR CONDENSER
C 13	18-243	20 MFD. 25 W V ELECTROLYTIC

CODE	PART NO	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 MEGOHM " "
R 3	60-178	470 M OHM " "
R 4	60-185	22 M " " "
R 5	60-217	1000 " " "
R 6	60-182	60 " 1/2 W. "
R 7	60-236	15 M " 1 W. "
R 8	60-245	270 " " "
R 9	24-146	500 M " VOLUME CONTROL (WITH SW)

CODE	PART NO.	DESCRIPTION 0-63
T 1	82-11	LOOP ANTENNA
T 2	10-326	B C OSCILLATOR COIL
T 3	10-323	S W. ANTENNA COIL
T 4	10-320	S W OSCILLATOR COIL
T 5	10-317	1 ST I F TRANSFORMER
T 6	10-312	2 ND. I.F. TRANSFORMER
T 7	------	OUTPUT TRANSFORMER (ON SPKR)
T 8	80-179	POWER TRANSFORMER
1	79-275	5" DYNAMIC SPEAKER
2	69-145	BAND SWITCH
3	69-140	PHONO SWITCH
4	20 127	TRIMMER BLOCK
5	20 129	TRIMMER (ON LOOP)

MODELS 1031,0,W.



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
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ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION
C 1	1607	05 MFD 400 V TUBULAR COND
C 2	16-124	001 " " " "
C 3	1622	05 " 200 V " "
C 4	16-121	.01 " " " "
C 5	1504	.00025 MFD MICA CONDENSER
C 6	1501	.0001 " " "
C 7	1503	.00005 " " "
C 8	18-241	20 X 10 " 150 W.V. ELECTROLYTIC
C 9	19-154	2 GANG VARIABLE COND. ALSO C10
C 11	20-129	TRIMMER (ON LOOP)

R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-195	1 " " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " " "
R 5	60-185	22M " " "
R 6	60-184	150 " " "
R 7	60-220	27 " " "
R 8	24-142	500M " VOLUME CONTROL (WITH SW.)

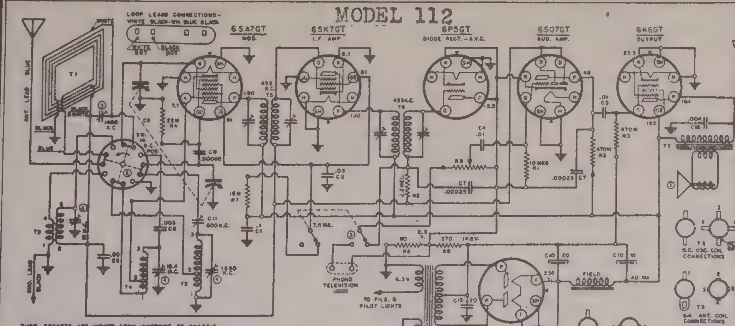
T 1	LOOP ANTENNA
T 2	OSCILLATOR COIL
T 3	1 ST. I F TRANSFORMER
T 4	2 ND. " "
T 5	OUTPUT TRANSFORMER (ON SPKR.)
1	5" DYNAMIC SPEAKER

AUTOCRAT RADIO CO.

MODEL 112
MODEL 113

MODEL 114
MODEL 116
Schematics,Volt

MODEL 112



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

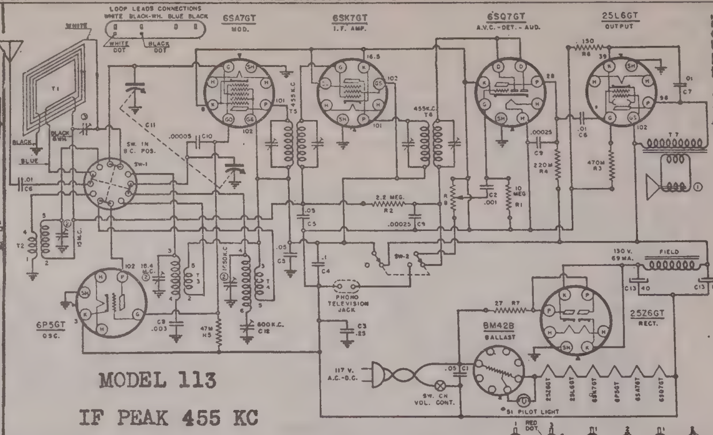
IF PEAK 455 KC

CODE	PART NO.	DESCRIPTION
C1	16-116	.1 MFD. 400 V. TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	16-119	.01 " " " "
C4	16-121	.01 " 200 V. " "
C5	1622	.05 " " " "
C6	15-110	.003 MFD. MICA CONDENSER
C7	1504	.00025 " " "
C8	1503	.00005 " " "
C9	19-158	2 GANG VARIABLE CONDENSER
C10	18-284	20 X 10 MFD. 350 W.V. ELECTROLYTIC
C11	20-126	PADDING CONDENSER
C12	1651	.004 MFD. 600 V. TUBULAR CONDENSER
C13	18-243	20 MFD. 25 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470 M OHM " "
R4	60-185	22 M " " "
R6	60-102	60 " 1/2 W. "
R7	60-236	15 M " 1 W. "
R8	60-245	270 " " "
R9	24-145	500M " VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-69
T1	82-11	LOOP ANTENNA
T2	10-326	B.C. OSCILLATOR COIL
T3	10-323	S.W. ANTENNA COIL
T4	10-320	S.W. OSCILLATOR COIL
T5	10-315	1ST. I.F. TRANSFORMER
T6	10-312	2ND. I.F. "
T7	------	OUTPUT TRANSFORMER (ON SPKR.)
T8	80-179	POWER "
1	79-275	5" DYNAMIC SPEAKER
2	69-146	BAND SWITCH
3	69-140	PHONO SWITCH
4	20-127	TRIMMER BLOCK
5	20-129	TRIMMER (ON LOOP)

MODEL 113



MODEL 113

IF PEAK 455 KC

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VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

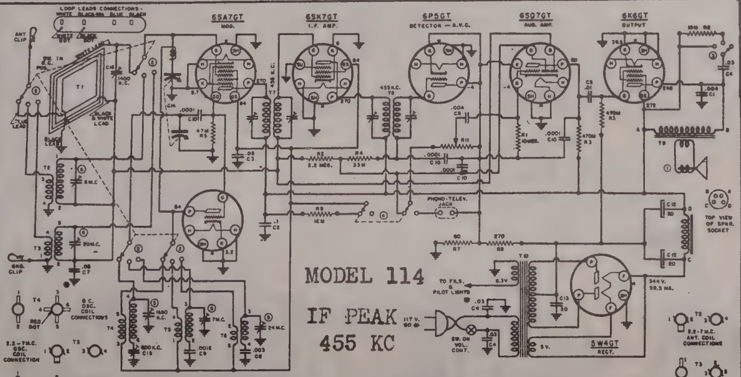
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-118	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 400 V. " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-158	2 GANG VARIABLE CONDENSER
C12	20-126	PADDING CONDENSER
C13	18-256	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	40-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-145	500M " VOLUME CONTROL
SW1	69-146	BAND SWITCH
SW2	69-140	PHONO "

CODE	PART NO.	DESCRIPTION 0-76
T1	82-11	LOOP ANTENNA (B.C)
T2	10-323	S.W. ANTENNA COIL
T3	10-320	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-317	1ST. I.F. TRANSFORMER
T6	10-312	2ND. " "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

MODEL 114



MODEL 114

IF PEAK 455 KC

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VOLTAGES ARE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES

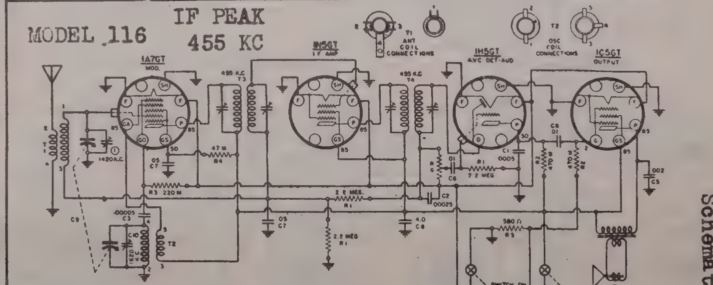
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C1	1651	.004 MFD. 600 V. TUBULAR CONDENSER
C2	16-116	.1 " 400 V. " "
C3	1607	.05 " " " "
C4	1648	.03 " " " "
C5	16-119	.01 " " " "
C6	16-125	.004 " " " "
C7	1622	.05 " 200 V " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	15-119	.0018 " " "
C10	1501	.0001 " " "
C12	18-236	20 X 20 " 450 W.V. ELECTROLYTIC
C13	18-243	20 MFD. " 25 W.V. "

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470 M OHM " "
R4	60-186	33 M " " "
R5	60-177	47 M " " "
R6	60-215	10 M " " "
R7	60-182	60 " 1/2 W. "
R8	60-245	270 " 1 W. "
R9	60-251	16 M " 2 W. "
R10		
R11	24-144	500 M VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-76
T1	82-13	LOOP ANTENNA (B.C.)
T2	10-324	ANTENNA TRANSFORMER (2.2-7M.C.)
T3	10-322	" " (7.7-24 M.C.)
T4	10-318	OSCILLATOR " (B.C.)
T5	10-327	" " (2.2-7M.C.)
T6	10-329	" " (7.7-24 M.C.)
T7	10-315	1ST. I.F. TRANSFORMER
T8	10-312	2ND. " "
T9	------	OUTPUT "
T10	80-185	POWER "
1	79-284	6" DYNAMIC SPEAKER
2	69-142	BAND SWITCH
3	69-143	TONE "

MODEL 116



IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R2	60-178	470 M OHM " " "
R3	60-180	220 M " " " "
R4	60-177	47 M " " " "
R5	60-201	560 " " " "
R6	24-138	1 MEGOHM VOLUME CONTROL

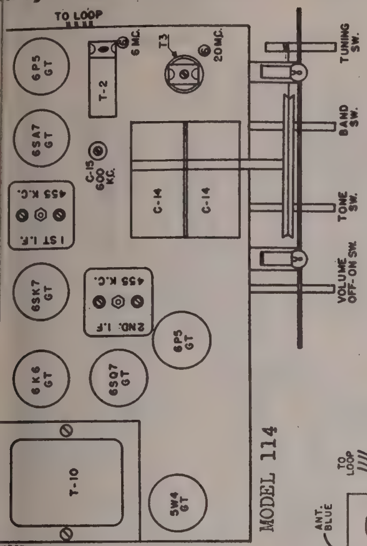
CODE	PART NO	DESCRIPTION
C1	15-112	0005 MFD MICA CONDENSER
C2	1504	00025 " " "
C3	1503	00005 " " "
C4	15-117	000015 " " "
C5	1608	002 MFD. 400 V TUBULAR CONDENSER
C6	16-121	01 " 200 V " "
C7	1622	05 " " " "

CODE	PART NO.	DESCRIPTION 0-42 0-41
T1	10 313	ANTENNA COIL
T2	10-294	OSCILLATOR COIL
T3	10-293	1ST. I.F TRANSFORMER
T4	10-296	2ND " "

L 119 MODEL 120
et,Trimmers,Alignment

AUTOCRAT RADIO CO.

MODEL 112 MODEL 113
MODEL 114 MODEL 115
MODEL 116 MODEL 118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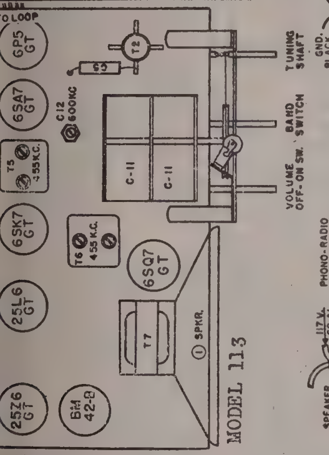
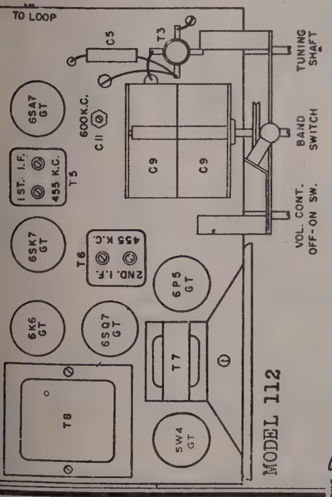

MODEL 113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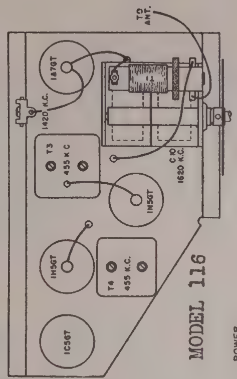
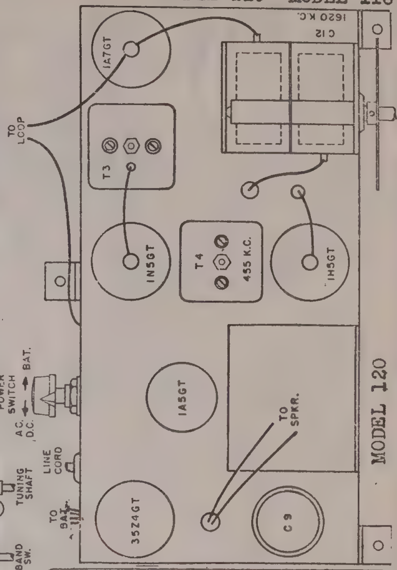

MODEL 116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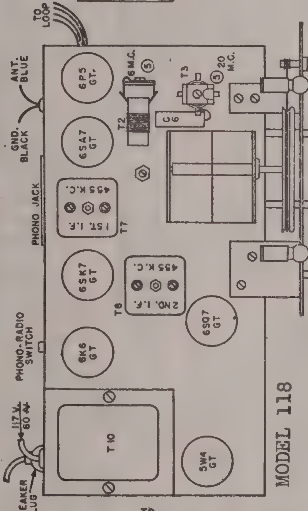
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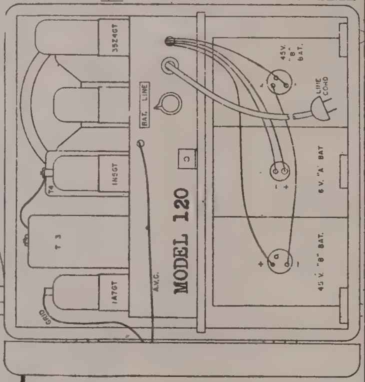
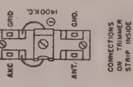
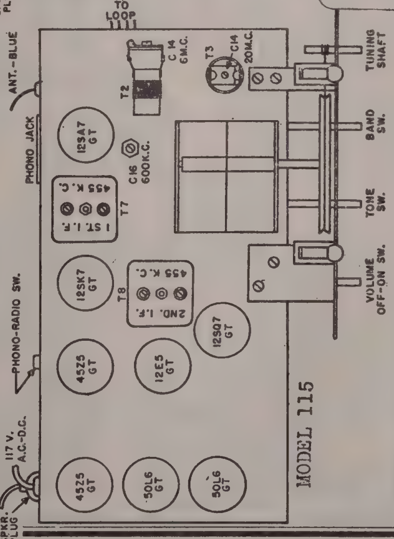
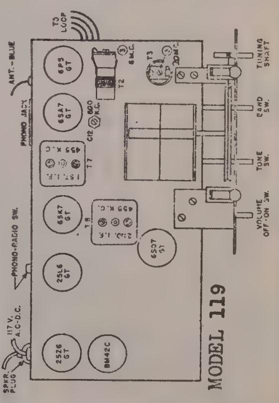

MODEL 120


CONNECTIONS ON TRIMMER STRIP INSIDE REAR COVER

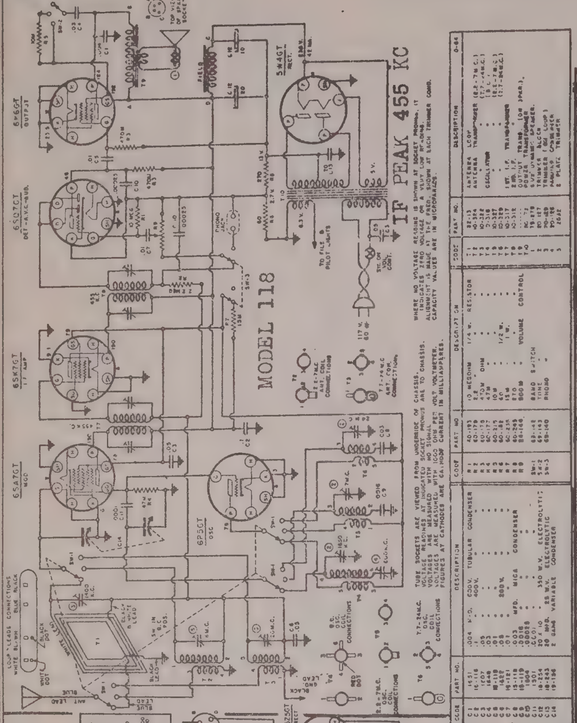

MODEL 115

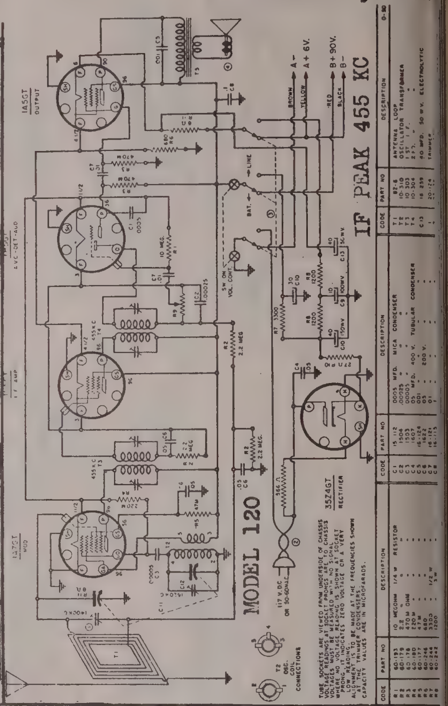

MODEL 119

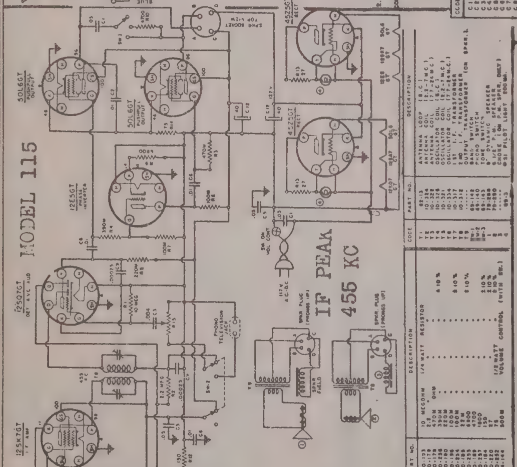
MODEL 115

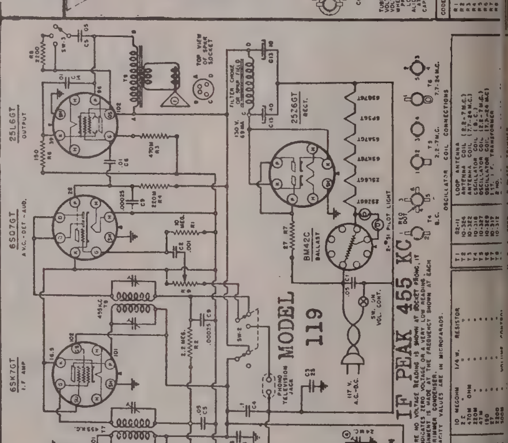
AUTOCRAT RADIO CO.

MODEL 118
MODEL 119
MODEL 120
Schematics,Volta









hematics,Socket
mmers,Voltage
ignment

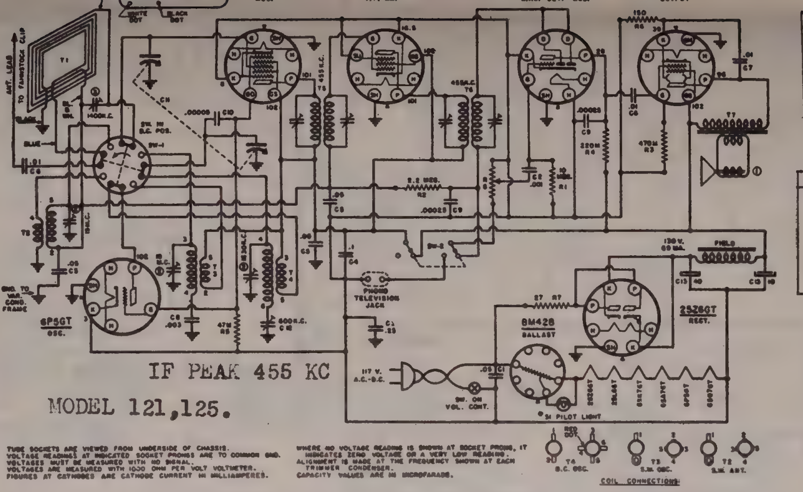
AUTOCRAT RADIO CO.

MODELS 121,125
MODEL 123

CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C 2	16-124	.001 " " " "
C 3	16-120	.25 " 200 V. " "
C 4	16-115	.1 " " " "
C 5	1622	.05 " " " "
C 6	16-121	.01 " " " "
C 7	16-119	.01 " 400 V " "
C 8	15-116	.003 MFD. MICA CONDENSER
C 9	1304	.00025 " " "
C 10	1303	.00005 " " "
C 11	19-162	2 GANG VARIABLE CONDENSER
C 12	20-130	PADDING CONDENSER
C 13	18-255	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. , RESISTOR
R 2	60-179	2.2 " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " " "
R 5	60-177	47M " " "
R 6	60-164	150 " " "
R 7	60-220	27 " " "
R 8	24-146	500M " VOLUME CONTROL
SW1	69-145	BAND SWITCH
SW2	69-140	PHONO "

CODE	PART NO.	DESCRIPTION 10-70
T 1	82-11	LOOP ANTENNA (B.C.)
T 2	10-337	S.W. ANTENNA COIL
T 3	10-338	S.W. OSCILLATOR COIL
T 4	10-318	B.C. " "
T 5	10-317	1 ST. I.F. TRANSFORMER
T 6	10-312	2 ND. " "
T 7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

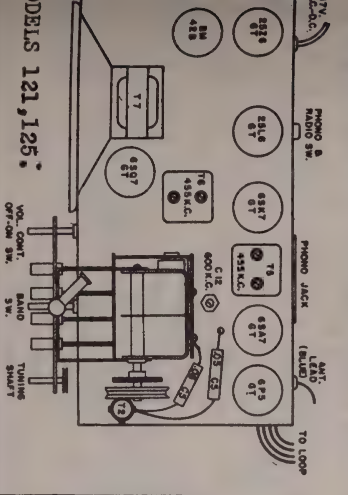


IF PEAK 455 KC

MODEL 121,125.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.



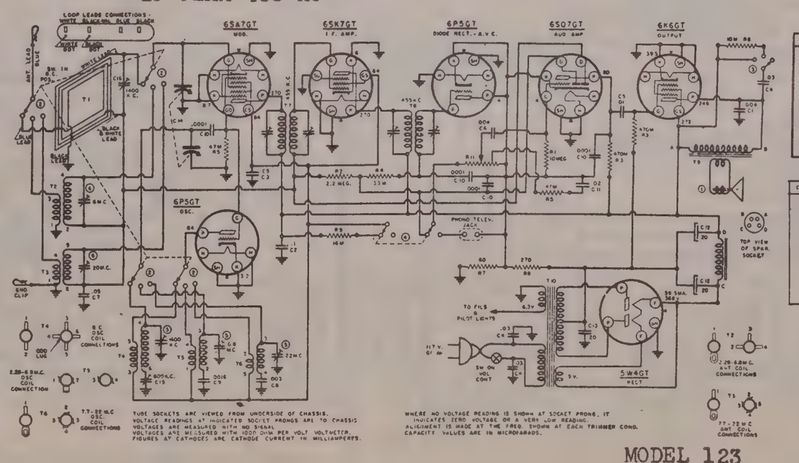
MODELS 121,125.

CODE	PART NO.	DESCRIPTION
C 1	1651	.004 MFD. 600 V. TUBULAR CONDENSER
C 2	16-116	.1 " 400 V " "
C 3	1607	.05 " " " "
C 4	1640	.03 " " " "
C 5	16-119	.01 " " " "
C 6	16-185	.004 " " " "
C 7	1622	.05 " 200 V. " "
C 8	15-118	.003 MFD. MICA CONDENSER
C 9	15-119	.0016 " " "
C 10	1501	.0001 " " "
C 11	16-123	.02 200 V TUBULAR CONDENSER
C 12	18-256	20 X 20 " 450 W.V. ELECTROLYTIC
C 13	18-243	20 MFD. " 25 W.V "
C 14	19-161	2 GANG VARIABLE CONDENSER
C 15	20-130	PADDING CONDENSER
C 16	20-129	TRIMMER (ON LOOP)

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W RESISTOR
R 2	60-179	2 2 " " "
R 3	60-178	470 M OHM " "
R 4	60-186	33 M " " "
R 5	60-177	47 M " " "
R 6	60-215	10 M " " "
R 7	60-182	60 " 1/2 W "
R 8	60-245	270 " 1 W "
R 9	60-231	16 M " 2 W. "
R 10		
R 11	24-143	500 M " VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-75
T 1	82-13	LOOP ANTENNA (B C)
T 2	10-335	ANTENNA TRANSFORMER (2 20-6.8MC)
T 3	10-340	" " (7.7-22MC)
T 4	10 318	OSCILLATOR " (B C)
T 5	10-339	" " (2.20-6.8MC)
T 6	10-336	" " (7.7-22MC)
T 7	10-317	1ST I.F. TRANSFORMER
T 8	10-318	2ND " "
T 9	------	OUTPUT "
T 10	80-183	POWER "
1	79-292	8 DYNAMIC SPEAKER
2	69-142	BAND SWITCH
3	69-143	TONE "
4	69-140	PHONO " (2 SECT.)
5	20-127	TRIMMER BLOCK (3 SECT)
6	2032	2 PLATE TRIMMER

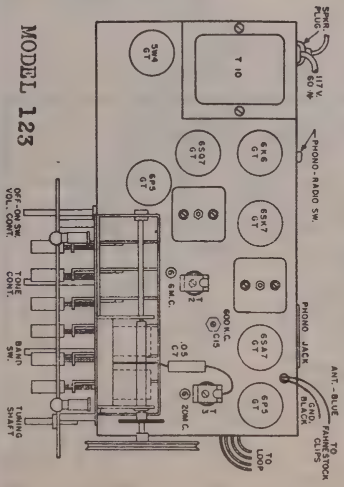
IF PEAK 455 KC



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES ARE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.

MODEL 123

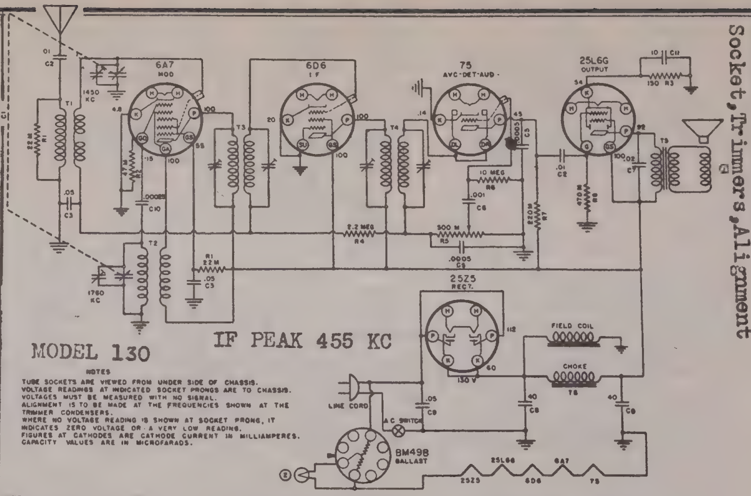


MODEL 123

MODEL 130
Schematic,Voltage
Socket,Trimmers,Alignment

AUTOCRAT RADIO CO.

MODEL 142
Schematic,Sock



MODEL 130

IF PEAK 455 KC

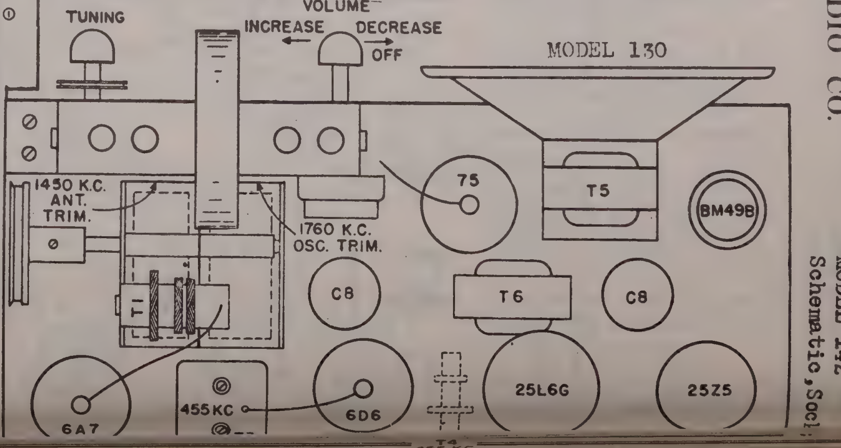
NOTES

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.

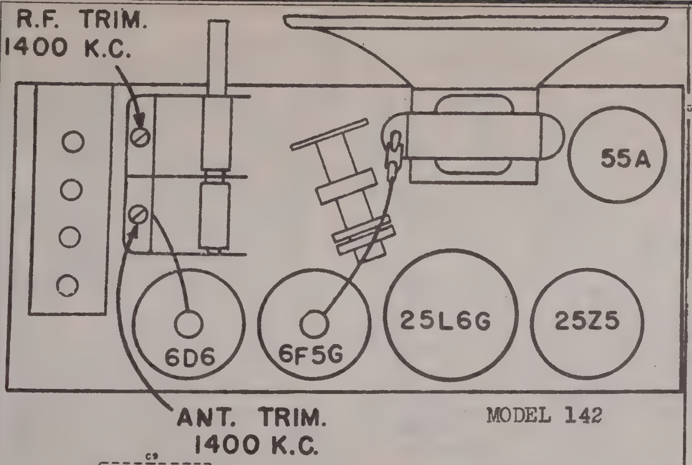
CODE.	PART NO	DESCRIPTION
R1	60-185	22 M OHM RESISTOR
R2	60-177	47 M OHM RESISTOR
R3	60-184	150 OHM " ±10%
R4	60-179	2.2 MEGOHM RESISTOR
R5	24-124	500 M OHM VOLUME CONTROL
R6	60-193	10 MEGOHM RESISTOR
R7	60-180	220 M OHM "
R8	60-178	470 M OHM "

CODE	PART NO.	DESCRIPTION
C1	19-132	VARIABLE CONDENSER
C2	16-121	.01 MFD. 200 V CONDENSER
C3	1622	.05 MFD. " "
C5	15-112	.0005 MF MICA CONDENSER
C6	16-124	.001 MF 400 V CONDENSER
C7	1605	.02 MF " " "
C8	18-232	40 MFD. 150 W.V. ELECTROLYTIC
C9	1607	.05 MF 400 V CONDENSER
C10	1504	.00025 MF MICA CONDENSER
C11	18-235	5. MFD. 25 V. CONDENSER

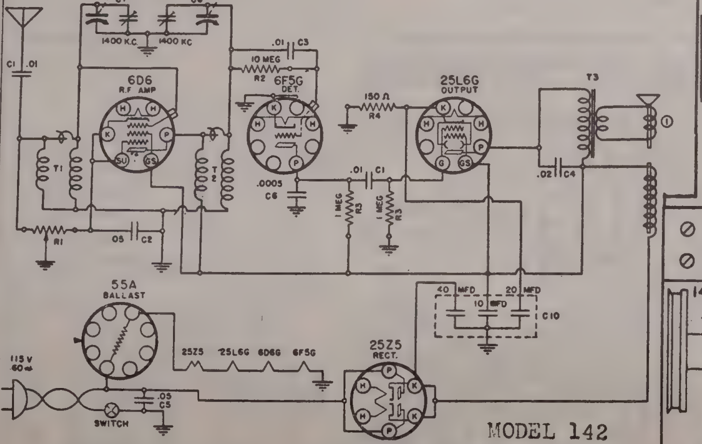
CODE	PART NO	DESCRIPTION
T1	10-239	ANTENNA TRANSFORMER
T2	10-240	OSCILLATOR "
T3	10-241	1ST I.F. TRANSFORMER
T4	10-242	2ND I F "
T5		OUTPUT "
1	79-233	SPEAKER
2	8901	PILOT LIGHT #40
T6	33-214	CHOKE



MODEL 130



MODEL 142

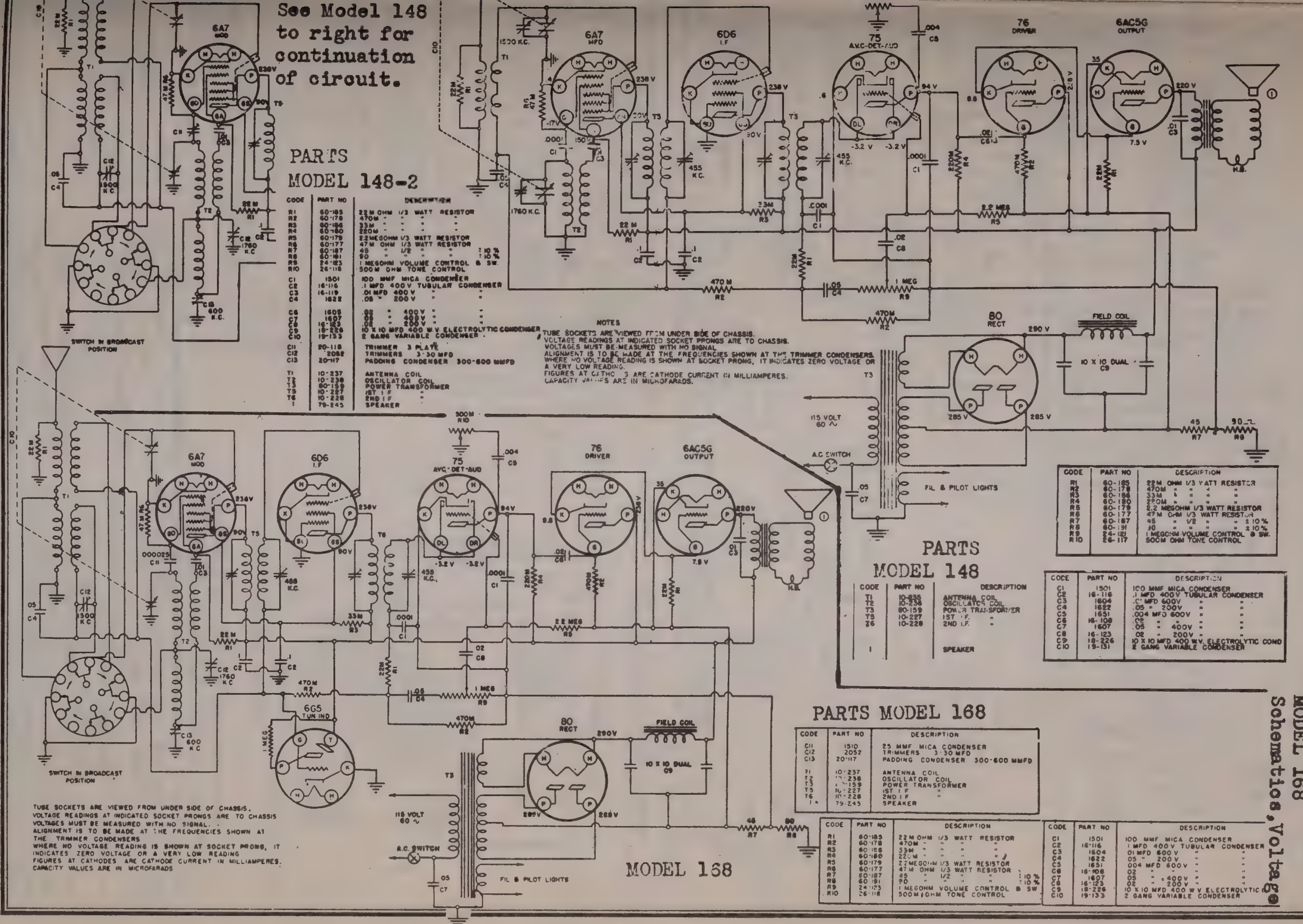


MODEL 142

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 542
C1	1604	.01 MFD. 600V. TUBULAR CONDENSER	R1	24-127	VOLUME CONTROL & SWITCH
C2	1622	.05 MFD. 200 V. " "	R2	60-193	10 MEGOHM 1/3 W. RESISTOR
C3	16-119	.01 MFD. 400 V. "	R3	60-195	1 " " "
C4	16-108	.02 MFD. 600 V. " "	R4	60-184	150 OHMS " "
C5	1607	.05 MFD. 400V. " "			
C6	15-112	.0005 MFD. MICA CONDENSER	T1	10-249	ANTENNA COIL
C7 } C9	19-135	ANTENNA VARIABLE COND	T2	10-250	R.F COIL
C8 } C9		OSCILLATOR VARIABLE COND.	T3		OUTPUT TRANSFORMER
C10	18-234	FILTER CONDENSER 40 X 10 MF			

AUTOCRAT RADIO CO.

MODEL 148
MODEL 148-2
MODEL 168
Schematics,Voltage



PARTS MODEL 148-2

CODE	PART NO	DESCRIPTION
R1	60-185	22 M OHM 1/3 WATT RESISTOR
R2	60-178	470M " " " "
R3	60-186	33M " " " "
R4	60-180	220M " " " "
R5	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R6	60-177	47 M OHM 1/3 WATT RESISTOR
R7	60-187	45 " 1/2 " " ±10 %
R8	60-191	90 " " " " ±10 %
R9	24-123	1 MEGOHM VOLUME CONTROL & SW.
R10	26-118	500 M OHM TONE CONTROL
C1	1501	100 MMF MICA CONDENSER
C2	16-116	.1 MFD 400 V TUBULAR CONDENSER
C3	16-119	.01 MFD 400 V " "
C4	1622	.05 " 200 V " "
C6	1608	.02 " 400 V " "
C7	1607	.05 " 400 V " "
C8	16-123	.02 " 200 V " "
C9	18-226	10 X 10 MFD 400 W.V. ELECTROLYTIC CONDENSER
C10	19-133	2 GANG VARIABLE CONDENSER
C11	20-118	TRIMMER 3 PLATE
C12	2082	TRIMMERS 3-30 MFD
C13	20-117	PADDING CONDENSER 300-600 MMFD
T1	10-237	ANTENNA COIL
T2	10-238	OSCILLATOR COIL
T3	80-159	POWER TRANSFORMER
T5	10-227	1ST I F "
T6	10-228	2ND I F "
1	79-245	SPEAKER

NOTES

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.

PARTS MODEL 148

CODE	PART NO	DESCRIPTION
T1	10-235	ANTENNA COIL
T2	10-236	OSCILLATOR COIL
T3	80-159	POWER TRANSFORMER
T5	10-227	1ST I.F. "
T6	10-228	2ND I.F. "
1		SPEAKER

CODE	PART NO	DESCRIPTION
R1	60-185	22M OHM 1/3 WATT RESISTOR
R2	60-178	470M " " " "
R3	60-186	33M " " " "
R4	60-180	220M " " " "
R5	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R6	60-177	47M OHM 1/3 WATT RESISTOR
R7	60-187	45 " 1/2 " " ±10 %
R8	60-191	90 " " " " ±10 %
R9	24-121	1 MEGOHM VOLUME CONTROL & SW.
R10	26-117	500M OHM TONE CONTROL

CODE	PART NO	DESCRIPTION
C1	1501	100 MMF MICA CONDENSER
C2	16-116	.1 MFD 400V TUBULAR CONDENSER
C3	1604	.01 MFD 600V " "
C4	1622	.05 " 200V " "
C5	1651	.004 MFD 600V " "
C6	16-108	.02 " " " "
C7	1607	.05 " 400V " "
C8	16-123	.02 " 200V " "
C9	18-226	10 X 10 MFD 400 W.V. ELECTROLYTIC COND
C10	19-131	2 GANG VARIABLE CONDENSER

PARTS MODEL 168

CODE	PART NO	DESCRIPTION
C11	1510	25 MMF MICA CONDENSER
C12	2052	TRIMMERS 3-30 MFD
C13	20-117	PADDING CONDENSER 300-600 MMFD
T1	10-237	ANTENNA COIL
T2	[illegible]-238	OSCILLATOR COIL
T3	[illegible]-159	POWER TRANSFORMER
T5	10-227	1ST I F "
T6	10-228	2ND I F "
1	79-245	SPEAKER

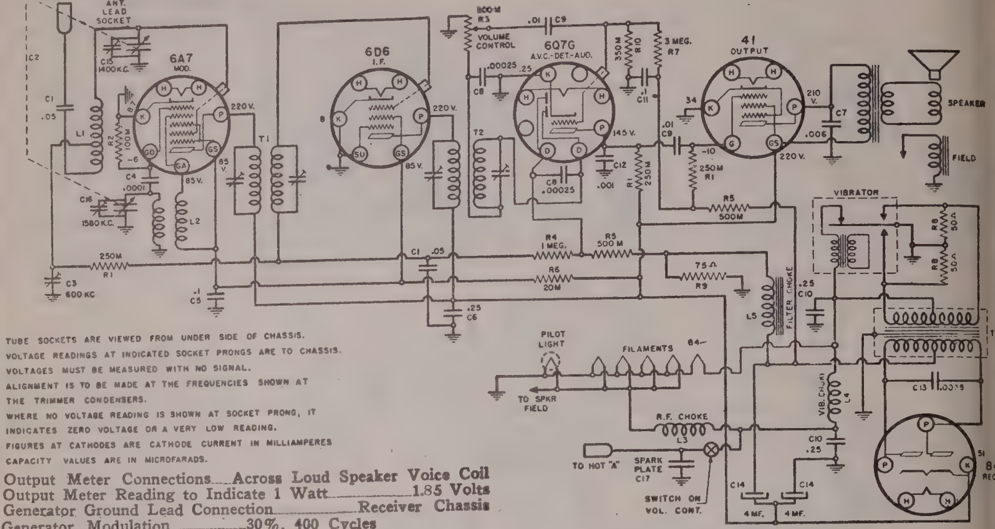
CODE	PART NO	DESCRIPTION
R1	60-185	22 M OHM 1/3 WATT RESISTOR
R2	60-178	470M " " " "
R3	60-186	33M " " " "
R4	60-180	220M " " " "
R5	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R6	60-177	47 M OHM 1/3 WATT RESISTOR
R7	60-187	45 " 1/2 " " ±10 %
R8	60-191	90 " " " " ±10 %
R9	24-123	1 MEGOHM VOLUME CONTROL & SW
R10	26-118	500M OHM TONE CONTROL

CODE	PART NO	DESCRIPTION
C1	1501	100 MMF MICA CONDENSER
C2	16-116	1 MFD 400 V TUBULAR CONDENSER
C3	1604	01 MFD 600 V " "
C4	1622	05 " 200 V " "
C5	1651	004 MFD 600 V " "
C6	16-108	02 " " " "
C7	1607	05 " 400 V " "
C8	16-123	02 " 200 V " "
C9	18-226	10 X 10 MFD 400 W V ELECTROLYTIC
C10	19-133	2 GANG VARIABLE CONDENSER

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS

MODEL 359
Schematic,Voltage,Socket
Trimmers,Alignment,Notes

AUTOCRAT RADIO CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.

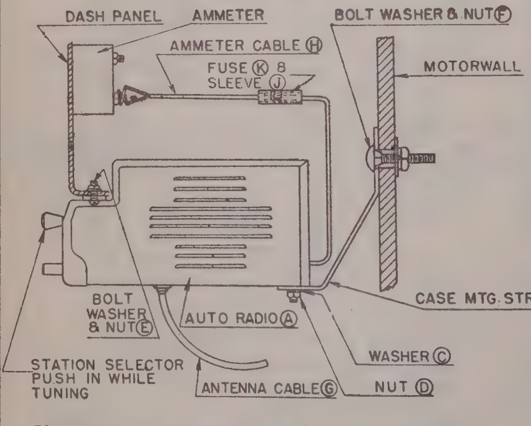
Output Meter Connections....Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt..........1.85 Volts
Generator Ground Lead Connection..........Receiver Chassis
Generator Modulation..........30%, 400 Cycles
Position of Volume Control..........Fully On

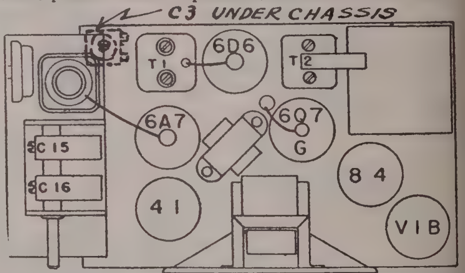
Position of Variable	Generator Frequency	Dummy Antenna	Generator Connection	Trimmer Adjustments (In Order Shown)	Trimmer Function
Closed	456 KC	.1 mfd.	6A7 Grid	T2, T1	I. F.
Fully Open	1580 KC	.0002 mfd.	Antenna Conn.	C16	Oscillator Trimmer
1400 KC	1400 KC	.0002 mfd.	Antenna Conn.	C15	Antenna Trimmer
600 KC	600 KC	.0002 mfd.	Antenna Conn.	C3	Antenna Padder

The variable condenser should be at 600 k.c. for antenna adjustment.

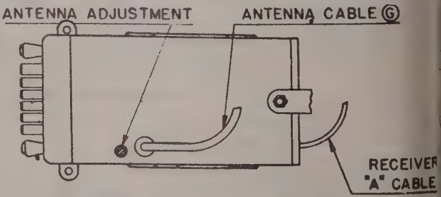
The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A final adjustment of antenna padder condenser C3 is always made after the receiver is installed in the car, in order to match the car antenna.

Always keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver from interfering with accurate alignment.





LOCATIONS OF PARTS ON TOP OF CHASSIS



If an antenna was located coming from the corner post of the car, it will probably have an inner wire covered with the metal braid. (If it has a plug at its end, cut off the plug). Scrape clean and solder the white wire of the receiver's antenna lead to the inner wire of the car antenna lead. Be certain these inner wires do not at any time touch the outer shield. (See Fig. 5.)

After the connection is cleaned and connected, cover the joint carefully with tape. (See Fig. 6.)

Connect the pigtail of the receiver's antenna wire to the pigtail braid of the car's antenna lead-in. Wrap pigtails and solder together using rosin core solder. IMPORTANT—Make certain when bolting soldered pigtail ends to car that the section is scraped clean and a good chassis ground. (See Fig. 7.)

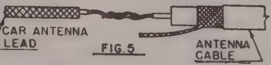


FIG.5

FIG.6

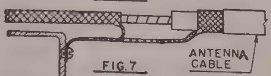
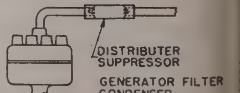
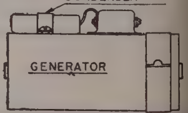


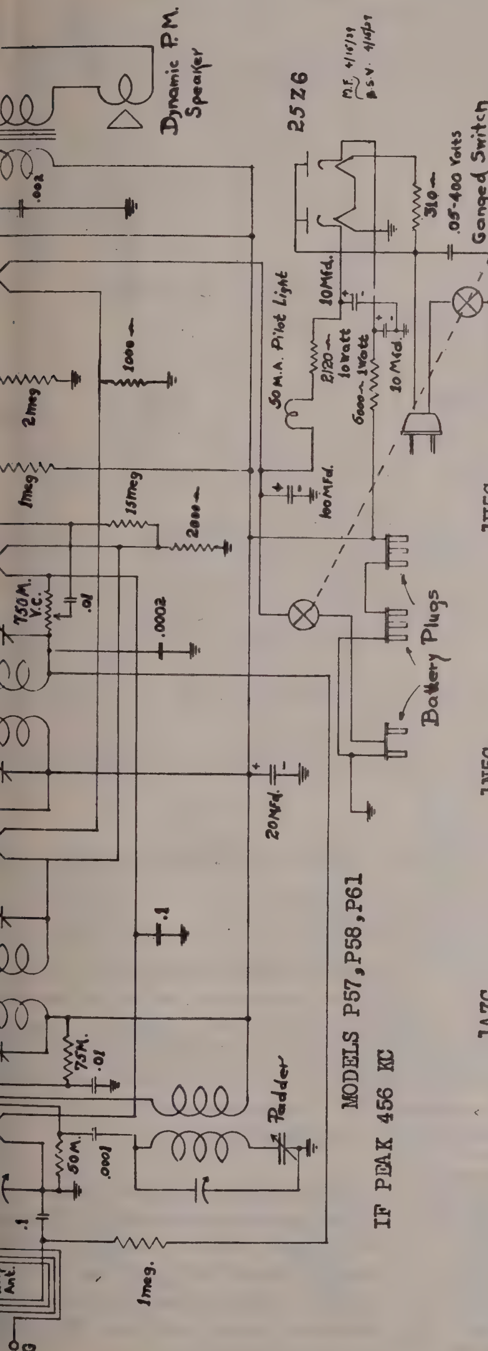
FIG.7





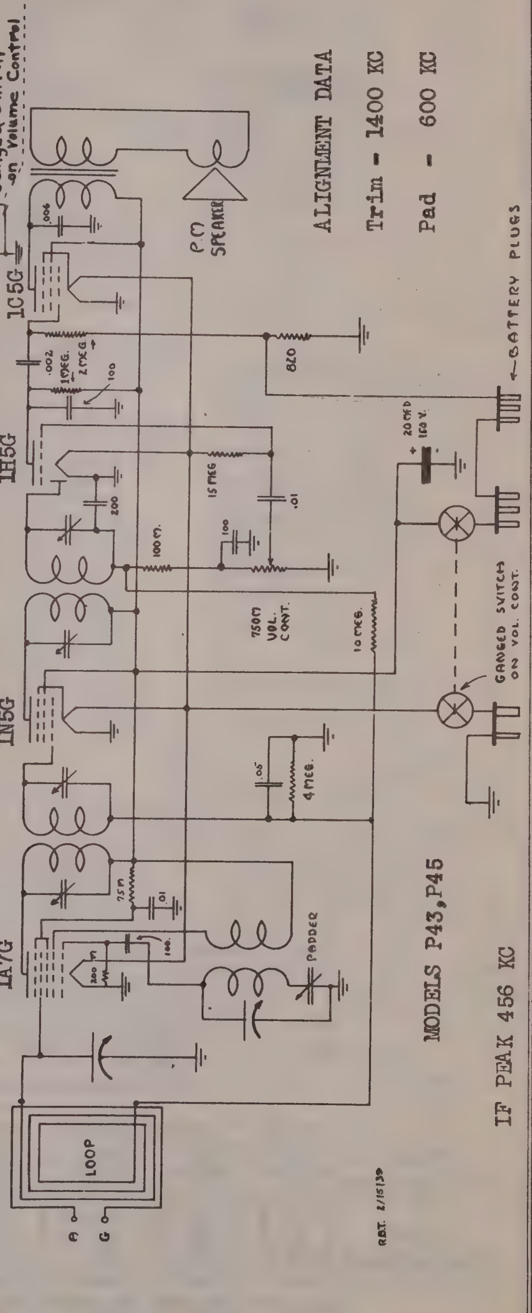
AUTOMATIC RADIO MFG. CO., INC.

MODELS P43,P45
MODELS P57,P58,P61
Schematics



MODELS P57,P58,P61

IF PEAK 456 KC



ALIGNMENT DATA

Trim - 1400 KC

Pad - 600 KC

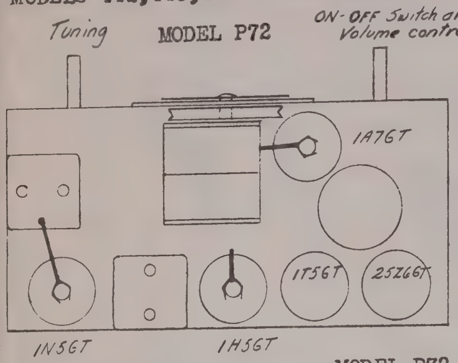
MODELS P43,P45

IF PEAK 456 KC

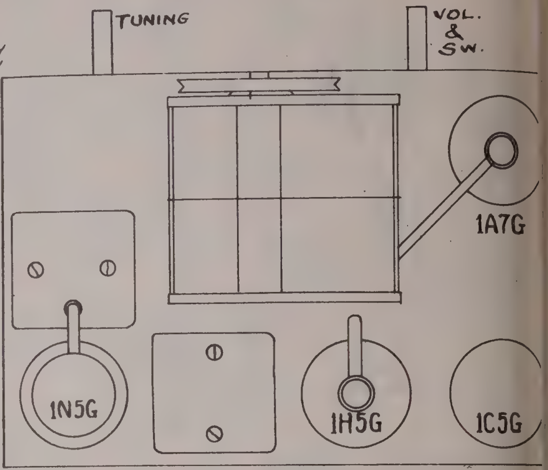
MODELS P43,P45
MODEL P57
MODEL P72
Socket Layouts
MODELS 402,403,404,405,406,408
MODELS 442,443,446 Tuner Data

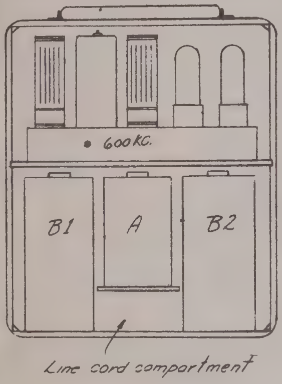
AUTOMATIC RADIO MFG. CO., INC.

MODEL P72



MODELS P43,P45





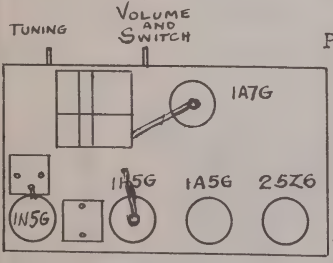
MODEL P72

PUSH-BUTTON LINE-UP MODELS 442,443,446

To adjust push-buttons to desired stations:

1. Press second button from right and tune in manually the one of the four desired stations having the lowest number of kilocycles (nearest right hand end of tuning dial). Note its program.
2. Press third button from right with volume control set to full volume, insert screwdriver blade into slot of large screw in corresponding hole at rear of set directly behind this button, and rotate one turn or two in either direction until same station is heard at maximum volume, then adjust small screw in same hole until greatest volume and best quality are obtained.
3. Adjust fourth button in the same manner to the desired station with the next higher kilocycle reading (next station to the left on the manual tuning dial).
4. Repeat this procedure for buttons 5 and 6.

In some cases it may be desirable to make a slight final readjustment on all fou buttons some time after the original setting, to compensate for changes due to tem perature and climatic conditions.



MODEL P57

PUSH-BUTTON DATA MODELS 402,403,404,405,406,408

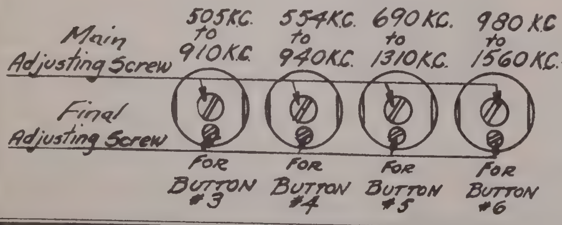
1. Loosen all buttons by turning them counter-clockwise.
2. Locate a desired station by manual tuning.
3. Adjust one button to this station by pushing button in as far as it will go, keeping t station tuned in, then release.
4. When button returns to original position, tighten it by turning clockwise. Station is no tuned in permanently on this button.
5. Repeat operations 2, 3 and 4 on each succeeding button until all have been adjusted stations desired.

In some cases it may be desirable to make a slight final readjustment on all four buttons som time after the original setting to compensate for changes due to temperature and climatic condition

---

CAUTION: In setting up push buttons, for consistent reception, be sure the adjustments a made to the *local* station on a network broadcast, and that a weaker, distant station with the sa program is not selected.

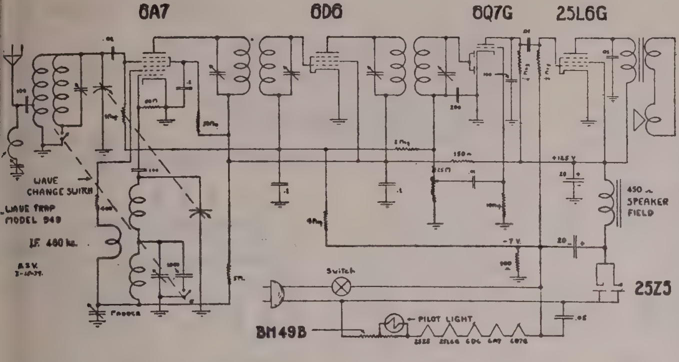
PUSH-BUTTON DATA MODELS 442,443,446



NOTE: To adjust to desired station, press in corresponding button directly in front. Turn main adjusting screw to obtain selected station, then turn final adjusting screw to obtain best clarity and volume. Do not turn volume control on full while making adjustments.

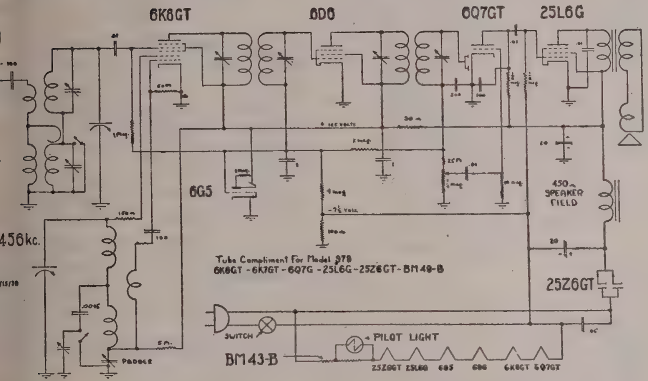
AUTOMATIC RADIO MFG. CO., INC.

MODELS M-66,M-77
MODELS 939,949
MODELS 975,979,988
Schematics



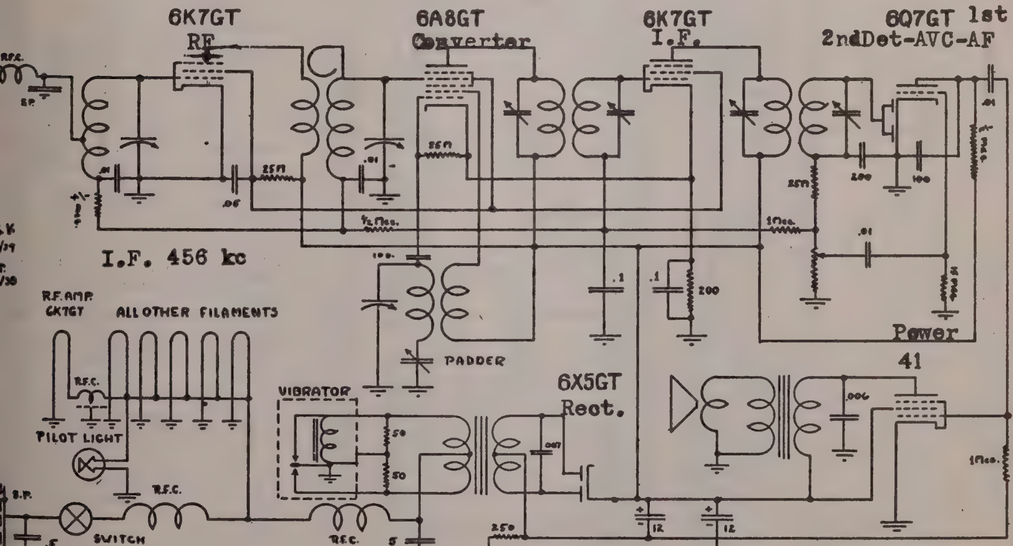
Models
939 and 949

6A7- Converter
6D6- I. F.
6Q7G- 2nd Det-AVC-1st AF
25L6G-Power
25Z5-Rect.


6K8GT
6D6
6Q7GT
25L6G
6G5
456kc.
450 ~ SPEAKER FIELD
25Z6GT
SWITCH
PILOT LIGHT
BM43-B
PADDER
Tube Compliment For Model 979
6K8GT - 6K7GT - 6Q7G - 25L6G - 25Z6GT - BM49-B
25Z6GT 25L6G 6G5 6D6 6K8GT 6Q7GT

Models
975
979
988

6K8GT- Converter
6D6- I.F.
6Q7GT-2nd Det-AVC-1st AF
25L6G-Power
25Z6GT-Rect.



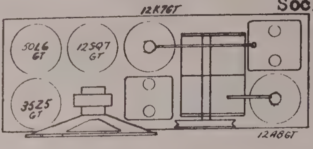
Model M-66,
also as M-77 (without push-buttons)

MODELS M-66,M-77
MODELS 400,401
MODELS 402,403,406
MODELS 404,405,408

AUTOMATIC RADIO MFG. CO., INC.

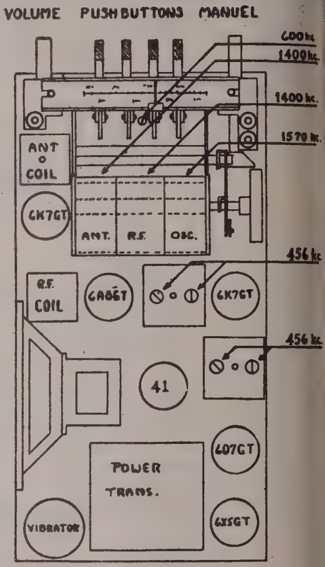
MODELS 440 to 444,4
MODELS 448,
450,452,454
MODEL 480
Socket Layouts

TUBE LOCATION CHART —

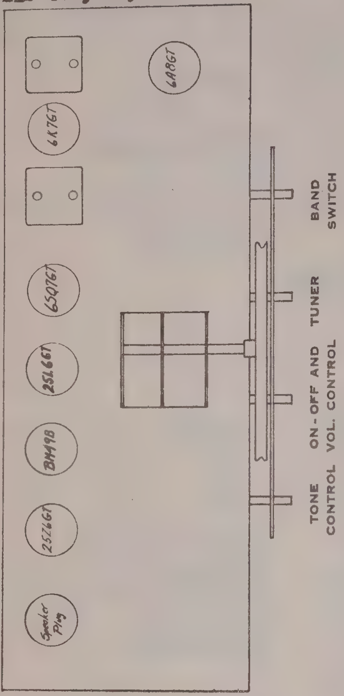


MODELS 402-403-406

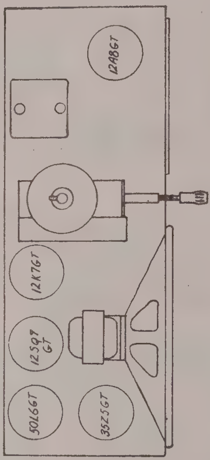
MODELS M66 & M7



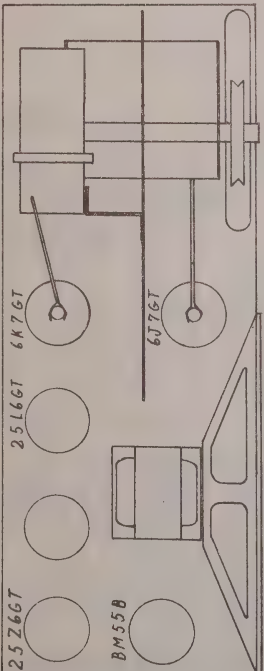
TUBE LOCATION—MODEL 480



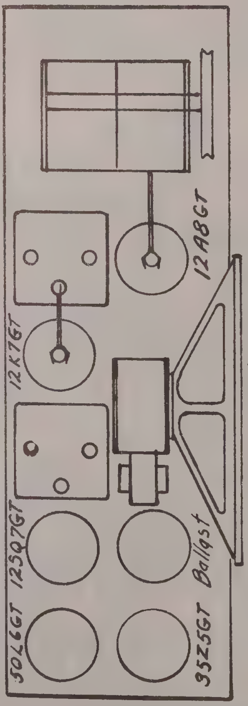
TUBE LOCATION CHART — MODELS 404-405-408



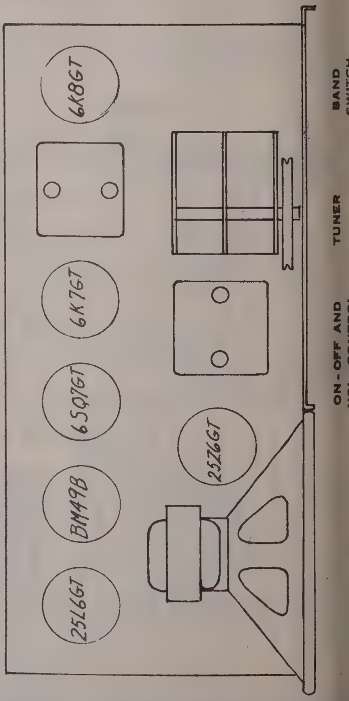
TUBE LOCATION CHART — MODELS 400-401



TUBE LOCATION — MODELS 440-441-442-443-444-446

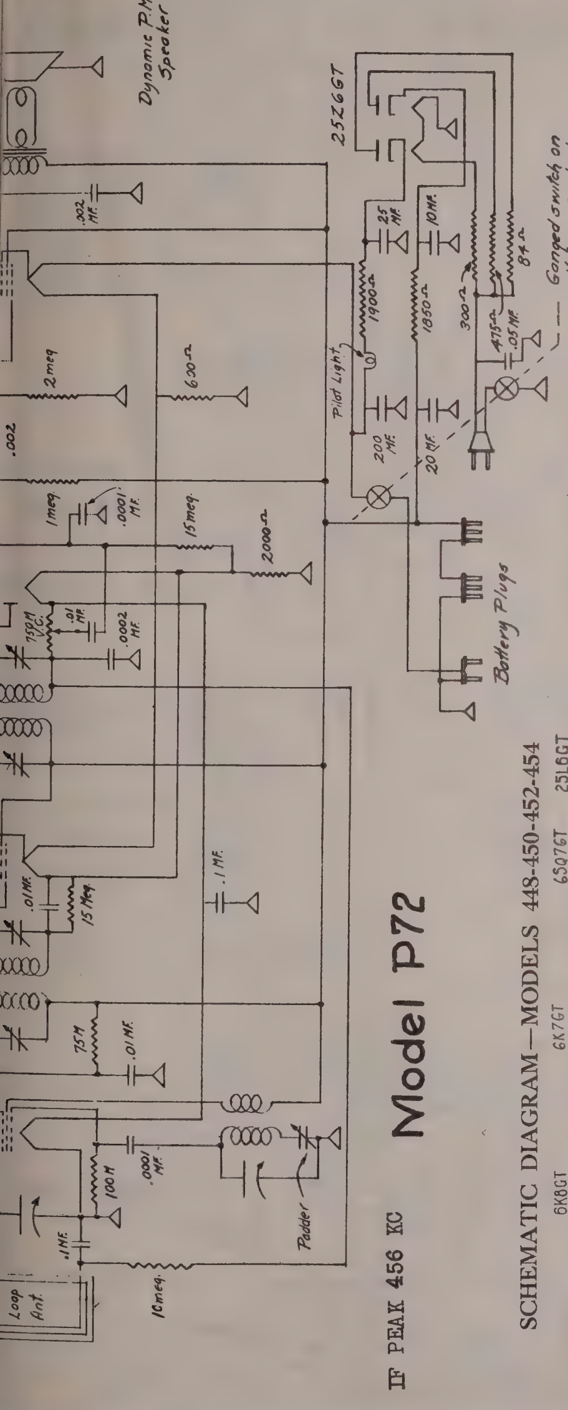


TUBE LOCATION—MODELS 448-450-452-454



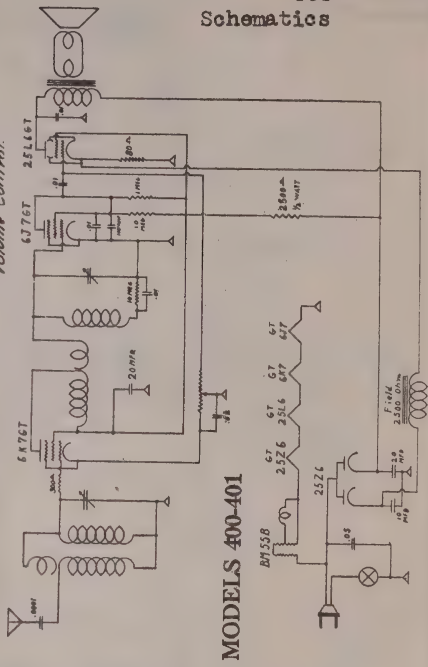
AUTOMATIC RADIO MFG. CO. INC.

MODEL P72
MODELS 400,401
MODELS 448,450,452
454
Schematics

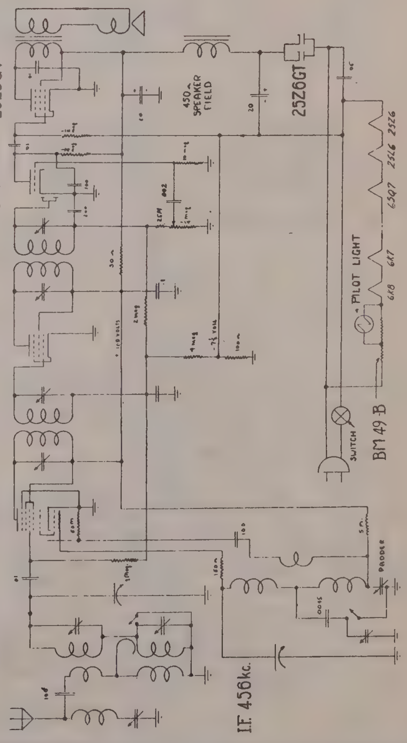


Model P72

IF PEAK 456 KC



MODELS 400-401

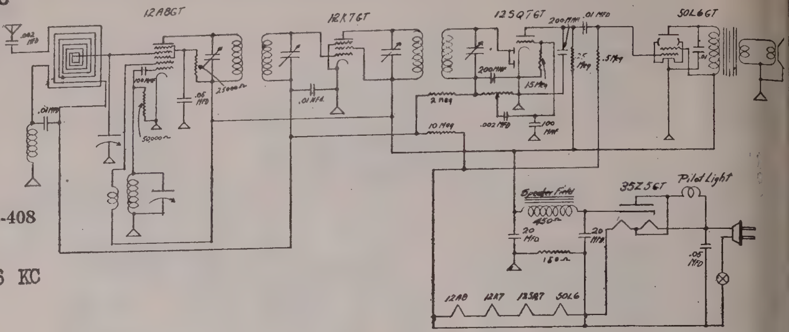


SCHEMATIC DIAGRAM—MODELS 448-450-452-454

IF 456kc.

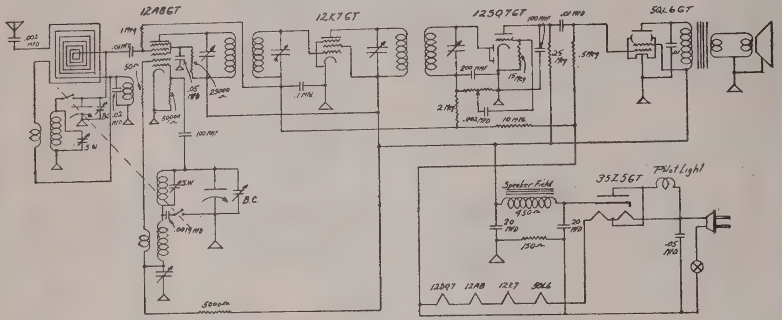
MODELS 402 to 406,408
MODELS 440,441,444
MODELS 442,443,446
MODEL 480
Schematics

AUTOMATIC RADIO MFG. CO., INC.



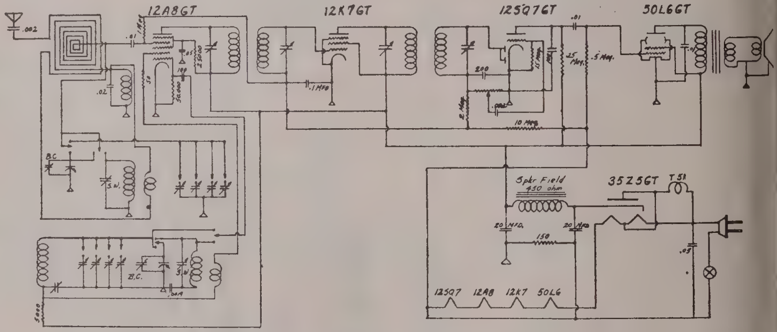
MODELS 402-403-
404-405-406-408

IF PEAK 456 KC



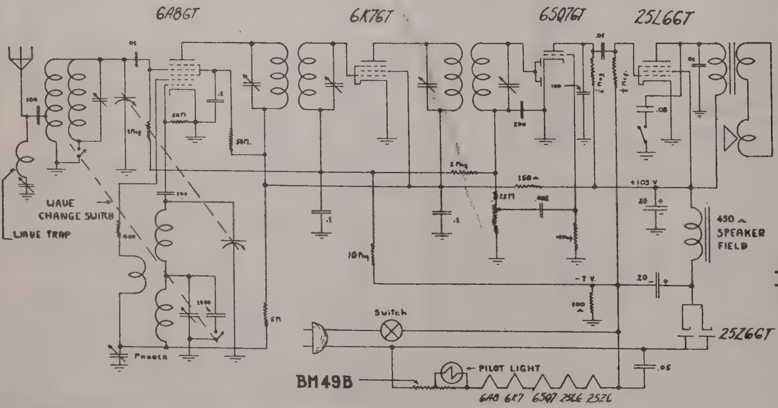
MODELS
440-441-444

IF PEAK 456 KC



MODELS
442-443-446

IF PEAK 456 KC



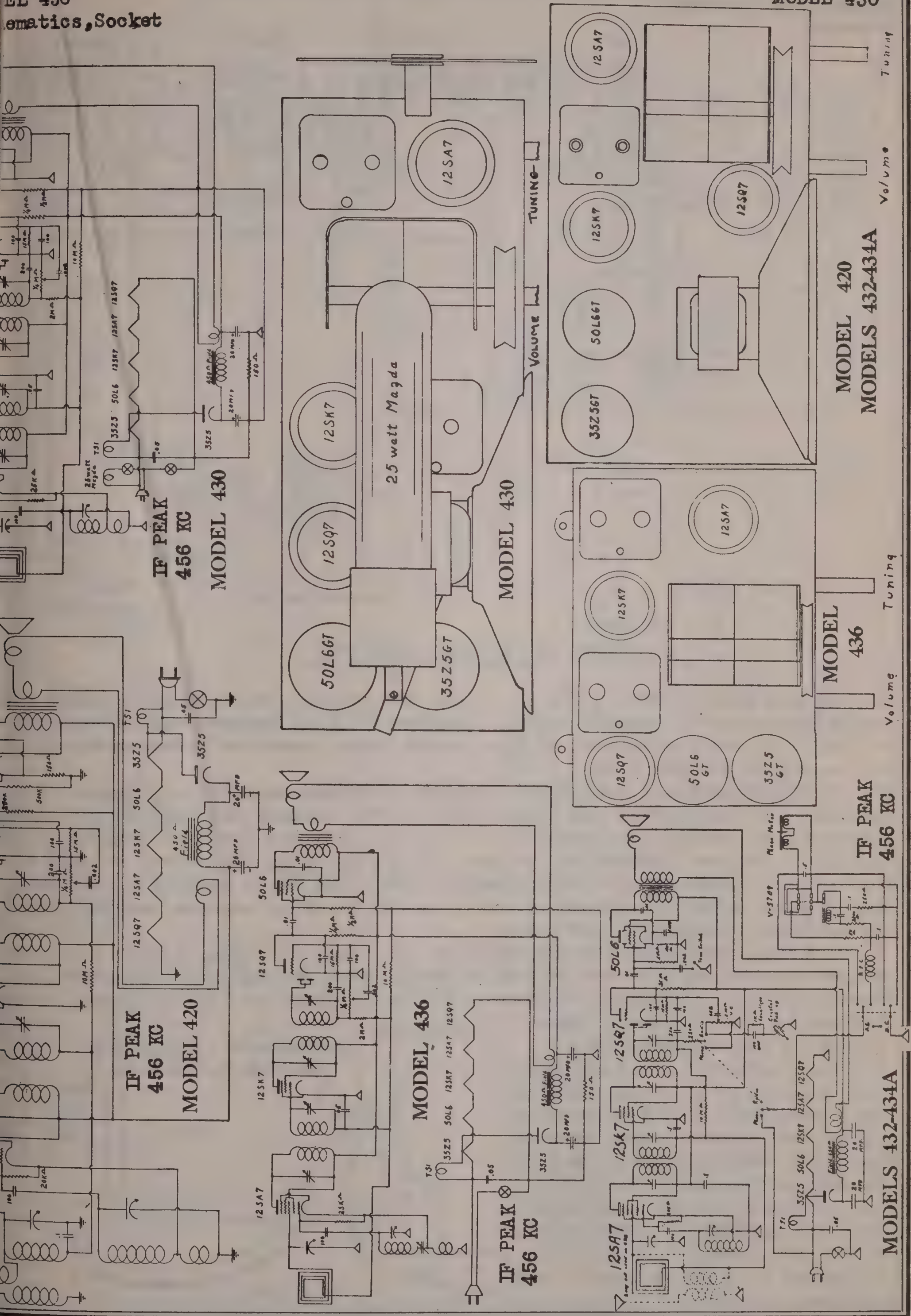
MODEL 480

IF PEAK 480 KC

ELS 432,434A
EL 436
ematics, Socket

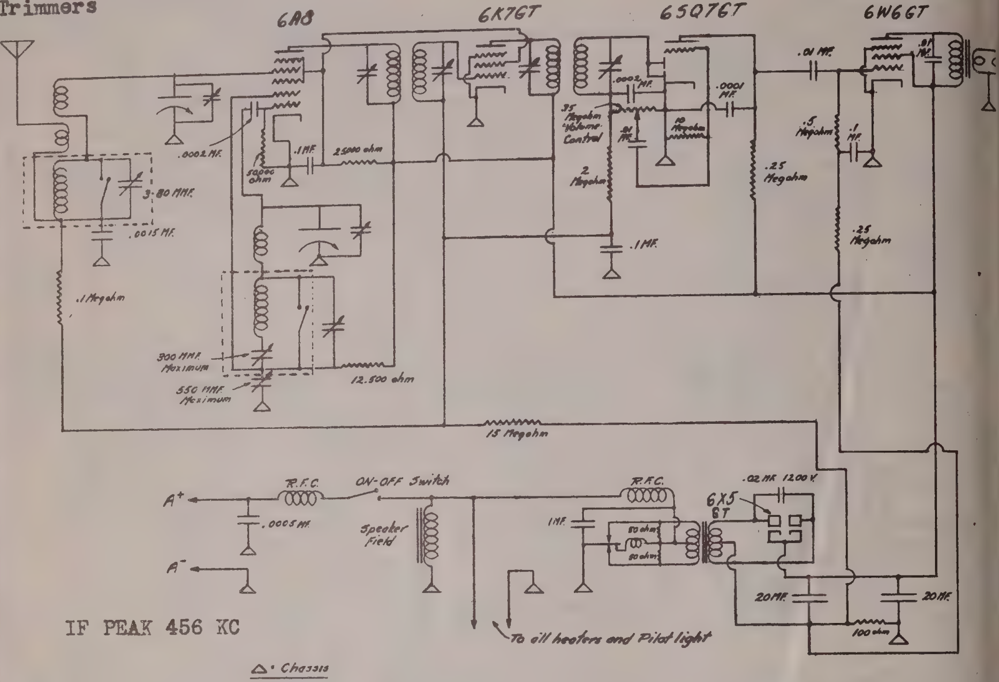
AUTOMATIC RADIO MFG. CO., INC.

MODEL 420
MODEL 430



MODEL 911
Schematic,Alignment
Trimmers

AUTOMATIC RADIO MFG. CO., INC.



IF PEAK 456 KC

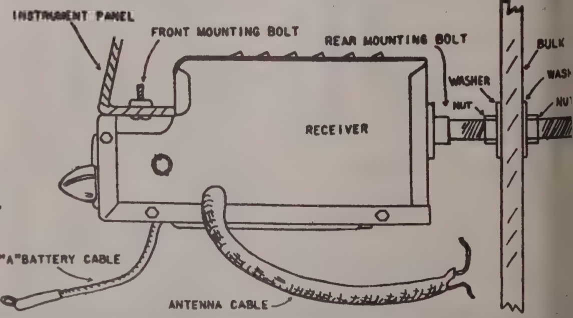
ALIGNMENT AND TRIMMER LOCATIONS

IF. Connect signal lead at 456 KC to the 6A8 control grid. Connect output mete across secondary of speaker output transformer. With weakest signal necessary to obtain .5 volt deflection on the output meter, peak the trimmers on the firs and second IF transformers.

RF. Align intermediate band first. Follow procedure carefully. Connect a 200 m condenser in series with the signal lead to the antenna terminal of the receive Turn the band switch counter-clockwise to the intermediate band position. Adjus oscillator trimmer located at the rear of the variable condenser, to 1560 KC wi the variable condenser set at mechanical zero. Pad lower section of the dual pa der, located under the composite coil, to 600 KC. Trim antenna section (front) the variable condenser at 1400 KC.

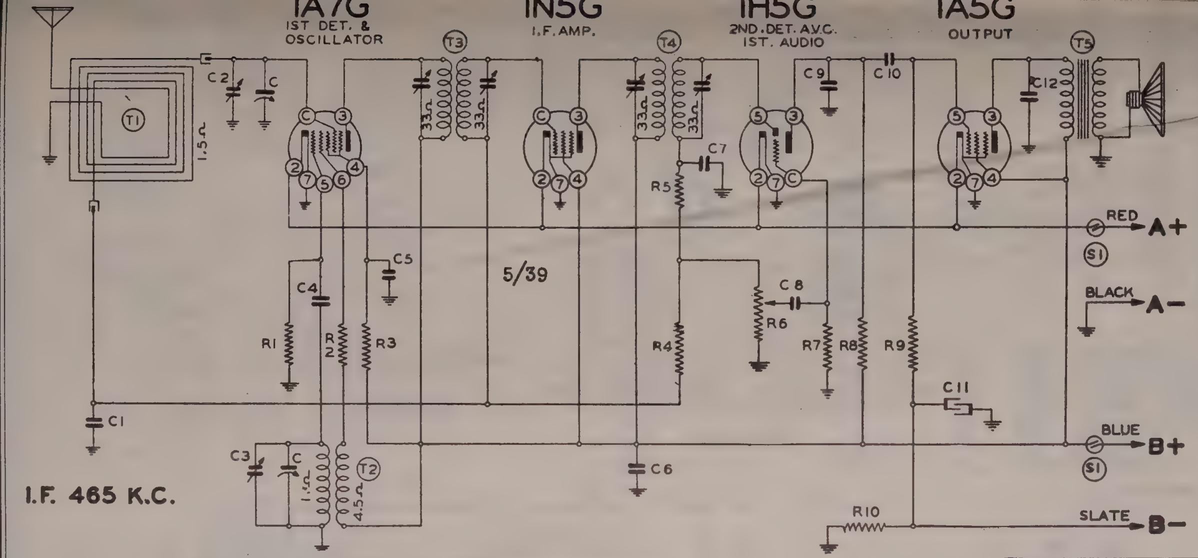
Turn wave switch to the clockwise or long wave position. Adjust oscillator trimmer mounted on the wave switch to 346 KC with the variable condenser set at mechanical zero. Pad upper section of the dual padder at 149 KC. Adjust antenna trimmer to 300 KC through hole on top of the antenna coil.

When installed in an automobile best results will be had on the long wave band if the trimmer is readjusted. Tune in some station near 900 meters; remove the plug located on the right hand side of the receiver; insert a screwdriver into the trimmer condenser slot; and rotate slowly in either direction until best results are obtained.



BELMONT RADIO CORP.

MODEL 407
Schematic,Voltage,Socket
Trimmers,Alignment



RESISTORS

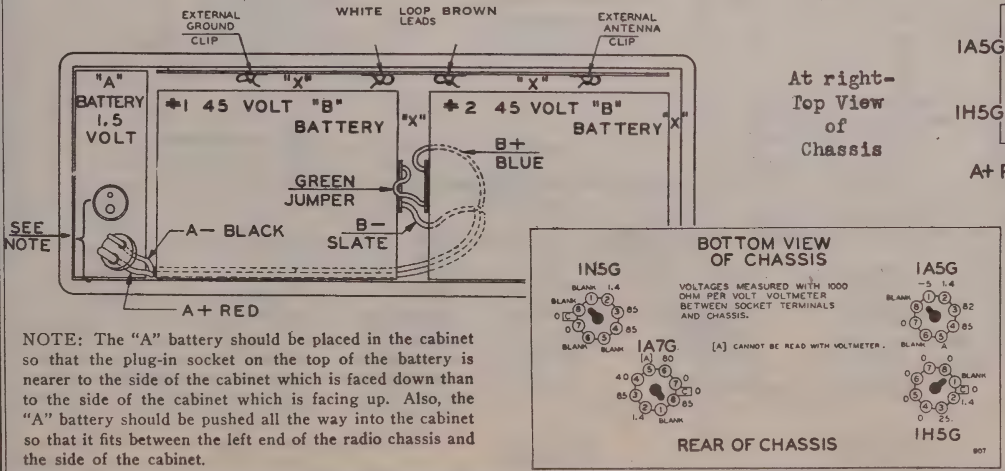
R1	1309	200M ohm—⅓ w. 20%
R2	13018	4M ohm—⅓ w. 20%
R3	130208	40M ohm—⅓ w. 20%
R4	13038	2 megohm—⅓ w. 20%
R5	13020	100M ohm—⅓ w. 20%
R6	101173	1 megohm volume control
R7	130257	5. megohm—⅓ w. 25%
R8	13037	750M ohm—⅓ w. 20%
R9	13038	2 megohm—⅓ w. 20%
R10	13070	500 ohm—⅓ w. 10%

CONDENSERS

C	102108	2 gang variable condenser
C1	10022	.05 x 200 v. 25%
C2		R. F. Trimmer on Gang
C3		Oscillator Trimmer on Gang
C4	12912	.00025 mica—20%
C5	1009	.05 x 200 v. 25%
C6	1006	.25 x 200 v. 20%
C7	12912	.00025 Mica 20%
C8	10025	.002 x 600 v. 25%
C9	12912	.00025 Mica 20%
C10	10078	.01 x 200 v. 25%
C11	11975	10 mfd. x 25 w. v. lytic
C12	10025	.002 x 600 v. 25%

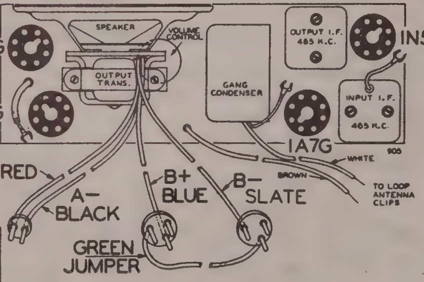
PARTS

T1	Loop Antenna Complete
T2	B. C. Oscillator Coil
T3	Input I. F. Coil
T4	Output I. F. Coil
T5	5" Speaker with output transformer
S1	D.P.S.T. On-off switch on volume cont



NOTE: The "A" battery should be placed in the cabinet so that the plug-in socket on the top of the battery is nearer to the side of the cabinet which is faced down than to the side of the cabinet which is facing up. Also, the "A" battery should be pushed all the way into the cabinet so that it fits between the left end of the radio chassis and the side of the cabinet.

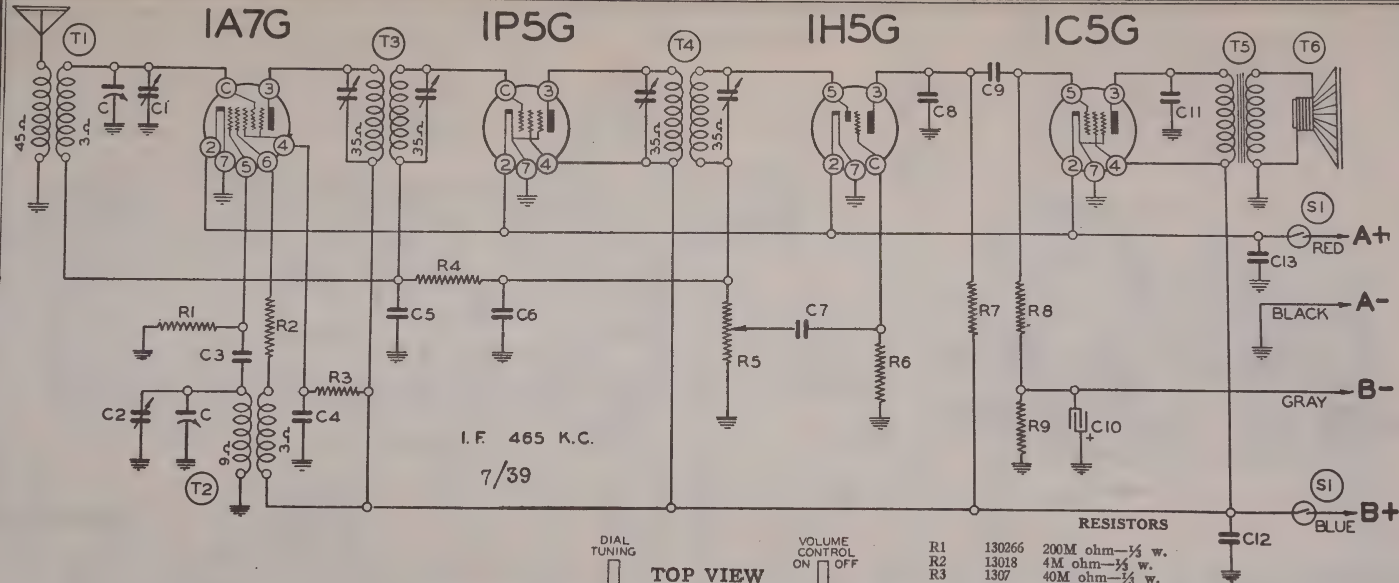
At right-
Top View
of
Chassis



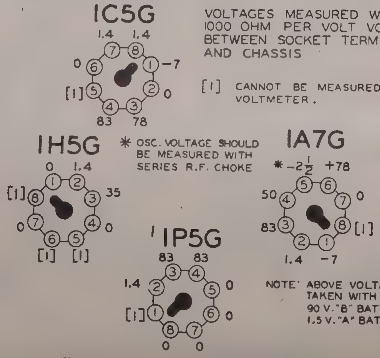
When aligning IF and Osc. - disconnect loop and connect 1 meg. resistor bet. loop leads from chassis. Trim osc. at 1650 Kc-
To align loop, reconnect same and remove 1 meg. resistor.
Trim at 1400 KC.

MODEL 460,Series A
Schematic,Voltage,Socket
Trimmers,Alignment

BELMONT RADIO CORP.



BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS

[1] CANNOT BE MEASURED WITH VOLTMETER.

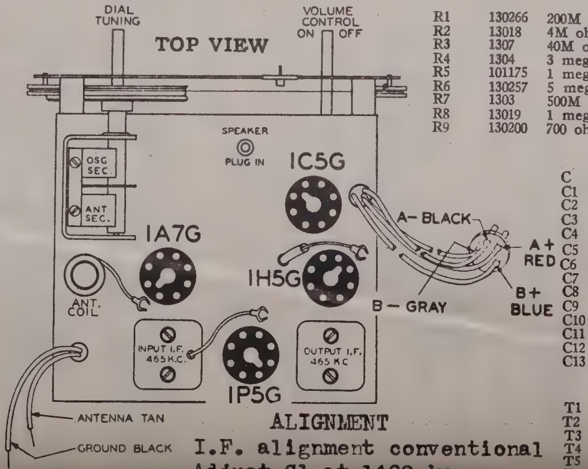
* OSC. VOLTAGE SHOULD BE MEASURED WITH SERIES R.F. CHOKE

NOTE: ABOVE VOLTAGES ARE TAKEN WITH A FULL 90 V. "B" BATTERY AND 1.5 V. "A" BATTERY

REAR OF CHASSIS

924

TOP VIEW



ALIGNMENT

I.F. alignment conventional
Adjust C1 at 1400 kc
Adjust C2 at 1730 kc

RESISTORS

R1	130266	200M ohm—⅓ w.
R2	13018	4M ohm—⅓ w.
R3	1307	40M ohm—⅓ w.
R4	1304	3 megohm—⅓ w.
R5	101175	1 megohm volume control
R6	130257	5 megohm—⅓ w.
R7	1303	500M ohm—⅓ w.
R8	13019	1 megohm—⅓ w.
R9	130200	700 ohm—⅓ w.

CONDENSERS

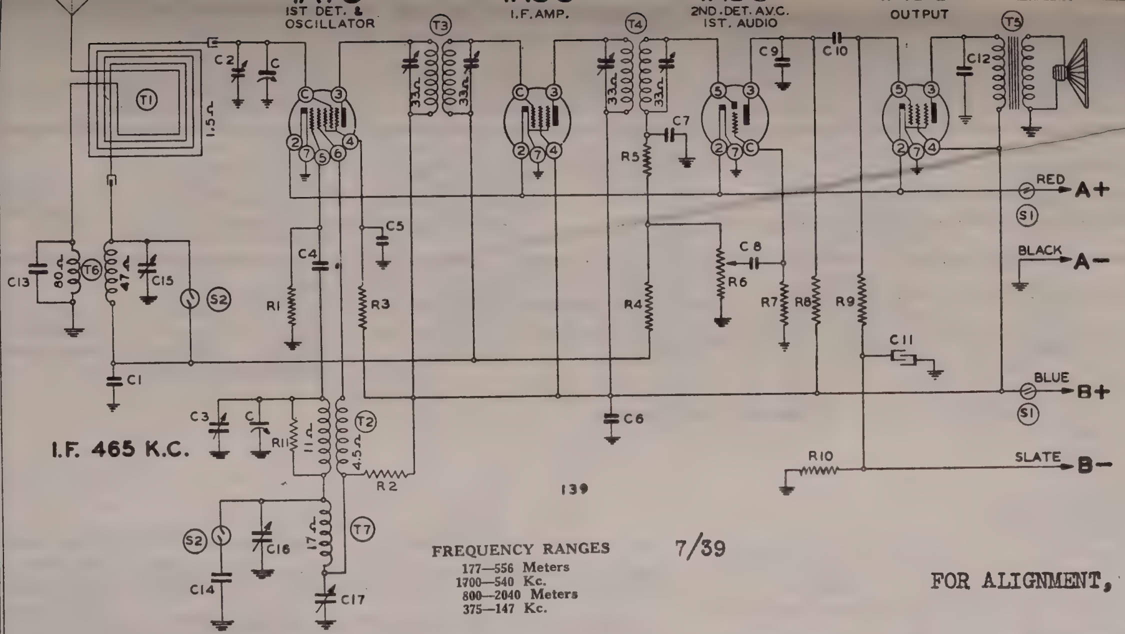
C	102110	2 gang variable condenser
C1		Antenna Trimmer on gang
C2		Oscillator trimmer on gang
C3	12912	.00025 mica
C4	1009	.05 x 200 v.
C5	1009	.05 x 200 v.
C6	1295	.0001 mica
C7	10012	.003 x 600 v.
C8	1295	.0001 mica
C9	10011	.01 x 400 v.
C10	11975	10 mfd. x 25 w. v.
C11	10012	.003 x 600 v.
C12	10064	.25 x 200 v.
C13	10020	.1 x 200 v.

PARTS

T1	111132	Antenna Coil
T2	110122	Oscillator Coil
T3	108151B	Input I. F. - 465 kc.
T4	108153	Output I. F. - 465 kc.
T5	10591	Output Transformer
T6	114166	5 in. P. M. Speaker
S1		Off-on switch on Volume control

BELMONT RADIO CORP.

MODEL 411, Series A
Schematic, Voltage
Socket, Trimmers



I.F. 465 K.C.

139

FREQUENCY RANGES
177—556 Meters
1700—540 Kc.
800—2040 Meters
375—147 Kc.

7/39

FOR ALIGNMENT, SEE INDEX

R2	13018	4M ohm—⅓ w.—20%
R3	130208	40M ohm—⅓ w.—20%
R4	13038	2 megohm—⅓ w.—20%
R5	13020	100M ohm—⅓ w.—20%
R6	101173	1 megohm volume control
R7	130257	5. megohm—⅓ w.—25%
R8	13037	750M ohm—⅓ w. 20%
R9	13038	2 megohm—⅓ w.—20%
R10	13070	500 ohm—⅓ w.—10%
R11	130232	25M ohm—⅓ w.—10%

CONDENSERS

C	102109B	2 gang variable condenser
C1	10022	.05 x 200 v.—25%
C2		R.F. Trimmer on Gang
C3		Oscillator Trimmer on Gang
C4	12912	.00025 mica—20%
C5	1009	.05 x 200 v.—25%
C6	1006	.25 x 200 v.—20%
C7	12912	.00025 mica—20%
C8	10025	.002 x 600 v.—25%
C9	12912	.00025 mica—20%
C10	10078	.01 x 200 v.—25%
C11	11975	10 mfd. x 25 w. v. lytic
C12	10025	.002 x 600 v.—25%
C13	12912	.00025 mica—20%
C14	10078	.01 x 200 v.—25%
C15	124103	L.W. Antenna Trimmer
C16	124103	L.W. Oscillator Trimmer
C17	124103	L.W. Oscillator Padder
		C15, C16 and C17 in one unit

Power Output.......100 Milliwatts Undistorted, 175 Milliwatts Maximum

Intermediate Frequency.......645.1 Meters (465 KC.)

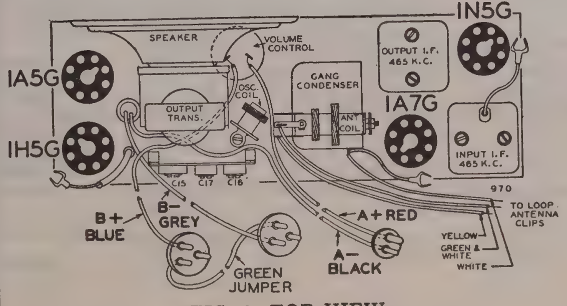
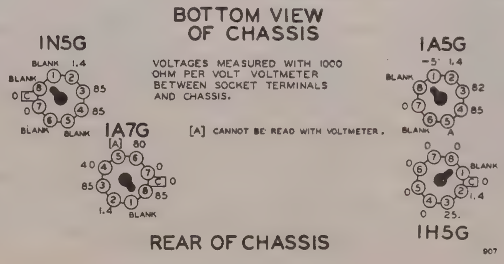


FIG. 2—TOP VIEW


BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
[A] CANNOT BE READ WITH VOLTMETER.
IN5G
BLANK
1.4
85
0
IA7G
[A]
80
40
IA5G
−5
82
IH5G
25.
REAR OF CHASSIS
907

PARTS

T1	111141	Loop Antenna Complete
T2	110121	B.C. Oscillator Coil
T3	108151	Input I.F. Coil
T4	108152	Output I.F. Coil
T5	114165	5" Speaker with output transformer
T6	111140	L.W. Antenna Coil
T7	110129	L.W. Oscillator Coil
S1		D.P.S.T. On-off switch on volume cont.
S2	12570B	Band Switch

MODEL 411, Series A
MODEL 510, Series A
Alignment

BELMONT RADIO CORP.

The alignment procedures for Belmont Model 411, Series A, and Model 510, Series A, are given below. Note "C" for Model 411 applies also to Models 407, 635, Series A, and 636, Series A and B.

MODEL 411 (Series A)

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1A7G Tube	"M.W."	Rotor full open (Plates out of mesh)	Four trimmers on top (See Fig. 1)	Output and input I. F.	(See Note "A") Adjust to maximum output
MEDIUM WAVE BAND	1700 Kc.	.1 MFD.	Grid of 1A7G Tube	"M.W."	Rotor full open (Plates out of mesh)	Trimmer (C3) front section of gang (See Fig. 4)	Medium Wave Oscillator	(See Note "A") Adjust to maximum output
	1400 Kc.		See Note "C"	"M.W."	Set dial at 1400 Kc.	Trimmer (C2) rear section of gang (See Fig. 4)	Antenna	(See Note "B") Adjust to maximum output
LONG WAVE BAND	375 Kc.		See Note "C"	"L.W."	Rotor full open (Plates out of mesh)	Trimmer (C16) (See Fig. 5)	Long Wave Oscillator	Adjust to maximum output
	375 Kc.		See Note "C"	"L.W."	Rotor full open (Plates out of mesh)	Trimmer (C15) (See Fig. 5)	Antenna	Adjust to maximum output
	150 Kc.		See Note "C"	"L.W."	Set dial at 150 Kc.	Trimmer (C17) (See Fig. 5)	Long Wave Osc. Pad.	Adjust to maximum rock dial. (See note "D")

NOTE "A"—A 1 megohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer, (C3). The loop antenna must be disconnected from the chassis.

NOTE "B"—Remove the 1 megohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust trimmer (C2). (See note "C").

NOTE "C"—Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

NOTE "D"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

TEST FREQUENCIES USED:	Kilocycles	Meters
I. F.	465	645.1
Long Wave	150	2000
	375	800
Medium Wave	1400	214
	1700	177

MODEL 510 (Series A)

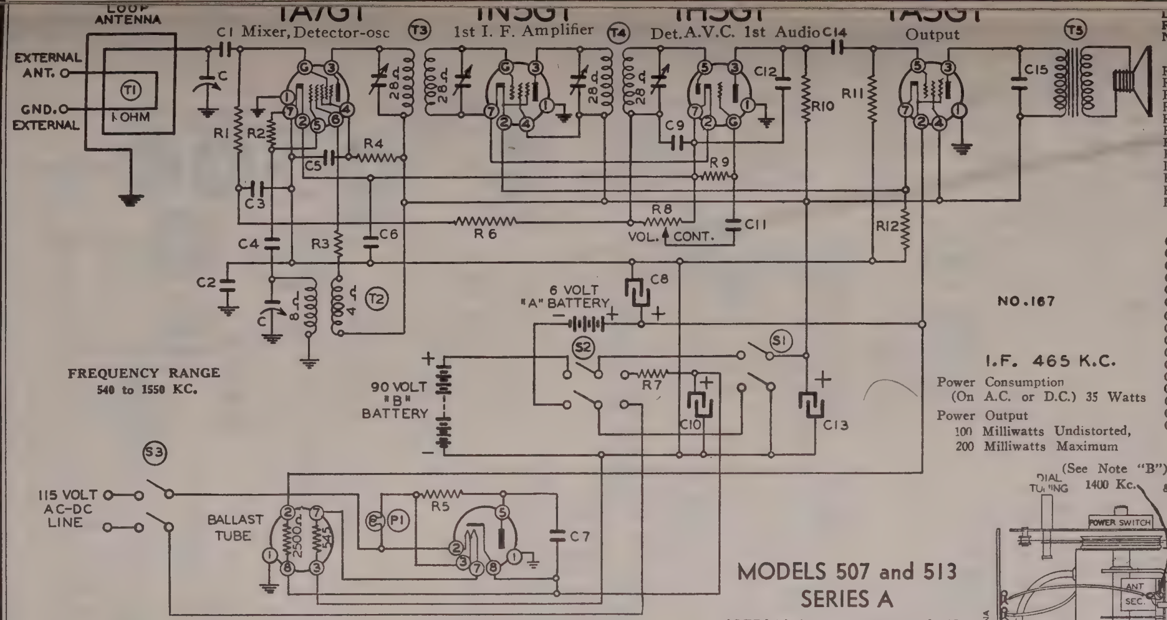
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C6) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C3) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See Fig. 3)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

Connect -B of radio chassis to ground post of signal generator through .1 mf condenser.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

MODELS 507,513,Series A
Serial 211,300 and up
Schematic,Voltage,Trimmers
Socket,Alignment

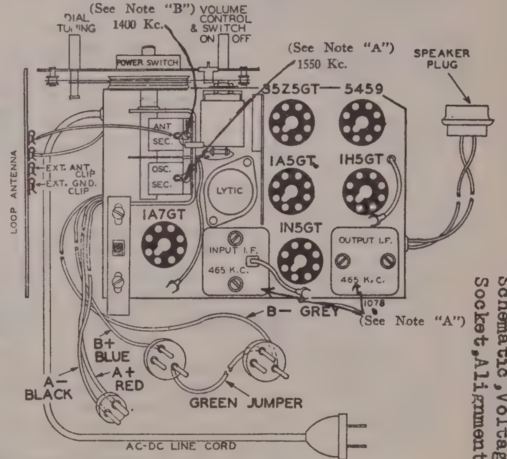


NO.167

I.F. 465 K.C.

Power Consumption
(On A.C. or D.C.) 35 Watts
Power Output
100 Milliwatts Undistorted,
200 Milliwatts Maximum

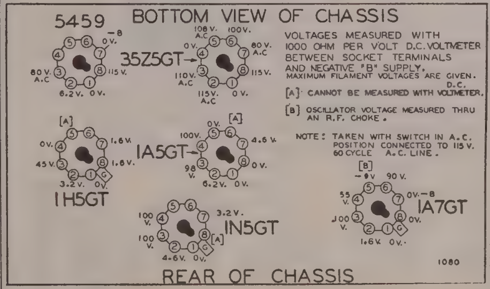
Diagram Ref. No.	Part No.	
		RESISTORS
R1	13038	2 megohm—⅓ w.
R2	130266	200M ohm—⅓ w.
R3	13018	4M ohm—⅓ w.
R4	130208	40M ohm—⅓ w.
R5	130215	25 ohm—½ w.
R6	130170	3 megohm—⅓ w.
R7	130129	2500 ohm—⅓ w.
R8	101210	1 megohm volume control
R9	130257	5 megohm—⅓ w.
R10	1303	500M ohm—⅓ w.
R11	13038	2 megohm—⅓ w.
R12	13092	1M ohm—⅓ w.
		CONDENSERS
C	102125	2 gang variable condenser
C1	12912	.00025
C2	100110	.2 mfd. x 400 v.
C3	1009	.05 x 200 v.
C4	12912	.00025
C5	1009	.05 x 200 v.
C6	10020	.1 x 200 v.
C7	10011	.01 x 400 v.
C8	119104	Lytic 200 mfd. x 6 w. v.
C9	1295	.0001 mfd.
C10	119104	Lytic 40 mfd. x 150 w. v.
C11	10025	.002 x 600 v.
C12	1292	.0005 mfd.
C13	119104	Lytic 20 mfd. x 150 w. v.
C14	10011	.01 x 400 v.
C15	10025	.002 x 600 v.
		C8, C10 and C13 in same unit



MODELS 507 and 513
SERIES A
(SERIAL No. 211,300 and UP)

12/39

Ballast **5459** **35Z5GT** Rectifier


5459
BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT D.C. VOLTMETER BETWEEN SOCKET TERMINALS AND NEGATIVE "B" SUPPLY. MAXIMUM FILAMENT VOLTAGES ARE GIVEN. D.C.
[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] OSCILLATOR VOLTAGE MEASURED THRU AN R.F. CHOKE.
NOTE: TAKEN WITH SWITCH IN A.C. POSITION CONNECTED TO 115 V. 60 CYCLE A.C. LINE.
-8
0 V.
80 V. A.C
115 V.
6.2 V.
0 V.
35Z5GT
108 V. A.C
100 V.
0 V.
80 V. A.C
110 V. A.C
115 V.
115 V. A.C
0 V.
[A]
1.6 V.
0 V.
45 V.
1.8 V.
3.2 V.
0 V.
1H5GT
1A5GT
0 V.
[A]
100 V.
4.6 V.
98 V.
0 V.
6.2 V.
0 V.
100 V.
3.2 V.
100 V.
[A]
1N5GT
4.6 V.
0 V.
[B]
-9 V
90 V.
55 V.
0 V. -B
100 V.
0 V.
1A7GT
1.6 V.
0 V.
1080
REAR OF CHASSIS

SERVICE NOTES—

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. All voltages are indicated on the voltage chart.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows: "A"—50 ma., "B"—8 ma.

ALIGNMENT NOTES

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments. The ground of the signal generator is connected to the negative "B" wire of the radio and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

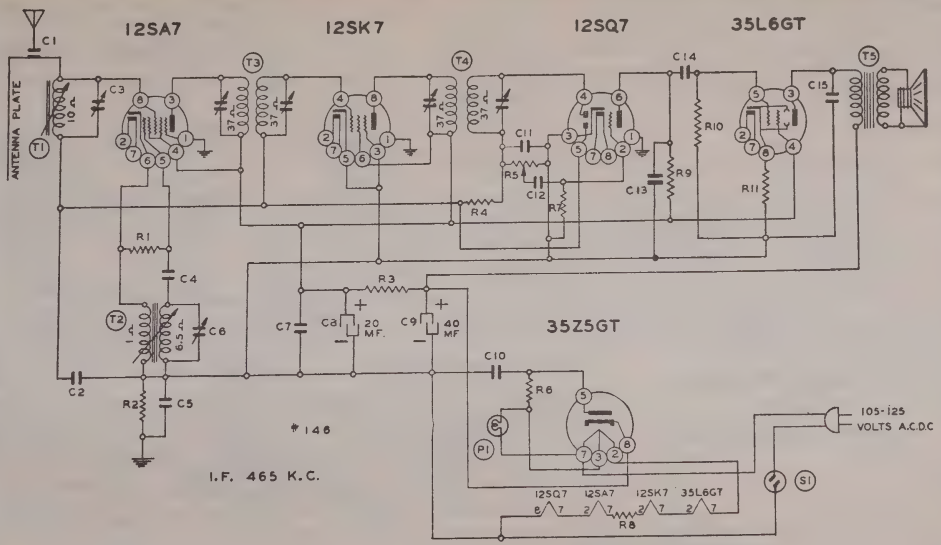
NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the ground terminal of the loop assembly. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the antenna terminal of the loop assembly.

It is important when making this adjustment that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.

T1	111171	Loop Antenna
T2	110144	Oscillator Coil.
T3	108171	Input I. F. Coil—465 kc.
T4	108172	Output I. F. Coil—465 kc.
T5	114189	Speaker with output transform
S1	101210	Switch on volume control
S2	125106	Power Switch
S3	125107	Cut-off switch in line cord
P1	107249	Pilot light T47

MODEL 510,Series A
Schematic,Voltage
Socket,Trimmers

BELMONT RADIO CORP.



RESISTORS

R1	130176	20M ohm—⅓ w.
R2	130100	150M ohm—⅓ w.
R3	130279	1M ohm—1 watt
R4	1304	3 megohm—⅓ w.
R5	101196	500M ohm volume control
R6	130293	30 ohm—1 watt
R7	130257	5 megohm—⅓ w.
R8	130288	50 ohm—1.5 watt
R9	1302	75M ohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	130166	150 ohm—⅓ w.

CONDENSERS

C1	131262	.00001 washer condenser (on Antenna plate)
C2	10022	.05 x 200 v.
C3	124100	Antenna Trimmer
C4	12930	.00005 Mica
C5	10091	.15 x 400 v.
C6	124100	Oscillator Trimmer
C7	10022	.05 x 200 v.
C8	11992	20 mfd. x 150 v. lytic
C9	11992	40 mfd. x 150 v. lytic
C10	10013	.05 x 400 v.
C11	12912	.00025 mica
C12	10025	.002 x 600 v.
C13	1292	.0005 mica
C14	10011	.01 x 400 v.
C15	10011	.01 x 400 v.

C3 and C6 in one unit
C8 and C9 in one unit

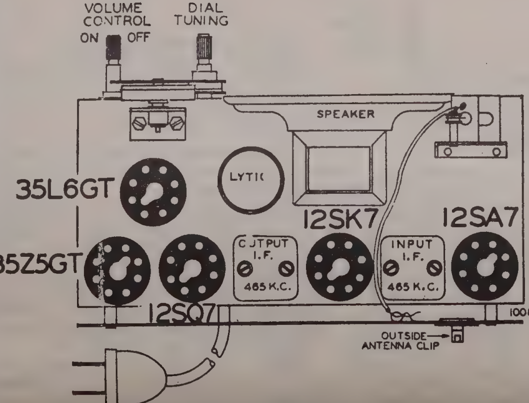
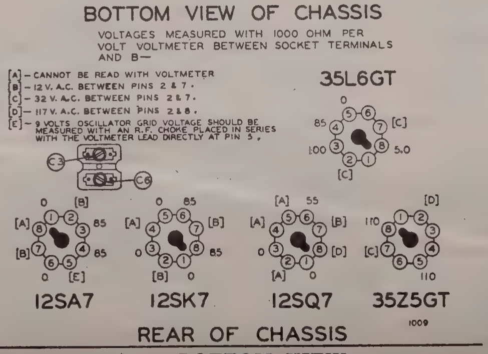


FIG. 1—TOP VIEW



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

[A]—CANNOT BE READ WITH VOLTMETER
[B]—12 V. A.C. BETWEEN PINS 2 & 7.
[C]—32 V. A.C. BETWEEN PINS 2 & 7.
[D]—117 V. A.C. BETWEEN PINS 2 & 8.
[E]—9 VOLTS OSCILLATOR GRID VOLTAGE SHOULD BE MEASURED WITH AN R.F. CHOKE PLACED IN SERIES WITH THE VOLTMETER LEAD DIRECTLY AT PIN 5.

FIG. 3.—BOTTOM VIEW

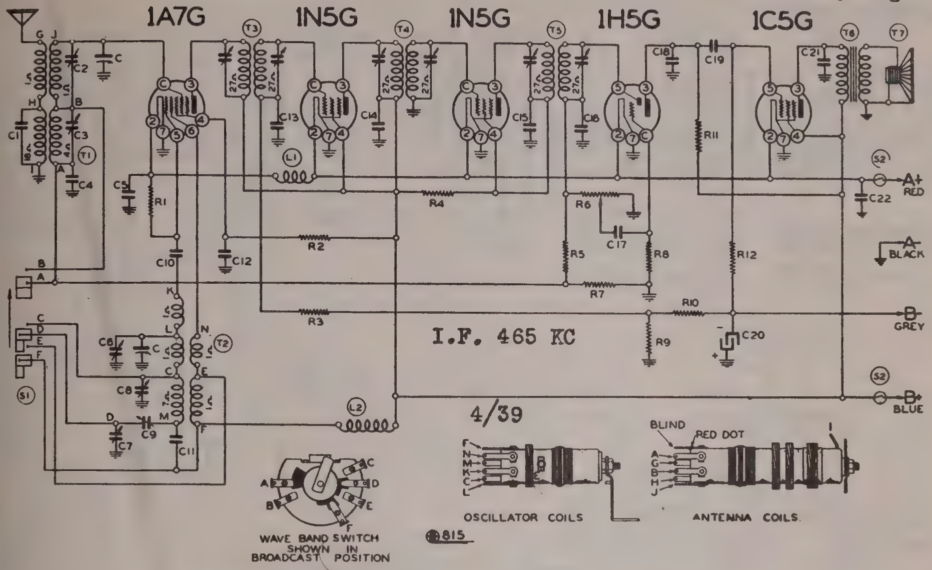
FOR ALIGNMENT, SEE INDEX

PARTS

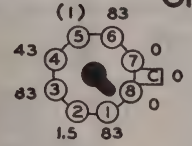
T1	111136B	Antenna Coil Complete
T2	110126B	Oscillator Coil
T3	108157C	Input I. F. Coil—465 kc.
T4	108157C	Output I. F. Coil—465 kc.
T5	114170	4" P. M. Speaker and Transformer
S1	101196	Off-on switch on volume control
P1	107249	6-8 v. pilot light T-47

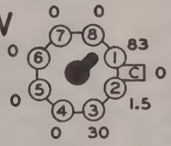
BELMONT RADIO CORP.

MODEL 511,Series A
Schematic,Voltage
Socket,Alignment



(Conv.) 1A7G BOTTOM VIEW OF CHASSIS

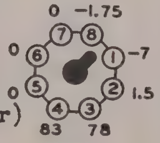




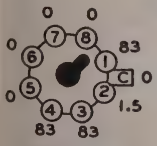
(2nd Det.) 1H5G
(AVC-AF)

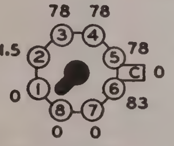
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

(1) CANNOT BE READ WITH VOLTMETER.



(Power) 1C5G





812

1N5G (I.F.) 1N5G (I.F.)

REAR OF CHASSIS

RESISTORS

R1	200M ohm—⅓ w.
R2	50M ohm—⅓ w.
R3	1 megohm—⅓ w.
R4	3M ohm—⅓ w
R5	2 megohm—⅓ w.
R6	250M ohm—volume control
R7	4 megohm—⅓ w.
R8	1 megohm—⅓ w.
R9	180 ohm—⅓ w.
R10	450 ohm—⅓ w.
R11	500M ohm—⅓ w
R12	1 megohm—⅓ w.

CONDENSERS

C	2 gang variable condenser
C1	.0001 mica
C2	S.W. Antenna Adj. Trimmer
C3	B.C. Antenna Adj. Trimmer
C4	.05 x 200 v.
C5	.25 x 200 v.
C6	S.W Osc. Adj. Trimmer on gang
C7	S.W. Adj. Series pad .003 w. c.
C8	B.C Osc. Adj. Trimmer
C9	B.C. Adj. Series Pad 580 mmf. w. c.
C10	.00005 mica
C11	.05 x 200 v.
C12	.1 x 200 v.
C13	.05 x 200 v.
C14	.25 x 200 v
C15	.1 x 200 v.
C16	.00025 mica
C17	.006 x 600 v.
C18	.0002 mica
C19	.01 x 400 v.
C20	20 mfd. lytic w. v. 25 v.
C21	.004 x 600 v.
C22	.25 x 200 v.

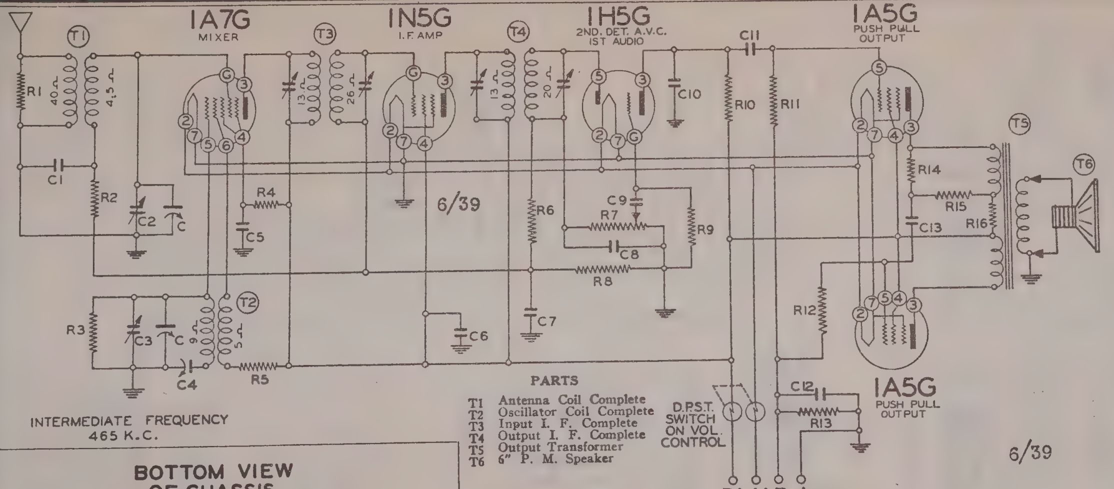
PARTS

T1	111117	Antenna Coil Complete
T2	110106	Oscillator Coil Complete
T3	108133	Input I. F. 465 kc. complete
T4	108135	Interstage I. F.—465 kc. complete
T5	108134	Output I.F.—465 kc. complete
T6	114115	6" P. M. Speaker
L1	10568	"A" Choke
L2	1233	R. F. "B" Choke
S1	12573	Wave Band Switch
S2		D.P. S.T. Switch on Volume Control
T7	10569	Output Transformer

ALIGNMENT

I.F. alignment conventional
SW- Trim 17 MC; pad 6MC
BB- Trim osc at 1750 kc
Trim ant. at 1400 kc
Pad at 600 kc

MODEL 551B,Series A
Issue B
Schematic,Voltage,Socket
Trimmers,Alignment



PARTS

T1	Antenna Coil Complete
T2	Oscillator Coil Complete
T3	Input I. F. Complete
T4	Output I. F. Complete
T5	Output Transformer
T6	6" P. M. Speaker

RESISTORS

R1	13021	20M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	1309	200M ohm—⅓ w.
R4	130208	40M ohm—⅓ w.
R5	13071	4M ohm—⅓ w.
R6	13038	2 megohm—⅓ w.
R7	101140	1 megohm—volume cont
R8	13038	2 megohm—⅓ w.
R9	13019	1 megohm—⅓ w.
R10	13037	750M ohm—⅓ w.
R11	13019	1 megohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	130222	350 ohm—⅓ w.
R14	13019	1 megohm—⅓ w.
R15	130232	25M ohm—⅓ w.
R16	130264	1000 ohm—⅓ w.

CONDENSERS

C	10289	2 gang Variable Conden:
C1	1009	.05 x 200 v.—25%
C2		Antenna Section Trimmer
C3		Oscillator Section Trimmer
C4	12464	Series Pad
C5	10070	.5 x 120 v.—20%
C6	10048	.25 x 200 v.
C7	1009	.05 x 200 v.
C8	1295	.0001 Mica
C9	10011	.01 x 400 v.
C10	12921	.0002 Mica
C11	10078	.01 x 200 v.
C12	11935	10 mfd. x 25 volts—lytic
C13	10078	.01 x 200 v.

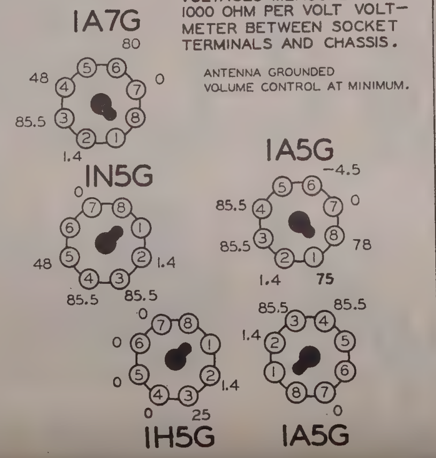
ALIGNMENT

I.F.-conventional
Trim osc at 1735 kc
Pad osc at 600 kc
Trim ant. at 1400 kc

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

ANTENNA GROUNDED
VOLUME CONTROL AT MINIMUM.



REAR OF CHASSIS

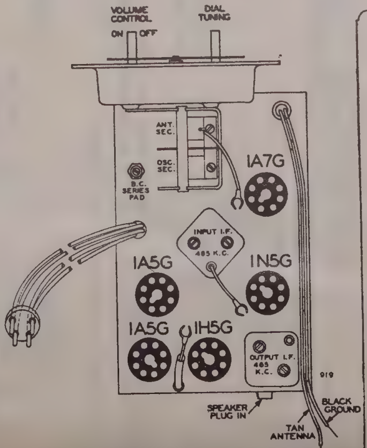
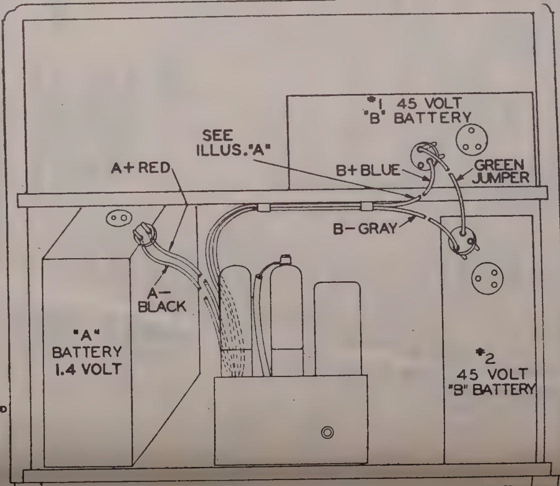


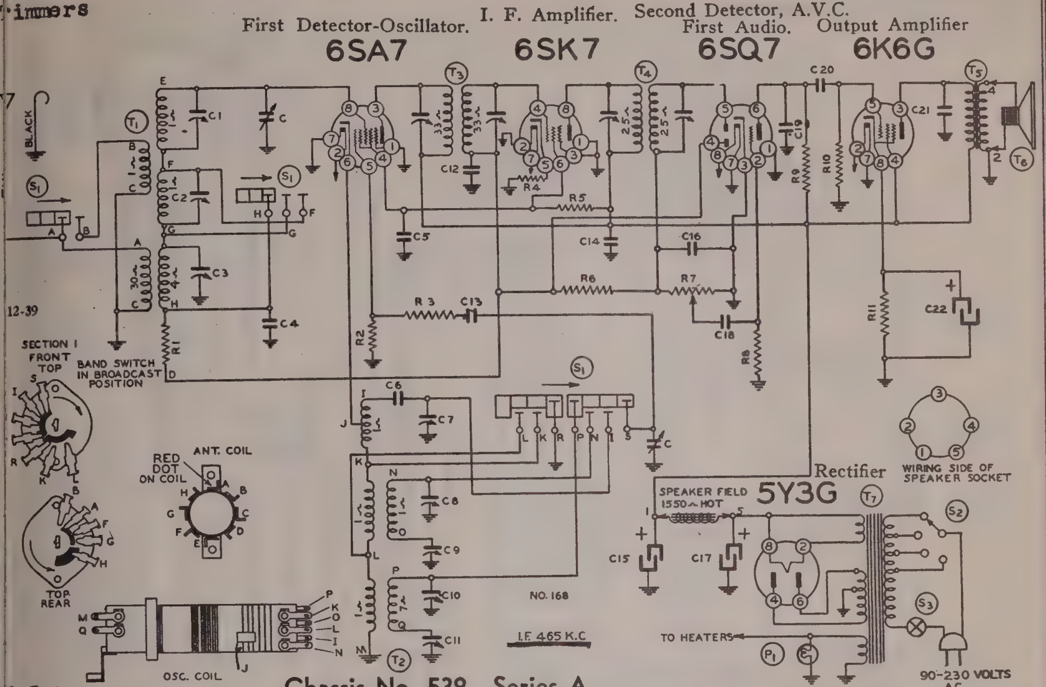
FIG. 1—TOP VIEW



rial 9M259100 and up
hematic,Voltage,Socket
immers

BELMONT RADIO CORP

MODELS 539-415,etc.(Export)
Chassis 539,Series A



Chassis No. 539—Series A
(Serial No. 9M259100 and up)
For Models 539-415, Etc.

f. o.	Part No.	Description
		RESISTORS
	13011	250M ohm—⅓ w.
	130194	35M ohm—⅓ w.
	130299	10 ohm—⅓ w.
	130239	250 ohm—⅓ w.
	130242	12M ohm—1 watt
	1304	3 megohm—⅓ w.
7	101208	1 megohm volume control
	130223	10 megohm—⅓ w.
	13011	250M ohm—⅓ w.
10	13019	1 megohm—⅓ w.
11	13070	500 ohm—⅓ w.
		CONDENSERS
	102124	Two Gang Variable Condenser
	124124	S. W. Antenna Trimmer
	124124	M. W. Antenna Trimmer
	124124	B. C. Antenna Trimmer
	1009	.05 x 200 v.
	1001	.1 x 400 v.
	129153	.006—S. W. Padder (Set at Factory)
7	124123	S. W. Oscillator Trimmer
	124123	M. W. Oscillator Trimmer
	129154	.0025 M. W. Padder
10	124123	B. C. Oscillator Trimmer
11	129155	B. C. Padder
12	10026	.02 x 400 v.
13	1295	.0001 Mica
14	1001	.1 x 400 v.
C15	119103	40 mfd. lytic
C16	1295	.0001 Mica
C17	119103	10 mfd. lytic
C18	10025	.002 x 600 v.
C19	1292	.0005 Mica
C20	10026	.02 x 400 v.
C21	10071	.004 x 600 v.
C22	119103	20 mfd. lytic x 25 w. v. C15, C17 and C22 in same unit
		PARTS
T1	111169	Antenna Coil
T2	110143	Oscillator Coil
T3	108169B	Input I. F.
T4	108170	Output I. F.
T5	10575	Output Transformer
T6	114176	6" Dynamic Speaker (1550 ohm field)
T7	104193	Power Transformer 40-60 cycles 90-230 volts
S1	125105	Band Switch
S2		Voltage Switch on Power Transformer
S3		Volume Control—On-Off switch
P1	10794	Pilot Light Bulb T-44

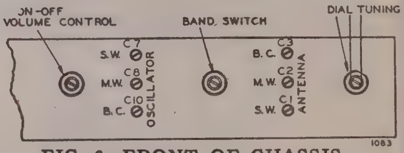


FIG. 3—FRONT OF CHASSIS

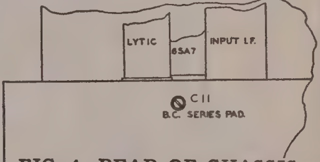


FIG. 4—REAR OF CHASSIS

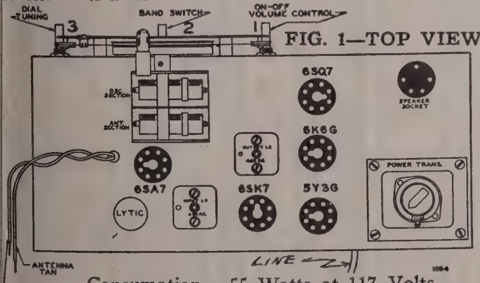
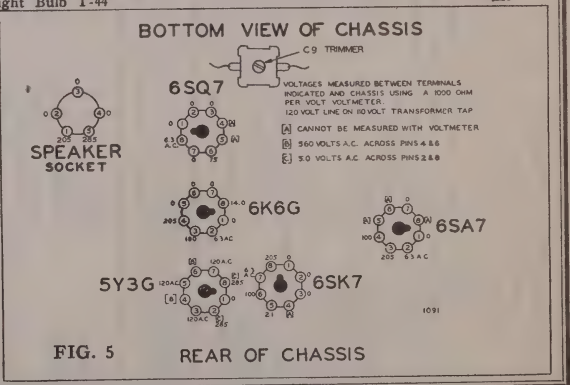


FIG. 1—TOP VIEW



VOLTAGES MEASURED BETWEEN TERMINALS INDICATED AND CHASSIS USING A 1000 OHM PER VOLT VOLTMETER.
120 VOLT LINE ON 110 VOLT TRANSFORMER TAP

[A] CANNOT BE MEASURED WITH VOLTMETER
[B] 560 VOLTS A.C. ACROSS PINS 4 & 6
[C] 5.0 VOLTS A.C. ACROSS PINS 2 & 8

FIG. 5 REAR OF CHASSIS

Consumption.......55 Watts at 117 Volts
Output
.......1.5 Watts Undistorted, 3 Watts Maximum

MODELS 539-415,etc.(Export)
Chassis 539,Series A
Alignment
MODEL 577D
Tuner Data

ALIGNMENT PROCEDURE CHASSIS 539.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

No aligning adjustments should be attempted with the chassis in the cabinet.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mf., 200 Mmf., 400 Ohms.

BAND	SIGNAL GENERATOR		Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
	Frequency Setting	Dummy Antenna						
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C7) (See Fig. 3)	Short wave oscillator	See Note "A" Adjust to maximum output
	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C1) (See Fig. 3)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 MC	Trimmers (C8, C2) (See Fig. 3)	Medium wave oscillator and antenna	Adjust to maximum output
	2.3 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.3 MC	Trimmer (C9) (See Fig. 5)	Medium wave osc. series pad	Adjust to maximum rock dial. (See note "B")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C3) (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C11) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS MODEL 577D

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. **Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.**

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

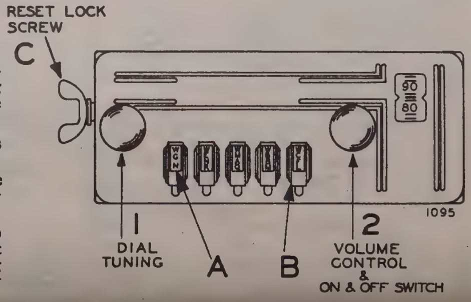
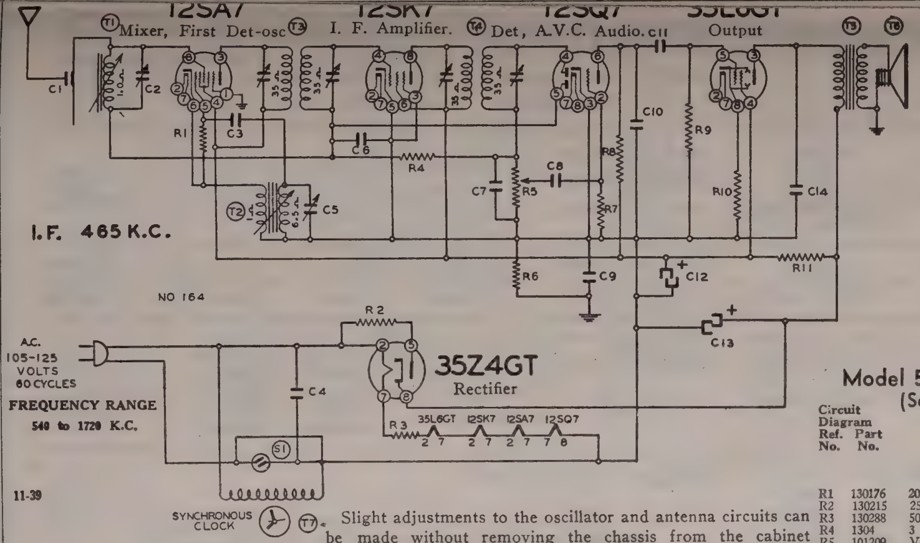


FIG. 2—FRONT VIEW

BELMONT RADIO CORP.

MODEL 571,Series A
Serial 189300 and up
Schematic,Voltage,Socket
Trimmers,Notes



FREQUENCY RANGE
540 to 1720 K.C.

11-39

Model 571 Series A
(Serial No. 189300 and up)

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—⅓ w.
R2	130215	25 ohm—½ w.
R3	130288	50 ohm—1½ w.
R4	1304	3 Megohm—⅓ w.
R5	101209	Volume Control—½ Meg.
R6	130100	150M ohm—⅓ w.
R7	130257	5 Megohm—⅓ w.
R8	130100	150M ohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	130166	150 ohm—⅓ w.
R11	130199	1500 ohm—1 w.
		CONDENSERS
C1	131262	.0002 Washer Condenser (Ant. Clip on Ant. Plate)
C2	124100	Ant. Section Dual Trimmer
C3	12939	.00005 Mica
C4	1001	.1 x 400 v.
C5	124100	Osc. Section Dual Trimmer
C6	10013	.05 x 400 v.
C7	1295	.0001 Mica
C8	10025	.002 x 600 v.
C9	10091	.15 x 400 v.
C10	1292	.0005 Mica
C11	10071	.004 x 600 v.
C12	11992	20 Mfd. 'Lytic
C13	11992	40 Mfd. 'Lytic.
C14	10011	.01 x 400 v.
		C2 and C5 in one unit.
		C12 and C13 in one unit.
		PARTS
T1	111136	Antenna Coil Complete
T2	110126	Oscillator Coil
T3	108157D	Input I. F. Coil—465 Kc.
T4	108157E	Output I. F. Coil—465 Kc.
T5	105106	Output Transformer
T6	114187	4" Speaker—PM.
T7	104188	Electric Clock Complete
S1		On-Off Switch on Volume Control

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through a hole which is provided on the bottom of the cabinet. (Remove snap-in button.)

The two adjustments on the trimmer assembly can be reached with a long insulated type screwdriver through this hole.

SERVICE NOTES:

Voltages taken from different points of circuit to —B are measured with all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

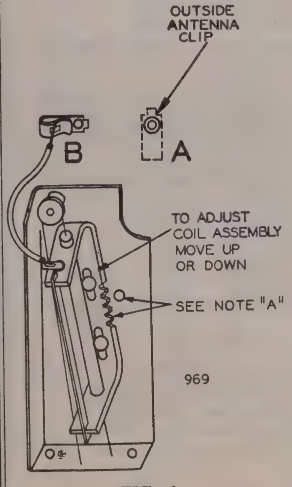


FIG. 4

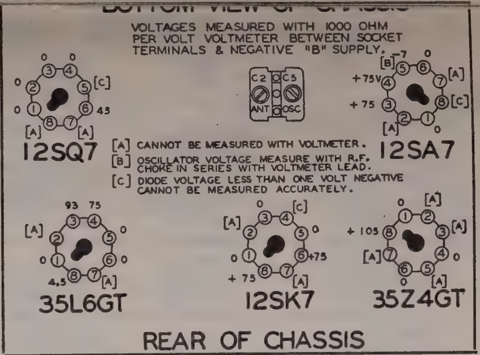

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & NEGATIVE "B" SUPPLY.
[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] OSCILLATOR VOLTAGE MEASURE WITH R.F. CHOKE IN SERIES WITH VOLTMETER LEAD.
[C] DIODE VOLTAGE LESS THAN ONE VOLT NEGATIVE CANNOT BE MEASURED ACCURATELY.
12SQ7
12SA7
35L6GT
12SK7
35Z4GT
C2 C5
ANT OSC
+75V
+75
-7
45
93 75
4.5
+75
+105
REAR OF CHASSIS

FIG. 3—BOTTOM VIEW

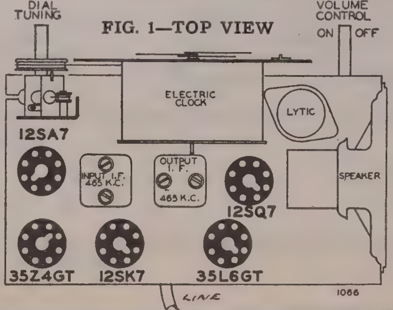


FIG. 1—TOP VIEW

Power Consumption..........35 Watts
Power Output....800 Milliwatts Undistorted,
1.2 Watts Maximum

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. Condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.

Model 571 Series A (Serial No. 189300 and up)

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C5) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C2) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C2) (See Fig. 3)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track; if the trimmer requires considerable change, it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

MODEL 629 SERIES A (Serial No. 9L225000 and up)

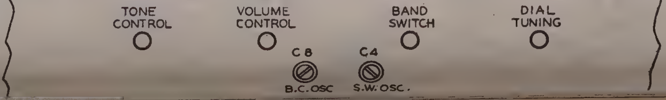
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	18.3 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Rotor full open (Plates out of mesh)	Trimmer (C4) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC.	Trimmer (C5)	Short Wave antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C8) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1400 Kc.	Trimmer (C6)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C7) (See Fig. 5)	Broadcast oscillator series pad (Bottom of chassis)	Adjust to maximum rock dial. (See note "A")

NOTE "A." Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

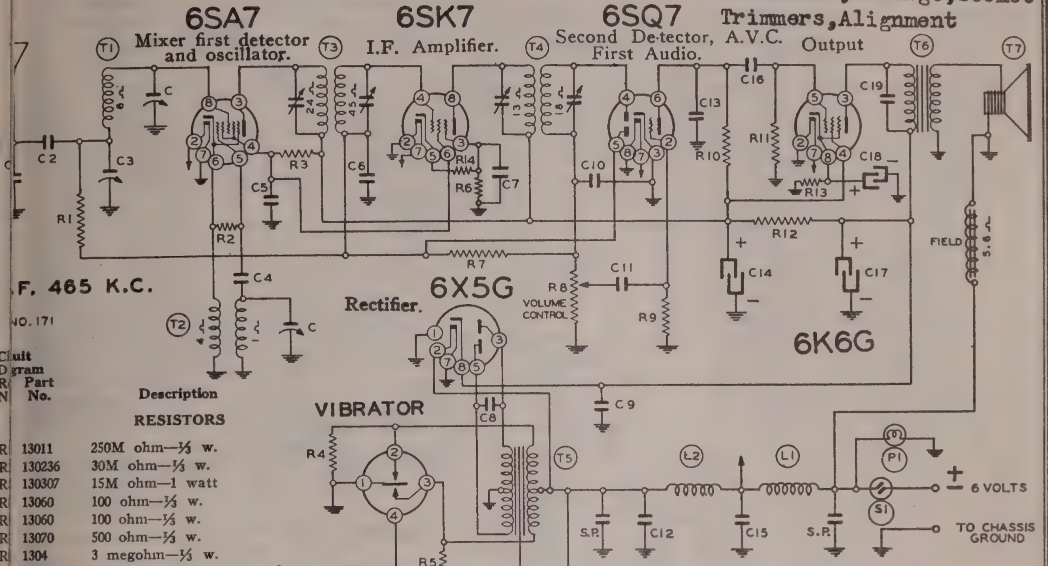
After each band is completed, repeat the procedure as a final check.

FIG. 4.—FRONT OF CHASSIS



BELMONT RADIO CORP.

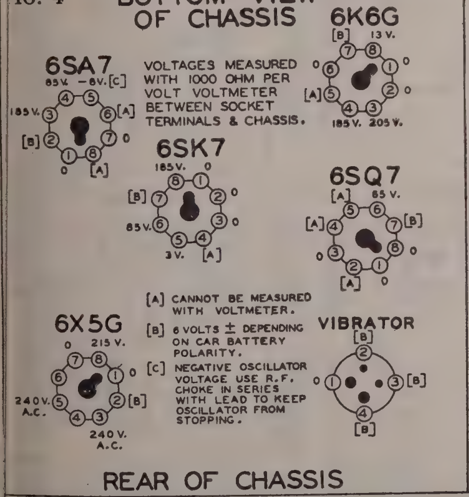
MODEL 577D
Serial 214845 up
Schematic, Voltage, Socket
Trimmers, Alignment



577 ISSUE D
January 1940
Serial No. 214845 Up

Ciuit Dgram R N	Part No.	Description
		RESISTORS
R	13011	250M ohm—⅓ w.
R	130236	30M ohm—⅓ w.
R	130307	15M ohm—1 watt
R	13060	100 ohm—⅓ w.
R	13060	100 ohm—⅓ w.
R	13070	500 ohm—⅓ w.
R	1304	3 megohm—⅓ w.
R	101110	1 megohm volume control
R	130257	5 megohm—⅓ w.
R	13011	250M ohm—⅓ w.
R	1303	500M ohm—⅓ w.
R	130199	1500 ohm—1 watt
R	130308	750 ohm—1 watt
R	130174	50 ohm—⅓ w.
		CONDENSERS
C	10269	2 gang variable condenser
C	1293	.00002 mica
C	10055	.01 x 400 volts
C	12434	Adj. Antenna Trimmer
C	12921	.0002 mica
C	100115	.05 x 400 v.
C	1009	.05 x 200 v.
C	10020	.1 x 200 v.
C	10034	.005 x 1200 v.
C	12912	.00025 mica
C	1295	.0001 mica
C	10025	.002 x 600 v.
C12	10031	.5 x 120 v.
C13	1292	.0005 mica
C14	119105	15 ufd. lytic x 350 w. v.
C15	10031	.5 x 120 v.
C16	10078	.01 x 200 v.
C17	119105	15 ufd. lytic x 350 w. v.
C18	119105	20 ufd. lytic x 25 w. v.
C19	10087	.01 x 600 v.
		C14, C17 and C18 in same unit
		PARTS
T1	11195B	Antenna Coil
T2	110146	Oscillator Coil
T3	108139	Input I. F. Coil—465 kc.
T4	108121B	Output I. F. Coil—465 kc.
T5	104131	Power Transformer
T6	10567	Output Transformer
T7	114114-R	5" Dynamic Speaker (5.6 ohm field)
L1	10568	"A" Choke
L2	10566	"A" Choke
S1		Switch on volume control
P1	10797	Pilot light (T51) 6-8 volts
S.P.	11749	(2) Spark Plates

FIG. 4 BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

[A] CANNOT BE MEASURED WITH VOLTMETER.

[B] 6 VOLTS ± DEPENDING ON CAR BATTERY POLARITY.

[C] NEGATIVE OSCILLATOR VOLTAGE USE R.F. CHOKE IN SERIES WITH LEAD TO KEEP OSCILLATOR FROM STOPPING.

FOR TUNER SEE INDEX

1-40

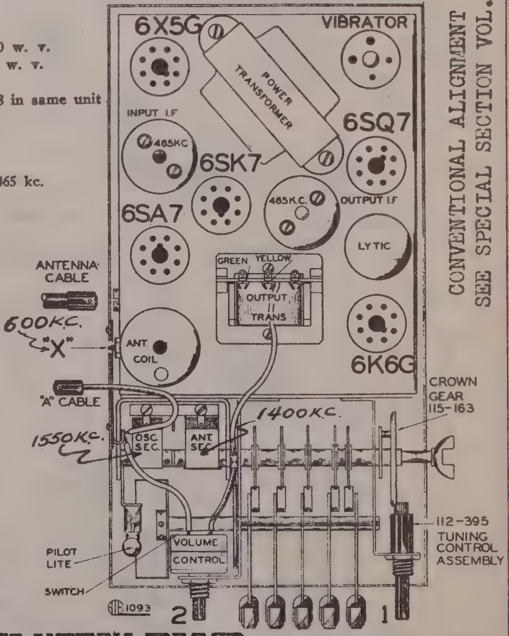


FIG. 3—TOP VIEW

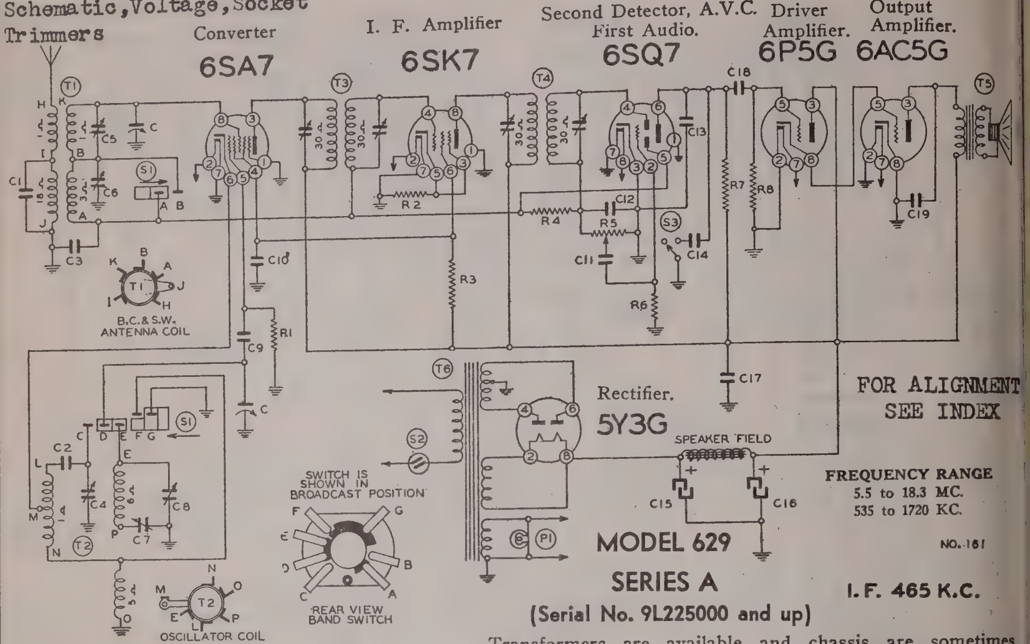
ADJUST ANTENNA TRIMMER

Tune in a weak signal at approximately 600 K.C. with volume control about three-fourths on. Adjust trimmer screw "X" until maximum output is obtained.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII.

MODEL 629, Series A
Serial 9L225000 up
Schematic, Voltage, Socket
Trimmers

BELMONT RADIO CORP.



FOR ALIGNMENT SEE INDEX

FREQUENCY RANGE
5.5 to 18.3 MC.
535 to 1720 KC.

NO. 161

MODEL 629

SERIES A

(Serial No. 9L225000 and up)

I. F. 465 K.C.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts.

Power Consumption..........50 Watts (At 115 volts 50-60 cycles

Power Output..........1.5 Watts Undistorted, 2.4 Watts Maximun

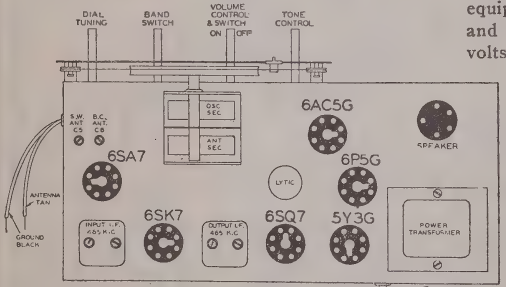
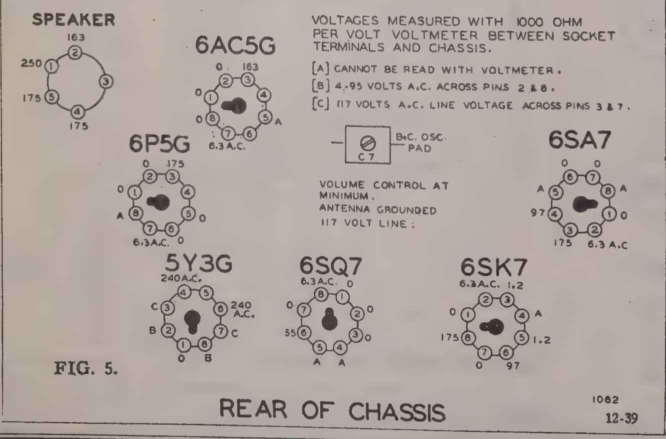


FIG. 1—TOP VIEW

Ref. No.	Part No.	Description
		CONDENSERS
C	102124	2 gang variable condenser
C1	1295	.0001 mica
C2	12964	.00275 mica
C3	10022	.05 x 200 v.
C4	124121	Dual Adjustable Condenser (S.W. Osc.)
C5	124122	Dual Adjustable Condenser (S.W. Ant.)
C6	124122	Dual Adjustable Condenser (Bc. Ant.)
C7	129151	.000468 comp. condenser (Bc. Osc. Pad)
C8	124121	Dual Adjustable Condenser (Bc. Osc.)
C9	12939	.00005 mica
C10	10013	.05 x 400 v.
C11	10071	.004 x 600 v.
C12	1295	.0001 mica
C13	1292	.0005 mica
C14	10012	.003 x 600 v.
C15	119102	10 mfd. lytic condenser
C16	119102	30 mfd. lytic condenser
C17	1001	.1 x 400 v.
C18	10026	.02 x 400 v.
C19	10012	.003 x 600 v
		C5 and C6 in one unit
		C4 and C8 in one unit
		C15 and C16 in one unit
		RESISTORS
R1	130208	40M ohm—1/3 w.
R2	130168	100 ohm—1/3 w.
R3	130306	7500 ohm—1 watt
R4	1304	3 megohm—1/3 w.
R5	101208	Volume Control and Switch (1 Megohm)
R6	130257	5 megohm—1/3 w.
R7	13011	250M ohm—1/3 w.
R8	13019	1 megohm—1/3 w.
		PARTS
T1	111168	B.C. S.W. Antenna Coil
T2	110142	B.C. S.W. Oscillator Coil
T3	108169	Input I.F. Coil—465 kc.
T4	108106S	Output I.F. Coil—465 kc.
T5	114188	6" Dynamic Speaker (1500 Ohm Fi
T6	104189	Power Transformer
S1	125103	Band Switch
S2		On-Off switch on volume control
S3	125104	Tone Control Switch
P1	10794	Pilot light T44

BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[A] CANNOT BE READ WITH VOLTMETER.

[B] 4.95 VOLTS A.C. ACROSS PINS 2 & 8.

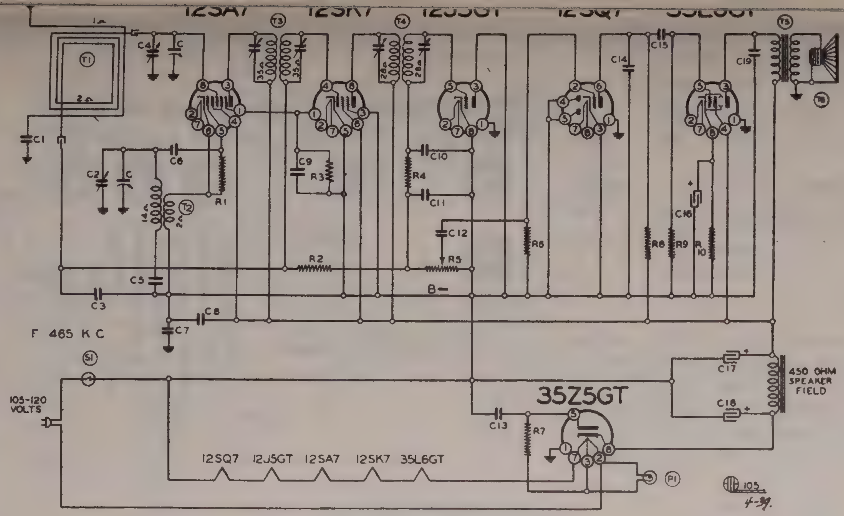
[C] 117 VOLTS A.C. LINE VOLTAGE ACROSS PINS 3 & 7.

VOLUME CONTROL AT MINIMUM.
ANTENNA GROUNDED
117 VOLT LINE:

FIG. 5.

12-39

BELMONT RADIO CORP.



RESISTORS

R1	13021	20M ohm—⅓ w.
R2	1304	3 megohm—⅓ w.
R3	13011	250M ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	101127	1 megohm volume control
R6	130225	15 megohm—⅓ w.
R7	130284	25 ohm—½ w.
R8	13011	250M ohm—⅓ w.
R9	1303	500M ohm—⅓ w.
R10	130166	150 ohm—⅓ w.

CONDENSERS

C	102104	2 gang variable condenser
C1	1292	.0005 mica
C2		Oscillator trimmer on gang
C3	1009	.05 x 200 v.
C4		Antenna Trimmer on gang
C5	1009	.05 x 200 v.
C6	12912	.00025 Mica
C7	10091	.15 x 400 v.
C8	1006	.25 x 200 v.
C9	1009	.05 x 200 v.
C10	1295	.0001 Mica
C11	1295	.0001 Mica
C12	10012	.003 x 600 v.
C13	1001	.1 x 400 v.
C14	1295	.0001 Mica
C15	10078	.01 x 200 v.
C16	11953E	40 mfd. x 25 w. v. lytic
C17	11953E	30 mfd. x 150 w. v. lytic
C18	11953E	30 mfd. x 150 w. v. lytic
C19	10026	.02 x 400 v.

C15, C16 and C17 in same unit

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12J5GT Second Detector, A.V.C.
1—Type 12SQ7 First Audio Amplifier.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

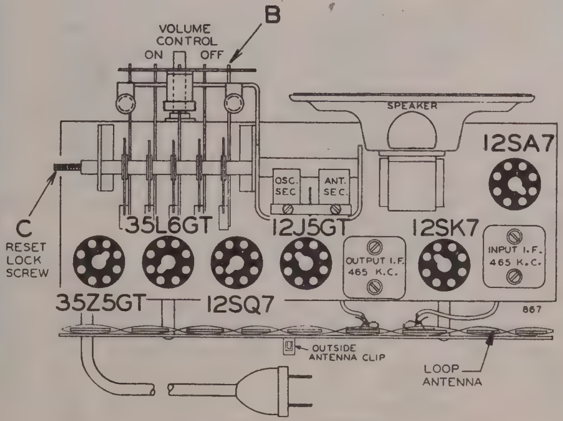
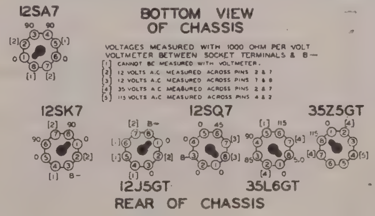


FIG. 1—TOP VIEW



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & B—

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 12 VOLTS A.C MEASURED ACROSS PINS 2 & 7
[3] 12 VOLTS A.C MEASURED ACROSS PINS 7 & 8
[4] 35 VOLTS A.C MEASURED ACROSS PINS 2 & 7
[5] 115 VOLTS A.C MEASURED ACROSS PINS 4 & 2

REAR OF CHASSIS

PARTS

T1	120270	Loop Antenna
T2	110114	Oscillator Coil
T3	108140D	Input I. F.
T4	108145B	Output I. F.
T5	10588B	Output Transformer
T6	114116G	5 in. Dynamic Speaker (450 ohm field)
P1	107249	6-8 v. pilot light T47
S1		Off-on switch on volume control

ALIGNMENT

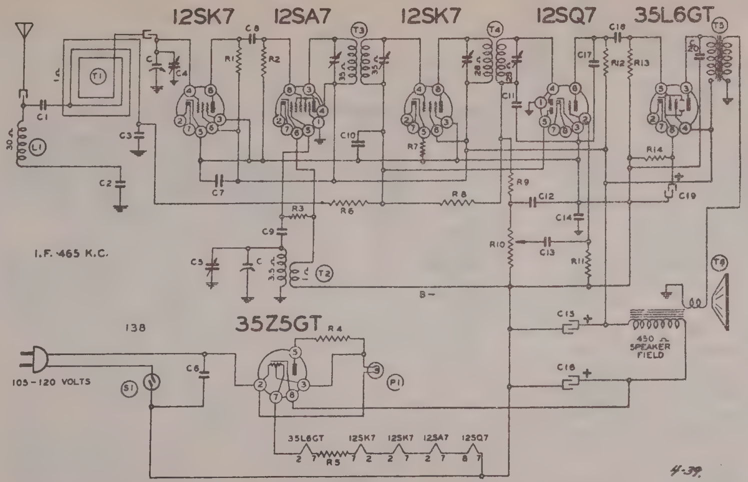
Connect B- of radio chassis to ground post of signal generator through .1 mf condenser.

I.F. peak 465 kc. I.F. alignment conventional. See Vol. VIII.

Trim oscillator at 1650 kc.
Trim antenna at 1400 kc. (Lay signal generator lead near, but not on, loop when adjusting trimmer.

MODEL 636,Series A
Schematic,Voltage
Socket,Trimmers,Alignment

BELMONT RADIO CORP.



RESISTORS

R1	130218	5M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	130176	20M ohm—⅓ w.
R4	130295	25 ohm—1 watt
R5	130295	25 ohm—1 watt
R6	130100	150M ohm—⅓ w.
R7	130203	40 ohm—⅓ w.
R8	1304	3 megohm—⅓ w.
R9	13012	50M ohm—⅓ w.
R10	101127	1 megohm volume control
R11	130257	5 megohm—⅓ w.
R12	13011	250M ohm—⅓ w.
R13	1303	500M ohm—⅓ w.
R14	130166	150 ohm—⅓ w.

CONDENSERS

C	102104B	2 gang variable condenser
C1	12951	.000125 Mica
C2	12912	.00025 Mica
C3	10026	.02 x 400 v.
C4		Antenna Trimmer on gang
C5		Oscillator trimmer on gang
C6	1001	.1 x 400 v.
C7	1006	.25 x 200 v.
C8	1295	.0001 Mica
C9	1295	.0001 Mica
C10	1009	.05 x 200 v.
C11	1295	.0001 Mica
C12	1295	.0001 Mica
C13	10012	.003 x 600 v.
C14	100110	.2 x 400 v.
C15	11953E	30 mfd. lytic—150 w. v.
C16	11953E	30 mfd. lytic—150 w. v.
C17	1295	.0001 Mica
C18	10078	.01 x 200 v.
C19	11953E	40 mfd.—25 w. v. lytic
C20	10026	.02 x 400 v.
		C15, C16, and C19 in same unit

1—Type 12SK7 R. F. Amplifier.
1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

I.F. 465 KC

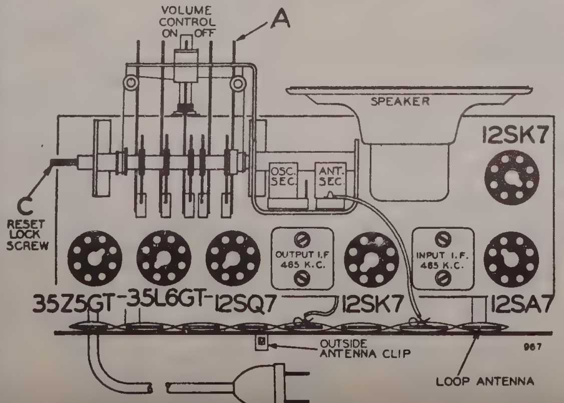
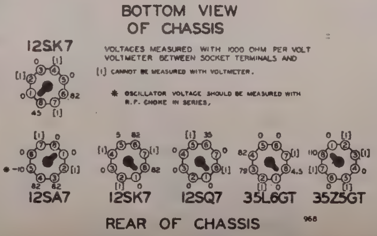


FIG. 1—TOP VIEW


BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND
[1] CANNOT BE MEASURED WITH VOLTMETER.
* OSCILLATOR VOLTAGE SHOULD BE MEASURED WITH R.F. CHOKE IN SERIES.
12SK7
12SA7
12SK7
12SQ7
35L6GT
35Z5GT
REAR OF CHASSIS
968

PARTS

T1	111139	Loop Antenna
T2	110128	Oscillator Coil
T3	108140F	Input I. F. Coil
T4	108145B	Output I. F. Coil
T5	10588B	Output Transformer
T6	114116G	5" Dynamic Speaker (450 ohm field)
L1	1237	Antenna Loading Coil
P1	107249	6-8 volt, Pilot light - T-47
S1		Off-on Switch on Volume Control

For alignment procedure, see instructions for Belmont Model 635, Series A.

MODELS 706-391,706-398
706-378,etc.

BELMONT RADIO CORP.

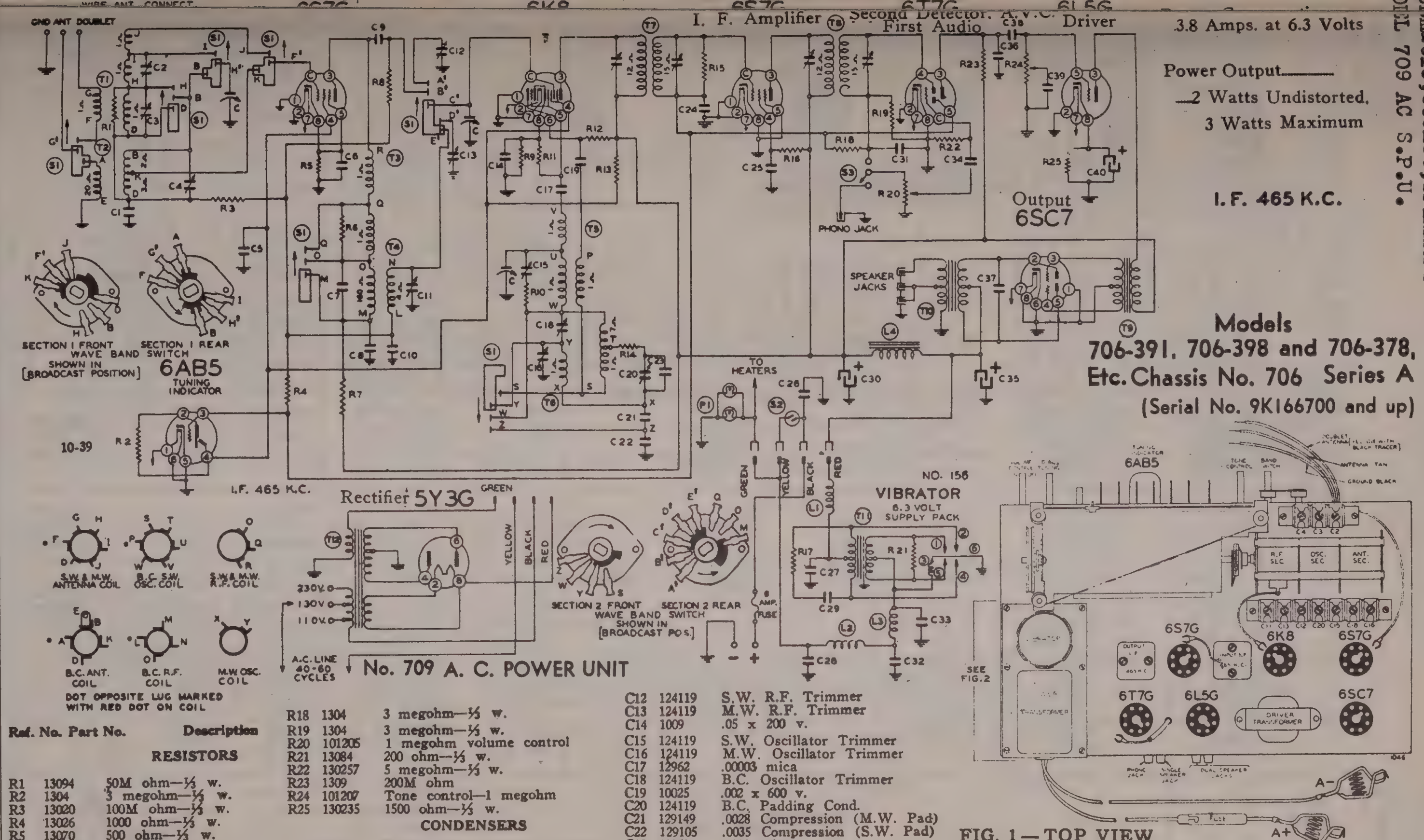
ssis 706, Series A
matic,Socket,Trimmers
EL 709 AC S.P.U.

Models 706-391, 706-398 and 706-378, Etc. Chassis No. 706 Series A
(Serial No. 9K166700 and up)

3.8 Amps. at 6.3 Volts

Power Output
2 Watts Undistorted,
3 Watts Maximum

I. F. 465 K.C.



No. 709 A. C. POWER UNIT

FIG. 1 — TOP VIEW

Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—⅓ w.
R2	1304	3 megohm—⅓ w.
R3	13020	100M ohm—⅓ w.
R4	13026	1000 ohm—⅓ w.
R5	13070	500 ohm—⅓ w.
R6	130232	25M ohm—⅓ w.
R7	13026	1000 ohm—⅓ w.
R8	13019	1 megohm—⅓ w.
R9	13083	300 ohm—⅓ w.
R10	13097	200 ohm—⅓ w.
R11	13012	50M ohm—⅓ w.
R12	13048	15M ohm—⅓ w.
R13	130245	10M ohm—1 watt
R14	130299	10 ohm—⅓ w.
R15	13019	1 megohm—⅓ w.
R16	13012	50M ohm—⅓ w.
R17	13064	3500 ohm—⅓ w.
R18	1304	3 megohm—⅓ w.
R19	1304	3 megohm—⅓ w.
R20	101205	1 megohm volume control
R21	13084	200 ohm—⅓ w.
R22	130257	5 megohm—⅓ w.
R23	1309	200M ohm
R24	101207	Tone control—1 megohm
R25	130235	1500 ohm—⅓ w.
		CONDENSERS
C	102121	Three Gang Variable Condenser
C1	10090	.02 x 400 v.
C2	124118	S.W. Antenna Trimmer
C3	124118	M.W. Antenna Trimmer
C4	124118	B.C. Antenna Trimmer
C5	10013	.05 x 400 v.
C6	1009	.05 x 200 v.
C7	12938	.00005 mica
C8	10090	.02 x 400 v.
C9	10090	.02 x 400 v.
C10	10090	.02 x 400 v.
C11	124119	B.C. R.F. Trimmer
C12	124119	S.W. R.F. Trimmer
C13	124119	M.W. R.F. Trimmer
C14	1009	.05 x 200 v.
C15	124119	S.W. Oscillator Trimmer
C16	124119	M.W. Oscillator Trimmer
C17	12962	.00003 mica
C18	124119	B.C. Oscillator Trimmer
C19	10025	.002 x 600 v.
C20	124119	B.C. Padding Cond.
C21	129149	.0028 Compression (M.W. Pad)
C22	129105	.0035 Compression (S.W. Pad)
C23	12959	.0003 mica
C24	1009	.05 x 200 v.
C25	10013	.05 x 400 v.
C26	10078	.01 x 200 v.
C27	10013	.05 x 400 v.
C28	10031	.5 x 120 v.
C29	100114	.006 x 1200 v. oil type
C30	11998	30 uf. lytic—300 w.v.
C31	1295	.0001 mica
C32	10031	.5 x 120 v.
C33	10031	.5 x 120 v.
C34	10025	.002 x 600 v.
C35	11998	30 uf. lytic—300 w.v.
C36	12912	.00025 mica
C37	10071	.004 x 600 v.
C38	10011	.01 x 400 v.
C39	10078	.01 x 200 v.
C40	11998	40 uf. lytic—25 w.v.

C2, C3 and C4 are in same unit
C11, C12, C13, C15, C16, C18 and C20 are in same unit
C30. C35 and C40 are in same unit.

FOR TUNER SEE INDEX

CHASSIS 706
CHASSIS 707
CHASSIS 708
Alignment, Trimmers

CHASSIS 706, 707, and 708
ALIGNMENT PROCEDURE

- Tone control—in treble position.
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7* I. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	23 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 23 MC	Trimmer (C15) (See Fig. 3)	Short wave oscillator	See Note "A" Adjust to maximum output
	23 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Dial Set at 23 MC	Trimmer (C2, C12) (See Fig. 3)	Short wave antenna and R. F.	See Note "B" Adjust to maximum output
MEDIUM WAVE BAND	6.5 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6.5 MC	Trimmer (C16) (See Fig. 3)	Medium wave oscillator	Adjust to maximum output
	6.5 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6.5 MC	Trimmer (C3, C13) (See Fig. 3)	Medium wave antenna and R. F.	Adjust to maximum output
BROADCAST BAND	2000 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C18) (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1800 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1800 Kc.	Trimmer (C4, C11) (See Fig. 3)	Broadcast antenna and R. F.	Adjust to maximum output
	550 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 550 Kc.	Trimmer (C20) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "C")

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. As an example of this a fundamental 23 megacycle signal can be tuned in not only at 23 on the dial, but also at approximately 22 megacycles.

NOTE "B"—When adjusting the antenna and R.F. trimmers be sure and "follow" the signal to exact resonance by slight readjustment of the gang condenser as trimmer reaction on oscillator frequency is quite noticeable at high frequencies.

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

*IN CHASSIS 706 Grid of 6S7G I. F. Tube

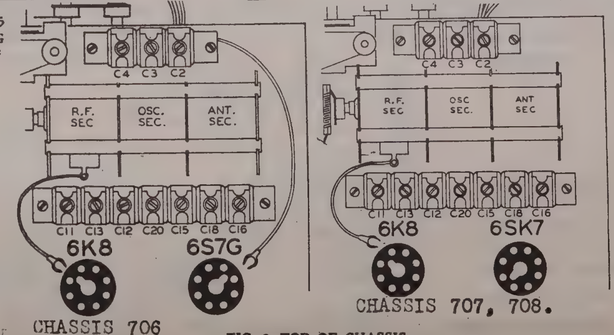


FIG. 3—TOP OF CHASSIS

Chassis No. 707—Series A
(Serial No. 9K167300 and up)
BALLAST RESISTOR TUBES:

Use one of the following:

Type No. 5465 for 100 to 125 volt line voltage. Type No. 5463 for 125 to 145 volt line voltage. Type No. 5464 for 210 to 250 volt line voltage.

ASSIS 707
ASSIS 708
ASSIS 792
ASSIS 793B
ner Data

BELMONT RADIO CORP.

MODEL 709 S.P.U.
Installation Notes
CHASSIS 706
Voltage, Tuner

INSTALLING THE MODEL 709 POWER UNIT

For 100-250 Volt 40/60 Cycle A. C. Operation)

In Chassis 706.

. **Remove the chassis from the cabinet,** by removing the four chassis mounting bolts from the bottom of the cabinet.

. Referring to Fig. 1, note that the **6-volt power unit** is fastened to the top of the radio chassis with **eight copper head screws,** (six on top of chassis, and two on rear flange of chassis).

. Remove the eight copper head screws.

. Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks.

Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.

. Place the model 709 A.C. power unit (see Fig. 2) on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.

(a) The **red lead** should be plugged into the pin jack which is marked with a **red dot.**

(b) The **green lead** connects to the pin jack which is marked with a **green dot.**

(c) The **yellow lead** connects to the pin jack which is marked with a **yellow dot.**

(d) The **black lead** connects to the pin jack which is marked with a **black dot.**

6. Mount the power unit to the chassis using the eight copper head screws.

IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly. Set the switch on the top of the power transformer to the proper voltage.

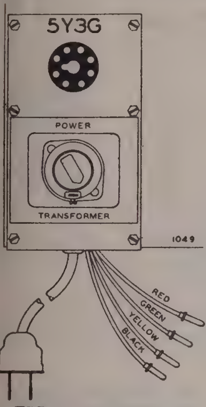


FIG. 2—MODEL 709 A. C. POWER UNIT

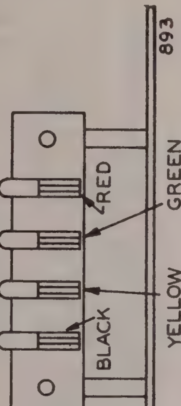
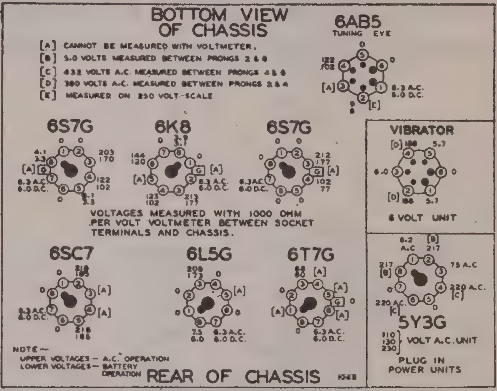


FIG. 3—CONNECTOR STRIP ON CHASSIS FOR POWER UNIT

VOLTAGE DATA CHASSIS 706.


BOTTOM VIEW OF CHASSIS
[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] 5.0 VOLTS MEASURED BETWEEN PRONGS 2 & 8
[C] 432 VOLTS A.C. MEASURED BETWEEN PRONGS 4 & 6
[D] 380 VOLTS A.C. MEASURED BETWEEN PRONGS 2 & 4
[E] MEASURED ON 250 VOLT SCALE
6AB5
TUNING EYE
6S7G
6K8
6S7G
VIBRATOR
6 VOLT UNIT
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
6SC7
6L5G
6T7G
5Y3G
110 130 230 VOLT A.C. UNIT
PLUG IN POWER UNITS
NOTE—
UPPER VOLTAGES — A.C. OPERATION
LOWER VOLTAGES — BATTERY OPERATION
REAR OF CHASSIS

All voltages as indicated on the voltage chart are measured with a fully charged 6 volt storage battery or from 117 volt A. C. line if the Model 709 A. C. power unit is installed in place of the 6 volt power unit.

PROCEDURE FOR SETTING THE AUTOMATIC PUSH BUTTONS

'or Chassis 706, 707, 708, 792, and 793B.

1. Pull the "Reset" button **all the way out** (see control No. 6,), and rotate the button to the **left** (counter-clockwise) until it cannot be turned any further.

You will note that as the button is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually **start unlocking** the tuner mechanism. Beyond this point the button will turn quite easily again until the tuner mechanism is **completely unlocked.** At this point do not force the button any further. The tuner mechanism is now **unlocked.**

(NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Push in **all the way** any one of the push buttons and at the same time **push in firmly** on the dial tuning knob. **Both the dial tuning knob and the push button** should be **pushed hard** enough to make them **stay latched in.**

You may find it necessary to rotate the dial tuning knob slightly when pushing it in to make certain that the gears mesh properly.

For Chassis 792 and 793B only.

3. Both the pushbutton and the dial tuning knob are now **latched in. Do not hold the pushbutton in by hand while tuning in a station.** Tune in by means of the dial tuning knob the station indicated on the station call letter tab on the pushbutton which is latched in. Turn the dial tuning knob very slowly back and forth until the station is clearest. The station will then be accurately tuned in.

For Chassis 706, 707, and 708 only.

3. Press in on the **push button which is latched in.** Holding it in **firmly,** tune in by means of the dial tuning knob the station indicated on the station call letter tab on this push button. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the push button).

For all Models

4. Push in **all the way** another push button, at the same time push the dial tuning knob in so that **both the push button** and the **dial tuning knob** are **latched in together.** Holding the push button in **firmly,** tune in the station indicated on the call letter tab on this push button.

5. Follow this procedure until you have tuned in all of your favorite stations.

6. Pull the "Reset" button **all the way out** and rotate the button to the **right** (clockwise) until it cannot be turned any further. This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place.

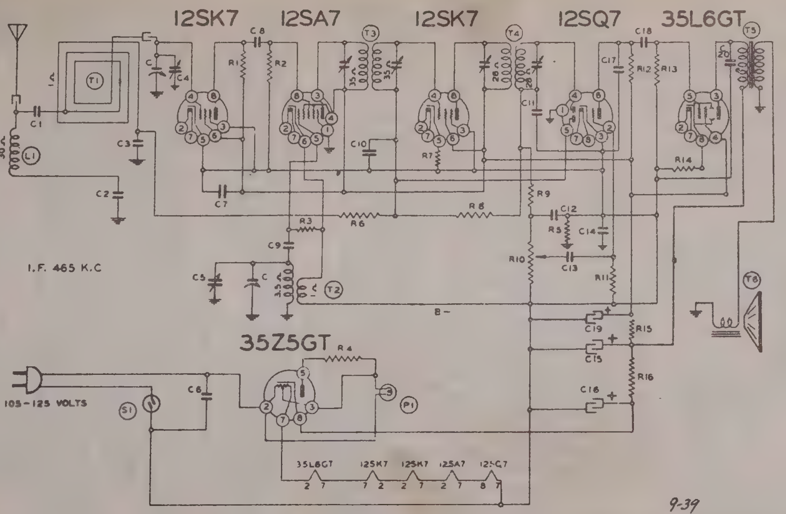
CHANGING STATIONS:

If you should desire to change any station you selected to another, pull the "Reset" button all the way out and rotate the button to the left (counter-clockwise) and unlock the tuner mechanism. Select the new station as explained. (NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner push buttons, it is due to the tuner mechanism not being unlocked all the way. Pull the "Reset" button out all the way and rotate the button to the left (counter-clockwise) until it will turn no further. The dial mechanism should work freely with the tuner push button pressed in).

After you have selected the new station, pull the "Reset" button all the way out and rotate the button to the **right** (clockwise) to lock the tuner mechanism. Be sure the button is turned until it will turn no further.

MODEL 636,Series B
Schematic,Voltage
Socket,Trimmers
Alignment

BELMONT RADIO CORP.



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RESISTORS

R1	130218	5M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	13094	50M ohm—⅓ w.
R4	130295	25 ohm—1 watt
R5	130100	150M ohm—⅓ w.
R6	130100	150M ohm—⅓ w.
R7	130203	40 ohm—⅓ w.
R8	1304	3 megohm—⅓ w.
R9	13012	50M ohm—⅓ w.
R10	101127	1 megohm volume control
R11	130257	5 megohm—⅓ w.
R12	13011	250M ohm—⅓ w.
R13	1303	500M ohm—⅓ w.
R14	130166	150 ohm—⅓ w.
R15	130287	1200 Ohm—1 Watt
R16	130296	200 Ohm—1 Watt

CONDENSERS

C	102104B	2 gang variable condenser
C1	12951	.000125 Mica
C2	129146	.0006 Mica
C3	10026	.02 x 400 v.
C4		Antenna Trimmer on gang
C5		Oscillator trimmer on gang
C6	1001	.1 x 400 v.
C7	1006	.25 x 200 v.
C8	1295	.0001 Mica
C9	1295	.0001 Mica
C10	1009	.05 x 200 v.
C11	1295	.0001 Mica
C12	1295	.0001 Mica
C13	10012	.003 x 600 v.
C14	100110	.2 x 400 v.
C15	11994	20 mfd. lytic—150 w. v.
C16	11994	40 mfd. lytic—150 w. v.
C17	1295	.0001 Mica
C18	10078	.01 x 200 v.
C19	11994	20 mfd.—150 v. lytic
C20	10026	.02 x 400 v.
		C15, C16, and C19 in same unit

I.F. 465 KC

1—Type 12SK7 R. F. Amplifier.
1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

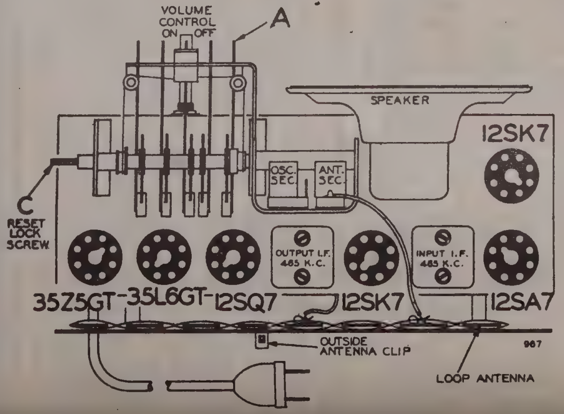
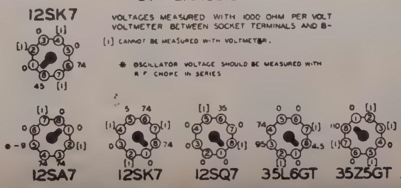


FIG. 1—TOP VIEW

BOTTOM VIEW
OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B-

[1] CANNOT BE MEASURED WITH VOLTMETER.

* OSCILLATOR VOLTAGE SHOULD BE MEASURED WITH R F CHOKE IN SERIES

REAR OF CHASSIS

1032

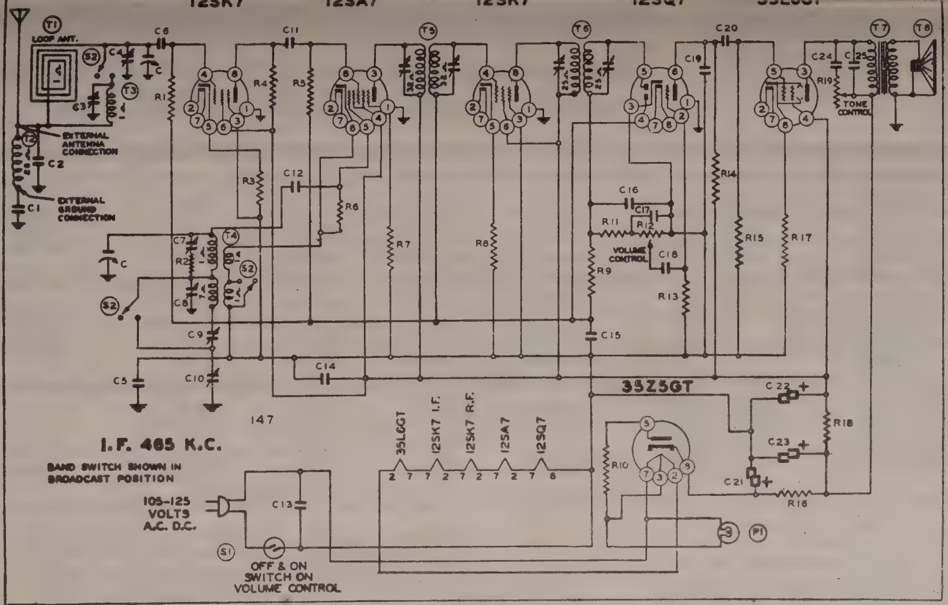
PARTS

T1	111139	Loop Antenna
T2	110128	Oscillator Coil
T3	108140F	Input I. F. Coil
T4	108145B	Output I. F. Coil
T5	105104	Output Transformer
T6	114180	5" P.M. Dynamic Speaker
L1	1237	Antenna Loading Coil
P1	107249	6-8 volt, Pilot light - T-47
S1		Off-on Switch on Volume Control

For alignment procedure, see instructions for Belmont Model 635, Series A.

BELMONT RADIO CORP.

MODEL 637
Schematic, Voltage
Socket, Trimmers

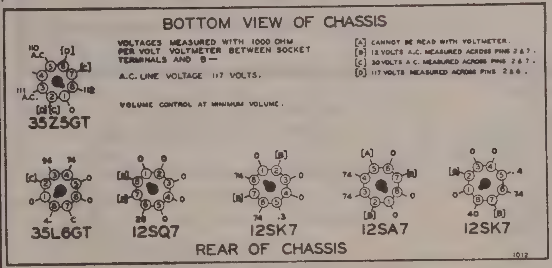


R1	13019	1 megohm—⅓ w.
R2	13027	50 ohm—½ w.
R4	130218	5M ohm—⅓ w.
R5	13020	100M ohm—⅓ w.
R6	13012	50M ohm—⅓ w.
R7	1309	200M ohm—⅓ w.
R8	130248	40 ohm—⅓ w.
R9	1304	3 megohm—⅓ w.
R10	130215	25 ohm—½ w.
R11	1301	25M ohm—⅓ w.
R12	101195	1 meg. volume control
R13	130257	5 megohm—⅓ w.
R14	1303	500M ohm—⅓ w.
R15	1303	500M ohm—⅓ w.
R16	130296	200 ohm—1 watt
R17	130166	150 ohm—⅓ w.
R18	130287	1200 ohm—1 watt
R19	101194	200M ohm tone control

CONDENSERS

C	102118	2 gang variable condenser
C1	10013	.05 x 400 v.
C2	12954	.003 Mica
C3	124105	Police Band Antenna Trimmer
C4	124105	B. C. Antenna Trimmer
C5	10024	.25 x 400 v.
C6	1292	.0005 Mica
C7	124107	Police Band Oscillator Trimmer
C8	124107	B. C. Oscillator Trimmer
C9	124104	B. C. Oscillator Pad
C10	124104	Police Band Oscillator Pad
C11	1295	.0001 Mica
C12	12912	.00025 Mica
C13	1001	.1 x 400 v.
C14	1009	.05 x 200 v.
C15	1009	.05 x 200 v.
C16	1295	.0001 Mica
C17	12938	.00005 Mica
C18	10071	.004 x 600 v.
C19	12912	.00025 Mica
C20	10078	.01 x 200 v.
C21	11994	40 mfd.—150 w. v.
C22	11994	20 mfd.—150 w. v.
C23	11994	20 mfd.—150 w. v.
C24	1009	.05 x 200 v.
C25	10026	.02 x 400 v.

C3 and C4 in one unit C7 and C8 in one unit
C9 and C10 in one unit C21, C22 and C23 in same unit


BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

A.C. LINE VOLTAGE 117 VOLTS.

VOLUME CONTROL AT MINIMUM VOLUME.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 12 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.
[C] 30 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.
[D] 117 VOLTS MEASURED ACROSS PINS 2 & 6.

FIG. 4—BOTTOM VIEW

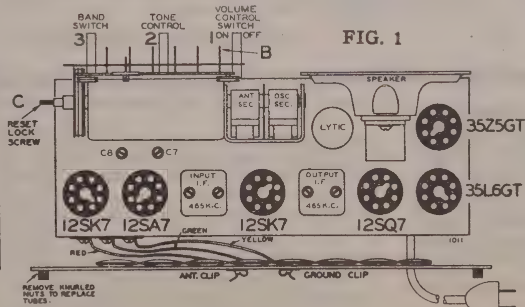


FIG. 1

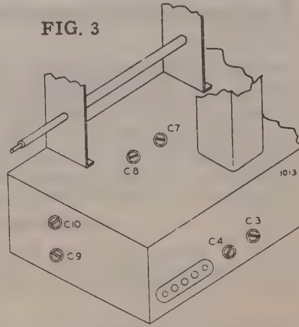


FIG. 3

T1	111144	Loop Antenna Assembly
T2	10535	R. F. Choke
T3	111143	Antenna Coil
T4	110132	B.C. S.W. Oscillator Coil
T5	108140G	Input I.F. Coil—465 kc.
T6	108145	Output I.F. Coil—465 kc.
T7	10589B	Output Transformer
T8	114177	5" P.M. Speaker
S1	101195	Volume Control and Switch
S2	12590	Wave Band Change Switch
P1	107249	6.3 volt T47 pilot light

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TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows.

1—Type 12SK7 R. F. Amplifier.
1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control at minimum, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. or D.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet. **It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.**

ALIGNMENT PROCEDURE

IMPORTANT: SEE ALIGNING INSTRUCTIONS.

- Loop antenna connected to radio.
- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 12SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	4050 Kc.	200 mmf.	Antenna Clip	Short Wave	Rotor full open (Plates out of mesh)	Trimmer C7 (See Fig. 3)	Short Wave oscillator	Adjust to maximum output
	3500 Kc.	200 mmf.	Antenna Clip	Short Wave	Set Dial at 3.5 Mc.	Trimmer C3 (See Fig. 3)	Short Wave antenna	Adjust to maximum output
	1650 Kc.	200 mmf.	Antenna Clip	Short Wave	Set Dial at 1.65 Mc.	Trimmer C10 (See Fig. 3)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1550 Kc.	200 mmf.	Antenna Clip	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C8 (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna Clip	Broadcast	Set Dial at 1400 Kc.	Trimmer C4 (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna Clip	Broadcast	Set Dial at 600 Kc.	Trimmer C9 (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

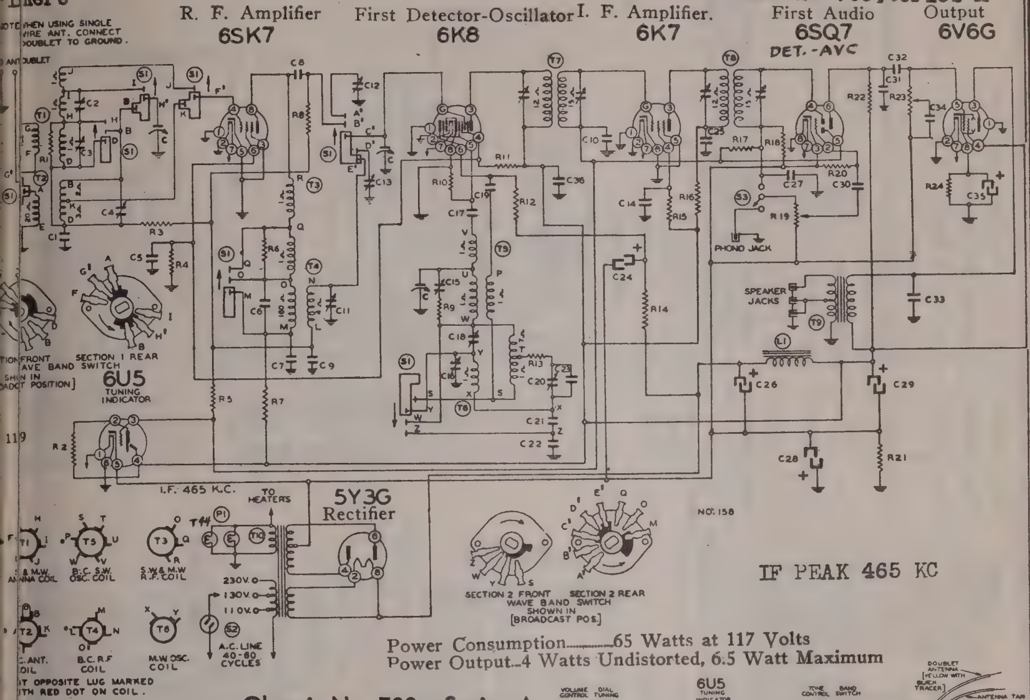
BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	1.5 to 4.0 MC.
Extreme Left Rotation	Broadcast	540 to 1550 KC.

Power Consumption……35 Watts
Power Output……1.25 Watts Undistorted, 1.8 Watts Maximum
Intermediate Frequency……465 KC.

er al 9K188300 up
h matic,Voltage,Socket
i ners

BELMONT RADIO CORP.

MODELS 708-391,708-398
708-378,etc.
Chassis 708,Series A



Power Consumption..........65 Watts at 117 Volts
Power Output...4 Watts Undistorted, 6.5 Watt Maximum

Chassis No. 708—Series A
(Serial No. 9K188300 and up)
For Models 708-391, 708-398 and 708-378, Etc.

Ref No.	Part No.	Description
		RESISTORS
1	13094	50M ohm—⅓ w.—10%
2	1303	500M ohm—⅓ w.
3	13020	100M ohm
4	13012	50M ohm—⅓ w.
5	13026	1000 ohm—⅓ w.
6	130232	25M ohm—⅓ w.
7	13026	1000 ohm—⅓ w.
8	13019	1 megohm—⅓ w.
9	13097	200 ohm—⅓ w.
10	13012	50M ohm—⅓ w.
R11	130304	12M ohm—2 watt
R12	13017	10M ohm—⅓ w.
R13	130299	10 ohm—⅓ w.
R14	13017	10M ohm—⅓ w.
R1	13020	100M ohm—⅓ w.
R1	13023	2M ohm—⅓ w.
R1	1304	3 megohm—⅓ w.
R18	1304	3 megohm—⅓ w.
R1	101205	1 megohm volume control
R2	130225	15 megohm—⅓ w.
R2	130303	35 ohm—⅓ w.
R2	1309	200M ohm—⅓ w.
R2	101206	150M ohm tone control
R2	130227	250 ohm—1 watt
		CONDENSERS
C	102121	3 gang variable condenser
C1	10090	.02 x 400 v.
C2	124118	S.W. Antenna Trimmer
C3	124118	M.W. Antenna Trimmer
C4	124118	B.C. Antenna Trimmer
C5	10013	.05 x 400 v.
C6	12938	.00005 mica
C7	10090	.02 x 400 v.
C8	10090	.02 x 400 v.
C	10090	.02 x 400 v.
C1	1009	.05 x 200 v.
C1	124119	B.C. R.F. Trimmer
C1	124119	S.W. R.F. Trimmer
C1	124119	M.W. R.F. Trimmer
C	10013	.05 x 400 v.
C	124119	S.W. Oscillator Trimmer
C	124119	M.W. Oscillator Trimmer
C	12962	.00003 Mica
C	124119	B.C. Oscillator Trimmer
C	10025	.002 x 600 v.
C	124119	B.C. Padding Condenser
C	129149	.0028 Compression M.W. Pad
C	129105	.0035 Compression S.W. Pad
C	12959	.0003 mica
C	11981	16 uf. lytic x 400 w. v.
C	1001	.1 x 400 v.

C26	119100	30 uf. lytic x 450 w. v.
C27	1295	.0001 mica
C28	11991	40 uf. lytic x 25 w. v.
C29	119100	30 uf. lytic x 450 w. v.
C30	10025	.002 x 600 v.
C31	12912	.00025 mica
C32	10013	.05 x 400 v.
C33	10097	.02 x 600 v.
C34	10078	.01 x 200 v.
C35	119100	40 uf. lytic—25 w. v.
C36	10013	.05 x 400 v.

C26, C29, and C35 in same unit.

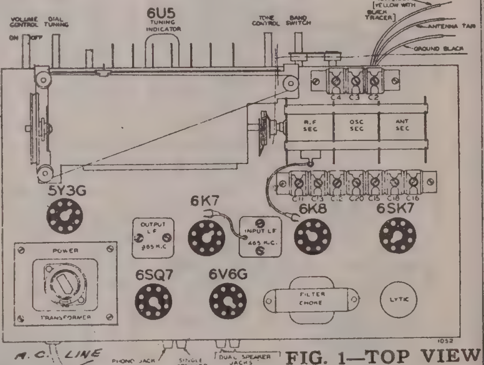
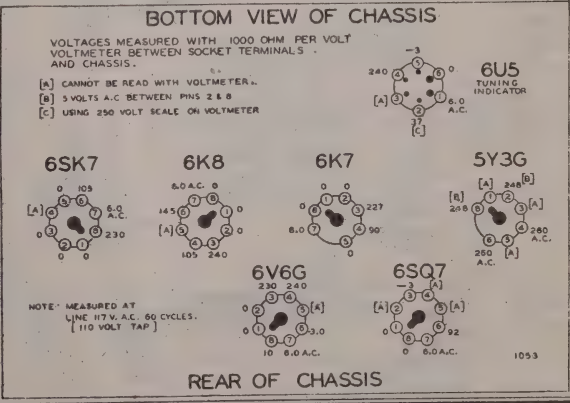


FIG. 1—TOP VIEW



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 5 VOLTS A.C BETWEEN PINS 2 & 8
[C] USING 250 VOLT SCALE ON VOLTMETER

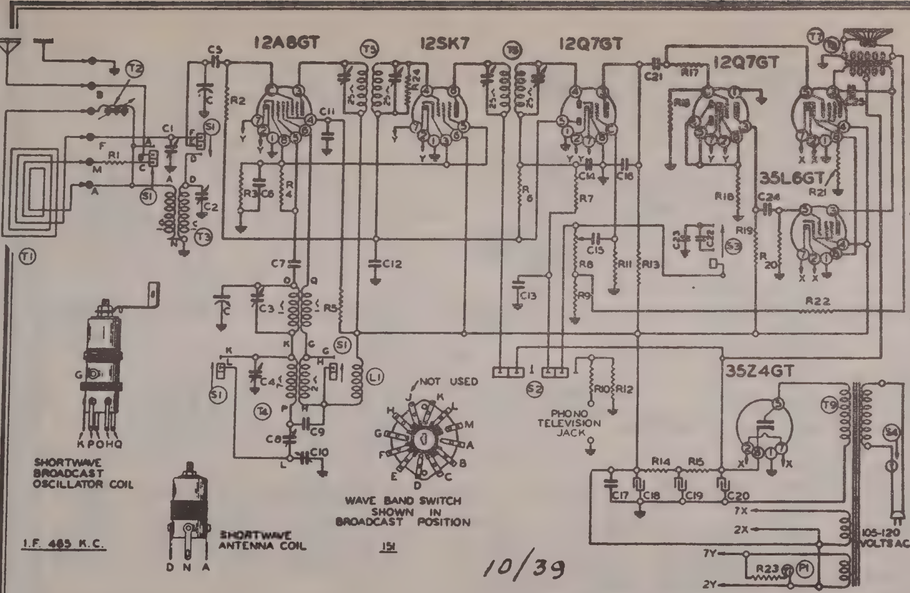
NOTE: MEASURED AT LINE 117 V. A.C. 60 CYCLES. [110 VOLT TAP]

MODEL 791
Schematic,Voltage,Socket

BELMONT RADIO CORP.

Oct.'39

FOR ALIGNMENT SEE INDE



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The type and function of each tube is as follows:

1—Type 12A8GT First Detector-oscillator.

1—Type 12SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).

1—Type 12Q7GT Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type 12Q7GT Phase Inverter.

2—Type 35L6GT Push-Pull Output Amplifier.

1—Type 35Z4GT High Vacuum Rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts, (see parts list).

CONDENSERS

Circuit Diagram Ref. No.	Part No.	Description
C	102123	2 gang variable condenser
C1	124117	B.C. Adj. Trimmer (Antenna)
C2	124116	S.W. Adj. Trimmer (Antenna)
C3	124112	S.W. Adj. Trimmer (Oscillator)
C4	124112	B.C. Adj. Trimmer (Oscillator)
C5	1292	.0005 mica
C6	100104	.5 x 100 v.
C7	12939	.00005 mica
C8	124113	B.C. Series Pad
C9	1009	.05 x 200 v.
C10	124113	S.W. Series Pad
C11	10020	.1 x 200 v.
C12	1009	.05 x 200 v.
C13	1295	.0001 mica
C14	1295	.0001 mica
C15	10025	.002 x 600 v.
C16	1292	.0005 mica
C17	10020	.1 x 200 v.
C18	119101	20 mfd. lytic
C19	119101	20 mfd. lytic
C20	119101	40 mfd. lytic
C21	10026	.02 x 400 v.
C22	1298	.0006 mica
C23	100112	.001 x 200 v.
C24	10026	.02 x 400 v.
C25	10087	.01 x 600 v.

C8 and C10 in same unit, C18, C19 and C20 in same unit
C3 and C4 in same unit

FREQUENCY RANGE

5.7 to 18.3 MC.

540 to 1550 KC.

Power Consumption........55 Watts

Power Output 3 Watts Undistorted, 3.6 Watts Maximum

RESISTORS

Diagram Ref. No.	Part No.	Description
R1	13079	400 ohm—⅓ w.
R2	13019	1 megohm—⅓ w.
R3	130168	100 ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	130149	15M ohm—⅓ w.
R6	130170	3 megohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	101195	1 megohm—volume control
R9	130215	25 ohm—⅓ w.
R10	13038	2 megohm—⅓ w.
R11	130225	15 megohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	1909	200M ohm—⅓ w.
R14	130294	1200 ohm—½ w.
R15	130294	1200 ohm—½ w.
R16	130236	30M ohm—⅓ w.
R17	130102	500M ohm—⅓ w.
R18	13022	5M ohm—⅓ w.
R19	1309	200M ohm—⅓ w.
R20	130102	500M ohm—⅓ w.
R21	13097	200 ohm—⅓ w.
R22	130168	100 ohm—⅓ w.

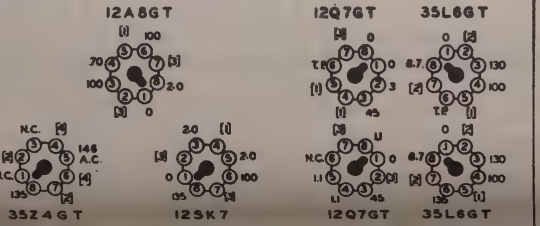
PARTS

T1	111157	Loop Antenna (Complete)
T2	111162	Loop Adjusting Coil
T3	111163	S.W. Antenna Coil
T4	110135	B.C. S.W. Oscillator Coil
T5	108163C	Input I.F.—465 kc.
T6	108163D	Output I.F.—465 kc.
T7	114182	6" P.M. Speaker
T8	10596	Output Transformer
T9	104175B	Power Transformer
S1	125100	Band Switch
S2	12570	Phono Radio Switch
S3	12599	Tone Switch

BOTTOM VIEW OF CHASSIS

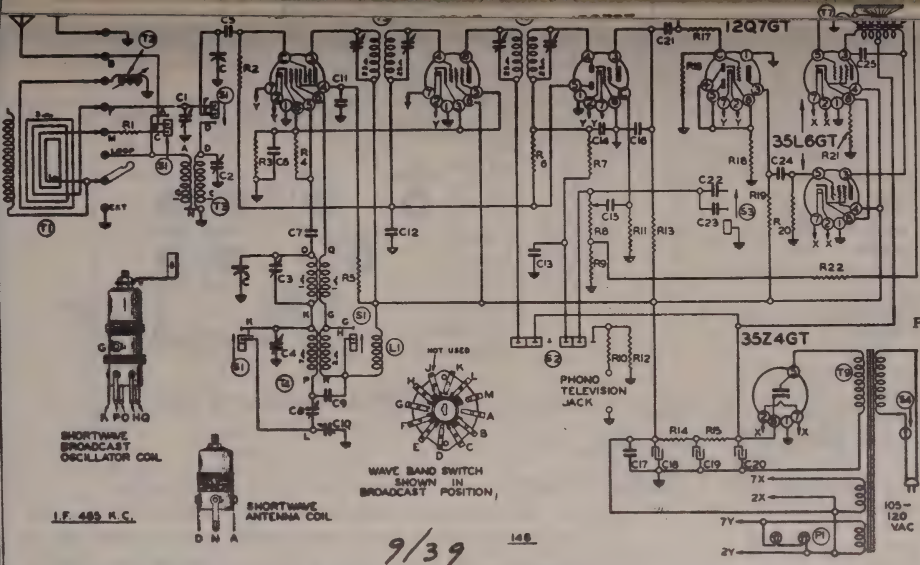
VOLTAGES MEASURED WITH 1000 OHM
PER VOLT VOLTMETER BETWEEN
SOCKET TERMINALS AND CHASSIS

[1] CANNOT BE MEASURED WITH VOLTMETER
[2] 20 VOLTS A.C. READ ACROSS PINS 2 & 7
[3] 11.6 VOLTS A.C. READ ACROSS PINS 2 & 7
[4] 115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 3 & 6
N.C.—NO CONNECTION
T.P.—TIE POINT



MODEL 792, Series A
Schematic, Voltage
Socket

BELMONT RADIO CORP.



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The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

1—Type 12A8GT First Detector-oscillator.

1—Type 12SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).

1—Type 12Q7GT Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type 12Q7GT Phase Inverter.

2—Type 35L6GT Push-Pull Output Amplifier.

1—Type 35Z4GT High Vacuum Rectifier.

FREQUENCY RANGE

5.7 to 18.3 MC.

540 to 1550 KC.

CONDENSERS

C	102119	2 gang variable condenser
C1	124111	B. C. Adj. Trimmer (Antenna)
C2	124111	S. W. Adj. Trimmer (Antenna)
C3	124112	S. W. Adj. Trimmer (Oscillator)
C4	124112	B. C. Adj. Trimmer (Oscillator)
C5	1292	.0005 mica
C6	100104	.5 x 100 v.
C7	12939	.00005 mica
C8	124113	B. C. Series Pad
C9	1009	.05 x 200 v.
C10	124113	S. W. Series Pad
C11	10020	.1 x 200 v.
C12	1009	.05 x 200 v.
C13	1295	.0001 mica
C14	1295	.0001 mica
C15	10025	.002 x 600 v.
C16	1292	.0005 mica
C17	10020	.1 x 200 v.
C18	119101	20 mfd. lytic
C19	119101	20 mfd. lytic
C20	119101	40 mfd. lytic
C21	10026	.02 x 400 v.
C22	1298	.0006 mica
C23	100112	.001 x 200 v.
C24	10026	.02 x 400 v.
C25	10012	.003 x 600 v.

C1 and C2 in same unit
C8 and C10 in same unit
C18, C19 and C20 in same unit
C3 and C4 in same unit.

Power Consumption——————— ————55 Watts

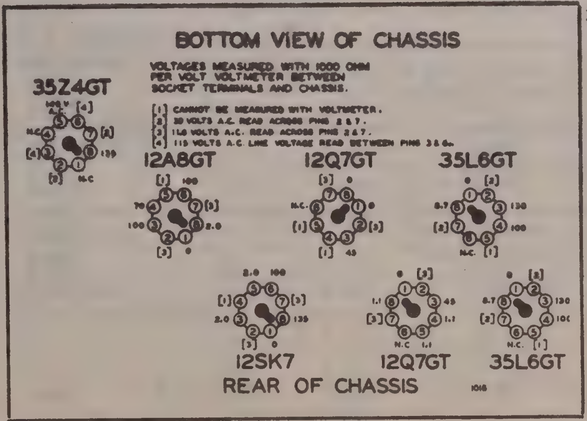
Power Output 3 Watts Undistorted, 3.6 Watts Maximum

RESISTORS

Circuit Diagram Ref. No.	Part No.	Description
R1	13079	400 ohm—⅓ w.
R2	13019	1 megohm—⅓ w.
R3	130168	100 ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	130149	15M ohm—⅓ w.
R6	130170	3 megohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	101159	1 megohm—volume control
R9	130215	25 ohm—⅓ w.
R10	13038	2 megohm—⅓ w.
R11	130225	15 megohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	1309	200M ohm—⅓ w.
R14	130294	1200 ohm—½ w.
R15	130294	1200 ohm—½ w.
R16	130236	30M ohm—⅓ w.
R17	130102	500M ohm—⅓ w.
R18	13022	5M ohm—⅓ w.
R19	1309	200M ohm—⅓ w.
R20	130102	500M ohm—⅓ w.
R21	13097	200 ohm—⅓ w.
R22	130168	100 ohm—⅓ w.

PARTS

T1	111154	Loop Antenna
T2	111153	Loop Adjusting Coil
T3	111151	S. W. Antenna Coil
T4	110135	B. C. S. W. Oscillator Coil
T5	108163	Input I. F.—465 kc.
T6	108163B	Output I. F.—465 kc.
T7	114178	10" P. M. Speaker
T8	10596	Output Transformer
T9	104175	Power Transformer
S1	12594	Band Switch
S2	12570	Phono Radio Switch
S3	12598	Tone Control Switch
S4		Off-on switch
L1	1233	R. F. "B" Choke
P1	10794	2 6-8 v. pilot lights


BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 30 VOLTS A.C. READ ACROSS PINS 2 & 7.
[3] 11.6 VOLTS A.C. READ ACROSS PINS 2 & 7.
[4] 115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 3 & 6.

MODEL 791
MODEL 792,Series A
Alignment,Trimmers

BELMONT RADIO CORP.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 12A8GT Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C3 (See Fig. 2)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)*	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C10 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROADCAST BAND (See Note A)	1550 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C4 (See Fig. 2)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Set Dial at 540 Kc.	Trimmer C8 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGNMENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 2)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 2)	Iron Core Tracking Coil	Adjust to maximum output

(See Fig. 2) FOR MODEL 792 SER. A.

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 12A8GT tube and ground terminal when setting the **Broadcast Band** oscill or end frequencies, (1550 and 540 K.C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals. (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

NOTE:- FIGURES TO LEFT REFER TO MODEL 791; FIGURES TO RIGHT REFER TO MODEL 792 Series A.

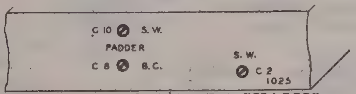


FIG. 4.—FRONT OF CHASSIS

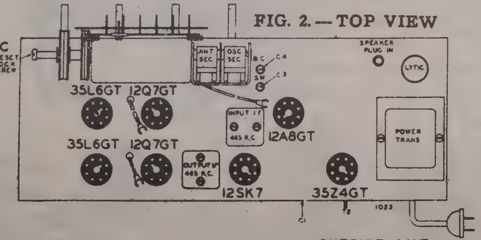


FIG. 2.—TOP VIEW

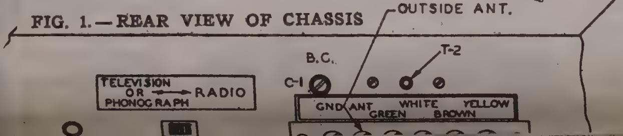

OUTSIDE ANT.
B.C.
T-2
C-1
TELEVISION OR PHONOGRAPH ← → RADIO
GND ANT GREEN WHITE BROWN YELLOW

FIG. 1.—REAR VIEW OF CHASSIS

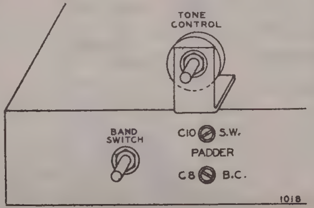


FIG. 4

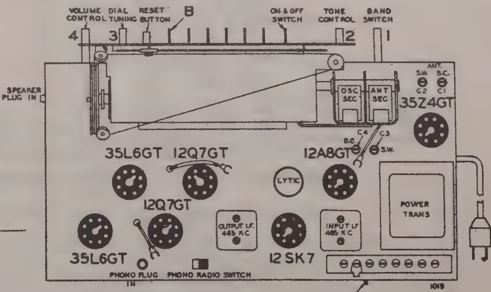
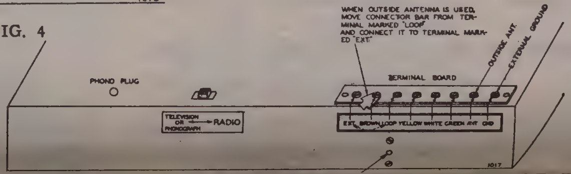


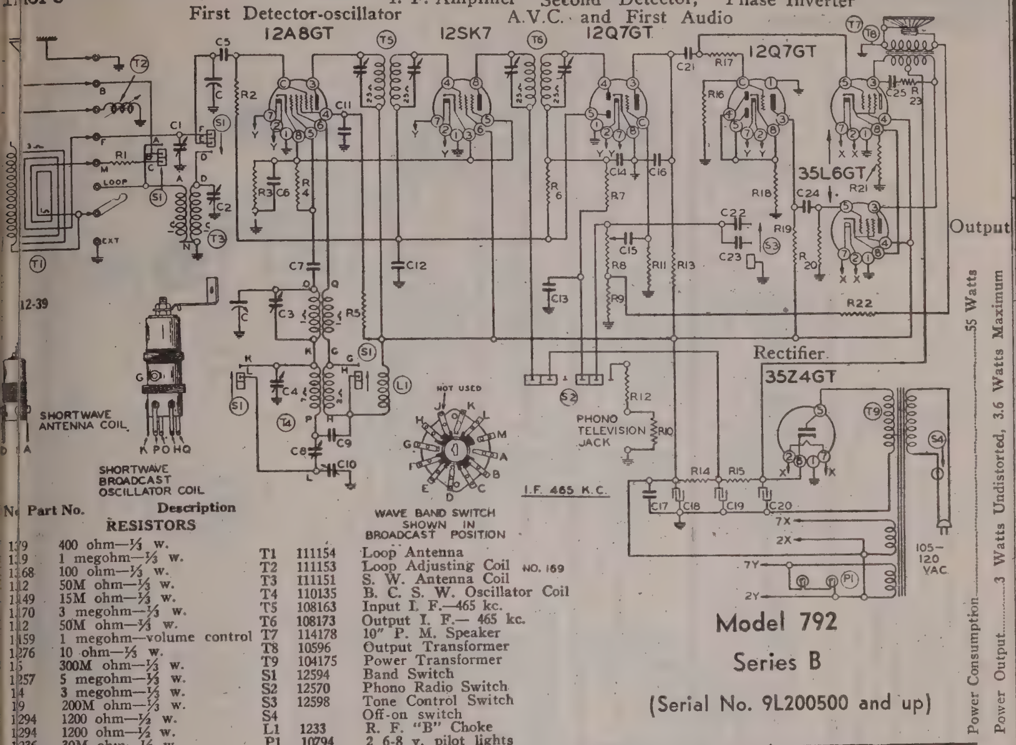
FIG. 2.—TOP VIEW


WHEN OUTSIDE ANTENNA IS USED, MOVE CONNECTOR BAR FROM TERMINAL MARKED "LOOP" AND CONNECT IT TO TERMINAL MARKED "EXT."
TERMINAL BOARD
OUTSIDE ANT.
EXTERNAL GROUND
PHONO PLUG
TELEVISION OR PHONOGRAPH ← → RADIO
EXT. BROWN LOOP YELLOW WHITE GREEN ANT GND
1017

he atic,Voltage,Socket
i ers

BELMONT RADIO CORP.

MODEL 792,Series B
Serial 9L200500 up



Model 792
Series B
(Serial No. 9L200500 and up)

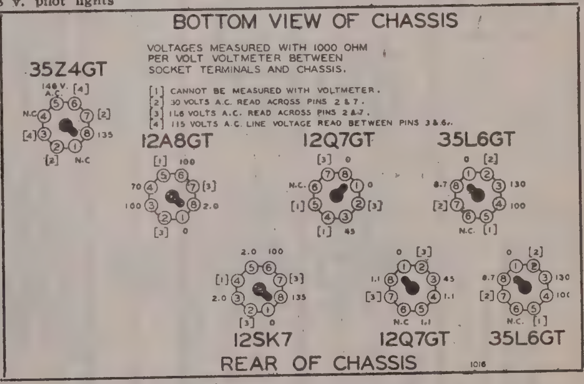
Power Consumption..........55 Watts
Power Output..........3 Watts Undistorted, 3.6 Watts Maximum

N	Part No.	Description
		RESISTORS
	1 79	400 ohm—⅓ w.
	1 9	1 megohm—⅓ w.
	1 68	100 ohm—⅓ w.
	1 2	50M ohm—⅓ w.
	1 49	15M ohm—⅓ w.
	1 70	3 megohm—⅓ w.
	1 2	50M ohm—⅓ w.
	1 159	1 megohm—volume control
	1 276	10 ohm—⅓ w.
	1 5	300M ohm—⅓ w.
	1 257	5 megohm—⅓ w.
	1 4	3 megohm—⅓ w.
	1 9	200M ohm—⅓ w.
	1 294	1200 ohm—½ w.
	1 294	1200 ohm—½ w.
	1 236	30M ohm—⅓ w.
	1 102	500M ohm—⅓ w.
	1 22	5M ohm—⅓ w.
	1 9	200M ohm—⅓ w.
	102	500M ohm—⅓ w.
	296	200 ohm—1 w.
	168	100 ohm—⅓ w.
	94	50M ohm—⅓ w.
		CONDENSERS
	119	2 gang variable condenser
	111	B. C. Adj. Trimmer (Antenna)
	111	S. W. Adj. Trimmer (Antenna)
	112	S. W. Adj. Trimmer (Oscillator)
	112	B. C. Adj. Trimmer (Oscillator)
	2	.0005 mica
	104	.5 x 100 v.
	39	.00005 mica
	113	B. C. Series Pad
	9	.05 x 200 v.
	113	S. W. Series Pad
	20	.1 x 200 v.
	9	.05 x 200 v.
	5	.0001 mica
	5	.0001 mica
	025	.002 x 600 v.
	2	.0005 mica
	020	.1 x 200 v.
	9101	20 mfd. lytic
	9101	20 mfd. lytic
	9101	40 mfd. lytic
	026	.02 x 400 v.
	98	.0006 mica
	0112	.001 x 200 v.
	026	.02 x 400 v.
	01	.1 x 400 v.

a C2 in same unit
a C10 in same unit
8, 19 and C20 in same unit
a C4 in same unit.

T1	111154	Loop Antenna
T2	111153	Loop Adjusting Coil NO. 169
T3	111151	S. W. Antenna Coil
T4	110135	B. C. S. W. Oscillator Coil
T5	108163	Input I. F.—465 kc.
T6	108173	Output I. F.— 465 kc.
T7	114178	10" P. M. Speaker
T8	10596	Output Transformer
T9	104175	Power Transformer
S1	12594	Band Switch
S2	12570	Phono Radio Switch
S3	12598	Tone Control Switch
S4		Off-on switch
L1	1233	R. F. "B" Choke
P1	10794	2 6-8 v. pilot lights

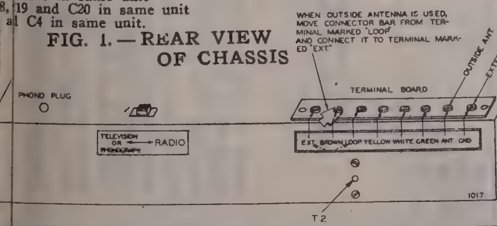
BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 30 VOLTS A.C. READ ACROSS PINS 2 & 7.
[3] 11.6 VOLTS A.C. READ ACROSS PINS 2 & 7.
[4] 115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 3 & 6.

FIG. 1.—REAR VIEW OF CHASSIS


WHEN OUTSIDE ANTENNA IS USED, MOVE CONNECTOR BAR FROM TERMINAL MARKED "LOOP" AND CONNECT IT TO TERMINAL MARKED "EXT."
OUTSIDE ANT.
EXTERNAL GROUND
TERMINAL BOARD
EXT. BROWN LOOP YELLOW WHITE GREEN ANT GND
PHONO PLUG
TELEVISION OR PHONOGRAPH
RADIO
1017
T2

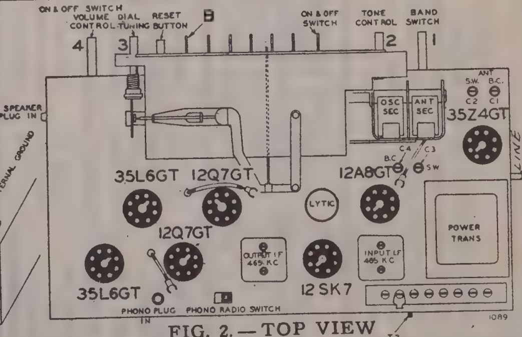


FIG. 2.—TOP VIEW

MODEL 792,Series B
MODEL 793,Series B
Alignment,Trimmers

BELMONT RADIO CORP.

CHASSIS 792, 793B. ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 12A8GT Mixer	Broadcast	Rotor full " (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C3 (See Fig. 5)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 5)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C10 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROADCAST BAND (See Note A)	1550 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C4 (See Fig. 5)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Set Dial at 540 Kc.	Trimmer C8 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGNMENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

It is important during loop alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 12A8GT tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1550 and 540 K.C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

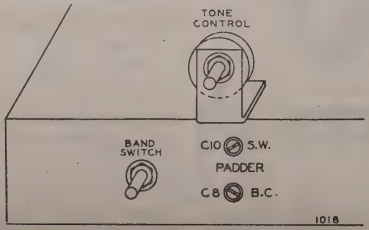
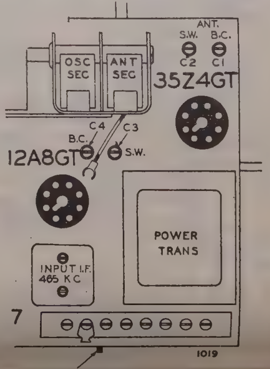
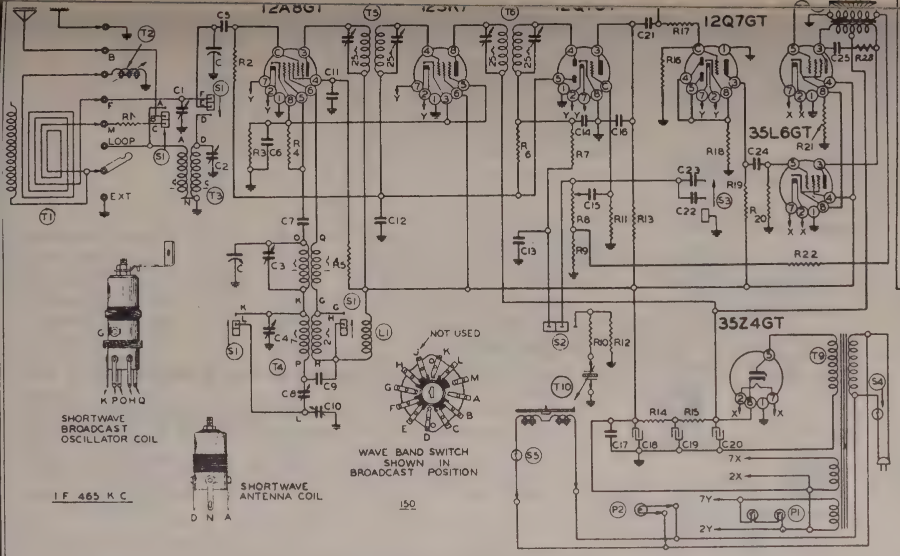


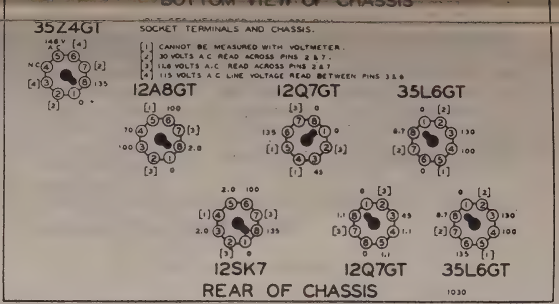
FIG. 4



BELMONT RADIO CORP.

MODEL 793,Series A
Schematic,Voltage
Socket




35Z4GT
SOCKET TERMINALS AND CHASSIS.
[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 30 VOLTS A C READ ACROSS PINS 2 & 7.
[3] 11.6 VOLTS A.C READ ACROSS PINS 2 & 7
[4] 115 VOLTS A C LINE VOLTAGE READ BETWEEN PINS 3 & 6
12A8GT
12Q7GT
35L6GT
12SK7
12Q7GT
35L6GT
REAR OF CHASSIS
1030

TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes:

The type and function of each tube is as follows:

1—Type 12A8GT First Detector-oscillator.

1—Type 12SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).

1—Type 12Q7GT Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type 12Q7GT Phase Inverter.

2—Type 35L6GT Push-Pull Output Amplifier.

1—Type 35Z4GT High Vacuum Rectifier.

10/39

Circuit Diagram Ref. No.	Part No.	Description
RESISTORS		
R1	13079	400 ohm—⅓ w.
R2	13019	1 megohm—⅓ w.
R3	130168	100 ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	130149	15M ohm—⅓ w.
R6	130170	3 megohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	101202	1 megohm—volume control
R9	130276	10 ohm—⅓ w.
R10	13038	2 megohm—⅓ w.
R11	130257	5 megohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	1309	200M ohm—⅓ w.
R14	130294	1200 ohm—½ w.
R15	130294	1200 ohm—½ w.
R16	130236	30M ohm—⅓ w.
R17	130102	500M ohm—⅓ w.
R18	13022	5M ohm—⅓ w.
R19	1309	200M ohm—⅓ w.
R20	130102	500M ohm—⅓ w.
R21	130296	200 ohm—⅓ w.
R22	130168	100 ohm—⅓ w.
R23	13094	50M ohm—⅓ w.
CONDENSERS		
C	102119	2 gang variable condenser
C1	124111	B. C. Adj. Trimmer (Antenna)
C2	124111	S. W. Adj. Trimmer (Antenna)
C3	124112	S. W. Adj. Trimmer (Oscillator)
C4	124112	B. C. Adj. Trimmer (Oscillator)
C5	1292	.0005 Mica
C6	100104	.5 x 100 v.
C7	12939	.00005 Mica
C8	124113	B. C. Series Pad
C9	1009	.05 x 200 v.
C10	124113	S. W. Series Pad
C11	10020	.1 x 200 v.
C12	1009	.05 x 200 v.
C13	1295	.0001 mica
C14	1295	.0001 mica
C15	10025	.002 x 600 v.
C16	1292	.0005 mica
C17	10020	.1 x 200 v.
C18	119101	20 mfd. lytic
C19	119101	20 mfd. lytic
C20	119101	40 mfd. lytic
C21	10026	.02 x 400 v.
C22	1298	.0006 mica
C23	100112	.001 x 200 v.
C24	10026	.02 x 400 v.
C25	1001	.1 x 400 v.

C1 and C2 in same unit
C8 and C10 in same unit
C18, C19 and C20 in same unit
C3 and C4 in same unit

PARTS

T1	111154	Loop Antenna
T2	111153	Loop Adjusting Coil (Iron Core Tracking Coil)
T3	111151	S. W. Antenna Coil
T4	110135	B. C. - S. W. Oscillator Coil
T5	108163	Input I. F. - 465 Kc.
T6	108163B	Output I. F. - 465 Kc.
T7	114178	10" P. M. Speaker
T8	10596	Output Transformer
T9	104175	Power Transformer
T10	104174	Automatic Record Changer complete
S1	12594	Band Switch
S2	125101	Phono Radio Switch
S3	12598	Tone Switch
S4		Off-on switch on volume control
S5		Off-on switch on record changer
L1	1233	R. F. "B" Choke
P1	10794	2 6-8 v. pilot lights
P2	107290	Indicator Light

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 12A8GT Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C3 (See Fig. 5)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 5)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C10 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1550 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C4 (See Fig. 5)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Set Dial at 540 Kc.	Trimmer C8 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 12A8GT tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1550 and 540 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal. (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.7 to 18.3 MC.
Extreme Left Rotation	Broadcast	540 to 1550 KC.

Power Consumption (Radio Chassis only, less Phono Motor)..........55 Watts
Power Output..........3 Watts Undistorted, 3.6 Watts Maximum
Intermediate Frequency..........465 K.C.

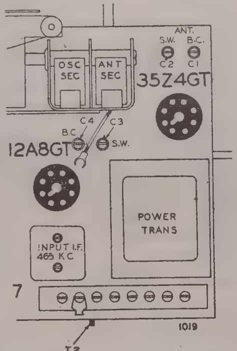


FIG. 5—TOP VIEW

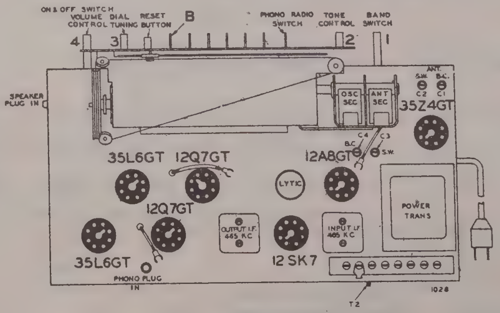


FIG. 2.—TOP VIEW

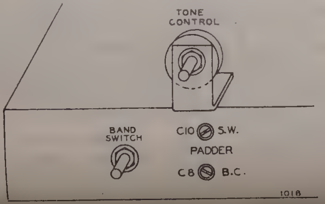
PHONOGRAPH OPERATION:

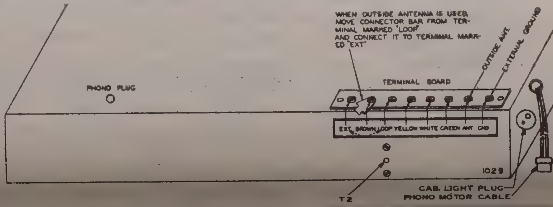
The Phono-Radio switch is of the push button type, (See button 5, fig. 3).

For Phono operation push Phono push button all the way in. This will disconnect the radio and connect the phonograph pick-up. The volume and tone controls on the front panel of the radio are used for either radio or for phonograph.

To switch back to radio playing position push in on any one of the automatic tuning push buttons or the manual dial tuning control knob.

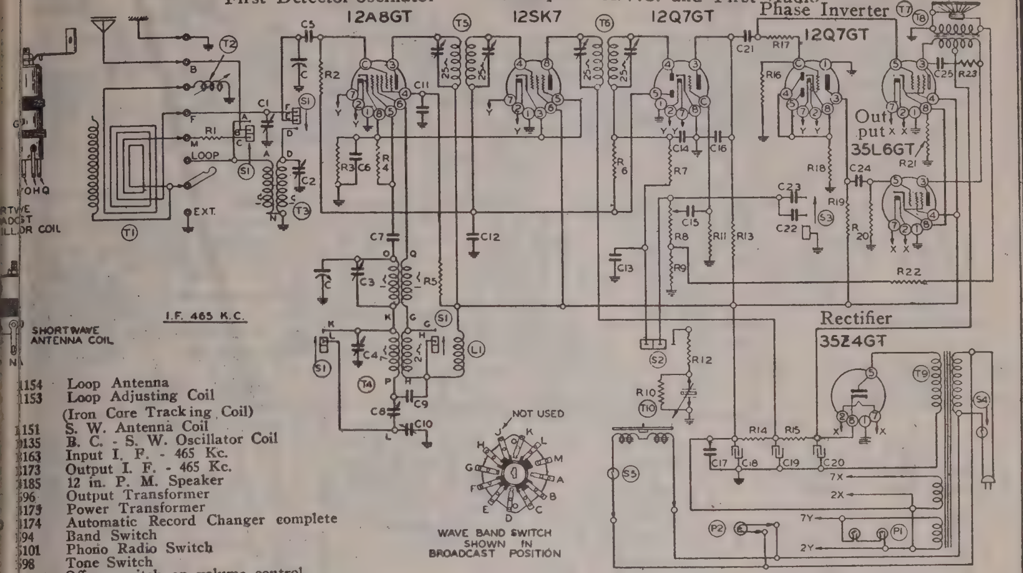
Included with this manual is a separate instruction manual for the Automatic Record Changer. Before operating the




PHONO PLUG
WHEN OUTSIDE ANTENNA IS USED, MOVE CONNECTOR BAR FROM TERMINAL MARKED "LOOP" AND CONNECT IT TO TERMINAL MARKED "EXT"
TERMINAL BOARD
OUTSIDE ANT.
EXTERNAL GROUND
EXT. BROWN LOOP YELLOW WHITE GREEN ANT GND
T2
1029
CAB. LIGHT PLUG
PHONO MOTOR CABLE

BELMONT RADIO CORP.

MODEL 793,Series B
Serial 9L199900 up



MODEL 793 B DEC-6-39

Model 793
Series B
(Serial No. 9L199900 and up)

FOR ALIGNMENT
SEE INDEX

Part No.	Description
1154	Loop Antenna
1153	Loop Adjusting Coil (Iron Core Tracking Coil)
151	S. W. Antenna Coil
135	B. C. - S. W. Oscillator Coil
163	Input I. F. - 465 Kc.
173	Output I. F. - 465 Kc.
185	12 in. P. M. Speaker
96	Output Transformer
175	Power Transformer
174	Automatic Record Changer complete
94	Band Switch
101	Phono Radio Switch
98	Tone Switch
	Off-on switch on volume control
	Off-on switch on record changer
33	R. F. "B" Choke
794	2 6-8 v. pilot lights
7290	Indicator Light

Part No.	Description
	RESISTORS
079	400 ohm—⅓ w.
019	1 megohm—⅓ w.
0168	100 ohm—⅓ w.
012	50M ohm—⅓ w.
0149	15M ohm—⅓ w.
0170	3 megohm—⅓ w.
012	50M ohm—⅓ w.
1202	1 megohm—volume control
0276	10 ohm—⅓ w.
05	300M ohm—⅓ w.
0257	5 megohm—⅓ w.
04	3 megohm—⅓ w.
09	200M ohm—⅓ w.
0294	1200 ohm—½ w.
0294	1200 ohm—½ w.
0236	30M ohm—⅓ w.
0102	500M ohm—⅓ w.
022	5M ohm—⅓ w.
09	200M ohm—⅓ w.
0102	500M ohm—⅓ w.
0296	200 ohm—⅓ w.
0168	100 ohm—⅓ w.
094	50M ohm—⅓ w.

CONDENSERS

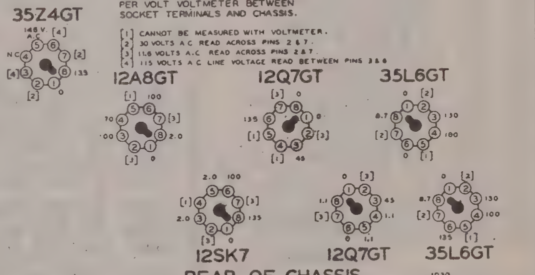
C	102119	2 gang variable condenser
C1	124111	B. C. Adj. Trimmer (Antenna)
C2	124111	S. W. Adj. Trimmer (Antenna)
C3	124112	S. W. Adj. Trimmer (Oscillator)
C4	124112	B. C. Adj. Trimmer (Oscillator)
C5	1292	.0005 Mica
C6	100104	.5 x 100 v.
C7	12939	.00005 Mica
C8	124113	B. C. Series Pad
C9	1009	.05 x 200 v.
C10	124113	S. W. Series Pad
C11	10020	.1 x 200 v.
C12	1009	.05 x 200 v.
C13	1295	.0001 mica
C14	1295	.0001 mica
C15	10025	.002 x 600 v.
C16	1292	.0005 mica
C17	10020	.1 x 200 v.
C18	119101	20 mfd. lytic
C19	119101	20 mfd. lytic
C20	119101	40 mfd. lytic
C21	10026	.02 x 400 v.
C22	1298	.0006 mica
C23	100112	.001 x 200 v.
C24	10026	.02 x 400 v.
C25	1001	.1 x 400 v.

C1 and C2 in same unit
C8 and C10 in same unit
C18, C19 and C20 in same
C3 and C4 in same unit

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM-PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 30 VOLTS A C READ ACROSS PINS 2 & 7.
[3] 11.6 VOLTS A.C READ ACROSS PINS 2 & 7.
[4] 115 VOLTS A C LINE VOLTAGE READ BETWEEN PINS 3 & 6



VICE NOTES:

Voltages taken from different points of circuit to chassis re measured with volume control full on, all tubes in their ockets and speaker connected, with a volt meter having a sistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured it 115 volts A. C. on the primary of the power transformer.

Consumption (Radio Chassis only, less Phono Motor).......55 Watts
Power Output..........................3 Watts Undistorted, 3.6 Watts Maximum

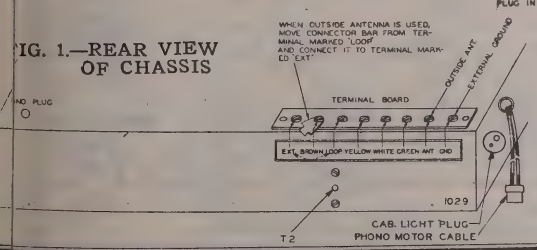


FIG. 1.—REAR VIEW OF CHASSIS

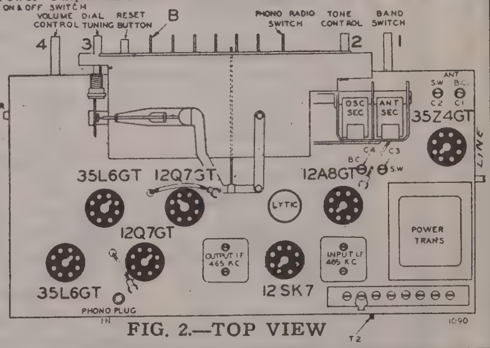
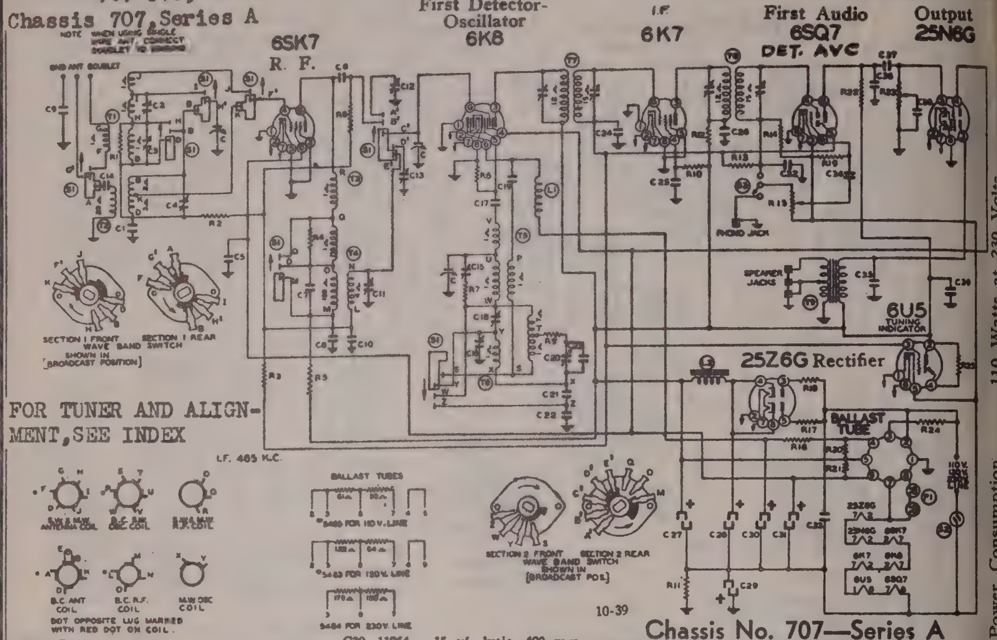


FIG. 2.—TOP VIEW

MODELS 707-391,707-398
707-378, etc.
Chassis 707,Series A

BELMONT RADIO CORP.

Serial 9K167300 up
Schematic,Voltage,Trim



FOR TUNER AND ALIGNMENT, SEE INDEX

10-39

Power Consumption..........110 Watts at 230 Volts

Chassis No. 707—Series A
(Serial No. 9K167300 and up) For
Models 707-391, 707-398 and 707-378, E

Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	13026	1000 ohm—⅓ w.
R4	130232	25M ohm—⅓ w.—10%
R5	13026	1000 ohm—⅓ w.
R6	13019	1 megohm—⅓ w.
R7	13097	200 ohm—⅓ w.—10%
R8	13012	50M ohm—⅓ w
R9	130299	10 ohm—⅓ w. 10%
R10	13020	100M ohm—⅓ w.
R11	130197	20 ohm—⅓ w. 10%
R12	13023	2000 ohm—⅓ w.
R13	1304	3 megohm—⅓ w.
R14	1304	3 megohm—⅓ w.
R15	101205	1 megohm volume control
R16	13022	5000 ohm—⅓ w.
R17	130168	100 ohm—⅓ w.
R18	130168	100 ohm—⅓ w.—10%
R19	130225	15 megohm—⅓ w
R20	130176	20M ohm—⅓ w. 10%
R21	130302	9M ohm—1.5 watt—10%
R22	1309	200M ohm—⅓ w.
R23	101207	1 megohm tone control
R24	10658	300 ohm—10%—50 watt
R25	13019	1 megohm—⅓ w.
		CONDENSERS
C	102121	Three gang variable condenser
C1	10090-B	.02 x 400 v.
C2	124118	S. W. Antenna Trimmer
C3	124118	M. W. Antenna Trimmer
C4	124118	B. C. Antenna Trimmer
C5	10013	.05 x 400 v.
C6	10090	.02 x 400 v.
C7	12938	.00005 mica
C8	10090	.02 x 400 v.
C9	10026	.02 x 400 v.
C10	10090	.02 x 400 v.
C11	124119	B.C. R.F. Trimmer
C12	124119	S.W. R.F. Trimmer
C13	124119	M.W. R.F. Trimmer
C14	10026	.02 x 400 v.
C15	124119	S.W. Osicllator Trimmer
C16	124119	M.W. Oscillator Trimmer
C17	12962	.0003 mica
C18	124119	B.C. Oscillator Trimmer
C19	10025	.002 x 600 v.
C20	124119	B.C. Padding condenser
C21,	129149	.0028 compression M.W. Pad
C22	129105	.0035 Compression S.W. Pad
C23	12959	.0003 mica
C24	1009	.05 x 200 v.
C25	10013	.05 x 400 v.
C26	1001	.1 x 400 v.
C27	11998	30 uf. lytic—300 w.v.
C28	11998	30 uf. lytic—300 w. v.
C29	11998	40 uf. lytic—25 w.v.
C30	11964	15 uf. lytic—400 w.v.
C31	11964	10 uf. lytic—350 w.v.
C32	1295	.0001 mica
C33	10013	.05 x 400 v.
C34	10025	.002 x 600 v.
C35	10026	.02 x 400 v.
C36	12912	.00025 mica
C37	10013	.05 x 400 v.
C38	10078	.01 x 200 v.
C39	10013	.05 x 400 v.

C2, C3 and C4 are in same unit.
C11, C12, C13, C15, C16, C18 and C20 in same unit.
C27, C28 and C29 in same unit.
C30 and C31 in same unit.

Ref. No.	Part No.	Description
T1	111156	S.W. M.W. Antenna Coil
T2	111158	B.C. Antenna Coil
T3	10955	S.W. M.W. R.F. Coil
T4	10956	B.C. R.F. Coil
T5	110140	B.C. S.W. Oscillator Coil
T6	110138	M.W. Oscillater Coil
T7	108165	1st I.F. Input Coil
T8	108119	2nd I.F. Output Coil
T9	10598	Output Transformer
	114179	8" P.M. Speaker or
	114186	12" P.M. Speaker
L1	1234	R.F. Choke
L2	10597B	"B" Filter Choke
S1	12595	Wave Band Switch
S2		On and Off Switch on volume control
S3	125101	Radio-Phono Switch
P1	10794	(2) Pilot Lights T-44

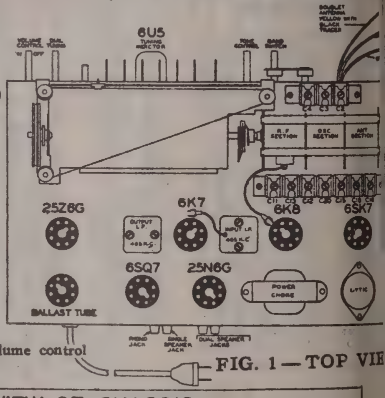
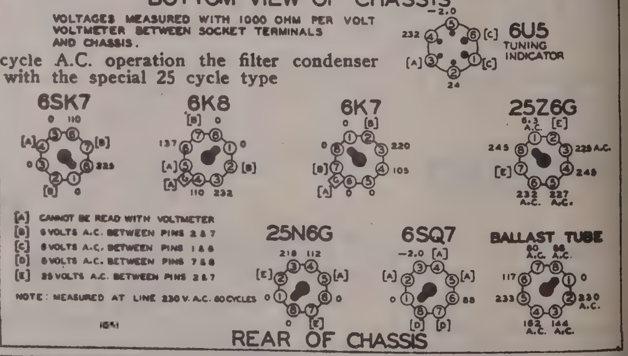


FIG. 1 — TOP VIE

NOTE:—For 25 cycle A.C. operation the filter condenser must be replaced with the special 25 cycle type

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

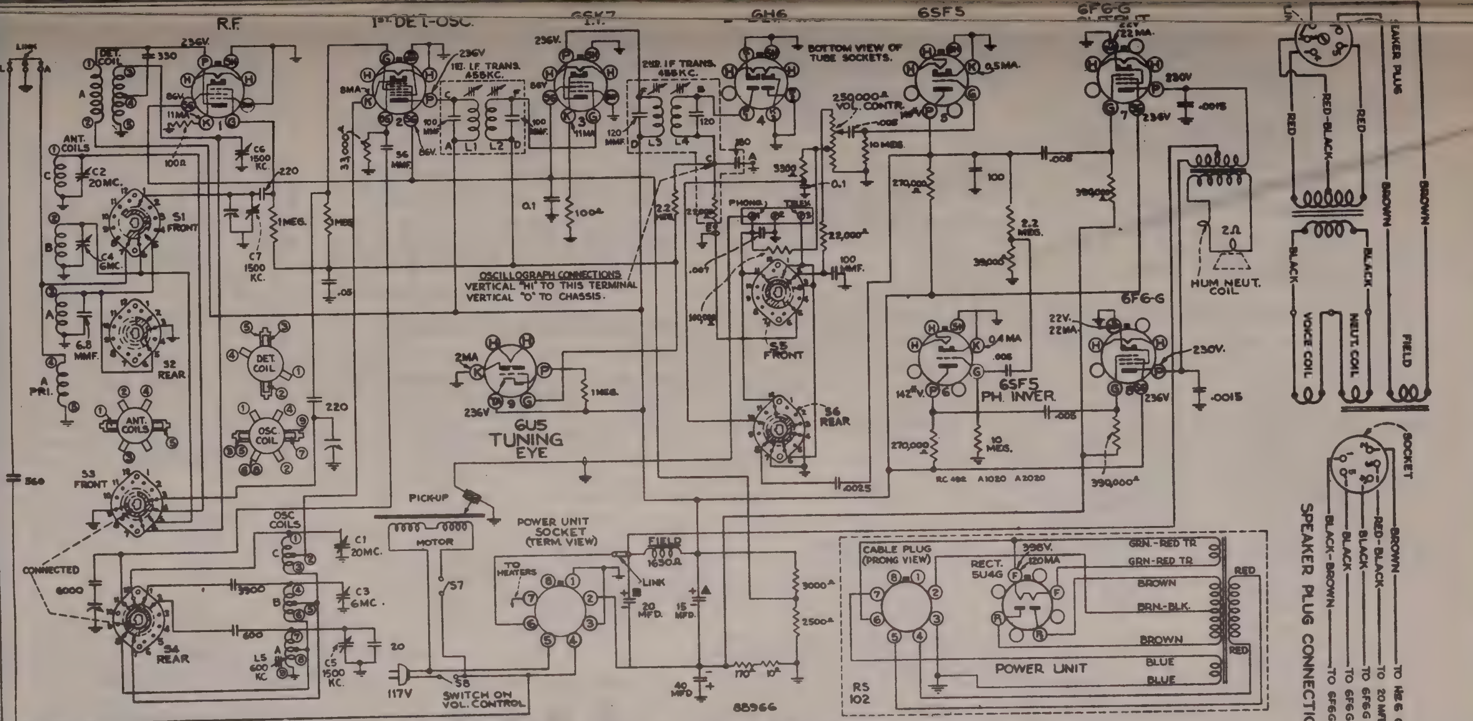


[A] CANNOT BE READ WITH VOLTMETER
[B] 6 VOLTS A.C. BETWEEN PINS 2 & 7
[C] 6 VOLTS A.C. BETWEEN PINS 1 & 8
[D] 6 VOLTS A.C. BETWEEN PINS 7 & 8
[E] 25 VOLTS A.C. BETWEEN PINS 2 & 7

NOTE: MEASURED AT LINE 230 V. A.C. 60 CYCLES

BRUNSWICK DIV.-MERSMAN BROS.

MODELS A1020,A2020
Schematic,Voltage
Notes



Voltages should hold within ±20% with 117 V. A.C. supply.
* Starred Voltages are operating voltages in circuits with high series resistance; the actual measured voltages will be lower, depending on the voltmeter loading.

Models A-1020 and A-2020 Brunswick Panatropes are combination ten-tube, three-band superheterodyne receivers and automatic phonographs.

Power Supply Rating

Rating A............ 105-125 volts, 50-60 cycles, 130 watts

Power Output

Undistorted	10 watts
Maximum	12 watts

Loudspeaker (RL-70K2)

Type	12-inch electrodynamic
V-C Impedance	2.2 ohms at 400 cycles

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil hole is located in the motor casting, adjacent to the spindle bearing, and is covered with a screw plug.

Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a Television attachment into the audio-amplifying circuit. The cable from the attachment should be connected to terminals 2 and 3, the shielded or ground lead going to terminal 2.

A Radio-Phono-Television switch is built into the chassis, allowing switching to be accomplished through the "Tone-Radio-Phono-Television" control on the control panel.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Intermediate Frequency

455 kc

First Edition

Tube Complement

(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector—Oscillator
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6H6	2nd Detector and A.V.C.
(5)	RCA-6SF5	A-F Amplifier
(6)	RCA-6SF5	Phase Inverter
(7)	RCA-6F6G	Power Output
(8)	RCA-6F6G	Power Output
(9)	RCA-6U5	Tuning Eye
(10)	RCA-5U4-G	Full-Wave Rectifier

Dial Lamp....... Mazda 44, 6.3 volts, 0.25 amp.

MODELS A1020,A2020
MODELS 1680,2660,2689,
A2600,3689
Alignment,Trimmers,
Socket,Dial Drive Data

BRUNSWICK DIV.-MERSMAN BROS.

1680, 2660, 2689 & A-2600

Alignment Procedure

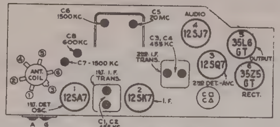
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

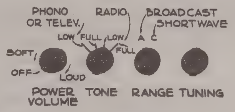
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground binding post, and keep the output as low as possible to avoid A.V.C. action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 mc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment. With the gang condenser in full mesh, the indicator should point 1/16 inch to the left of the maximum capacity mark on the calibration plate.

Dial Indicator Adjustment.—When the chassis is placed in the cabinet and with the gang condenser in full mesh, the indicator should point to the mark at the extreme left (low frequency) end of the glass dial scale.



Tube and Trimmer Locations

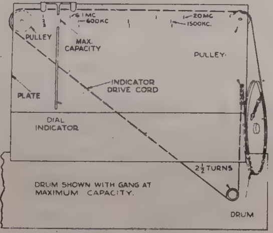


Controls

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet point between 550-750 kc	C3 and C4 (2nd I-F trans.)
2				C1 and C2 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C5 (osc.)*
4	Antenna terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C7 (osc.) C6 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C8 (osc.) Rock gang
6	Repeat step 4			

* Use minimum peak if two can be obtained. Check to determine that C5 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note: Oscillator tracks above signal on both bands.



Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

Adjustments for Push-Button Tuning

1680, 2660, 2689 & A-2600 A-1020 & A-2020

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.
2. Check to be sure the Phono-Radio switch is in "Radio" position.
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses above the push-buttons.

A-1020 & A-2020

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

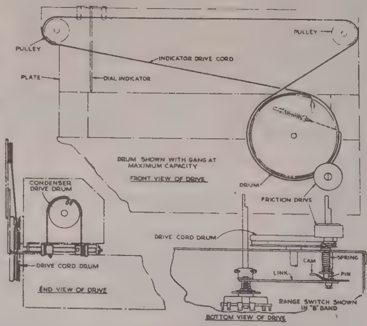
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 120 mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.



Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L3 and L4 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L1 and L2 (1st I-F trans.)
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (204.5°) "C" band	C1 (osc.)* C2 (ant.)
4		6 mc	6 mc (194°) "B" band	C3 (osc.)** C4 (ant.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (198.5°) "A" band	C5 (osc.) C6 (det.) C7 (ant.)
6		600 kc	600 kc (38°) "A" band	L5 (osc.) Rock gang
7	Repeat step 5.			

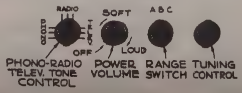
* Use minimum capacity peak if two can be obtained. Check to determine that C1 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

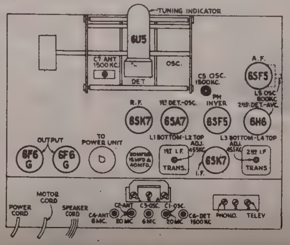
** Use minimum capacity peak if two can be obtained. Check to determine that C3 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

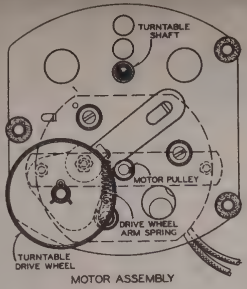


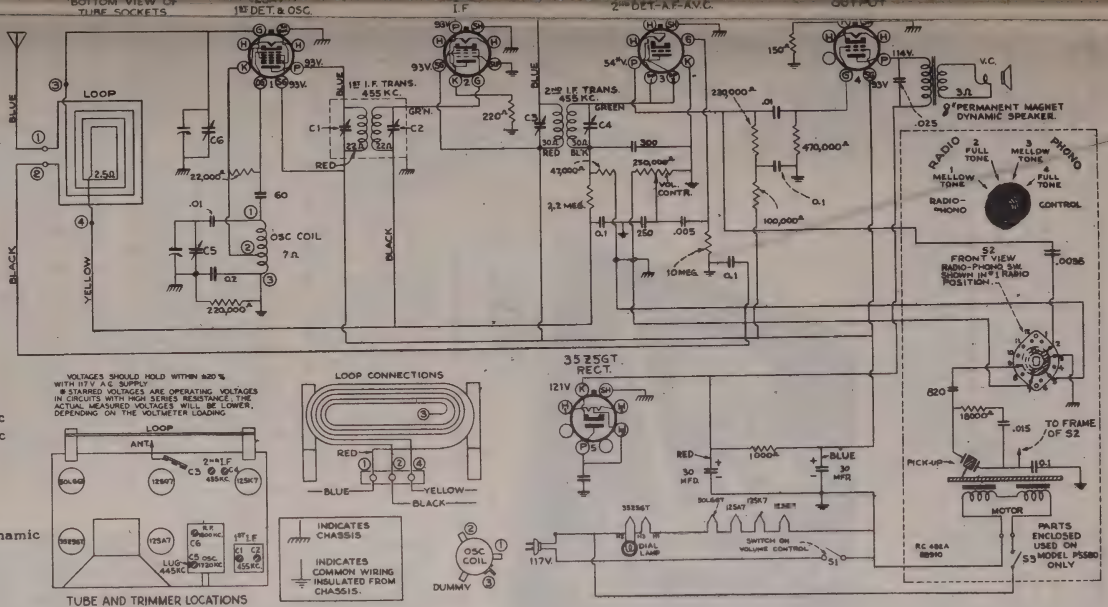


Tube and Trimmer Locations

BRUNSWICK DIV.-MERSMAN BROS.

MODELS T1580,T2580,3580
4580,Chassis RC-482
P5580,Chassis RC-482A
Schematic,Voltage
Alignment,Notes





VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V A C SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE, THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

TUBE AND TRIMMER LOCATIONS

Frequency Range	540-1,720 kc
Intermediate Frequency......	455 kc

Loudspeaker
Type .. 8-inch permanent magnet dynamic

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Power Output (125 volts, 60 cycle supply)

Undistorted	0.75 watts
Maximum	1.5 watts
Dial Lamp	Mazda 51, 7.5 volts, 0.2 amp.

Power Supply Rating (Models 3580, 4580, T-1580 and T-2580)

A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

Model P-5580—Although this model employs an ac-dc chassis it is not suitable for use on dc, as this would damage the motor.

The phonograph motor on Model P5580 is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the top and bottom motor spindle bearings, to the turntable spindle and to the turntable drive wheel bearing.

CAUTION: Keep oil away from drive bushing on top of motor spindle and from rubber driving tire on turntable drive wheel.

Power-Supply Polarity.—For operation on d-c (except Model P5580) the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" lead on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

MODELS A1020,A2020
MODEL A2600

BRUNSWICK DIV.-MERSMAN BROS.

MODELS 1700,A2700,A37
Automatic Record Chan
Notes

Automatic Record Changer

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cy

If the record changer or cabinet is not perfectly level, nor operation is likely to be affected.

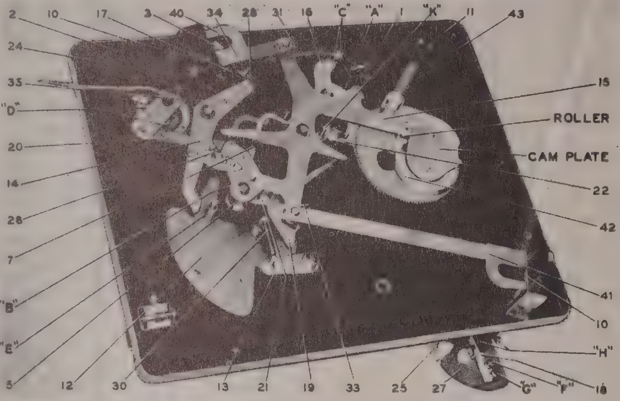
The 10 and 12 inch records must be absolutely flat for smo operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due pressure when the pickup is placed on the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.



NOTE: Numbers refer to parts—letters refer to adjustments

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" each of the record posts serves to separate the lower record from stack and to support the remaining records during the change cycle, is essential that the spacing between the knife and the rotating rec shelf "27" be accurately maintained. The spacing for the 10 i record is nominally .058 inch, and for the 12 inch record is .075 in

To adjust, rotate knife to the point of m mum vertical separat from the record shelf turn screw and lock "F" to give .055—. inch separation. Scr "G" must not be pressed during this justment. After setti screw "F" adjust scr "G" so that when its is depressed flush w top of record shelf, vertical spacing betwe the knife, in its lowest tational position, and shelf, is .072—.078 in

H. Record Suppo Shelf.—The record sh revolves during the chan cycle to allow the low record to drop onto t turntable. Both posts a rotated simultaneously a gear and rack coupl to the main lever "15 and it is necessary that a justment be such th the record is released fro both shelves at the san instant. To adjust, pla a 12 inch record on th turntable, rotate mechanism into cycle to the point where tone arm at maximum distance outward from turntable; lift record upwar until it is in contact with both separating knives, then loosen screw "H" and shift record shelves so that the curved inner edges of th shelves are uniformly spaced at least 1/16 inch from record edg Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectl horizontal, improper operation and jamming of mechanis will occur.

J. Tone Arm Rest Support (not shown).—When the changer i out-of-cycle, the front lower edge of the pickup head should be 5/1 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pi "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

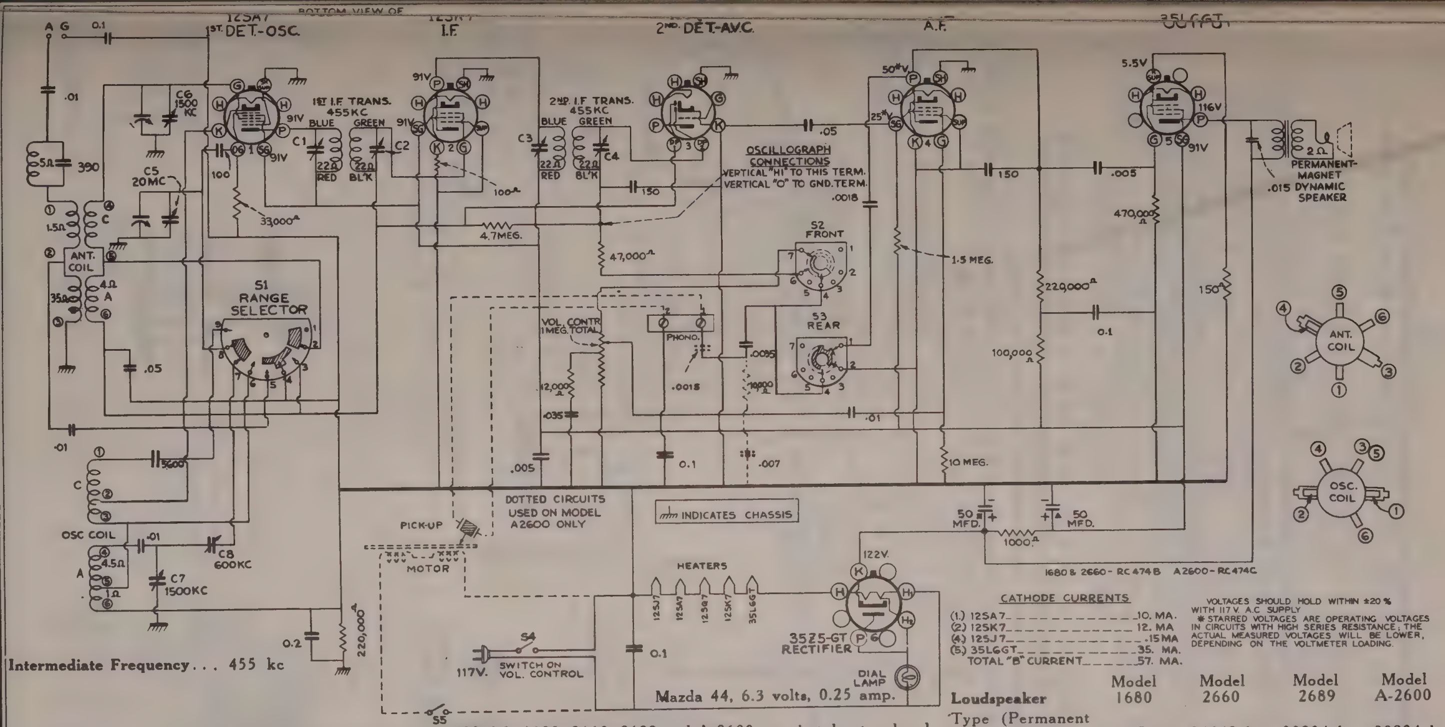
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records —Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "34."

BRUNSWICK DIV.-MERSMAN BROS.

MODELS 1680,2660,2689 A2600,3689

Schematic,Notes

Voltage



CATHODE CURRENTS

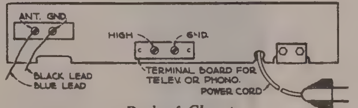
(1.) 12SA7 .... 10. MA.
(2) 12SK7 .... 12. MA
(4) 12SJ7 .... .15 MA
(5) 35L6GT .... 35. MA.
TOTAL "B" CURRENT .... 57. MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C SUPPLY

* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

Mazda 44, 6.3 volts, 0.25 amp.

Intermediate Frequency . . . 455 kc



Back of Chassis

Tube Complement

(1)	RCA-12SA7	1st Detector—Oscillator
(2)	RCA-12SK7	I-F Amplifier
(3)	RCA-12SQ7	2nd Detector, A.V.G.
(4)	RCA-12SJ7	A-F Amplifier
(5)	RCA-35L6GT	Power Output
(6)	RCA-35Z5GT	Half-Wave Rectifier

Models 1680, 2660, 2689 and A-2600 are six-tube, two-band superheterodyne receivers with push-button tuning.

Model A-2600 is a Panatrope combination with an automatic record player which permits the playing of seven 12-inch or eight 10-inch records, in succession. It has a crystal pickup and constant-speed self-starting motor.

Power Output (125 volts, 60 cycle supply)

Undistorted	0.8 watts
Maximum	1.4 watts

Power Supply Ratings (Models 1680, 2689 and 2660)

A-C Rating	105-125 volts, 50-60 cycles, 35 watts
D-C Rating	105-125 volts, direct current, 35 watts

MODEL A-2600.—Although this model employs an ac-dc chassis it is not suitable for use on dc, as this would damage the motor.

Loudspeaker	Model 1680	Model 2660	Model 2689	Model A-2600
Type (Permanent Magnet)	84477-4	84649-1	88934-1	88934-1
Size	8-inch	6-inch	10-inch	10-inch
Voice Coil Impedance at 400 cycles	2.2 ohms	2.0 ohms	2.2 ohms	2.2 ohms

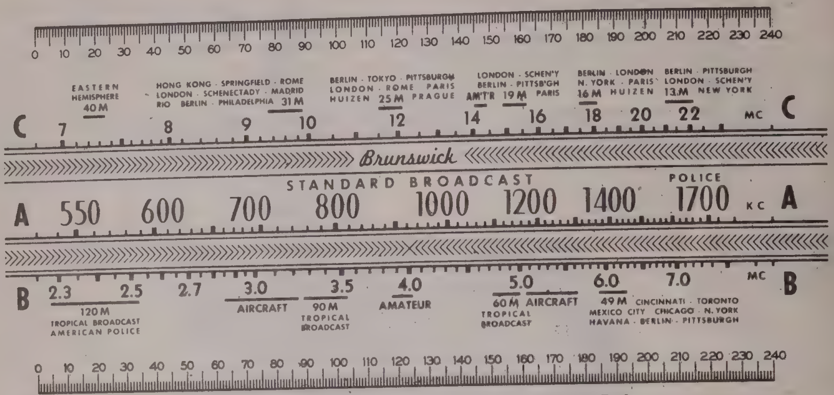
The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil hole is located in the motor casting, adjacent to the spindle bearing, and is covered with a screw plug.

MODELS 1700,A2700,A3720
Dial Data.Phono Data

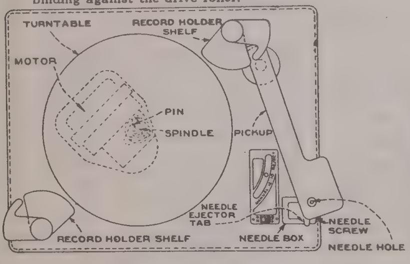
BRUNSWICK DIV.-MERSMAN BROS.



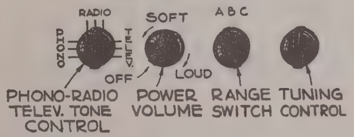
Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

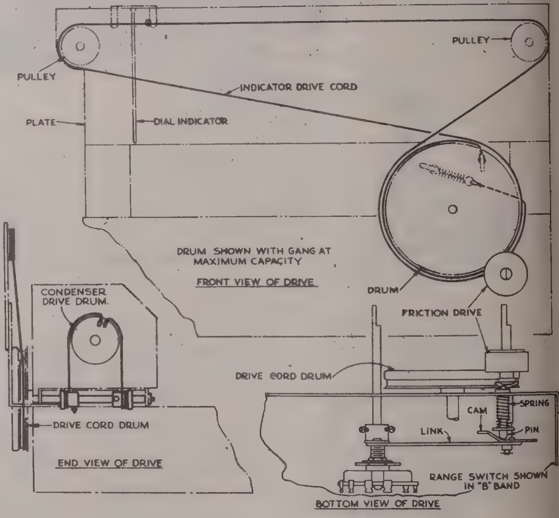
The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 40° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

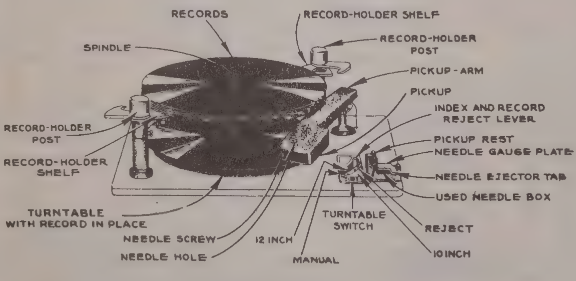
Note: In the Dial Indicator Drive Cord Assembly drawing at the right the mechanism is shown with the range switch in the "B" band position. In the "A" band position the trip arm on the range shaft must be adjusted so that when the push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.



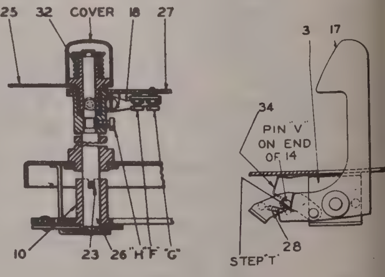
Motorboard and Controls







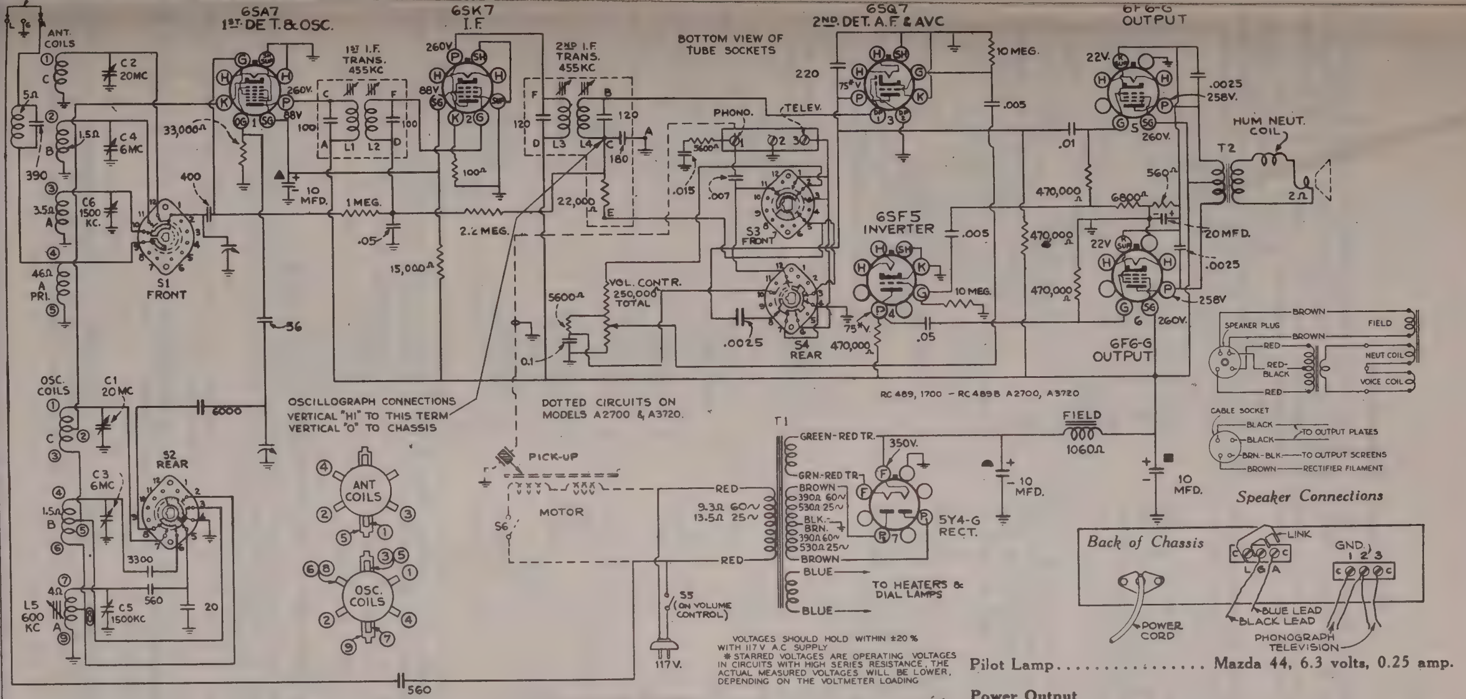
Top View of Automatic Record Changer



Details of Record Shelf Posts and Locating Lever Assemblies

BRUNSWICK DIV.-MERSMAN BROS.

MODELS 1700,A2700,A3720 Schematic,Voltage,Notes



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V A.C SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE, THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil hole is located in the motor casting, adjacent to the spindle bearing, and is covered with a screw plug.

Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a Television attachment into the audio-amplifying circuit. The cable from the attachment should be connected to terminals 2 and 3, the shielded or ground lead going to terminal 2.

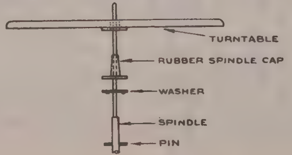
A Radio-Phono-Television switch is built into the chassis, allowing switching to be accomplished through the "Tone-Radio-Phono-Television" control on the control panel.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

CATHODE CURRENTS

(1.) 6SA7	11 MA.
(2.) 6SK7	11.5MA.
(3.) 6SQ7	.5MA.
(4.) 6SF5	.5MA.
(5.) 6F6G	21.0MA.
(6.) 6F6G	21.0MA.
TOTAL "B" CURRENT	65 MA

IF PEAK
455 KC



Turntable Assembly

Pilot Lamp............... Mazda 44, 6.3 volts, 0.25 amp.

Power Output
Undistorted.................................... 5.0 watts
Maximum.. 5.5 watts

Frequency Range
Standard Broadcast (A)................. 540-1,720 kc
Medium Wave (B)........................ 2.3-7.0 mc
Short Wave (C)......................... 7.0-22.0 mc

Intermediate Frequency........................ 455 kc

Power Supply Rating
Rating A............. 105-125 volts, 50-60 cycles, 85 watts
Models A-2700 and A-3720 with phono motor..... 110 watts

Loudspeaker	Model 1700	Model A-2700	Model A-3720
Type (Electrodynamic)	88938-1	88938-1	RL-70J-1
Size	10-inch	10-inch	12-inch
Voice Coil Impedance (At 400 cycles)	2.0 ohms	2.0 ohms	2.2 ohms

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

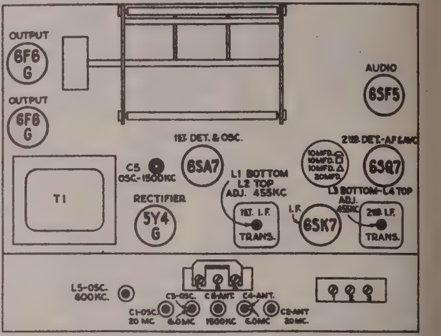
Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 120° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Tube and Trimmer Locations

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L3 and L4 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L1 and L2 (1st I-F trans.)
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (199°) "C" band	C1 (osc.)* C2 (ant.)
4		6 mc	6 mc (187.2°) "B" band	C3 (osc.)** C4 (ant.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (198.2°) "A" band	C5 (osc.) C6 (ant.)
6		600 kc	600 kc (40°) "A" band	L5 (osc.) Rock gang
7	Repeat step 5.			

* Use minimum capacity peak if two can be obtained. Check to determine that C1 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

** Use minimum capacity peak if two can be obtained. Check to determine that C3 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.

2. Check to be sure the Phono-Radio switch is in "Radio" position.

3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.

4. Proceed in a similar manner for the remainder of the push-buttons.

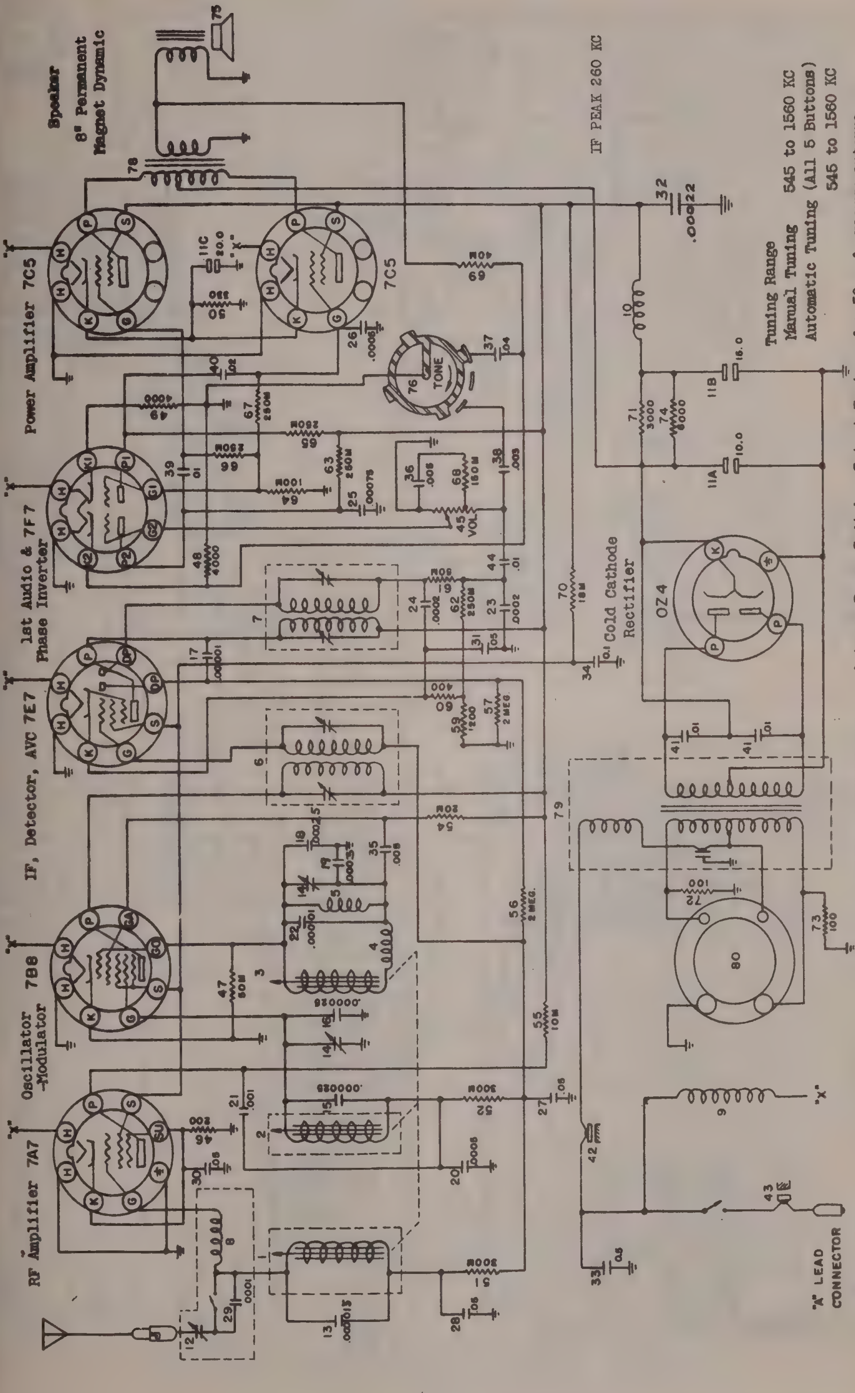
5. Insert the station marker tabs in the recesses above the push-buttons.

* * *

The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Schematic



Tuning Range
Manual Tuning 545 to 1560 KC
Automatic Tuning (All 5 Buttons) 545 to 1560 KC

Antenna Range Switch - Set at Factory for 50 mmf. vacuum antenna. For under car antenna turn range switch clockwise until it hits definite stop. (Approx. 180°). Antenna Trimmer Range 25 mmf. of antenna capacities selected by antenna range switch.

Power Output	6 Watts Undistorted
Power Consumption	6.6 Amperes at 6.0 Volts
Sensitivity	2 Microvolts at 1 Watt Output
Selectivity at 1000 times signal	35 KC

MODEL 77
Voltage, Alignment
Socket, Trimmers, Chassis

CADILLAC DIV.—GEN. MOTORS

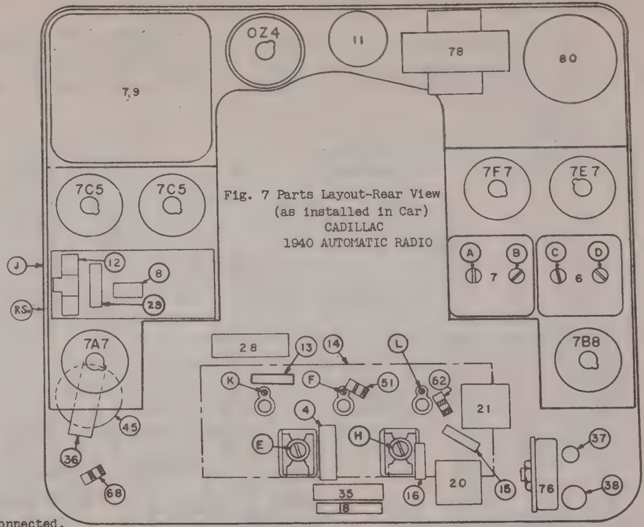


Fig. 7 Parts Layout-Rear View
(as installed in Car)
CADILLAC
1940 AUTOMATIC RADIO

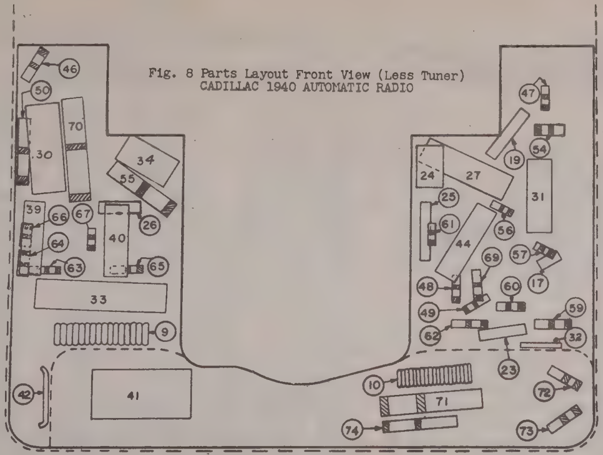


Fig. 8 Parts Layout Front View (Less Tuner)
CADILLAC 1940 AUTOMATIC RADIO

ALIGNMENT CHART

Set Volume Control fully on. Connect output meter across voice coil, leaving speaker connected.

Signal Generator Frequency Setting	Connect Output Lead of Signal Generator to	Dummy Antenna	Receiver Dial Setting	Adjust Trimmers to Maximum Output	Remarks
260	Through 7239928 IF Alignment Dummy to junction of condensers 15 and 16 at R.F. trimmer. H Fig. 1	.1 mf.	1560	IF Trimmers A & B, C & D Fig. 7	Attenuate signal and recheck
1580	Antenna terminal of set thru 7239929 Dummy	50 mmf.	High freq. end	Back out osc. coil adj. screw 1/16" F in Fig. 7	Rotate dial indicator to the high freq. end of dial as far as it will go
1580	"	"	"	Oscillator Trimmer E in Fig. 7	Attenuate signal and repeat
1560	"	"	1560	Screw in oscillator coil adj. screw E in Fig. 7	Adjust screw for maximum output
600	"	"	Tune to signal	RF and Antenna Trimmers H & J Fig. 7	
1400	"	"	"	RF and Antenna Coil Adj. screws K & L Fig. 7	
600	"	"	"	Check F & J Fig. 7	
Set installed in car. Connected to car antenna.	Tune to weak station	Car Antenna	Between 600 to 700 KC	Adjust Antenna Trimmer for Maximum Volume.	Vacuum Section of Antenna fully extended, tune to a weak signal.

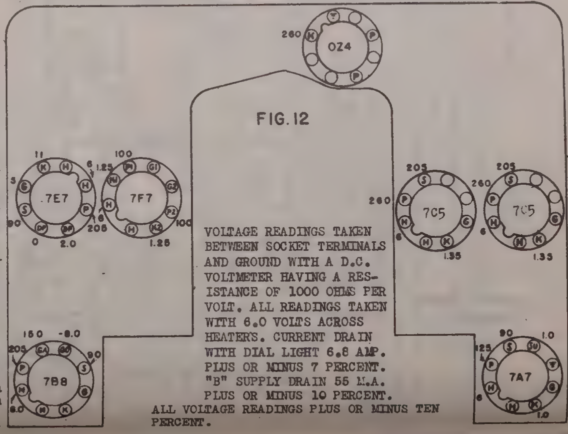


FIG. 12

VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS. CURRENT DRAIN WITH DIAL LIGHT 6.8 AMP. PLUS OR MINUS 7 PERCENT. "B" SUPPLY DRAIN 55 M.A. PLUS OR MINUS 10 PERCENT.
ALL VOLTAGE READINGS PLUS OR MINUS TEN PERCENT.

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Dial Drive and Tuner
Assembly

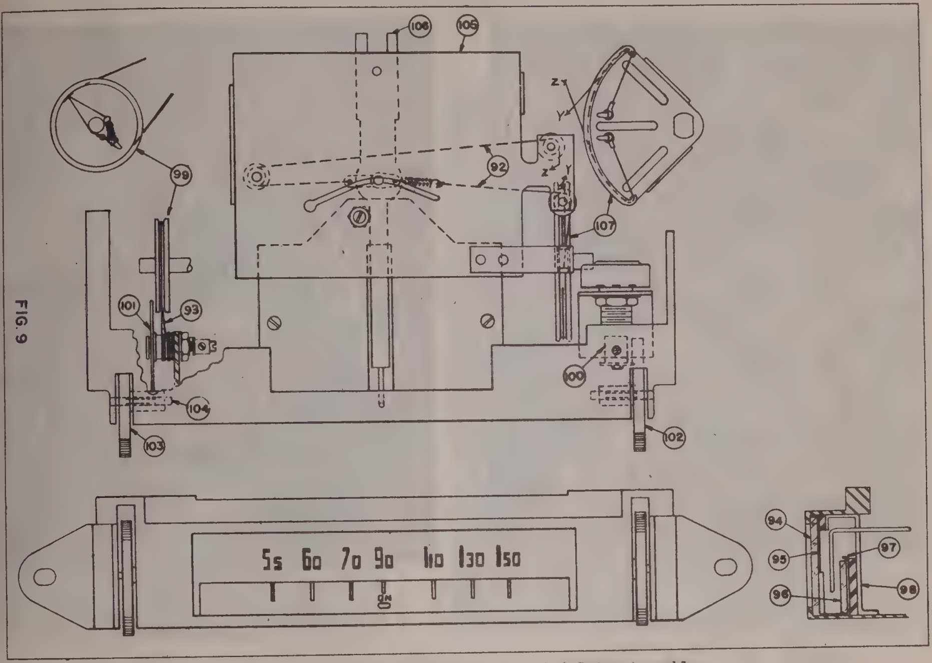


Fig. 9 General Arrangement - Dial & Drive Assembly

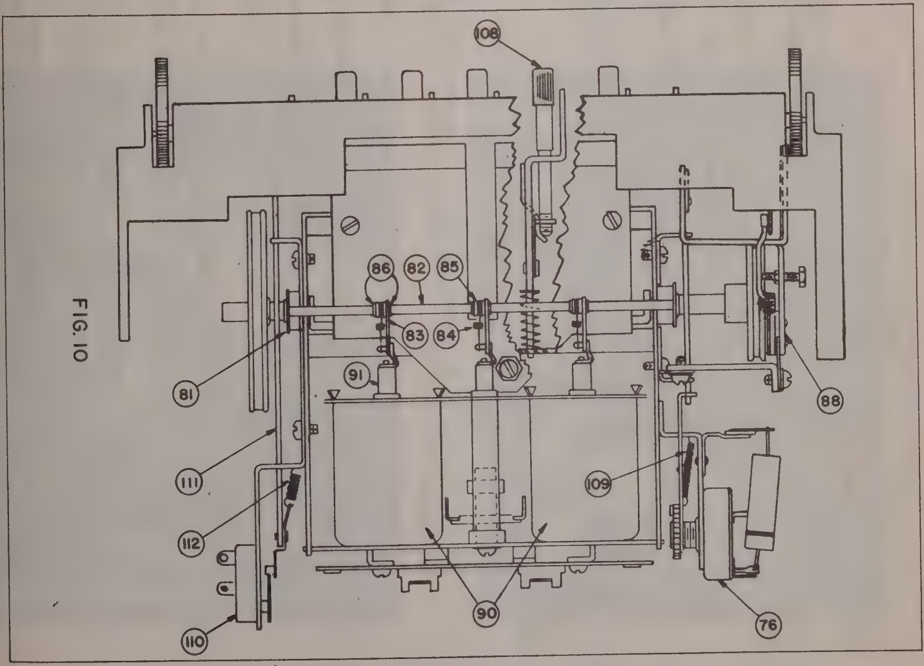


Fig. 10 Parts Layout - Tuner Unit - Bottom View

CADILLAC DIV.—GEN. MOTORS

SERVICE HINTS

Disassembling For Parts Replacements

To replace condensers, resistors, coils, etc., remove eight screws as shown in Fig. 1. Raise the bottom edge of the speaker cover, keeping it pushed forward so that the speaker field will clear the power supply shield, as shown in Figs. 2 and 3.

Unsolder voice coil lead "A" in Fig. 3 and set the speaker to the left of the set, as shown in Fig. 4. This exposes all of the wiring side of the chassis and component parts.

To replace tubes, vibrator or to realign when required, it is only necessary to remove the back cover.

To replace dial drive cord, remove the speaker and back cover as outlined above and remove eight screws holding the tuner cover, as shown in Fig. 5. Lay the cover back, as shown in Fig. 6, exposing the tuner unit and component parts.

Dial Cord or Pointer Replacement

1. Unhook the cord eyelets from drive pulley. Illustration 99 in Fig. 10.
2. Move pointer by hand toward the 1500 KC end of the dial until the pointer pivot pin drops through the enlarged end of the pointer guide slot.
3. Lift the pointer and pointer cord out of the tuner from the dial side.
4. File off the lower tip of the pointer guide pin, releasing the retaining washer and the cord pivot arms. Fig. 10.
5. With the pointer upside down and pointing away from the operator, put the long cord pivot arm on the left. Cord side up.
6. Place the short pivot arm (spring assembly) on the right. Cord side up.
7. Replace the retaining washer and solder it to the guide pin.
8. Replace the pointer. Place pivot pin in the enlarged end of the guide slot and then slide the rear end of the pointer into the rear support bearing.
9. Place the long cord behind the pointer and over pulleys. (Illustration 92 in Fig. 9 Page 130) Hook the cord eyelet over the drive pulley hook nearest the front of the tuner and push the cord into position around the pulley rim.
10. Put the spring loaded cord over pulleys in between the longer string and the tuner frame before hooking the cord eyelet to the drive pulley.

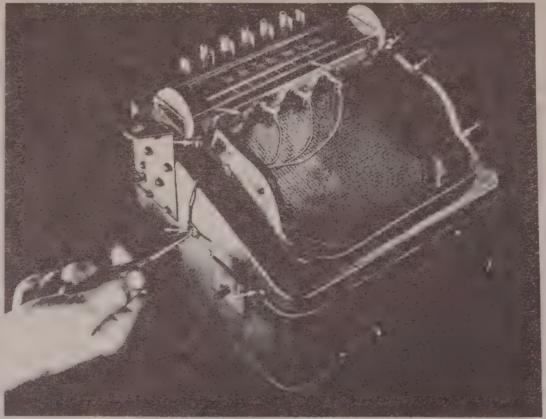


Fig. 1 Remove these 8 screws to disassemble

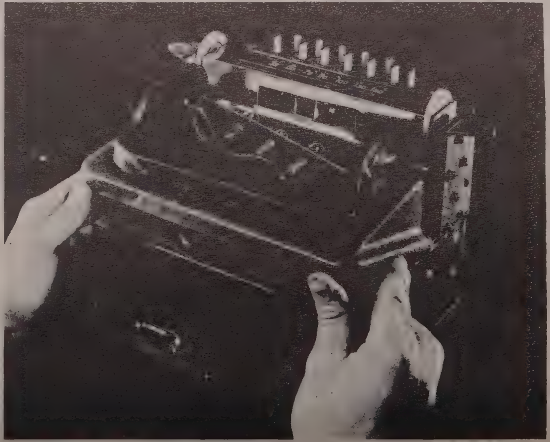


Fig. 2 Removing speaker cover

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Assembly Views

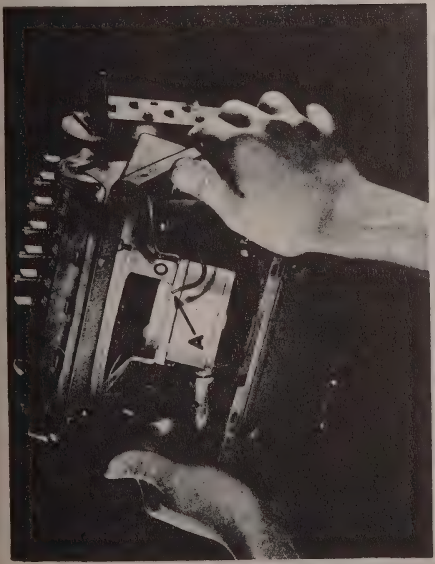


Fig. 3 Disconnect Voice Coil Lead before completing removal of cover

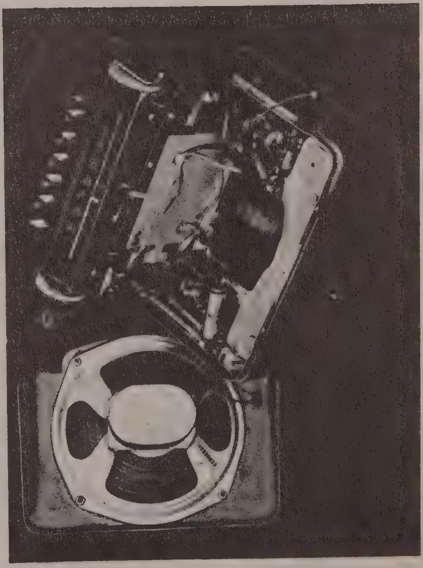


Fig. 4 Disassembled for service

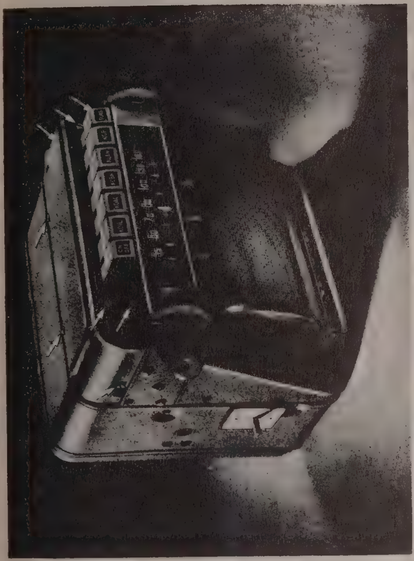


Fig. 5 Remove these 8 Screws to Disassemble tuner cover

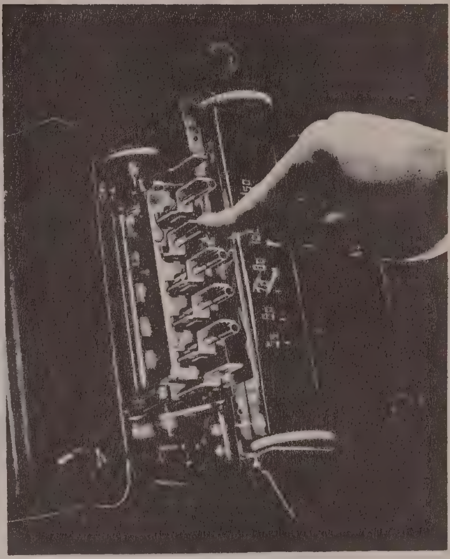


Fig. 6 Tuner accessible for service

MODEL 7238399
Voltage,Chassis
Socket

CADILLAC DIV.—GEN. MOTORS

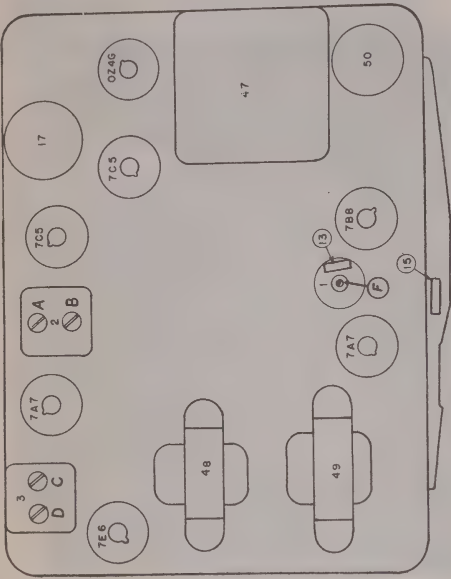


Fig. 5-Parts Layout-Top View-Cadillac 1940 Rear Compartment Radio

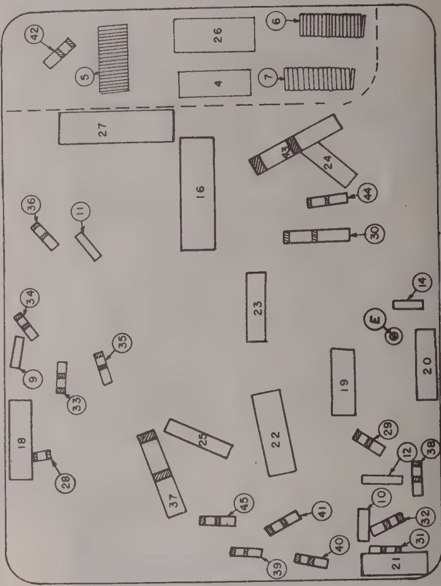
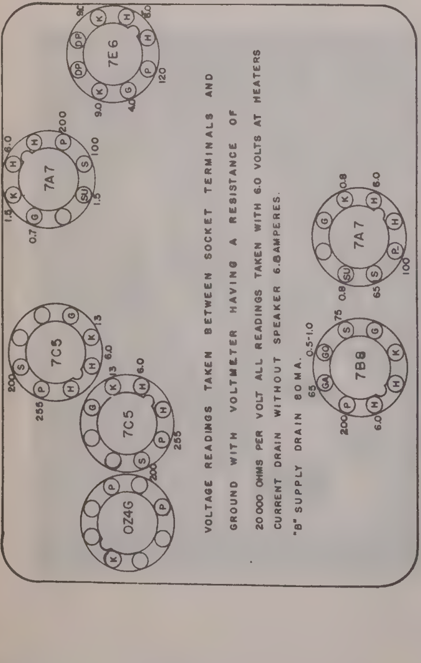


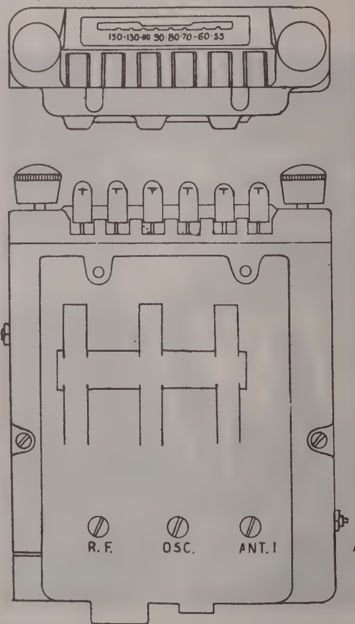
Fig. 6-Parts Layout-Bottom View-Cadillac 1940 Rear Compartment Radio



VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH VOLTMETER HAVING A RESISTANCE OF 20000 OHMS PER VOLT ALL READINGS TAKEN WITH 6.0 VOLTS AT HEATERS CURRENT DRAIN WITHOUT SPEAKER 6.8AMPERES.

"B" SUPPLY DRAIN 80MA.

Fig. 8-Voltage Chart-Cadillac 1940 Rear Compartment Radio

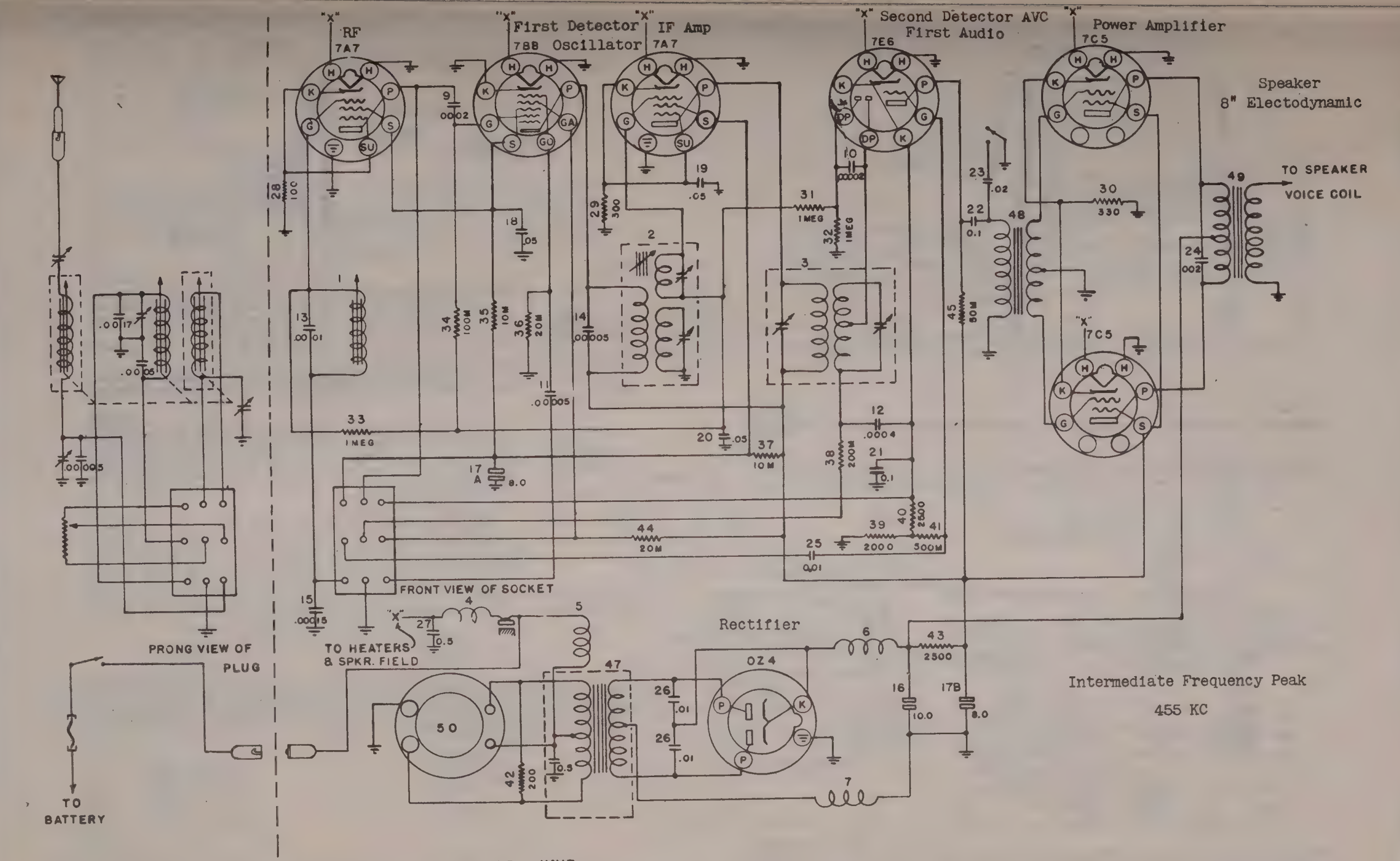


NOTE: In case of failure of the remote tuner unit, remove the unit and return to Cadillac Motor Car Division, Claims Department, for repair and return. The unit will then be repaired and completely checked, using the special tools required for proper adjustment. Defective tuners will be repaired within the warranty period without charge. Beyond the warranty period a net charge of $2.00 will be made.

Fig. 7-Automatic Tuner Outline-Cadillac 1940 Rear Compartment Radio

CADILLAC DIV.—GEN. MOTORS

MODEL 7238399
Schematic



Intermediate Frequency Peak

455 KC

Power Output	6 Watts Undistorted
Power Consumption	7.5 Amperes at 6 Volts
Sensitivity	2 Microvolts at 1 watt output
Selectivity at 1000 times signal	35 KC

Tuning Range	545 to 1560 KC
Manual Tuning	545 to 1560 KC
Automatic Tuning (all 6 buttons)	545 to 1560 KC

Antenna Trimmer - Set at Factory for 200 mmf. under car antenna

CADILLAC DIV.—GEN. MOTORS

ANTENNA INSTALLATION INSTRUCTIONS

Three Vacuum Antenna packages released for use on 1940 Cadillac and LaSalle cars are:

Part Number	Series
1436388	40-50
1436389	40-52,60S,62,72
1436390	40-75,90

These packages are identical except for the insulators and attaching parts, but it is extremely important that the proper assembly be used for the particular car on which the installation is being made, else the bakelite insulators will not properly fit the hood contours.

TO INSTALL VACUUM ANTENNA

1. Place the template supplied in the antenna package on the cowl and punch the center of the 1-1/32" hole with a center punch, using the 1/4" pilot drill of Hinkley-Myers J-1272-C tool to drill through the cowl at the angle shown in the top view of Fig. 1. After this hole is drilled raise the drill to a vertical position as shown in the lower view of Fig. 1 and drill through with the 1-1/32" cutter.

   If a Hinckley-Myers J-1272-C tool is not available this hole may be cut by drilling around the edge of the outline of the hole on the template with a 5/32" drill and filing off the rough edges. Care should be exercised so that the finished hole will not be too large.

   Hinckley-Myers tool J-1272-C may be purchased direct from Hinckley-Myers Co., Jackson, Michigan.

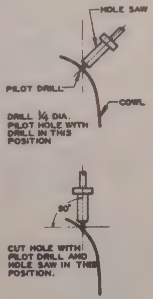

HOLE SAW
PILOT DRILL
COWL
DRILL 1/4 DIA. PILOT HOLE WITH DRILL IN THIS POSITION
90°
CUT HOLE WITH PILOT DRILL AND HOLE SAW IN THIS POSITION.

FIG. 1

2. **Remove side panel kick pad.**
3. **Assemble the hoses supplied with the antenna to the control valve as shown in Fig. 2 and install in the far left hole provided in the left end of the lower flange of the instrument panel.**

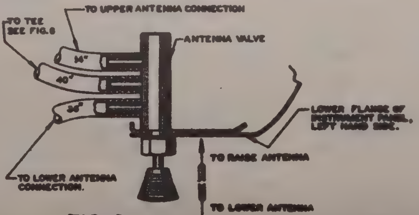

TO TEE SEE FIG.6
TO UPPER ANTENNA CONNECTION
ANTENNA VALVE
14"
40"
36"
LOWER FLANGE OF INSTRUMENT PANEL, LEFT HAND SIDE.
TO RAISE ANTENNA
TO LOWER ANTENNA CONNECTION.
TO LOWER ANTENNA

FIG. 2

4. Attach the bottom antenna support bracket (L) to the front end body brace on Series 40-50,52,62 and 72 with self tapping screw, as shown in Fig. 3. The hole is provided in Series 40-50 but must be drilled in Series 40-52,62 and 72. On Series 40-60S,75 and 90 this support is built into the body brace and it is only necessary to insert the rubber grommet through the hole.

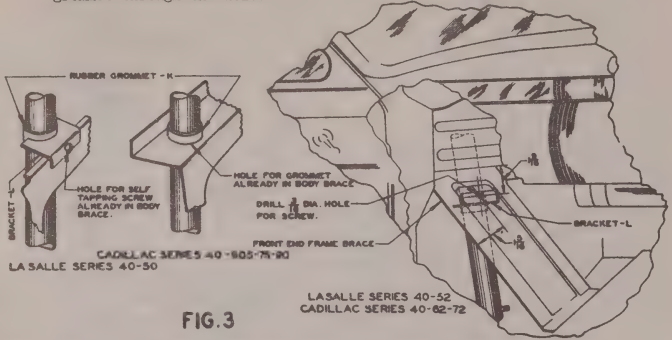

RUBBER GROMMET - K
BRACKET - L
HOLE FOR SELF TAPPING SCREW ALREADY IN BODY BRACE.
HOLE FOR GROMMET ALREADY IN BODY BRACE
DRILL 3/16 DIA. HOLE FOR SCREW.
BRACKET-L
FRONT END FRAME BRACE
1 3/16
1 3/16
CADILLAC SERIES 40-60S-75-90
LA SALLE SERIES 40-50
LASALLE SERIES 40-52
CADILLAC SERIES 40-62-72

FIG. 3

5. Lower the antenna assembly through the hole in the cowl and put on rubber grommet (K) in Fig. 3 and washer (J) and rubber spacer (H) in Fig. 4.
6. Assemble lower hose connection to the bottom of the antenna, as shown in Fig. 5.

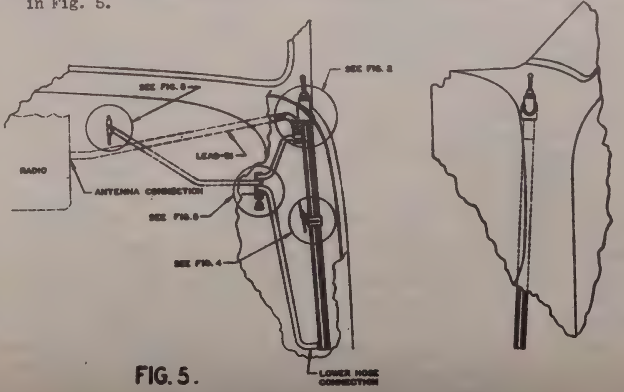


FIG. 5.

7. Assemble antenna lead and upper hose connection with parts in order as shown in Fig. 4.

8. Ground antenna lead shield to upper body brace with self tapping screw. The hole for this screw is provided on Series 40-50,60S,75 and 90. On Series 40-52, 62 and 72 it will be necessary to drill a 9/64" hole for this screw.

9. Attach the 14" length of hose securely to the upper antenna connection through cap, as shown in Fig. 4.

10. Attach the 36" length of hose to the lower hose connection on the antenna, as shown in Fig. 5.

11. Raise the antenna through the hole in the cowl and install the rubber pad (G) Bakelite insulator (F) Washer (E) Spring (D) Brass Washer (C) Packing gland (B) and nut (A). Tighten nut (A) until the shoulder and the antenna insulator seats against the top of antenna shield, as shown in Fig. 4. IMPORTANT - When tightening nut (A) do not get it too tight. Turn it down carefully until the stop is reached, then back off slightly.

12. Push grommet (K) into place in bracket (L) or the hole in the support brace, as shown in Fig. 3.

13. Cut windshield wiper hose and insert the tee connection. Attach the 40-inch length of hose to the tee connection, as shown in Fig. 6.

14. Plug the antenna lead into the radio set and check adjustment of the antenna trimmer for proper setting. Radios shipped from the factory are set for use with the vacuum aerial.

15. Start the motor and check the operation of the antenna. Push the control valve up to raise the antenna and pull down and lower the antenna. For best operation occasionally wipe the antenna rod free of dust and other accumulation.

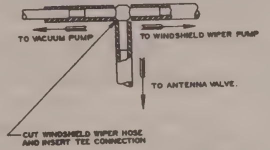


FIG.6

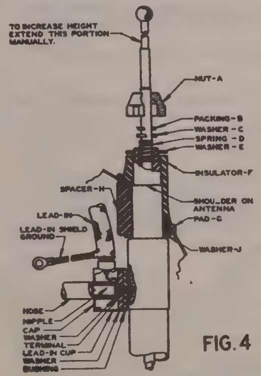
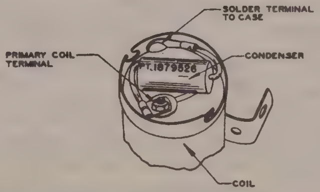


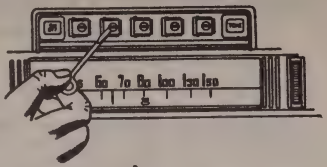
FIG.4

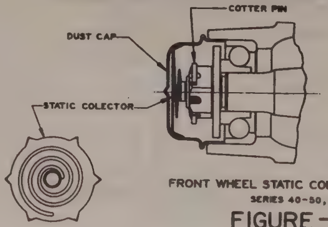


COIL CONDENSER INSTALLATION

Install coil condenser, Part #1879526, in the top of the ignition coil, using Tool J-726 to remove the cover. Make sure the coil is well grounded to the dash by scraping off the paint on the dash and coil bracket.

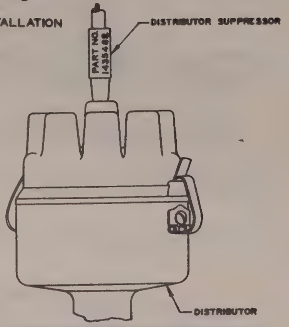
It is important that the buttons be set accurately. This may be accomplished by lowering the vacuum aerial to a point where the signal is just being heard. Setting the stations selected by the push buttons has been made easy. Pulling off a button reveals a screwdriver slot recessed in a brass tube next to the button plunger arm. This screw, when rotated counterclockwise by means of a screwdriver furnished with the set in the call letter envelope, unlocks the tuner setting for that particular button. The plunger arm is then held in a fully depressed position while the station is tuned in by means of the manual tuning wheels. The plunger arm is then released and the lock-up screw is tightened by rotating in a clockwise direction with the screwdriver provided. Check for accuracy of setting by tuning in from each end of the dial with the button.


5o 7o 8o 1oo 13o 15o



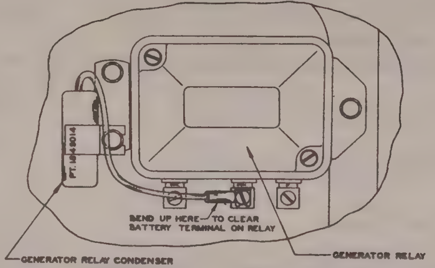
FRONT WHEEL STATIC COLLECTOR INSTALLATION
SERIES 40-50,52,60S,62,72

FIGURE - 8



DISTRIBUTOR SUPPRESSOR INSTALLATION

FIGURE-7


PT.1849014
BEND UP HERE TO CLEAR BATTERY TERMINAL ON RELAY
GENERATOR RELAY CONDENSER
GENERATOR RELAY

GENERATOR RELAY CONDENSER INSTALLATION

Install generator condenser, Part #1849014, on the generator terminal of the relay box.

Install suppressor, Part #1435482, in the center terminal of the

Install static collectors in the front wheels on Series 40-50,52, 62,60S, and 72. See Fig. 8. Bend cotter key over the nut as shown, so that it does not interfere with static collector.

On some cars it may be necessary to bend the oil and throttle line to the dash.

IGNITION SUPPRESSION

AND

WHEEL STATIC

SUPPRESSION

Bond motor to the frame at the two front motor supports, using the bond straps supplied in the antenna package.

Bond exhaust system to the frame, using bond straps supplied with the antenna.

Bond transmission mainshaft housing to center or crossmember.

Bond transmission housing to the floorboard, making the bond as short as possible.

Bond both engine blocks to the dash.

CADILLAC 1940 AUTOMATIC RADIO FOR REAR COMPARTMENT INSTALLATION

SETTING UP STATIONS ON PUSH BUTTONS

There are six push buttons on the remote tuner unit by means of which six stations may be set up for automatic tuning (see B, Fig. 1).

Select the six stations desired and punch out from the set of station call letter tabs supplied the call letters of the stations selected. On the top of each push button a slot is provided for inserting the call letter tabs (See A, Fig. 1). Insert the tabs, then proceed as follows:

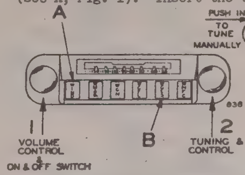


Fig. 1—Front View of Remote Tuner Unit

Fig. 2

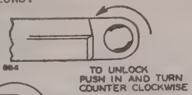


Fig. 3

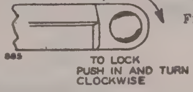


Fig. 4

TO UNLOCK

1. Push on the dial tuning knob hard enough to make it latch in. (See Fig. 2.)
2. Rotate the dial tuning knob to the left (counter-clockwise), until the knob cannot be turned any further without forcing. (See Fig. 3.)

As the knob is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually start unlocking the tuner mechanism. Beyond this point the knob will turn quite easily again until the tuner mechanism is completely unlocked. At this point do not force the knob any further. The tuner mechanism is now unlocked.

(NOTE: Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

SETTING PUSH BUTTONS

1. Push in all the way any one of the push buttons and at the same time hold in firmly the dial tuning knob. Both the dial tuning knob and the push button should be pushed hard enough to make them stay latched in. The reason for holding the dial tuning knob in firmly when the push button is pressed in is due to the latching mechanism in the remote tuner unit which is so constructed as to release the dial tuning knob entirely when a push button is pressed in. When setting up stations for automatic tuning, however, it is necessary that both the dial tuning knob and the push button be latched in together.

2. Press in on the push button which is latched in. Holding it in firmly, tune in by means of the manual tuning knob the station indicated on the station call letter tab on this push button. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the push button), until the station is accurately tuned in.

3. Push in all the way another push button, at the same time holding the dial tuning knob in so that both the push button and the dial tuning knob are latched in together. Holding the push button in firmly, tune in the station indicated on the call letter tab on this push button.

4. Follow this procedure until you have tuned in all six selected stations.

5. When the last push button has been properly set up it is necessary to release it from the latched-in position before the tuner mechanism can be locked. To release this push button, slightly depress any other push button, this will trip the latching mechanism and all the push buttons will be released to out position.

TO LOCK

(NOTE: All the push buttons must be in out position when locking the tuner mechanism.)

To lock the tuner mechanism push on the dial tuning knob hard enough to make it stay latched in. Rotate the dial tuning knob to the right (clockwise) until the knob cannot be turned any further with forcing it. (See Fig. 4) This will lock the tuner mechanism and all the stations that have been set up on the buttons will be locked in place for automatic tuning.

ANTENNA

An under car antenna must be used with the rear compartment radio. Instructions for installation are supplied with each antenna.

ALIGNMENT PROCEDURE

Two separate alignment procedures are included in these instructions. The first is to be considered the usual alignment procedure and the second to be used only when a tuning coil has been replaced or when some major change has been made in the tuning apparatus.

CAPACITY ALIGNMENT

I.F. Alignment at 455 KC

(a) Connect an output meter across the voice coil of the speaker leaving speaker connected or connecting a 1.7 ohm load instead of the speaker.

(b) Connect the ground lead of the signal generator to the set chassis and the signal lead to the "G" prong of the 7B8 tube through a .1 mfd. condenser.

(c) With signal generator frequency set at 455 kilocycles adjust the I.F. trimmers A, B, D & D and I.F. core adjustment E in the sequence named until maximum output is obtained. Fig. 5 & 6.

(d) Connect the signal lead of the signal generator to the antenna connection of the set through a 150 mmf. condenser. Adjust the I.F. trap adjustment F for MINIMUM response. (Generator frequency 455 KC) Fig. 5.

Alignment at 1530 KC

(a) Set frequency of the signal generator to 1530 KC.

(b) By means of the manual tuning control adjust the tuning control of the set to its highest frequency position against the high frequency stop.

(c) Adjust the oscillator trimmer ("osc" on tuning unit) for maximum output. See Fig. 7.

Alignment at 600 KC

(a) Set the signal generator frequency to 600 KC.

(b) Tune set to this signal and adjust the RF trimmer ("R.F." on tuning unit) for maximum output, while rocking tuning control back and forth through the signal. See Fig. 7.

(c) Adjust the antenna trimmers ("Ant 1" and "Ant 2") on the tuning unit for maximum output. Fig. 7.

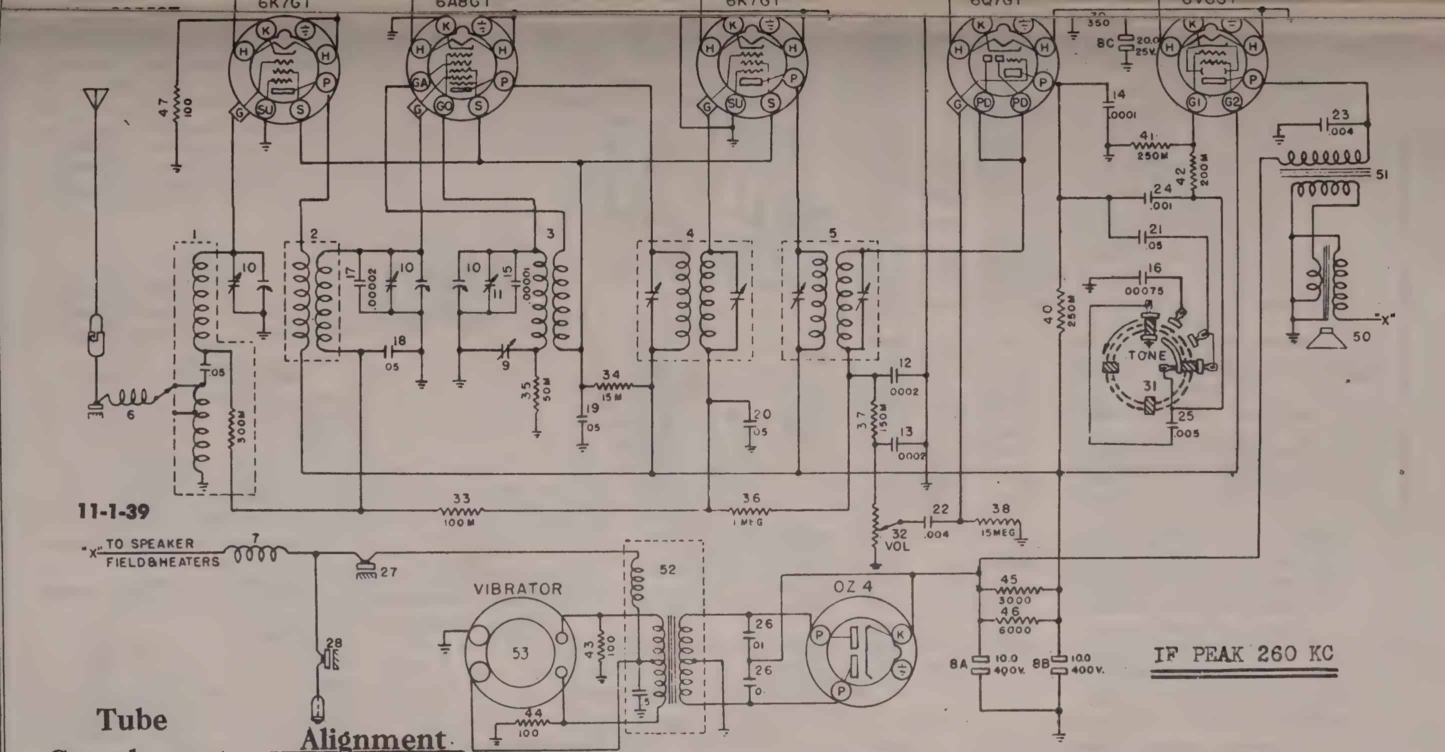
Alignment at 1400 KC

(a) Set signal generator frequency to 1400 kilocycles and tune set to this signal.

(b) Using an insulated three cornered prong tool adjust the core positions for maximum output reading.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985537
Schematic,Alignment



11-1-39

IF PEAK 260 KC

Alignment

At 260 KC:- Use a .1 mfd. condenser as dummy . Signal to 6A8GT grid (LEAVE GRID CAP IN PLACE). Adjust second and then first IF trimmers.

At 1560 KC:- Use a .00007 mfd. condenser as dummy. Signal to antenna post. Adjust oscillator parallel trimmer (e) for maximum output.

At 1400 KC:- Use a .00007 mfd. condenser as dummy. Connections as for 1560 KC. Adjust antenna RF (f) and (g) trimmers for maximum output.

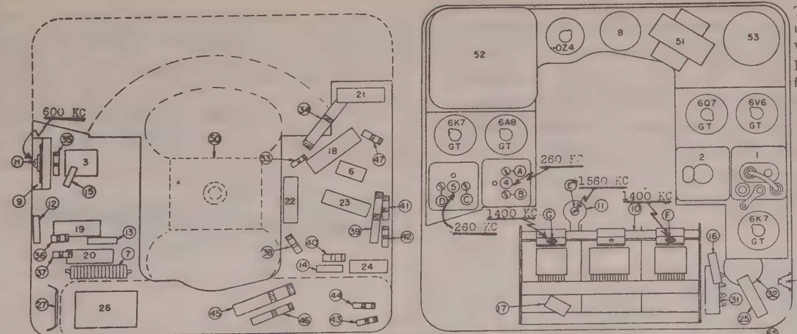
At 600 KC :- With same connections adjust oscillator pad (h) at 600 KC while rocking condenser, for maximum output. Readjust at 1400 KC. With station selector, tune in 1400 KC signal for maximum output. Readjust trimmer on antenna section of gang condenser for maximum output.

Tube Complement

Type	Function
6K7GT	R.F. Amplifier
6A8GT	Oscillator-Modulator
6K7GT	I.F. Amplifier
6Q7GT	2nd Detector and A.V.C.
6V6GT	Power Output
OZ4	Rectifier

MODEL 985537
Voltage,Chassis
Tuner,Parts

CHEVROLET DIV.—GEN. MOTORS



PARTS LOCATING DIAGRAM

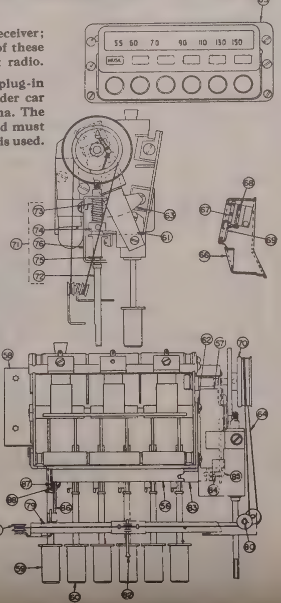
The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. A special tone control circuit is employed to give the desired tone with no distortion.

POWER SUPPLY: The power supply uses an OZ4 rectifier tube in conjunction with a full wave primary type vibrator.

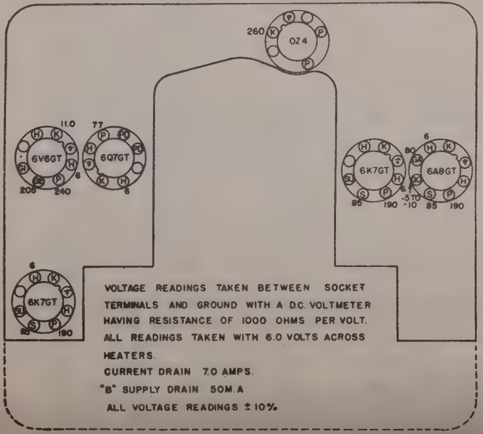
Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
7239170		Coil	Antenna Coil Assembly	1
7238665		Coil	R.F. Coil Assembly	2
7238676		Coil	Oscillator Coil Assembly	3
7239165		Coil	1st I.F. Assembly	4
7239164		Coil	2nd I.F. Assembly	5
7236560		Coil	Antenna Series Choke—Spark Noise Filter	6
7238679		Coil	Filament Choke—Motor Noise Filter	7
7239053		Condenser	Electrolytic Section A—10.0 mfd. 400V—"B" Input Filter Section B—15.0 mfd. 400V—"B" Output Filter Section C—20.0 mfd. 25V—Output Tube Cathode By-Pass	8
7238678		Condenser	Oscillator Trimmer—Oscillator Padding	9
7238550		Condenser	Variable Gang Tuning Plus Plungers	10
7239191		Condenser	Air Trimmer—Oscillator Shunt Trimmer	11
7231178		Condenser	Molded Mica .0002 mfd.—Diode Load By-Pass	12
7231178		Condenser	Molded Mica .0002 mfd.—Diode Load By-Pass	13
7239184	1210275	Condenser	Molded Mica .0001 mfd.—Audio Plate By-Pass	14
7239335		Condenser	Ceramic .000010 mfd.—Temp. Compensating	15
7238878		Condenser	Molded Mica .0007 mfd.—Tone Control (Music)	16
7238880		Condenser	Molded Mica .000020 mfd.—R.F. Stage Padding	17
7236842	7230592	Condenser	Tubular .05 mfd. 200V—A.V.C. By-Pass	18
7236842	7230592	Condenser	Tubular .05 mfd. 200V—Screen By-Pass	19
7236841	7230592	Condenser	Tubular .05 mfd. 400V—A.V.C. By-Pass	20
7239185	7230592	Condenser	Tubular .06 mfd. 400V—Tone Control (Voice)	21
7239186	7233243	Condenser	Tubular .004 mfd. 200V—Audio Coupling	22
7233243		Condenser	Tubular .004 mfd. 800V—Output Pad	23
7239188	1212097	Condenser	Tubular .001 mfd. 400 V—Audio Coupling	24
7232956	7230912	Condenser	Tubular .005 mfd. 200V—Tone Control (Bass)	25
7238669		Condenser	Dual .01 x .01 1200 V—Buffer	26
7238841		Condenser	Spark Plate on Power Supply Shield—Motor Noise Filter	27
7237181	7238841	Condenser	Spark Plate—Motor Noise Filter	28
7239020		Control	Tone Control Switch—3 Point Tone Control	31
7239120		Control	Volume Control—With Switch	32
1211118	1209883	Resistor, Ins.	100,000 ohms ½ Watt—A.V.C. Isolator	33
7233653		Resistor, Ins.	15,000 ohm 2 Watt—Screen Dropping	34
1211110	1210116	Resistor, Ins.	50,000 ohm ½ Watt—Oscillator Padder	35
1211139	1209885	Resistor, Ins.	1 megohm ½ Watt—A.V.C. Isolator	36
1211120	1211163	Resistor, Ins.	150,000 ohm ½ Watt—Diode Filter	37
1213343	7235837	Resistor, Ins.	15 megohm ½ Watt—6Q7GT—Grid	38
7234563		Resistor, Ins.	350 ohm 1 Watt—Output Tube Bias	39
1211124	1210117	Resistor, Ins.	250,000 ohm ½ Watt—Plate Dropping	40
1211124	1210117	Resistor, Ins.	250,000 ohm ½ Watt—6V6GT—Grid	41
1211122	1210119	Resistor, Ins.	200,000 ohm ½ Watt—Audio Coupling	42
1211000		Resistor, Ins.	100 ohm ½ Watt—Power Trans. Primary Load	43
1211000		Resistor, Ins.	100 ohm ½ Watt—Power Trans. Primary Load	44
7239306		Resistor, Ins.	3000 ohm 2 Watt—"B" Filter	45
1211071		Resistor, Ins.	6000 ohm 1 Watt—"B" Filter	46
1211000		Resistor, Ins.	100 ohm ½ Watt—6K7GT—Bias	47
7239162		Speaker		50
7239160		Transformer	Audio Output	51
7238894		Transformer	Vibrator Power	52
1213881	1212966	Vibrator		53
125588		Bulb	Dial Light	

ANTENNA SYSTEM: There are three antenna systems available for use with this receiver; the under car, the turret top, or the telescopic cowl antenna. Any one of these antennas will operate very efficiently when used with this Chevrolet radio.

ANTENNA CIRCUIT: The antenna circuit is directly coupled to the antenna. Two plug-in terminals are provided on the antenna coil; one for use with the under car antenna, and the other for use with the turret top or the cowl antenna. The antenna coil is connected at the factory for cowl antenna operation and must be changed to the under car antenna connection if an under car antenna is used.



TUNER PARTS LAYOUT



VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH A D.C. VOLTMETER HAVING RESISTANCE OF 1000 OHMS PER VOLT.

ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS.

CURRENT DRAIN 7.0 AMPS.

"B" SUPPLY DRAIN 50M.A

ALL VOLTAGE READINGS ± 10%

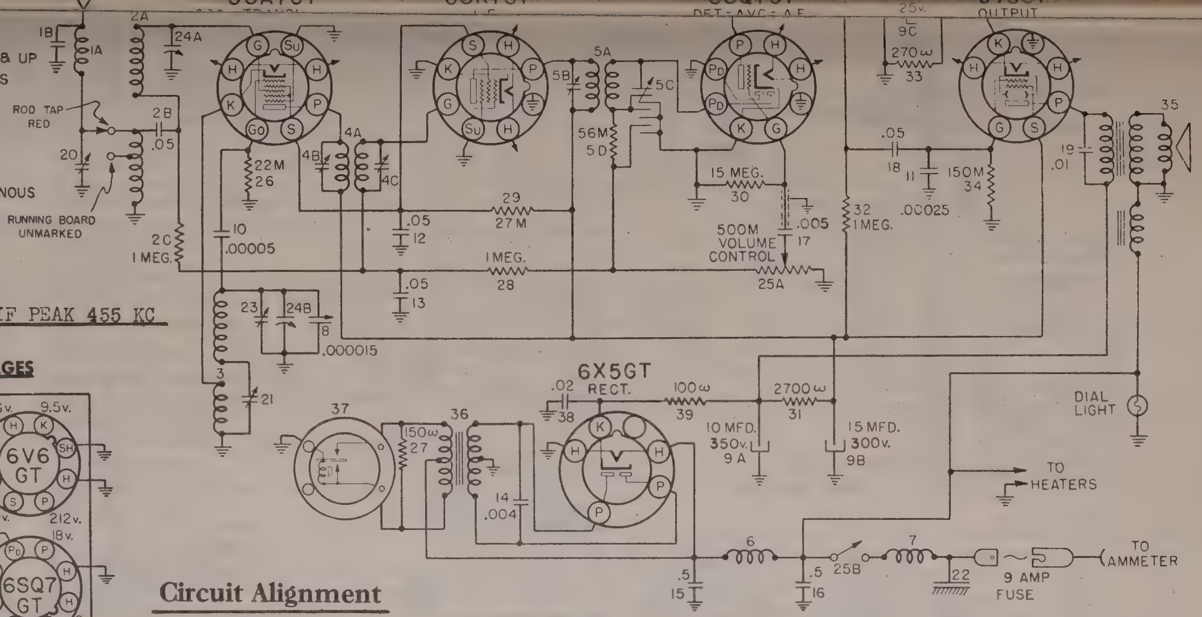
SOCKETS AND VOLTAGES

CHEVROLET DIV.—GEN. MOTORS

MODEL 985538
Schematic, Voltage
Alignment

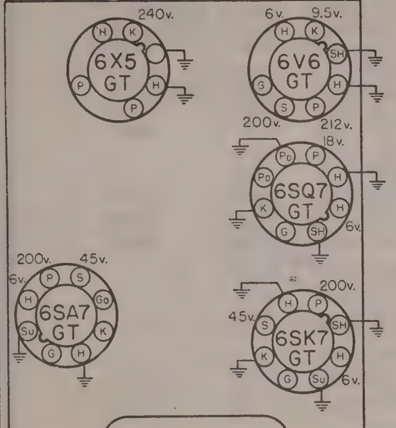
MODEL NUMBER - 985538
SERIAL NUMBER -- +B40-001000 & UP
BATTERY CURRENT - 6.5 AMPERES
B + VOLTS - 245
I.F. K.C. - 455
R.F. K.C. - 1520 TO 540
VIBRATOR TYPE - NON SYNCHRONOUS
YEAR - 1940

Part No. 985538
Date 11-1-39



IF PEAK 455 KC

SOCKETS AND VOLTAGES



BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.5 AMPERES. "B" SUPPLY DRAIN APPROXIMATELY 50 M.A.

Circuit Alignment

At 455 KC:- Connect signal generator lead to "X" (see fig.1) which is the grid lead of the 6SA7GT tube through a .1 mfd. condenser. Adjust trimmers (a) (b) (c) and (d) for maximum output.

At 1520 KC:- Connections as for 455 KC. Condenser at minimum capacity. Adjust (e) for maximum output.

At 540 KC:- With connections as above, condenser at maximum capacity, adjust oscillator pad (f) for maximum output.

At 1400 KC:- Use a .0002 mfd. condenser (ONLY) as dummy. Connect signal lead to antenna post (Place tap on antenna coil assembly to running board antenna position). Adjust antenna trimmer (g) to maximum output.

At 600 KC:- Readjust oscillator pad (f) at this frequency while rocking condenser.

FOR CONVENTIONAL ALIGNMENT PROCEDURE SEE SPECIAL SECTION VOL. VIII.

ANTENNA SYSTEM: There are three antenna systems available for use with this receiver; the under car, the turret top, or the telescopic cowl antenna. Any one of these antennas will operate very efficiently when used with this Chevrolet radio.

MODEL 985538
Chassis, Trimmers,
Dial Data, Parts

CHEVROLET DIV.—GEN. MOTORS

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1213858		Coil	Antenna Filter Assy	1
		Sec. A	Choke	
		Sec. B	Spark Noise By-Pass	
1213859		Coil	Antenna Coil Assy	2
		Sec. A	Antenna Coil	
		Sec. B	Cond. .05 mfd. 100V A.V.C. Blocking	
		Sec. C	Resistor 1 megohm—Grid Filter	
1213860		Coil	Oscillator	3
1213861		Coil	1st I.F. Assembly	4
		Sec. A	I.F. Transformer	
		Sec. B	Primary Trimmer	
		Sec. C	Secondary Trimmer	
1213862		Coil	2nd I.F. Assembly	5
		Sec. A	I.F. Transformer	
		Sec. B	Primary Trimmer	
		Sec. C	Secondary Trimmer and Filter	
		Sec. D	Resistor 56,000 ohm Diode Filter	
1213663		Choke	Vibrator Hash	6
1212452		Choke	"A" Lead Spark Filter	7
7238937		Condenser	Compensating .000015 mfd.	8
1213868		Condenser	Electrolytic Filter	9
		Sec. A	10 mfd. 350 Volt—"B" Filter	
		Sec. B	15 mfd. 300 Volt—"B" Filter	
		Sec. C	20 mfd. 25 Volt—6V6GT Cathode By-Pass	
1207625		Condenser	Molded .00005 mfd.—Osc. Coupling	10
1209055		Condenser	Molded .00025 mfd.—Filter	11
1210295	7230592	Condenser	.05 mfd. 200 Volt—Screen By-Pass	12
1210295	7230592	Condenser	.05 mfd. 200 Volt—A.V.C. Filter	13
1213854		Condenser	.004 mfd. 1500 Volt—Buffer	14
7237076	1212100	Condenser	.5 mfd. 100 Volt—Hash Filter	15
7237076	1212100	Condenser	.5 mfd. 100 Volt—Hash Filter	16
7232956	7230912	Condenser	.005 mfd. 200 Volt—Audio Coupling	17
1209308	7230592	Condenser	.05 mfd. 400 Volt—Audio Coupling	18
1208600		Condenser	.01 mfd. 600 Volt—Plate By-Pass	19
1213865		Condenser	Antenna Compensating	20
1213866		Condenser	Oscillator Padder	21
1212278		Condenser	Spark Plate—175-275 mmfd. Filter	22
1213880		Condenser	Oscillator Trimmer	23
1213867		Condenser	Variable and Tuner Unit	24
		Sec. A	Antenna Coil Tuning	
		Sec. B	Oscillator Tuning	
1213863		Control	Volume—On-Off Switch	25
		Sec. A	Vol. Control 500,000 ohms	
		Sec. B	On-Off Switch	
1211095	1210882	Resistor	22,000 ohm, ½ watt Osc. Grid Lead	26
1211005		Resistor	150 ohm 1 watt Vib. Filter	27
1209885		Resistor	1 megohm ½ watt A.V.C. Filter	28
1213342		Resistor	27,000 ohm 1 Watt Screen Voltage	29
1213343	7235837	Resistor	15 megohm ½ Watt—Grid Leak	30
1211051		Resistor	2700 ohm 1 Watt, "B" Voltage Filter	31
1209885		Resistor	1 megohm ½ Watt, Plate Load	32
1213846		Resistor	270 ohm 1 Watt, Grid Bias	33
1211163		Resistor	150,000 ohm ½ Watt, Grid Leak	34
1213864		Speaker and Transformer	Electro Dynamic with Output Transformer	35
1213670		Transformer	Power	36
1213655	1212966	Vibrator		37
1213881	1212966	Vibrator		37
1207799		Condenser	Tubular .02 mfd. 500 Volt	38
1211002		Resistor	Insulated 100 ohm, 1 Watt	39

GENERAL: This auto radio is a five tube single unit universal receiver with automatic push button tuning. Tuning is accomplished by a mechanical unit of rugged construction assuring accuracy. A special compensating condenser is employed in the oscillator circuit to minimize all receiver drift due to normal variation in car voltages and temperature ranges. The power supply consists of a 6X5GT power rectifier tube used in conjunction with a full wave plug in vibrator. The receiver is designed to mount in 1940 Chevrolet cars, and also in all other cars and trucks.

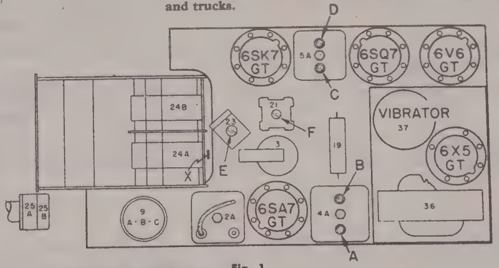


Fig. 1

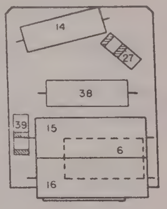


Fig. 3

TRIMMER	FREQUENCY
A, B, C, D,	455 KC
E	1520 KC
F	540 and 600 KC
G	1400 KC

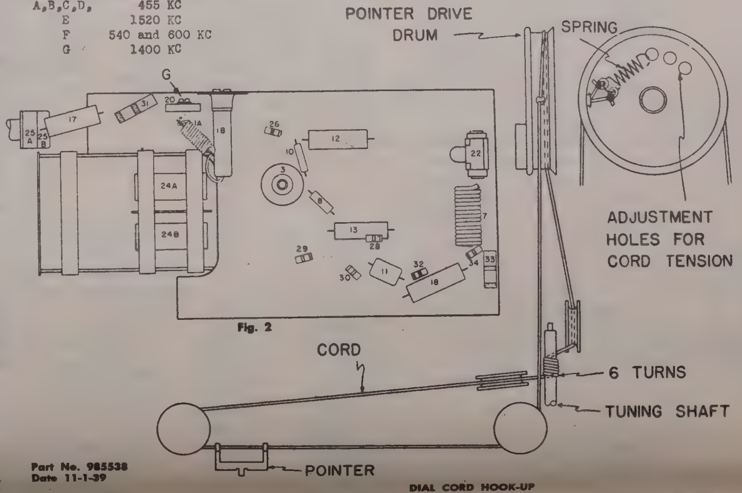


Fig. 2

DIAL CORD HOOK-UP

Part No. 985538
Date 11-1-39

CHEVROLET DIV.—GEN. MOTORS

MODEL 985651
Schematic,Voltage

I. F. = 465 KC

Part No.------985651
Date----Feb. 1, 1940

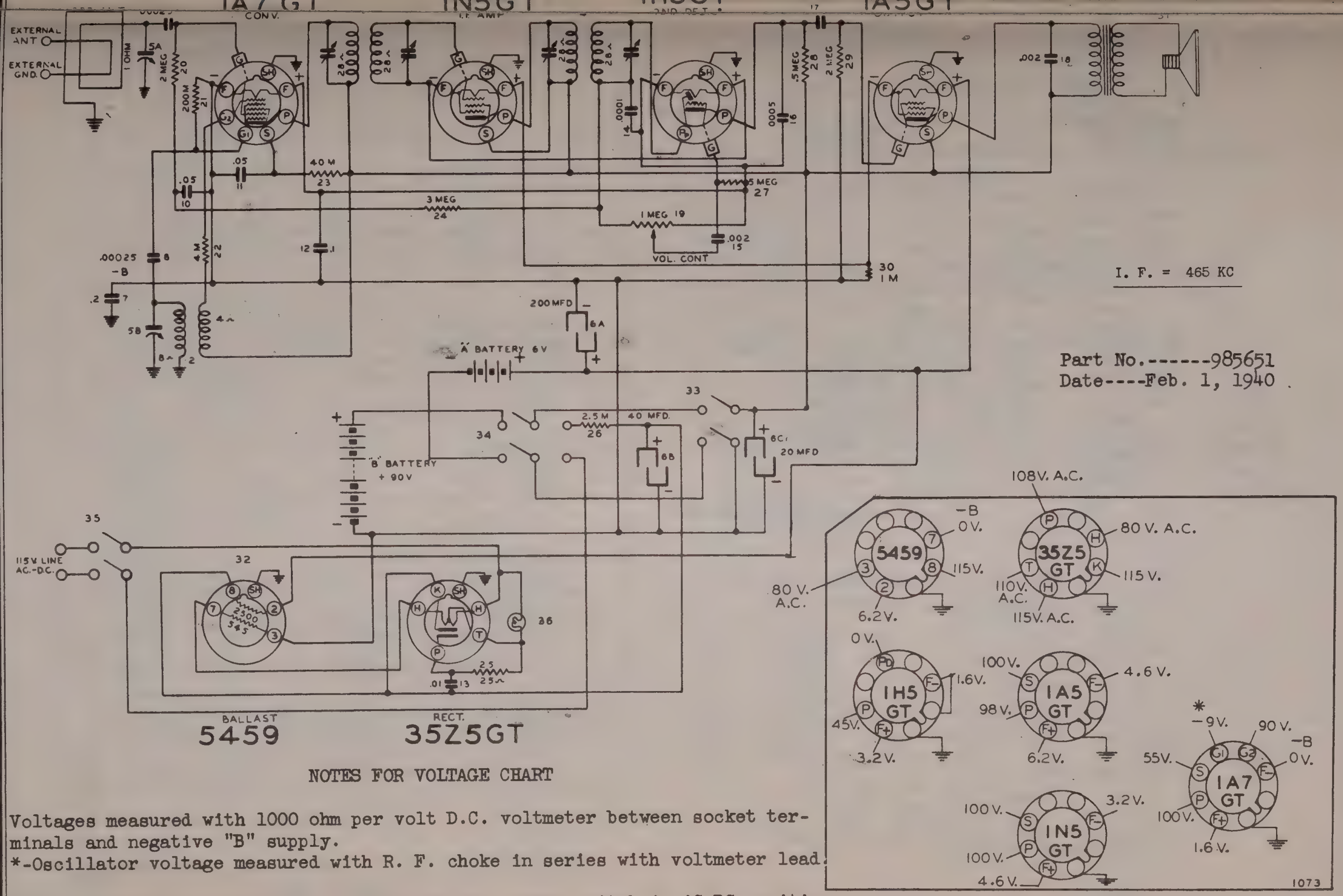


FIG.4 TUBE VOLTAGE CHART

NOTES FOR VOLTAGE CHART

Voltages measured with 1000 ohm per volt D.C. voltmeter between socket terminals and negative "B" supply.

*-Oscillator voltage measured with R. F. choke in series with voltmeter lead.

NOTE: Voltages as indicated are measured with power switch in AC-DC position and radio connected to 115 volt 60 cycle AC line.

MODEL 985651
Alignment,Chassis
Trimmers,Socket

CHEVROLET DIV.—GEN. MOTORS

CIRCUIT ALIGNMENT

IMPORTANT: If maximum sensitivity is to be obtained from this receiver, after re-alignment, it is very important that the following procedure be closely observed:

1. Aligning I.F. stages at 465 kilocycles.
    - a. Connect the signal lead of the test oscillator to the grid of the 1A7GT tube, through a .1 mfd. condenser.
    - b. Connect the ground lead of the test oscillator to the negative "B" lead of the radio (grey wire of the "B" battery lead assembly).
    - c. Connect the output meter across primary winding of the output transformer.
    - d. Set the test oscillator to exactly 465 kilocycles.
    - e. Adjust the trimmers on the 1st and 2nd I.F. transformers (Illus. No. 3 and No. 4, Fig. I) carefully for maximum output.

   These adjustments should be repeated several times and during the alignment the test oscillator output should be kept to as low a value as is consistent with obtaining readable indication on the output meter.
2. Aligning at 1550 kilocycles.
    - a. Leave the test oscillator leads connected the same as for aligning the I.F. circuits.
    - b. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
    - c. Set the test oscillator to 1550 kilocycles.
    - d. Adjust the trimmer for the oscillator section of the condenser gang (Illus. No. 5B, Fig. I) for maximum output. It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.
3. Aligning at 1400 kilocycles.
    - a. This adjustment should be made with the loop antenna placed alongside the chassis. It is important that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.
    - b. Connect the signal lead of the test oscillator to the external antenna terminal on the loop antenna through a 200 mmfd. dummy.
    - c. Connect the ground lead of the test oscillator to the external ground terminal on the loop antenna.
    - d. Set the test oscillator to exactly 1400 K.C.
    - e. Turn the condenser rotor plates until this frequency is tuned in with maximum output.
    - f. Adjust the trimmer on the condenser gang (Illus. No. 5A, Fig. I) for maximum output.

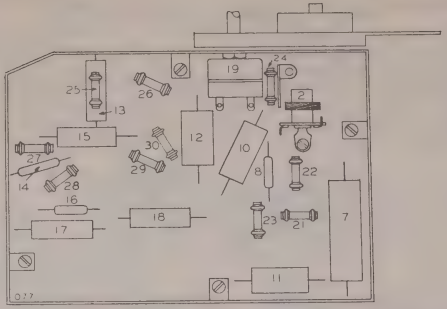


FIG. 3 PARTS LOCATING DIAGRAM PORTABLE RADIO #985651

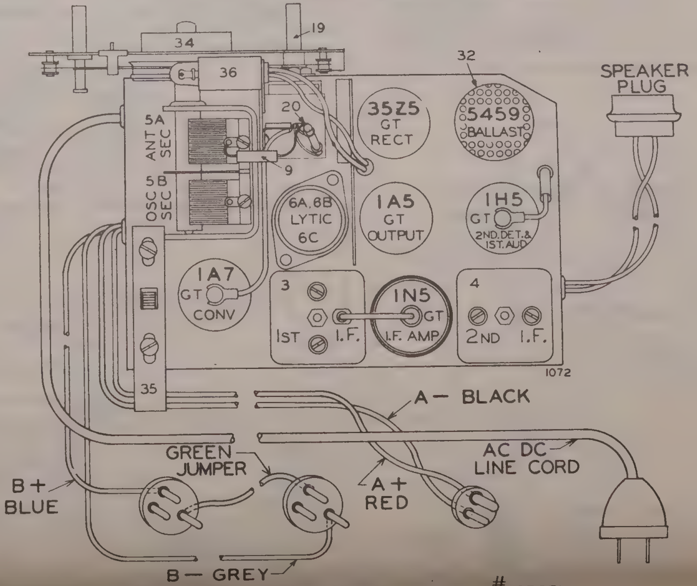
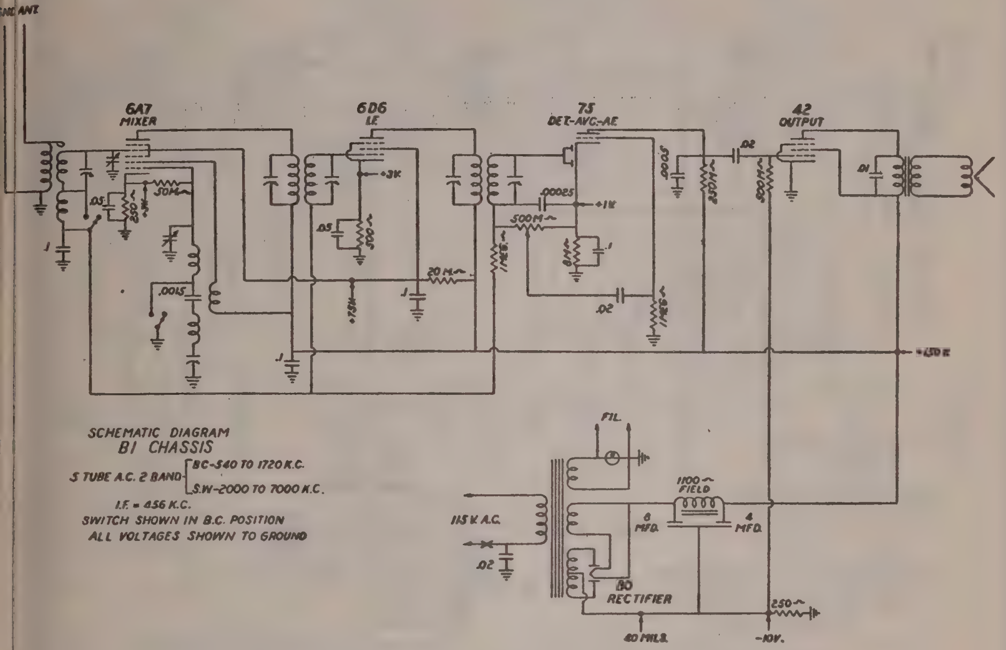


FIG. I TUBE LAYOUT PORTABLE RADIO #985651

CONTINENTAL RADIO & TELEV CORP

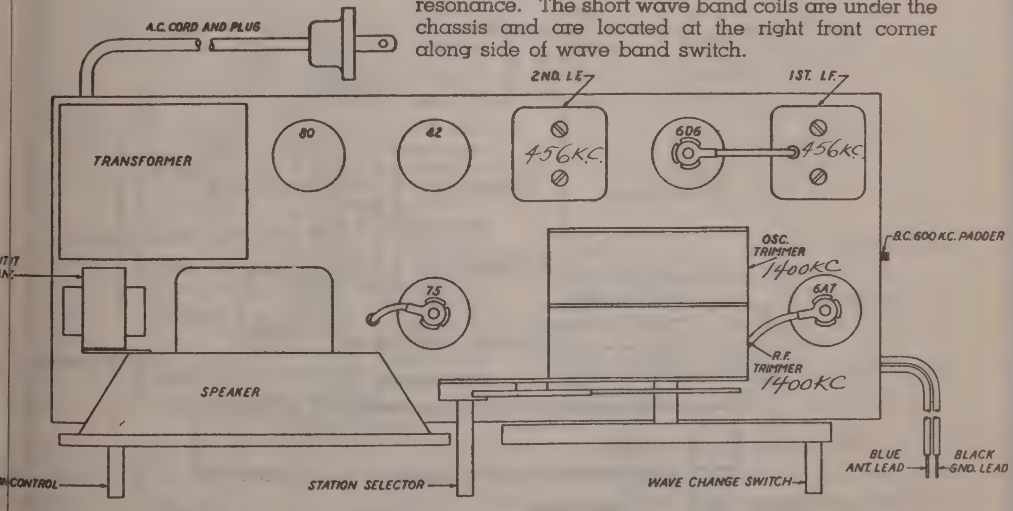
MODEL B1
Schematic, Socket
Alignment, Trimmers



SCHEMATIC DIAGRAM
B1 CHASSIS
5 TUBE A.C. 2 BAND — BC-540 TO 1720 K.C. / S.W.-2000 TO 7000 K.C.
I.F. = 456 K.C.
SWITCH SHOWN IN B.C. POSITION
ALL VOLTAGES SHOWN TO GROUND

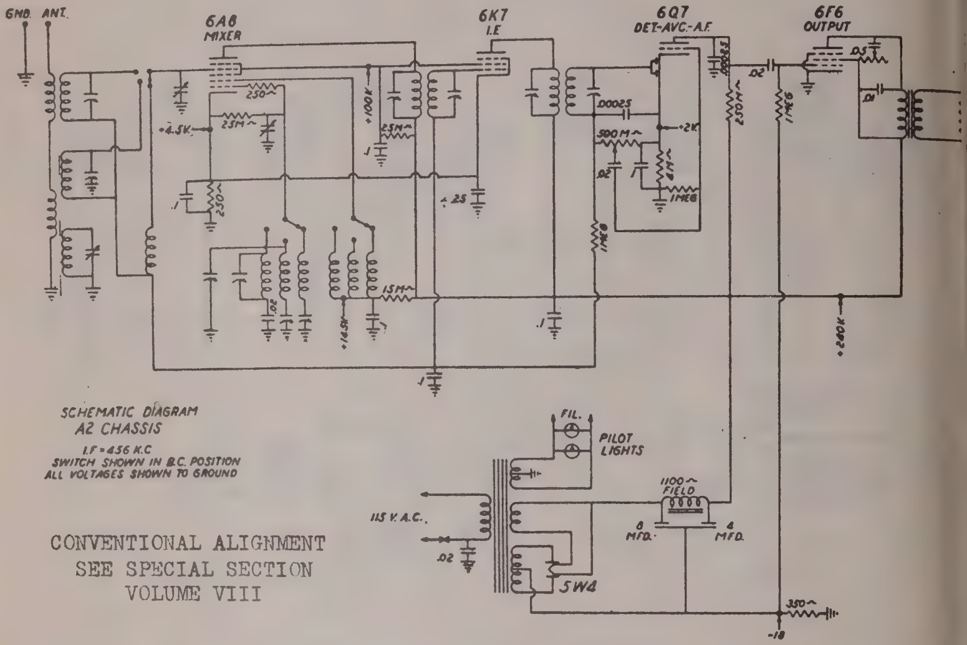
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

S.W. ALIGNMENT: Set the dial pointer to 6000KC (also the test oscillator) and adjust the antenna and antenna trimmer to resonance. The short wave band coils are under the chassis and are located at the right front corner along side of wave band switch.

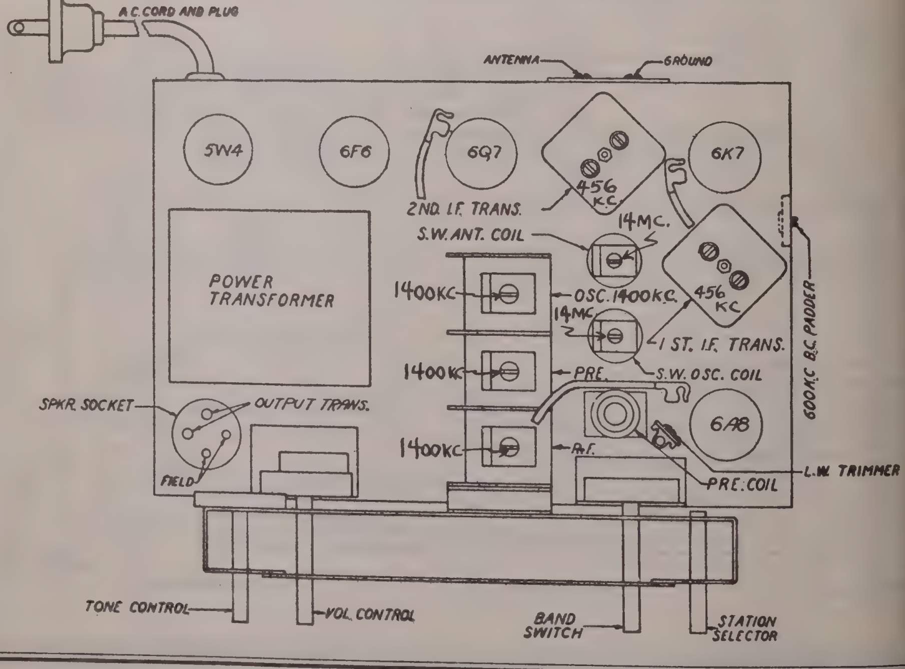


MODEL A2
Schematic, Socket
Alignment, Trimmers

CONTINENTAL RADIO & TELEV. CORP.

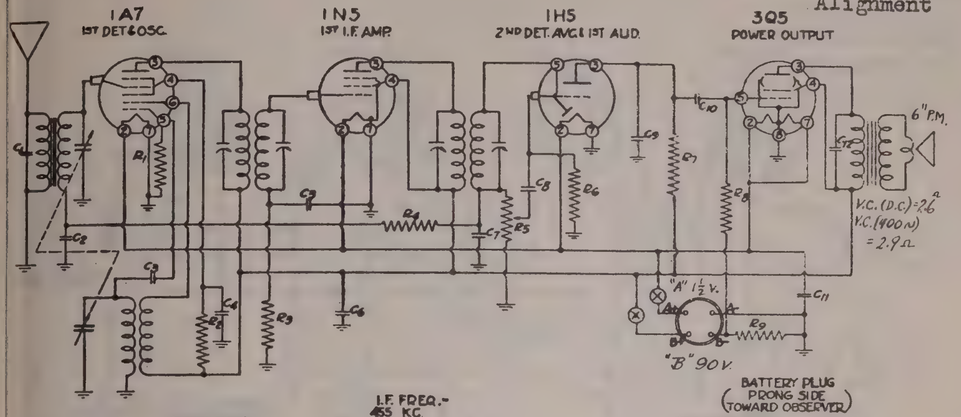


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



CONTINENTAL RADIO & TELEV. CORP.

MODELS A4,B4
MODELS C5,XC5
Schematics,
Alignment



RESISTORS

Ohms	Watts	No.	Ohms	Watts
200,000	½	R6	5 Meg.	¼
70,000	½	R7	250,000	¼
5 Meg.	¼	R8	500,000	¼
1 Meg.	¼	R9	440 10%	¼
500,000	V.C.			

CONDENSERS

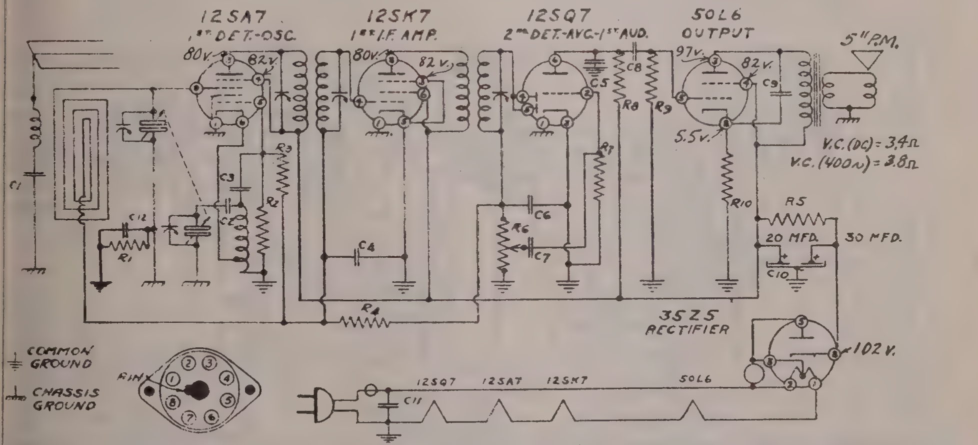
No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.00005	Mica	C7	.00025	Mica
C2	.05	200	C8	.01	400
C3	.00005	Mica	C9	.00025	Mica
C4	.1	200	C10	.01	400
C5	.002	400	C11	20 (Elect.)	25
C6	.001	200	C12	.005	400

F PEAK - 455 KC
I OSC. - 1730 KC
I ANT. - 1400 KC.

ISSUE A
MARCH 1940

A4,B4

For SOCKET LAYOUT
See INDEX



CONDENSERS

Capacity	Volts
.001	600
.02	400
.00005	Mica
.05	200
.0005	Mica
.00025	Mica
.01	400

C8	.002	600
C9	.01	400
C10	20.0	150
	30.0	150
C11	.05	400
C12	.25	200

RESISTORS

No.	Ohms	
R1	150,000	½ Watt
R2	20,000	½ Watt
R3	15,000,000	½ Watt
R4	2,000,000	½ Watt
R5	1,000	1 Watt
R6	500,000	Vol. Cont.
R7	5,000,000	½ Watt
R8	250,000	½ Watt
R9	500,000	½ Watt
R10	150	½ Watt 10%

C2 and R1 are used in Model XC5 only. In C5 Model only, all common grounds are connected to chassis ground.

C5 & XC5

ISSUE A
MARCH 1940

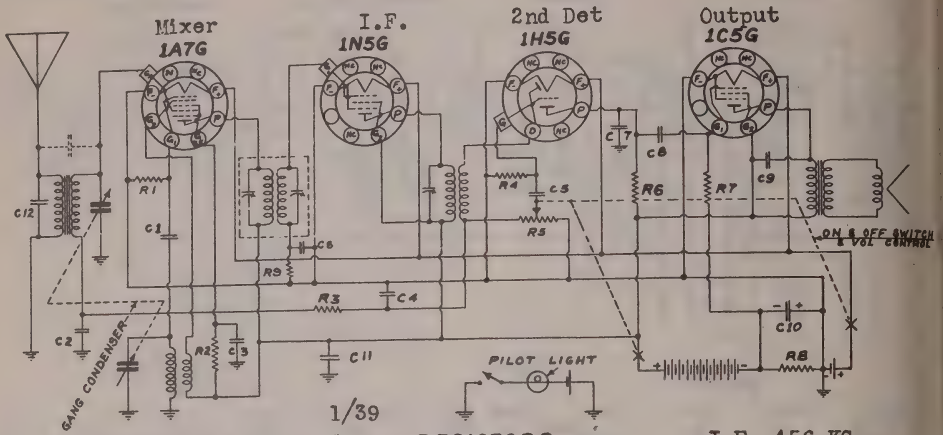
For SOCKET LAYOUT
See INDEX

F. PEAK - 455 KC
IM OSC. - 1730 KC
IM ANT. - 1400 KC

VOLTAGES: Line 115 v. AC. Power consumption, 30 watts. Volume control maximum. Meter 1000 ohms per volt. Read from point indicated to common ground.

MODEL 4C
MODEL 4J
Schematics,Alignment

CONTINENTAL RADIO & TELEV. CORP.



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CAPACITORS

Nº	CAP.-MFDS.	TYPE	Nº	CAP.-MFDS	TYPE
C1	.00025	MICA	C7	.00025	MICA
C2	.05	200V.	C8	.01	400V.
C3	.1	200V.	C9	.005	400V.
C4	.00025	MICA	C10	20. (ELECT.)	25V.
C5	.01	400V.	C11	.1	200V.
C6	.002	400V.	C12	.00005	MICA

RESISTORS

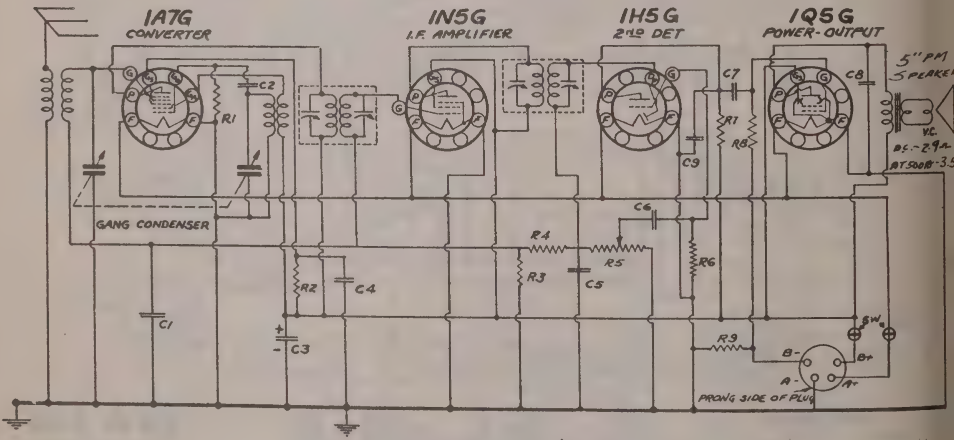
Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	200,000	¼	R6	250,000	¼
R2	70,000	¼	R7	500,000	¼
R3	1 MEG.	¼	R8	600	¼
R4	2 MEG.	¼	R9	2 MEG.	¼
R5	500,000	VOL CONTROL			

I.F. 456 KC

TRIM OSC- 1730 KC
TRIM ANT- 1400 KC

FOR SOCKET LAYOUT SEE INDE

MODEL 4C



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CAPACITORS					
NO.	MFDS	VOLTS	NO.	MFDS	VOLTS
C1	.05	200	C6	.01	400
C2	.00005	MICA	C7	.01	400
C3	4.0 (ELECT.)	150	C8	.002	400
C4	.05	200	C9	.00025	MICA
C5	.00025	MICA			

RESISTORS					
NO.	OHMS	WATTS	NO.	OHMS	WATTS
R1	200,000	½	R6	2,000,000	½
R2	70,000	½	R7	500,000	½
R3	2,000,000	½	R8	1,000,000	½
R4	2,000,000	½	R9	440	½
R5	500,000	V.C.			

I.F. 455 KC

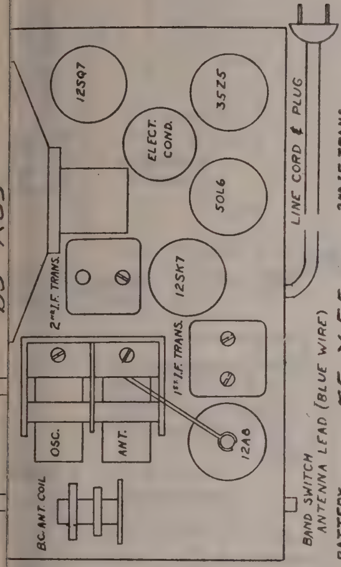
TRIM OSC-1730 KC
TRIM ANT-1400 KC

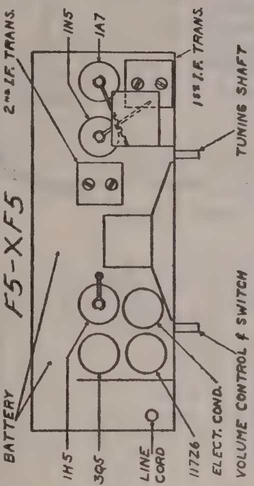
FOR SOCKET LAYOUT SEE IND

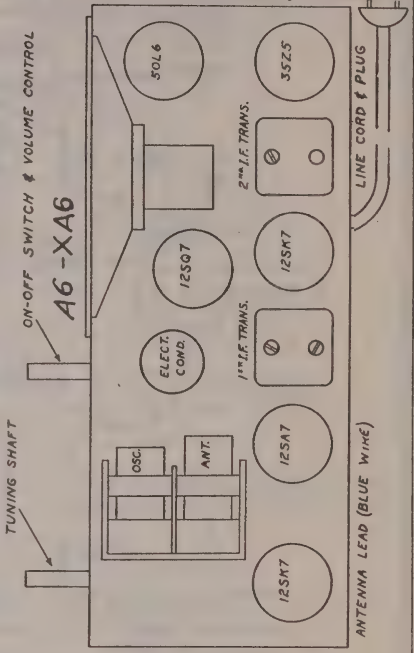
MODEL 4J

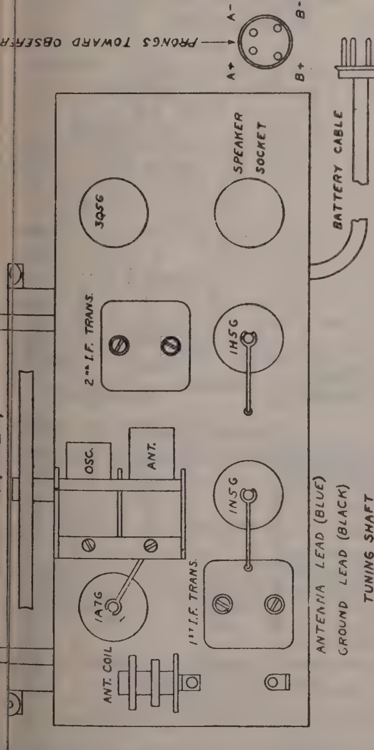
CONTINENTAL RADIO & TELEV. CORP.

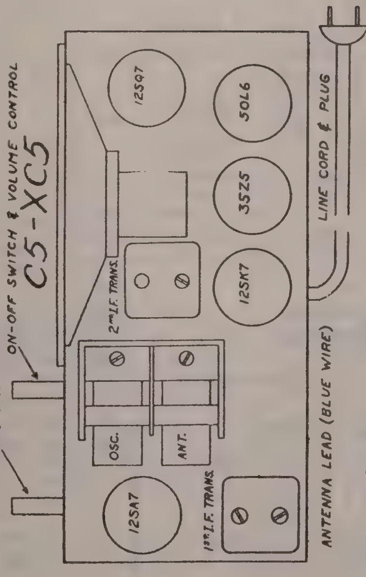
MODELS A4,B4
MODELS B5,XB5
MODELS C5,XC5
MODELS F5,XF5
MODELS G6,XG6
MODELS A6,XA6
Socket,Trimmers

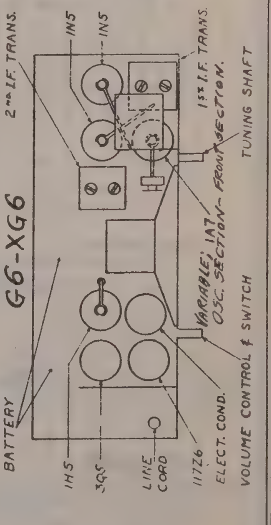








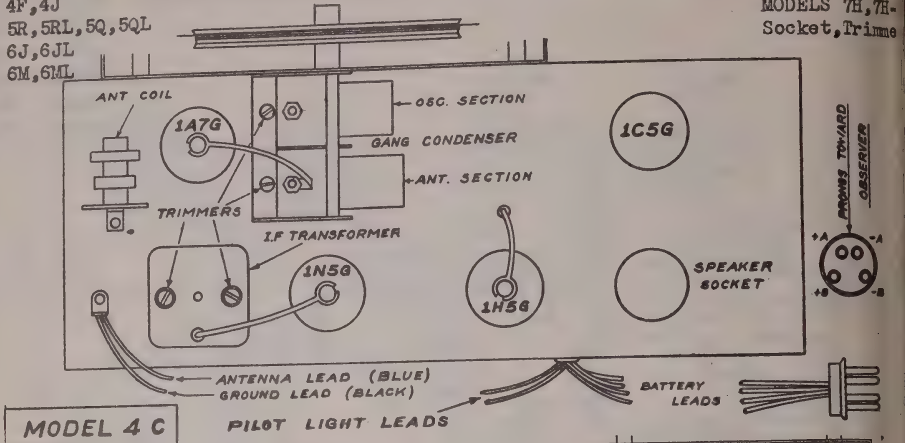


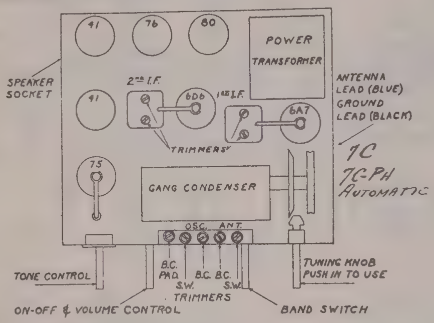


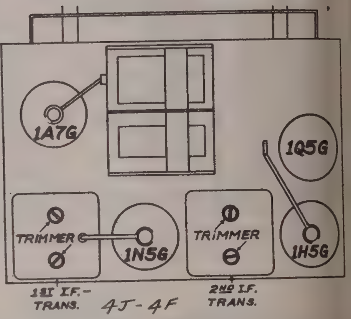
MODEL 4C
MODELS 4F,4J
MODELS 5R,5RL,5Q,5QL
MODELS 6J,6JL
MODELS 6M,6ML

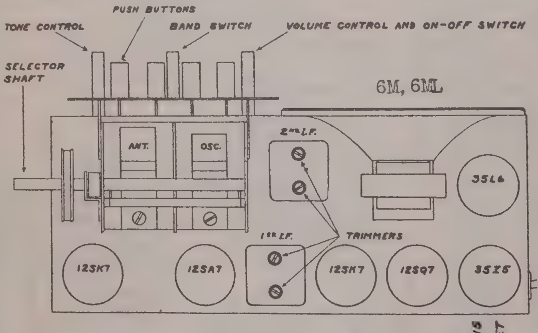
CONTINENTAL RADIO & TELEV. CORP.

MODEL 382-7H
MODELS 7C,7C
MODELS 7H,7H
Socket,Trimme

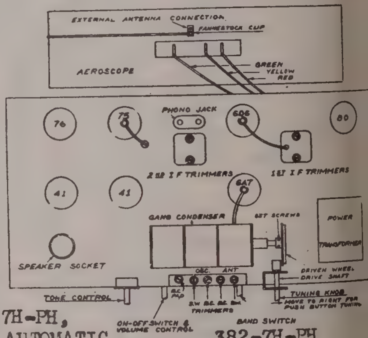




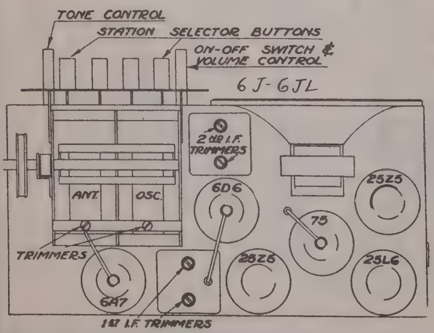


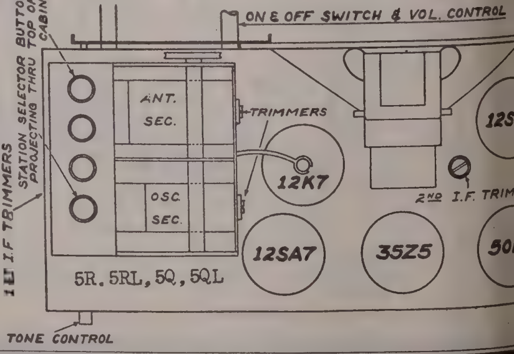


6M, 6ML



7H, 7H-PH,
7H-PH AUTOMATIC.
382-7H-PH

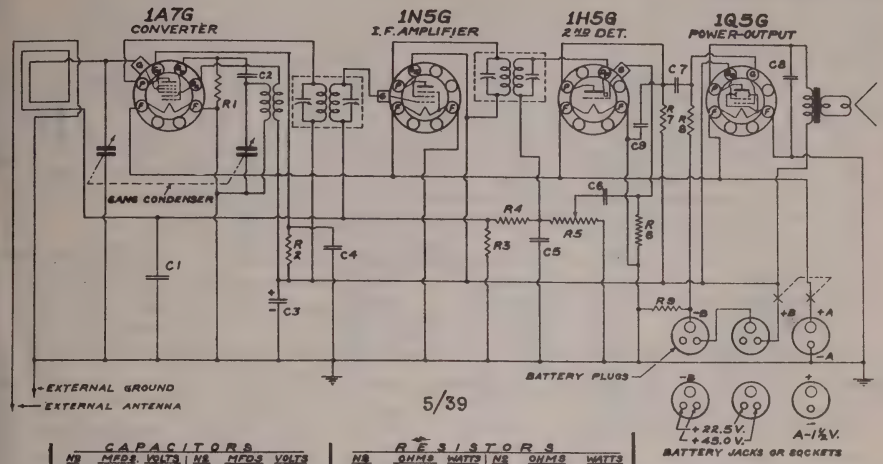



STATION SELECTOR BUTTONS PROJECTING THRU TOP OF CABINET
1ST I.F TRIMMERS
ON & OFF SWITCH & VOL. CONTROL
ANT. SEC.
TRIMMERS
12S
12K7
OSC. SEC.
2ND I.F. TRIM
12SA7
35Z5
50
TONE CONTROL

5R. 5RL, 5Q, 5QL

CONTINENTAL RADIO & TELEV. CORP.

MODEL 4F
MODELS 5Q,5QL
Schematics,Alignment



5/39

CAPACITORS

NO	MFDS.	VOLTS	NO	MFDS	VOLTS
C1	.05	200	C6	.01	400
C2	.00005	MICA	C7	.01	400
C3	4.0(ELECT)	150	C8	.002	400
C4	.05	200	C9	.00025	MICA
C5	.00025	MICA			

RESISTORS

NO	OHMS	WATTS	NO	OHMS	WATTS
R1	200,000	½	R6	2,000,000	½
R2	70,000	½	R7	500,000	½
R3	2,000,000	½	R8	1,000,000	½
R4	2,000,000	½	R9	440	½
R5	500,000	V.C.			

BATTERY PLUGS SHOWN WITH PRONGS AWAY FROM OBSERVER

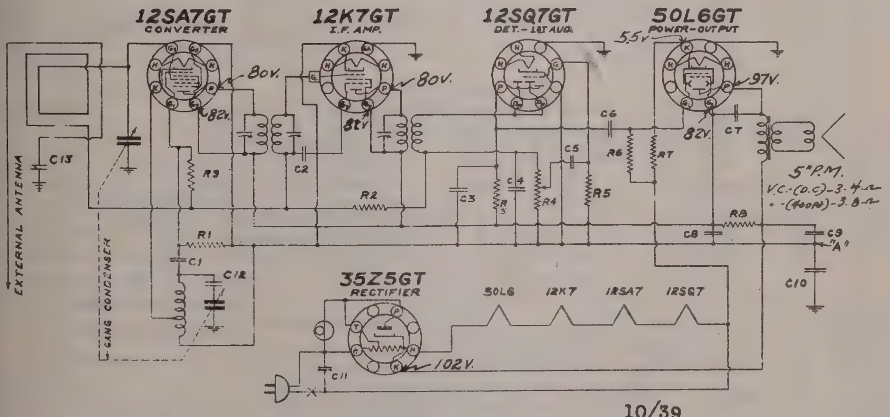
I.F. – 455 K.C.

I.F. 455 KC

TRIM OSC- 1610 KC
TRIM ANT- 1400 KC

MODEL 4F

I.F. ALIGNMENT CONVENTIONAL
FOR SOCKET LAYOUT SEE INDEX



10/39

RESISTORS

NO	OHMS	WATTS	NO	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS

NO	MFD.	VOLTS	NO	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

I.F. 455 K.C.

TUBES SHOW BOTTOM VIEW

C10 and C12 used in model 5QL only. On model 5Q point "A" is connected to chassis.

VOLTAGES;- LINE 115V. A.C.- POWER CONSUMPTION 30WATTS;- VOL. CONTR-MAX;- ANTENNA SHORTED TO GROUND;- METER 1000-Ω PER VOLT, 150VOLT SCALE;- TAKEN FROM POINT INDICATED TO POINT "A".

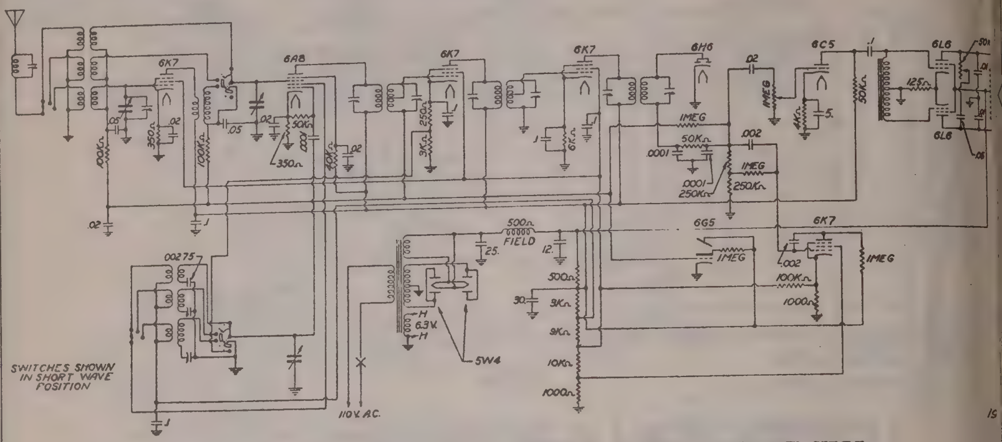
TRIM OSC-1730 KC
TRIM ANT-1400 KC

MODELS 5Q, 5QL

I.F. 455 KC
I.F. ALIGNMENT CONVENTIONAL
FOR SOCKET LAYOUT SEE INDEX

MODEL AM4
Schematic, Socket
Alignment, Trimmers

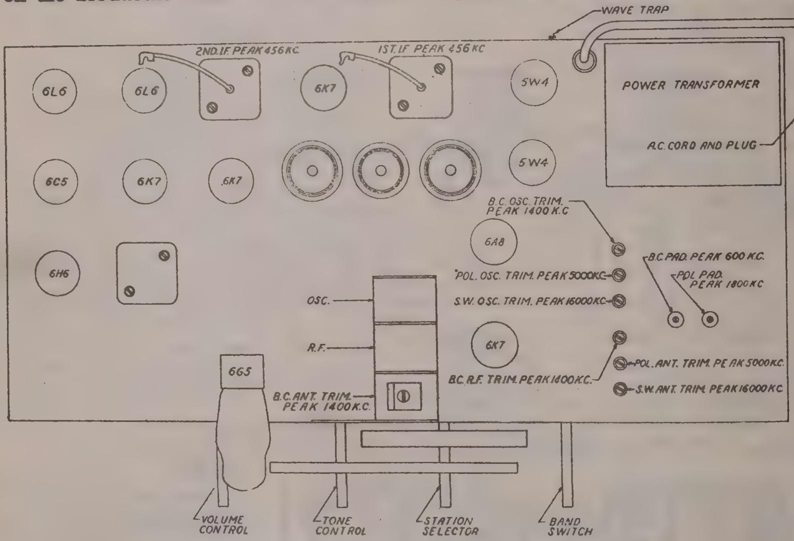
CONTINENTAL RADIO & TELEV. CORP.



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

WAVE TRAP ADJUSTMENT

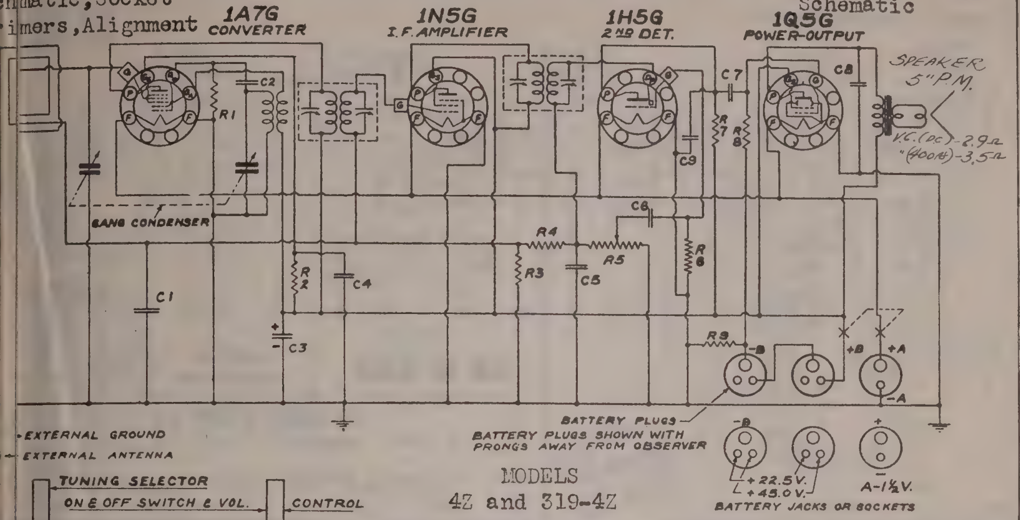
At the rear of the chassis near the Antenna and Ground posts is an adjustment screw connected to a trap circuit for elimination of code interference when operating on the broadcast band. If code interference is encountered adjustment of this screw filter it out. It is to be used only if such interfere is experienced in broadcast reception. It's use vents code transmitters operating on a freque around 456 K. C. from being received by the amplifier which is tuned to 456 K. C.



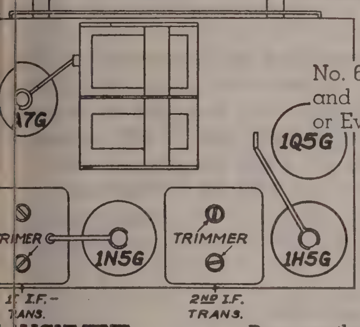
SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6A8 (short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage. Grounding or shorting the stator and grid components should be accomplished by groun the stator mounting nut to the frame of the denser with a screw-driver or any metallic ductor.

Do not wedge a screw-driver between the plate this is liable to permanently warp the plates thus prevent the oscillator section of the gang denser from tracking probably.



MODELS
4Z and 319-4Z



AT LEFT

TOP VIEW OF CHASSIS

POWER SUPPLY The power supply of this portable radio uses one Ray-O-Vac No. P96A, General No. 6-F-1, Burgess No. 6FP1 or Eveready No. 743. Portable "A" battery and two Ray-O-Vac No. 5303, General No. V-30-B, Burgess No. B30P1 or Eveready No. 762 Portable "B" batteries.

ALIGNMENT
BROADCAST BAND

Trim Ant.- 1400 kc
" Osc.- 1610 kc

I.F.- 455 kc

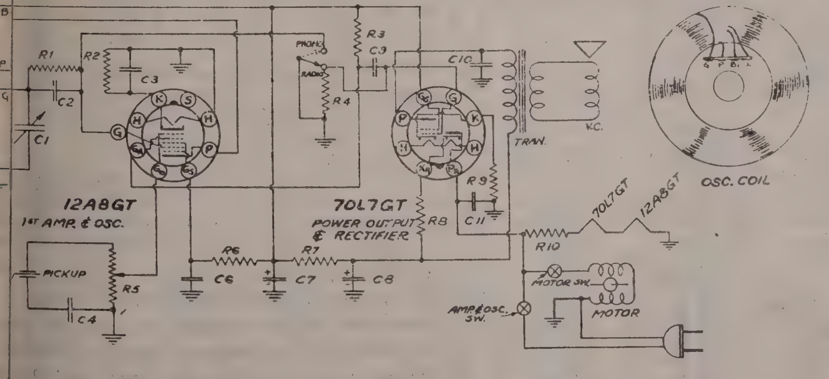
ALIGNMENT Remove the chassis from the cabinet and connect one end of a 100,000 ohm resistor the grid of the 1A7 tube and the other end to the A.V.C. fahnestock p See "antenna and ground" for location of this clip). Adjust the gnl generator to 455 KC and connect the output to the grid of the st detector tube (1A7) thru a .05 or .1 mfd. condenser. The ground of e ignal generator should be connected to the chassis ground. Align F. trimmers to peak or maximum reading on the output meter.

CAPACITORS

NO	MFDS.	VOLTS	NO	MFDS	VOLTS
C1	05	200	C6	.01	400
C2	.00005	MICA	C7	.01	400
C3	4.0(ELECT)	150	C8	.002	400
C4	.05	200	C9	.00025	MICA
C5	.00025	MICA			

RESISTORS

NO	OHMS	WATTS	NO	OHMS	WATTS
R1	200,000	½	R6	2,000,000	½
R2	70,000	½	R7	500,000	½
R3	2,000,000	½	R8	1,000,000	½
R4	2,000,000	½	R9	440	½
R5	500,000	V C			



PHONO AMPLIFIER & OSCILLATOR
SCHEMATIC DIAGRAM MODEL CW-13

SET AT 1575 KC

8/39

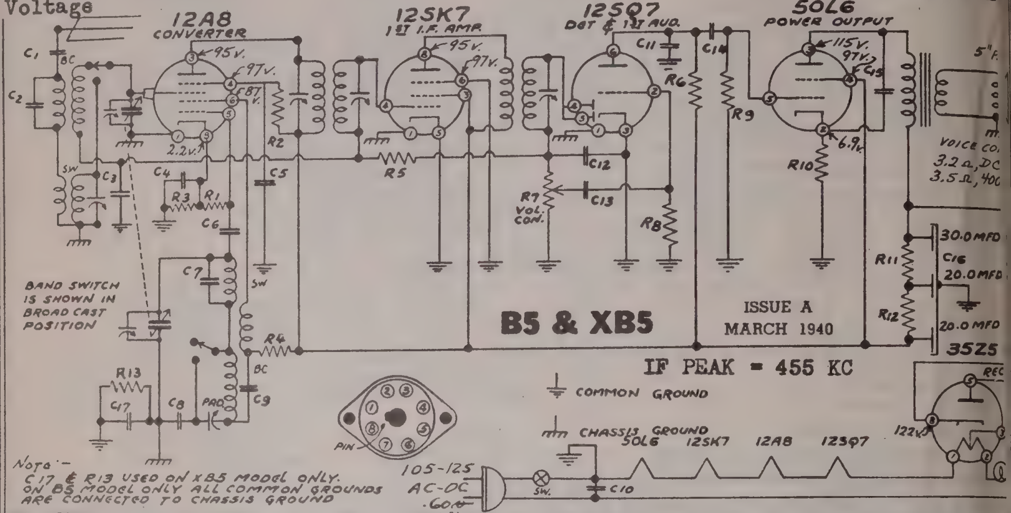
RESISTORS		
R1	50,000Ω	½w
R2	1,000Ω	½w
R3	50,000Ω	½w
R4	500,000Ω	½w
R5	1,000,000Ω	VOL.
R6	10,000Ω	½w
R7	3,000Ω	½w
R8	30Ω	½w
R9	250Ω ±10%	½w
R10	233Ω	5w

CONDENSERS		
C1	400-600μμf	PAD
C2	100μμf	MICA
C3	20μf	25.V.
C4	.05μf	200V.
C6	.05μf	200V.
C7	20μf	150.V.
C8	40μf	150.V.
C9	.01μf	400V.
C10	.02μf	400V.
C11	.05μf	400V.

MODELS B5,XB5
MODELS F5,XF5
Schematics,Alignment
Voltage

CONTINENTAL RADIO & TELEV. CORP.

FOR LAYOU
SEE INDE



B5 & XB5

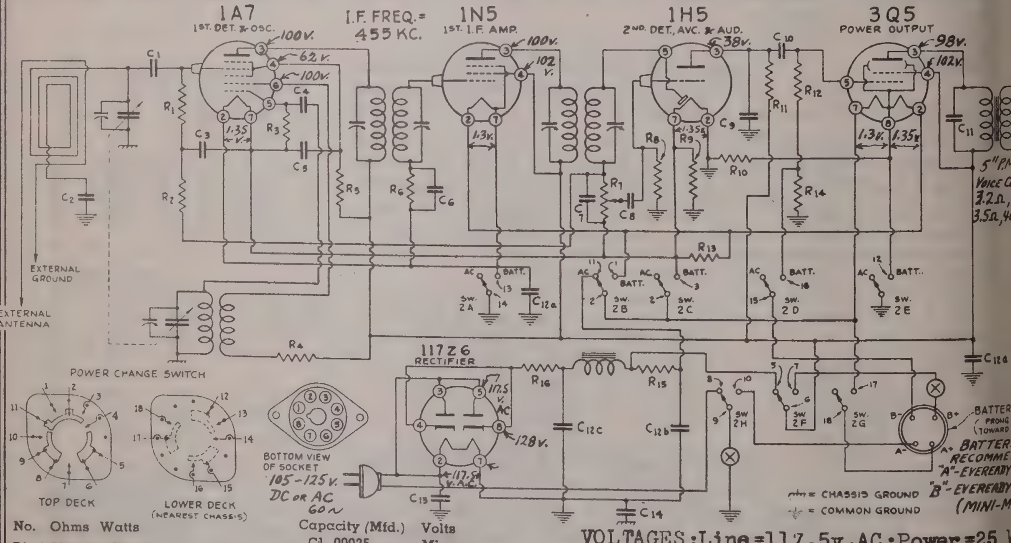
ISSUE A
MARCH 1940

IF PEAK = 455 KC

Note –
C17 & R13 USED ON XB5 MODEL ONLY.
ON B5 MODEL ONLY ALL COMMON GROUNDS ARE CONNECTED TO CHASSIS GROUND

No.	Ohms		No.	Ohms					C8	.003-5 %	Mica
R1	50,000	¼ Watt	R12	500	½ Watt				C9	.005	600
R2	20,000	¼ Watt	R13	150,000	¼ Watt				C10	.05	400
R3	440	¼ Watt							C11	.0005	Mica
R4	3,000	¼ Watt				No.	Capacity	Volts	C12	.00025	Mica
R5	2,000,000	¼ Watt				C1	.001	600	C13	.01	400
R6	250,000	¼ Watt				C2	.00005	Mica	C14	.002	400
R7	500,000	Vol. Cont.				C3	.05	200	C15	.01	400
R8	5,000,000	¼ Watt				C4	.05	200		30.0	150
R9	500,000	¼ Watt				C5	.05	200	C16	20.0	150
R10	200	¼ Watt				C6	.0001	Mica		20.0	150
R11	500	¼ Watt				C7	.00001	Mica	C17	.25	200

VOLTAGES:Line=117v.AC;Power=30W.Volume
Cont'l=Max. Meter=1000 ohms/volt(150 v.
scale). Measure with respect to common
ALIGNMENT PROCEDURE(See 7C-PH Automatic
Trim OSC. at 1730 KC (Broadcast)
Pad OSC. at 600 KC (Broadcast)
Trim ANT. at 1400 KC (Broadcast)
Trim ANT at 15000 KC (Short Wave)



No.	Ohms	Watts						Capacity (Mfd.)	Volts			
							C1	.00025	Mica			
R1	1,000,000	½	R9	110		½	C2	.1	200	C10	.01	400
R2	1,000,000	½	R10	750	—10%	½	C3	.01	200	C11	.002	400
R3	200,000	½	R11	250,000		½	C4	.0005	Mica	C12a	40.	25
R4	500	½	R12	1,000,000		½	C5	.05	200	C12b	40.	25
R5	30,000	½	R13	400		½	C6	.01	200	C12c	30.	150
R6	5,000,000	½	R14	400	—10%	½	C7	.00025	Mica	C12d	30.	150
R7	1,000,000	V.C.	R15	2,100		5	C8	.01	400	C13	.05	400
R8	5,000,000	½	R16	30		½	C9	.00025	Mica	C14	.25	200

In Model F5 switch points 4, 15, 16, 17 and 18 are not used. Switch points 4 is also not used on Model XF5.
Power change switch 2A thru 2H and the pictorial view shown in the "AC-DC" position.

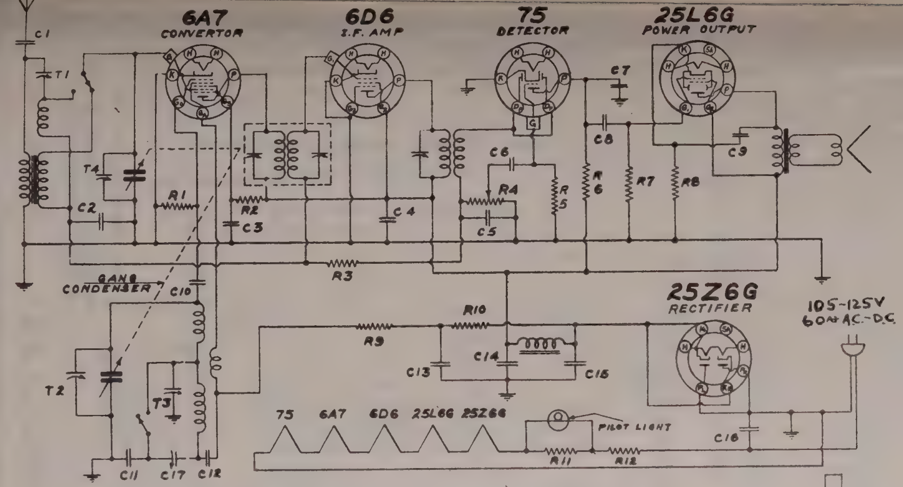
VOLTAGES:Line=117.5v.AC;Power=25 W
Vol.Cont'l=Max. Meter=1000 ohms/v
Measure with respect to common gn
ALIGNMENT(use common gnd): IF=455
*Trim Osc. at 1550 KC, Ant. at 140
*TRIM USING EXTERNAL GND.

F5 & XF5

ISSUE
FEB. 1

CONTINENTAL RADIO & TELEV. CORP.

MODEL 5LS
Schematic, Socket
Alignment, Trimmers



I.F. 456 K.C.
SWITCHES SHOWN
IN BROADCAST
POSITION

SCHEMATIC DIAGRAM
MODEL 5LS

CONDENSERS

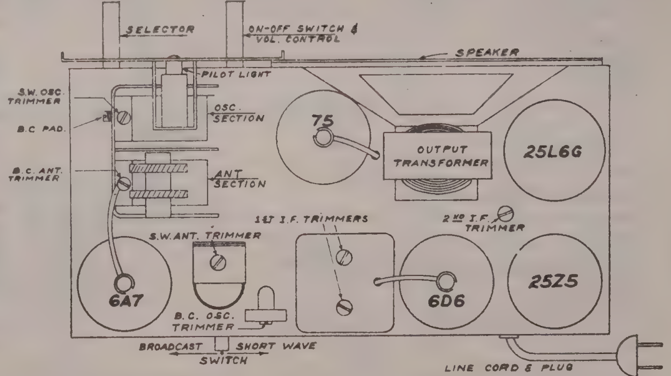
Nº	MFDS	VOLTS	Nº	MFDS.	VOLTS
C1	.0015	MICA	C10	.0001	MICA
C2	.05	200	C11	.0017±5%	
C3	.05	200	C12	.005	600
C4	.05	200	C13	5.0	150
C5	.00025	MICA	C14	25.0	150
C6	.01	400	C15	25.0	150
C7	.00025	MICA	C16	.05	400
C8	.01	400	C17	.00059	
C9	.005	600			

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	50,000	½	R10	10,000	½
R2	30,000	½			
R3	1 MEG	½			
R4	½ MEG. VOL. CONT.				
R5	5. MEG.	½			
R6	250,000	½			
R7	½ MEG	½			
R8	150	½			
R9	10,000	½			

TRIMMERS

Nº	USE	MMFS.
T1	S.W. ANT.	1.6 TO 20
T2	S.W. OSC.	
T3	B.C. OSC.	1.6 TO 20
T4	B.C. ANT.	



I.F. ALIGNMENT Adjust the test oscillator to 456 KC and with the band switch in B.C. position connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Connect ground of test oscillator to chassis ground through a .1 mfd. condenser. Align all three I.F. trimmers to peak or maximum reading on the output meter.

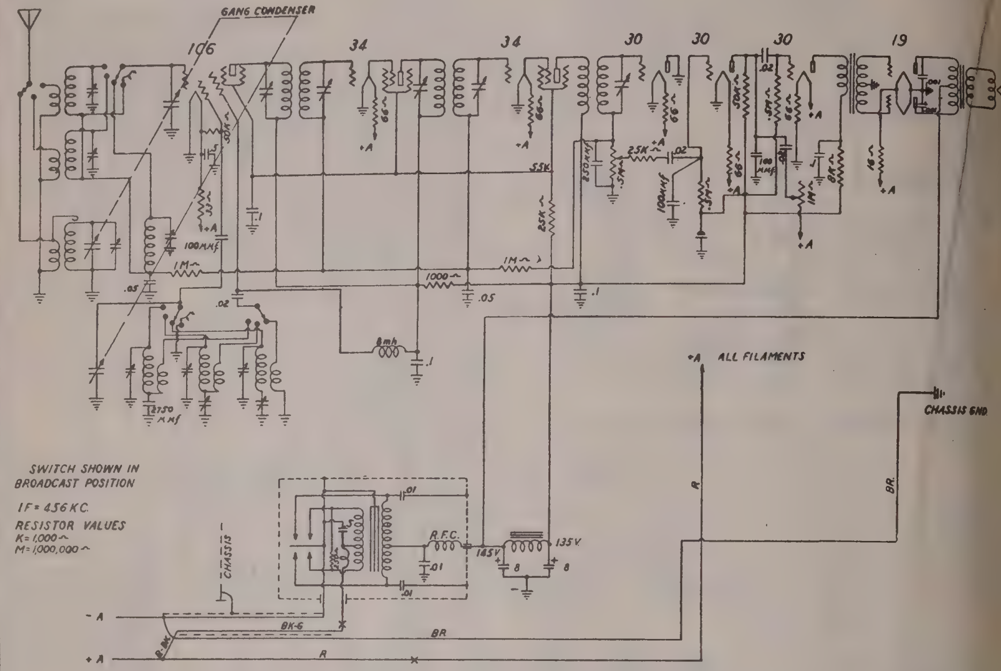
SHORTWAVE ALIGNMENT Adjust the oscillator to 18,100 KC and connect the output to the antenna lead, through a 400 ohm resistance. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (short wave oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 16000 K.C. and after tuning in the signal adjust the shortwave antenna trimmer to peak.

The receiver should now be tuned to the 6 megacycle signal from the generator and the sensitivity checked. No adjustment is required at this point.

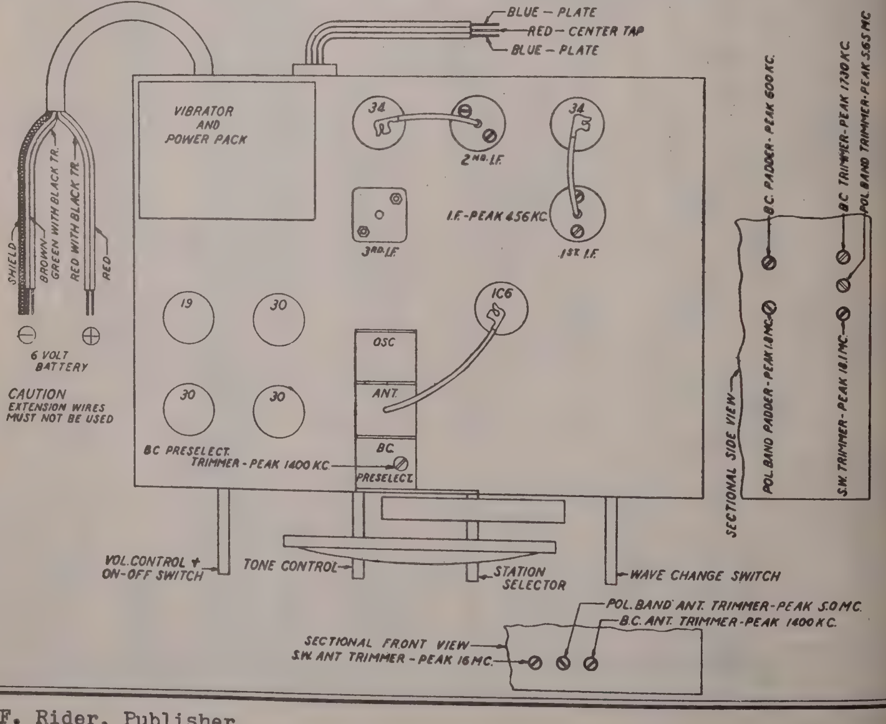
BROADCAST BAND ALIGNMENT The broadcast band may now be aligned Using a .0002 dummy antenna, set the generator to 1730 kilocycles. With the gang condenser at minimum capacity, adjust the broadcast oscillator trimmer to receive this signal. Then set the generator to 1400 kilocycles and adjust the broadcast antenna trimmer to peak. The generator is now set to 600 kilocycles and the broadcast padding condenser adjusted.

MODEL M5
Schematic, Socket
Trimmers, Alignment

CONTINENTAL RADIO & TELEV. CORP.

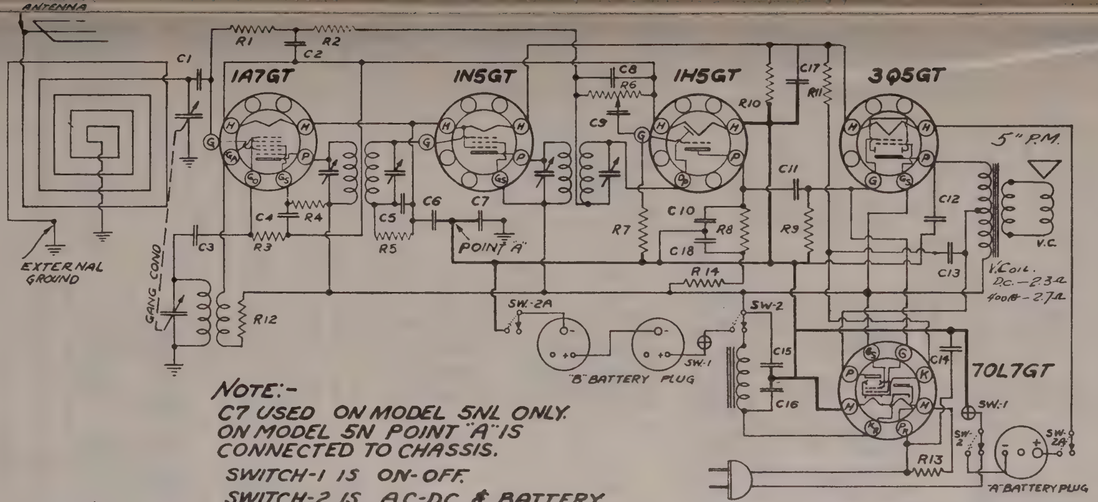


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.



CONTINENTAL RADIO & TELEV. CORP

MODELS 5N,5NL
Schematic,Socket
Alignment,Trimmers



NOTE:-
C7 USED ON MODEL 5NL ONLY.
ON MODEL 5N POINT "A" IS
CONNECTED TO CHASSIS.
SWITCH-1 IS ON-OFF.
SWITCH-2 IS A.C.-D.C. & BATTERY.
SWITCH-2 SHOWN FOR A.C.-D.C.
I.F. 455 K.C.
ON MODEL 5N SWITCH, SWITCH 2A NOT USED.

9/39

I.F. 455 KC

SCHEMATIC DIAGRAM MODEL 5N & 5NL

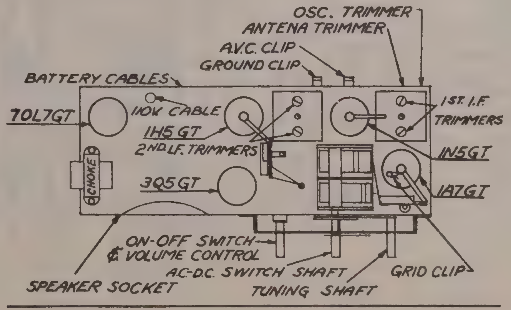


Fig. 1—Top View

TUBE FUNCTIONS
1A7GT- MIXER-OSCILLATOR
1N5GT- I.F. AMPLIFIER
1H5GT- 2ND DET-AVC-1ST A.F.
3Q5GT- OUTPUT
70L7GT-RECTIFIER

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.
TRIM OSC- 1550 KC, TRIM ANT- 1400 KC
PAD- 600 KC

CONDENSERS

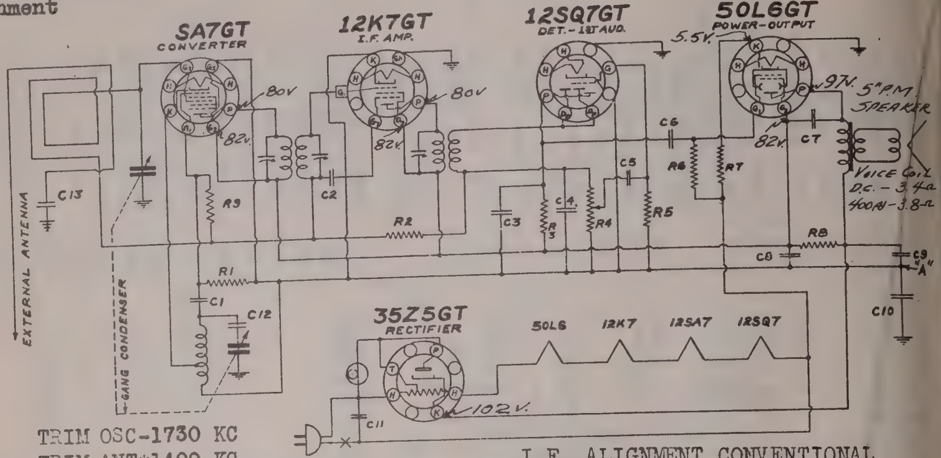
C1 -	.002	mfd.	600 volt
C2 -	.05	mfd.	400 volt
C3 -	.00005	mfd.	mica
C4 -	.05	mfd.	400 volt
C5 -	.002	mfd.	600 volt
C6 & C17-	40-40	mfd.	25 volt elect.
C7 -	.25	mfd.	200 volt (used in 5NL only)
C8 -	.00025	mfd.	mica
C9 -	.01	mfd.	400 volt
C10-	.00025	mica	
C11-	.01	mfd.	400 volt
C12-	.002	mfd.	600 volt
C13-	.01	mfd.	400 volt
C14-	.05	mfd.	400 volt
C15 C16-	20-30	mfd.	150 volt elect.
C18-	.1	mfd.	200 volt
	Gang Condenser		
	Trimmer Condenser		

RESISTORS

R1 -	2,000,000 ohm	½ watt
R2 -	2,000,000 ohm	½ watt
R3 -	200,000 ohm	½ watt
R4 -	25,000 ohm	½ watt
R5 -	5,000,000 ohm	½ watt
R6 -	1,000,000 ohm	Volume Control & Switch
R7 -	5,000,000 ohm	½ watt
R8 -	250,000 ohm	½ watt
R9 -	500,000 ohm	½ watt
R10-	1,000 ohm	½ watt 10%
R11-	30 ohm	½ watt 10%
R12-	750 ohm	½ watt
R13-	335 ohm	10 watt
R14-	100,000 ohm	½ watt

MODELS 5R,5RL
MODELS 5S,5SL
Schematics,Voltage
Alignment

CONTINENTAL RADIO & TELEV. CORP.



TRIM OSC-1730 KC
TRIM ANT*1400 KC

I.F. ALIGNMENT CONVENTIONAL

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

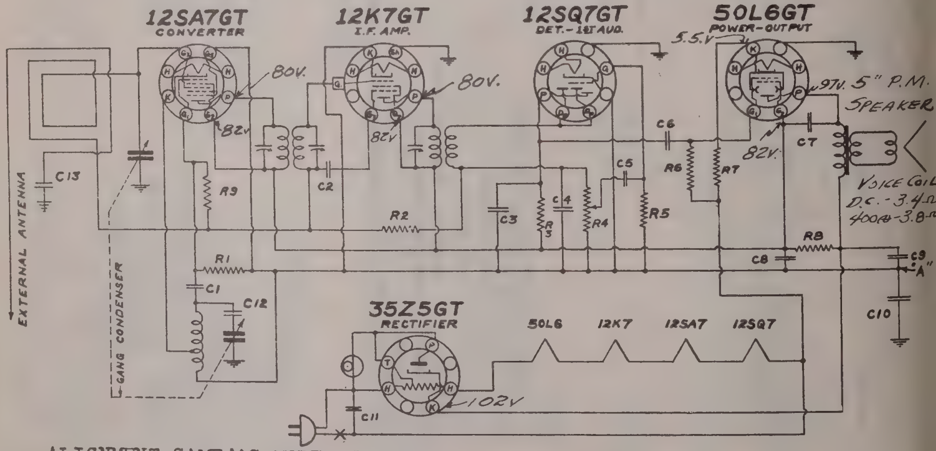
I.F. 455KC

MODELS 5R, 5RL

C10 and C14 used in model 5RL only. On model 5R point "A" is connected to ground.

Voltages:-From point indicated to "A",Line 115 V. A.C. Power consumption 30 watts, Meter 1000 ohms per volt. 150 volt scale.

FOR SOCKET LAYOUT SEE INDEX



ALIGNMENT SAME AS MODEL 5R ABOVE

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

I.F. 455KC

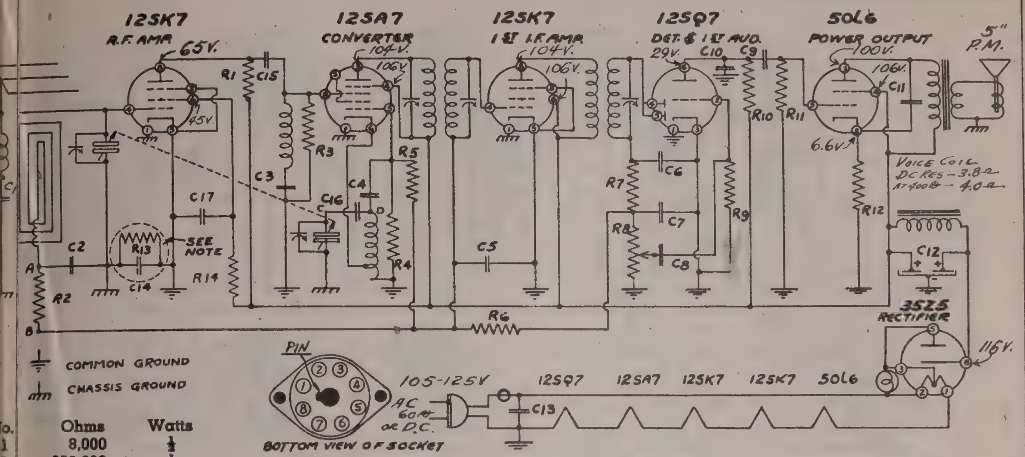
MODELS 5S, 5SL

C10 and C12 used in model 5SL only. On model 5S point "A" is connected to chassis.

Voltages:-(See note Model 5R above).

CONTINENTAL RADIO & TELEV. CORP.

MODELS A6,XA6
MODELS G6,XG6



o.	Ohms	Watts
1	8,000	½
2	250,000	¼
3	250,000	¼
4	20,000	¼
5	15,000,000	¼
6	2,000,000	¼
7	50,000	¼
8	500,000	V.C.
9	5,000,000	¼
10	250,000	¼
11	500,000	¼
12	200—10%	½
13	150,000	¼
14	40,000	¼

No.	Capacity	Voltage
C1	.001	600
C2	.05	200
C3	.000060—5%	Mica
C4	.00005	Mica
C5	.05	200
C6	.0001	Mica
C7	.00025	Mica
C8	.005	400
C9	.005	400
C10	.00025	Mica
C11	.01	400
C12	30-30 Elect.	150
C13	.05	400
C14	.25	200
C15	.00025	Mica
C16	.02	400
C17	.01	400

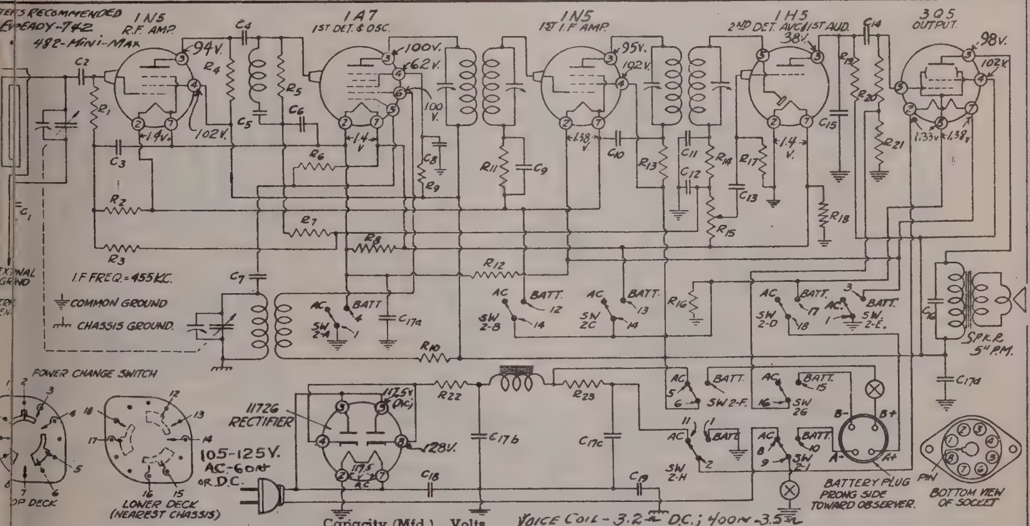
A6 & XA6

ISSUE A
JAN. 1940

VOLTAGES:- TAKEN FROM POINT INDICATED TO GROUND; LINE-115V. A.C.-VOL. CONTROL AT MAX.-METER-1000Ω PER VOLT,-PWR. CONSUMPTION 35W.

ALIGNMENT FREQ.:-
I.F. - 455KC
B.C. - 1730KC-OSCILLATOR
1400KC-ANTENNA
(A6-CHASSIS GND-XA6 COMMON GND USE. IMFD COND.)

In model A6 all common grounds become chassis grounds; C2, C14, C16, R2 and R13 are omitted and point A is connected to point B and point C is connected to point D.



VOICE COIL - 3.2Ω D.C.; 400~ - 3.5Ω

o.	Ohms	Watts
1	,000,000	½
2	,000,000	½
3	,000,000	½
4	10,000	½
5	250,000	½
6	200,000	½
7	,000,000	½
8	300	½
9	30,000	½
10	500	½
11	5,000,000	½
12	700	½
R13	5,000	½
R14	70,000	½
R15	1,000,000	V.C.
R16	1,500	½
R17	5,000,000	½
R18	150	½
R19	250,000	½
R20	1,000,000	½
R21	400 -10%	½
R22	30	½
R23	1,950	5

	Capacity (Mfd.)	Volts
C1	.1	200
C2	.00025	Mica
C3	.01	200
C4	.00005	Mica
C5	.00006	Mica
C6	.01	200
C7	.00005	Mica
C8	.01	400
C9	.01	200
C10	.05	200
C11	.00005	Mica
C12	.00005	Mica
C13	.01	400
C14	.01	400
C15	.00025	Mica
C16	.002	400
C17a	40.	25
C17b	30.	150
C17c	40.	25
C17d	30.	150
C18	.05	400
C19	.25	200

VOLTAGES:- LINE AT 117.5V. (A.C.), VOL. CONTR. -MAX., METER 1000Ω PER VOLT. P.C. - 25 WATTS; FROM GND. TO POINT IND.

ALIENMENT FREQ.:- (USE COMMON GROUND)
I.F. - 455K.C.
B.C. - 1550KC - OSCILLATOR.
-1400KC- ANTENNA.

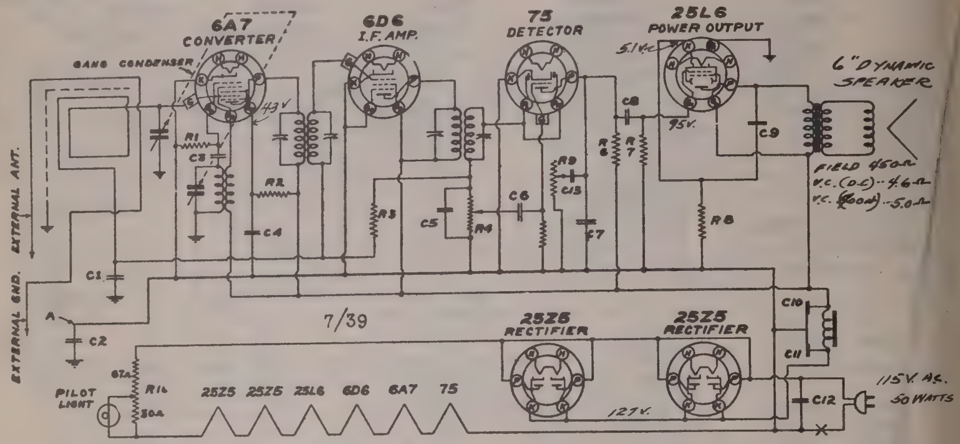
G6 & XG6

ISSUE A
FEB. 1940

In Model G6 switch points 15, 16, 17 and 18 are not used. Power change switch 2A thru 2I and the pictorial view shown in the "AC-DC" position.

MODELS 6J,6JL
MODELS 6M,6ML
Schematics,Alignment

CONTINENTAL RADIO & TELEV. CORP.



RESISTORS

Nº	OHMS	WATTS
R1	50,000	½
R2	30,000	½
R3	2,000,000	½
R4	500,000	VOL. CONT.
R5	5,000,000	½
R6	250,000	½
R7	500,000	½
R8	150 ± 10%	½
R9	500,000	TONE CONT.
R10	67 & 30	10

CONDENSERS

Nº	MFDS.	VOLTS
C1	.02	200
C2	.25	200
C3	.00005	MICA
C4	.05	200
C5	.00025	MICA
C6	.01	400
C7	.00025	MICA
C8	.01	400
C9	.02	400

Nº	MFDS.	VOLTS
C10	20.	150
C11	20.	150
C12	0.05	400
C13	0.005	600

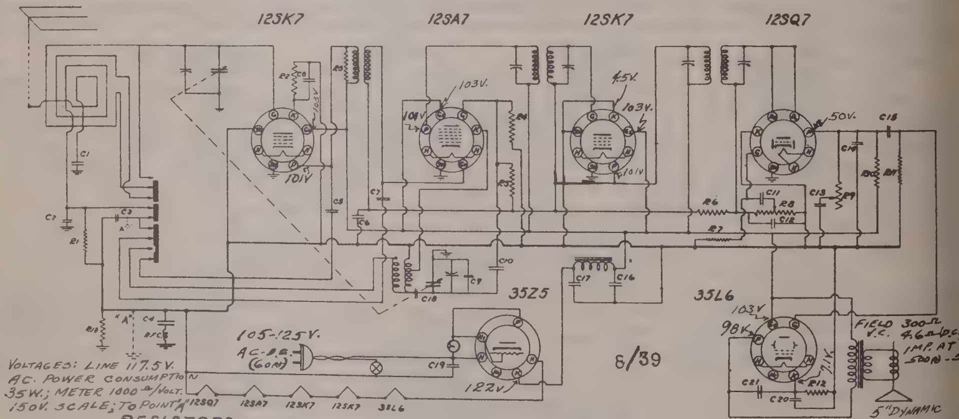
I.F. 455 K.C.
⏚ INDICATES CHASSIS GROUND
VOLTAGES: WITH METER 1000Ω/VOLT TO GROUND; ANT. SHORTED TO GROUND.

NOTE:- C2 USED ON MODEL 6JL ONLY ON MODEL 6J POINT "A" IS CONNECTED TO CHASSIS.

SCHEMATIC DIAGRAM
MODEL 6JL
MODEL 6J

I.F. ALIGNMENT CONVENTIONAL (SEE VOL. VIII).
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

(See Index for tube layout)



VOLTAGES: LINE 117.5V. AC. POWER CONSUMPTION 35W.; METER 1000Ω/VOLT. 150V. SCALE; TO POINT "A"

RESISTORS.

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	150K±10%	½	R8	500K-V.C.	½
R2	600±10%	½	R9	500K-T.C.-	½
R3	5K±10%	½	R10	150K.	½
R4	15 MEG.	½	R11	250K	½
R5	25K	½	R12	200±10%	½
R6	2 MEG	½	R13	150K	½
R7	5 MEG	½			

CAPACITORS.

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS.	Nº	MFD.	VOLTS
C1	.001	600	C8	.05	200	C15	.01	400
C2	.00127±5%	Mica	C9	.000010	Mica.	C16	20.	150
C3	.05	400	C10	.00005	Mica.	C17	20.	150
C4	.25	200	C11	.01	400	C18	.02	400
C5	.00006±5%	Mica.	C12	.00025	Mica	C19	.05	400
C6	.05	200	C13	.005	600	C20	20.	25
C7	.00006±5%	Mica	C14	.0005	Mica.	C21	.02	400

I.F. 455 K.C.

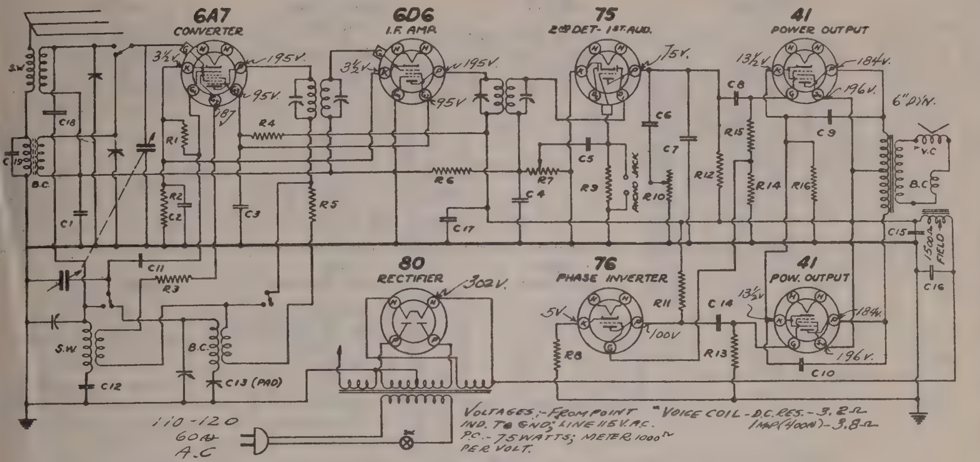
In model 6M only C3, C4, C18, R13 and the R.F. choke (RFC) are not used and points "A" are connected to chassis.

I.F. ALIGNMENT CONVENTIONAL (SEE VOL.VIII).
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

MODELS 6M, 6ML
(See Index for tube layout)

CONTINENTAL RADIO & TELEV. CORP.

MODEL 7C
MODEL 7H
Schematics, Alignment



CAPACITORS					
No.	MFDS	VOLTS	No.	MFDS	VOLTS
C1	.05	200	C11	.0001	MICA
C2	.25	200	C12	.004±5%	MICA
C3	.05	400	C13	300-600 μμfd	PADDER
C4	.00025	MICA	C14	.01	400
C5	.01	400	C15	10.0	350
C6	.005	600	C16	10.0	350
C7	.00025	MICA	C17	.05	400
C8	01	400	C18	GIMMICK	
C9	.005	600	C19	.0001	MICA
C10	.005	600			

RESISTORS					
No.	OHMS	WATTS	No.	OHMS	WATTS
R1	50,000	½	R11	50,000	½
R2	200	½	R12	250,000	½
R3	250	½	R13	500,000	½
R4	20,000	½	R14	100,000	½
R5	1,000	½	R15	400,000	½
R6	2 MEG	½	R16	300	½
R7	500,000	VOL. CON.			
R8	3,000	½			
R9	5 MEG	½			
R10	500,000	TONE CON.			

I.F. 455 KC

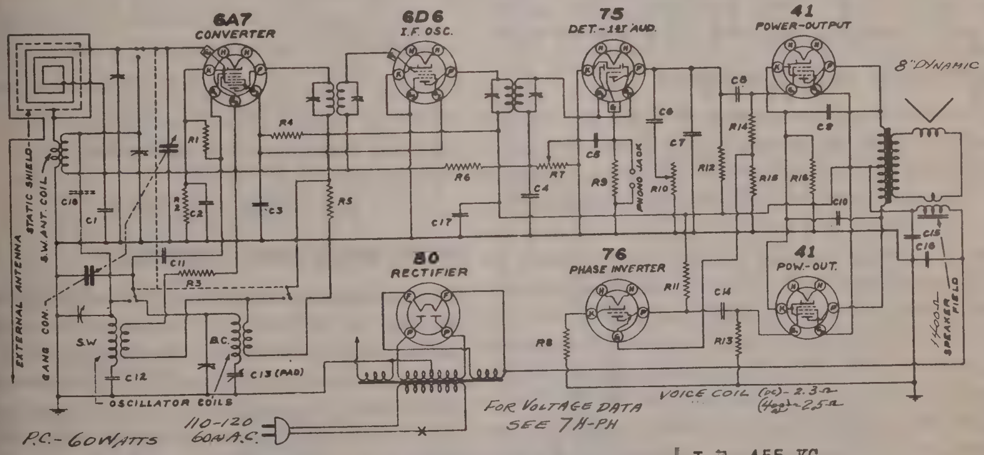
BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN
GANG CONDENSER CAPACITY 443 μμfds.

TRIM OSC- 1730 KC (BB)
TRIM OSC- 18100 KC (SW)
PAD OSC- 600 KC (BB)
TRIM ANT- 1400 KC (BB)
TRIM ANT- 16000 (SW)

MODEL 7C

FOR
ALIGNMENT PROCEDURE
SEE MODEL 7C-PH AUTOMATIC

FOR SOCKET LAYOUT SEE INDEX



CAPACITORS					
No.	MFDS.	VOLTS	No.	MFDS.	VOLTS
C1	.05	200	C10	.005	600
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004±5%	MICA
C4	.00025	MICA	C13	300-600 μμfds.	
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	GIMMICK	

RESISTORS					
No.	OHMS	WATTS	No.	OHMS	WATTS
R1	50,000	½	R10	500,000	TONE CON.
R2	300	½	R11	50,000	½
R3	250	½	R12	250,000	½
R4	20,000	½	R13	500,000	½
R5	1,000	½	R14	400,000	½
R6	2 MEG.	½	R15	100,000	½
R7	500,000	VOL. CON.	R16	300	½
R8	3,000	½			
R9	5 MEG.	½			

I.F. 455 KC

SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF SOCKETS SHOWN.
GANG CONDENSER CAPACITY 443 μμfds.

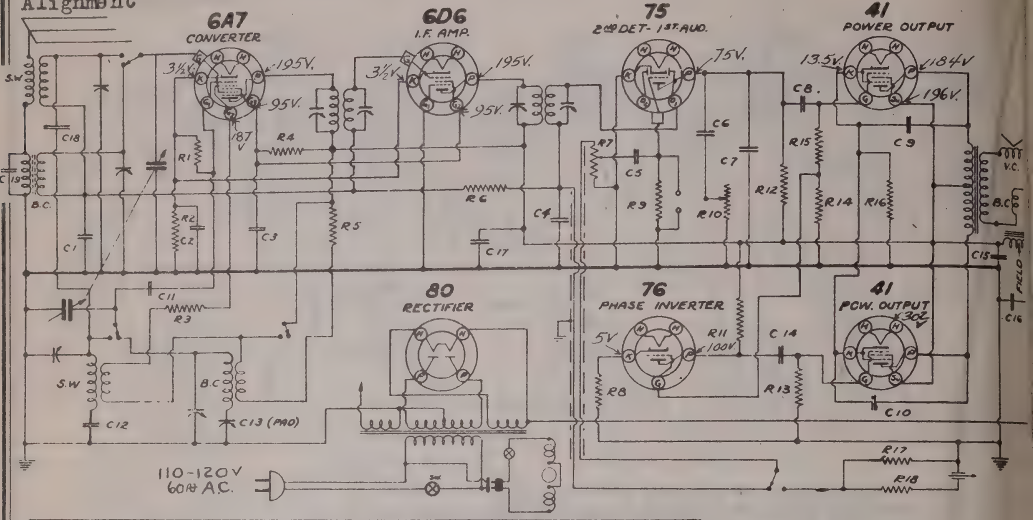
TRIM OSC-1550 KC (BB)
OTHER ALIGNMENT DATA SAME AS MODEL 7C

MODEL 7H

FOR SOCKET LAYOUT SEE INDEX

MODEL 7C-PH Automatic
Schematic, Voltage
Alignment

CONTINENTAL RADIO & TELEV. CORP.



CAPACITORS					
No.	MFDS.	VOLTS	No.	MFDS.	VOLTS
C1	.06	200	C11	.0001	MICA
C2	.25	200	C12	.004±5%	MICA
C3	.05	400	C13	300-600 mmfd.	PADDER
C4	.00025	MICA	C14	.01	400
C5	.01	400	C15	10.0	350
C6	.005	600	C16	10.0	350
C7	.00025	MICA	C17	.05	400
C8	.01	400	C18	GIMMICK	
C9	.005	600	C19	.0001	MICA
C10	.005	600			

RESISTORS					
No.	OHMS	WATTS	No.	OHMS	WATTS
R1	50,000	½	R11	50,000	½
R2	200	½	R12	250,000	½
R3	250	½	R13	500,000	½
R4	20,000	½	R14	100,000	½
R5	1,000	½	R15	400,000	½
R6	2 MEG.	½	R16	300	½
R7	600,000	VOL. CON.	R17	250,000	½
R8	3,000	½	R18	500,000	½
R9	5 MEG.	½			
R10	500,000	TONE CON.			

I.F. - 455 K.C.

BAND SWITCHES SHOWN IN BROADCAST POSITION

BOTTOM VIEW OF TUBE SOCKETS SHOWN

GANG CONDENSER CAPACITY 443 mmfds.

SCHEMATIC DIAGRAM MODEL 7C-P

I.F. ALIGNMENT

Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the signal generator to 1730 KC and connect the output to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. The oscillator and antenna trimmers may be reached by removing the dial escutcheon. (See Fig. 3 for trimmer locations.) The next step is to set the signal generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. Next, re-set the dial pointer on the receiver and the signal generator to 600 KC. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

SPEAKER (Part No. P3390) 12" Dynamic

Field resistance	1500 ohms
D.C. voice coil resistance	1.9 ohms
Voice coil impedance at 400 cycles	2.2 ohms

Voltages—Line 115 volts A.C. Power consumptio 90 watts. Volume control maximum. Meter 100 ohms per volt. (VOLTAGES ARE FROM POINT INDICATED TO GROUND).

FOR TUNER SEE INDEX

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the signa generator to 18100 KC and connecting the output t the antenna lead through a 400 ohm resistor. Set th gang at minimum and adjust the "short wave oscil lator trimmer" to receive the signal. Set the genera tor at 16,000 KC, tune in the signal and adjust th "short wave antenna" trimmer to give maximun output. As there is no variable low frequency pad ding condenser on this band, the sensitivity of th receiver should be checked at 6000 KC to determin whether the circuits are in line at this frequenc Should the receiver lack sensitivity at 6000 KC, th antenna and oscillator coils, as well as the mic padding condenser, should be tested.

CONTINENTAL RADIO & TELEV. CORP.

MODELS 7H-PH,7H-PH Automatic, 382-7H-PH
Schematic,Voltage,Tuner Alignment

VOL. CONT. AT MAX. P.C. 60 WATTS; (75 WATTS PH-MODELS 382-7H-PH)

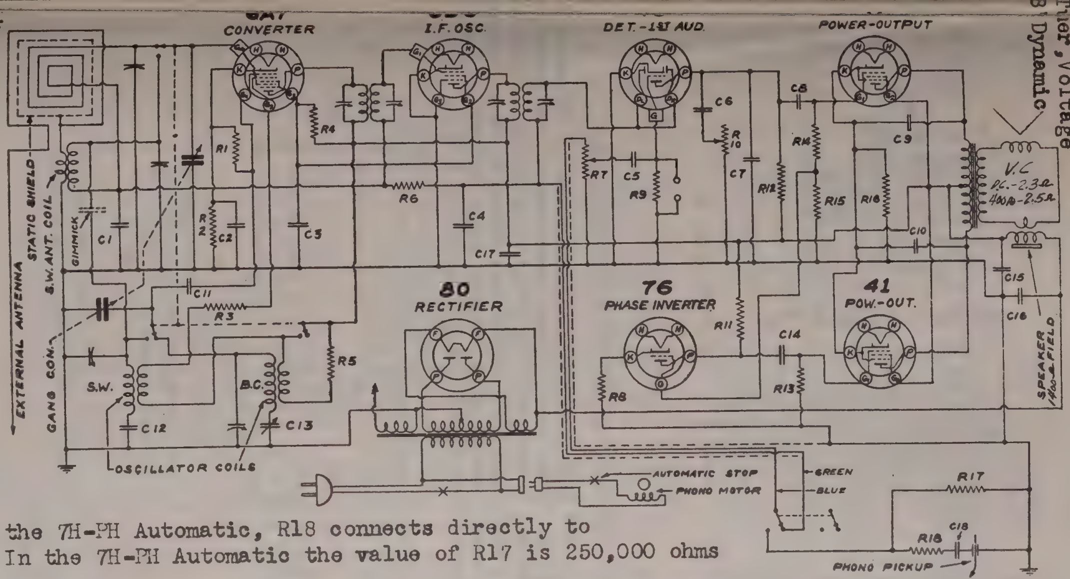
CAPACITORS

Nº	MFDS.	VOLTS	Nº	MFDS.	VOLTS
C1	.05	200	C10	.005	600
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004 ± 5%	MICA
C4	.00025	MICA	C13	300-600 μμfds.	
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	.0005	MICA

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	50,000	½	R10	500,000	TONE CON.
R2	300	½	R11	50,000	½
R3	250	½	R12	250,000	½
R4	20,000	½	R13	500,000	½
R5	1,000	½	R14	400,000	½
R6	2 MEG.	½	R15	100,000	½
R7	500,000	VOL. CON.	R16	300	½
R8	3,000	½	R17	100,000	½
R9	5 MEG	½	R18	500,000	½

I.F. — 455 K.C.
SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF SOCKETS SHOWN



FOR 12" DYN. SPKR. FIELD RES IS 1400Ω V.C. D.C.—3.5Ω; 400Ω—4Ω.

NOTE: C18 is not used on the 7H-PH Automatic, R18 connects directly to the Phono Pickup. In the 7H-PH Automatic the value of R17 is 250,000 ohms 1/2 watt.

PROCEDURE FOR SETTING UP PUSH BUTTONS

Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector knob. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

VOLTAGE DATA

6A7 tube	
Plate (P) to ground	190 volts
Screen grid (G3) to ground	94 volts
Anode grid (G2) to ground	183 volts
Cathode (K) to ground	3 volts
6D6 tube	
Plate (P) to ground	190 volts
Screen grid (G2) to ground	94 volts
75 tube	
Plate (P) to ground	85 volts
76 tube	
Plate (P) to ground	103 volts
Cathode (K) to ground	5 volts
41 tube	
Plate (P) to ground	181 volts
Screen grid (G2) to ground	190 volts
Cathode (K) to ground	12 volts
80 tube	
Filament (F) to ground	260 volts

IF PEAK 455 KC

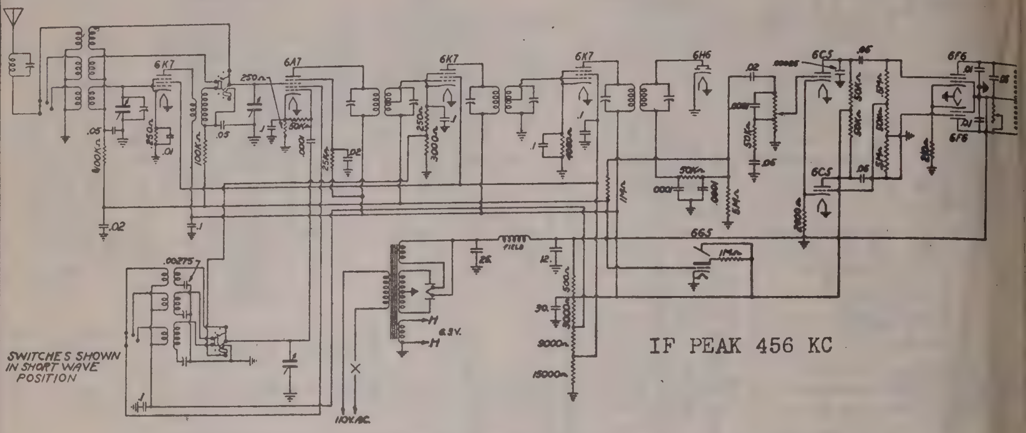
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII.

ALIGNMENT FREQUENCIES

BROADCAST BAND
TRIM OSC.--1550 KC
TRIM ANT.--1400 KC
PAD--- 600 KC

SHORT WAVE BAND
TRIM OSC.--18100 KC
TRIM ANT.--16000 KC

FOR TRIMMER LOCATIONS
SEE SOCKET LAYOUT.

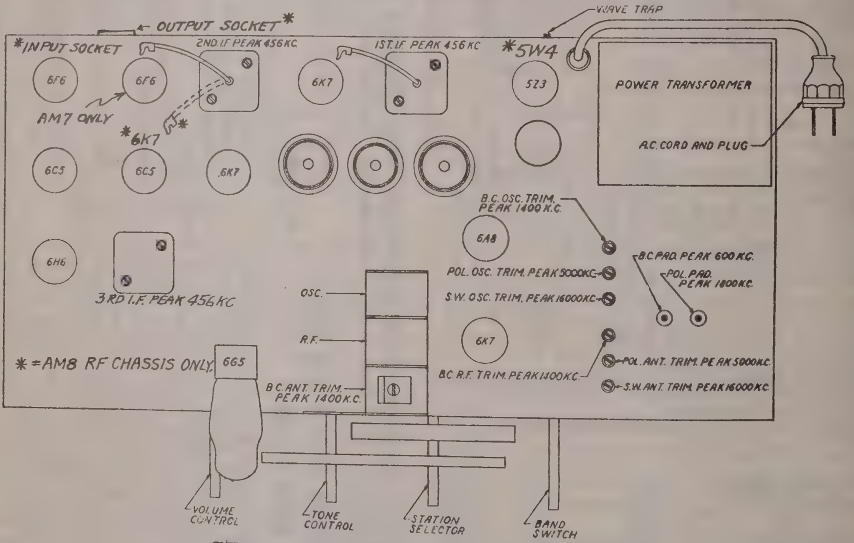


IF PEAK 456 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

WAVE TRAP ADJUSTMENT

At the rear of the chassis near the Antenna and Ground posts is an adjustment screw connected to a trap circuit for elimination of code interference when operating on the broadcast band. If code interference is encountered adjustment of this screw wil filter it out. It is to be used only if such interferenc is experienced in broadcast reception. It's use pre vents code transmitters operating on a frequenc around 456 K. C. from being received by the I. F amplifier which is tuned to 456 K. C.



SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6A8 (short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage. Grounding or shorting the stator and grid components should be accomplished by groundin the stator mounting nut to the frame of the con denser with a screw-driver or any metallic con ductor.

Do not wedge a screw-driver between the plates fo this is liable to permanently warp the plates an thus prevent the oscillator section of the gang con denser from tracking

AUTOMATIC RECORD CHANGER

This **Record Changer** will automatically play a series of eight 10" or seven 12" records of the standard 78 R.P.M. type. Records of the last few years with the standard eccentric or spiral stopping groove on the inside and an eccentric on the outside will operate the automatic mechanism. However, records of any size up to 12" may be played manually.

OPERATION

Before operating the phonograph, either automatically or manually, be sure that the pickup is down and can be moved by hand. If not, a "cycle" must be completed to bring it down. To do this, throw **Turntable Switch** "On". The turntable will begin to revolve and the cycle of motion on the pickup arm will be resumed. When the pickup arm comes down, turn off the **Turntable Switch.**

CAUTIONS

1. Never use force to start or stop the motor or any part of the record-changing mechanism or pickup arm.

2. The use of records which have become warped or damaged through improper care, may cause the mechanism to jam and damage the instrument. Records which have become warped, will slide on one another when playing, resulting in unsatisfactory reproduction.

3. This instrument is not recommended for playing 10" and 12" records in mixed sequence. If this service is desired, all records must be perfectly flat and free from warp. The **index** and **record reject lever** must be set at "10" and after playing the last selection, the pickup will come down in position for a 10" record and repeat the playing of the record on a 10" diameter unless the **turntable switch** is turned off. Any jamming of the mechanism under these conditions indicates that the records used are not perfectly flat or that their edges are not sufficiently smooth to permit normal operation of the separators in dropping each record in sequence onto the turntable.

4. Do not leave records on the record holder posts, as they are liable to warp, particularly so in warmer climates. Keep your records in a record file (album or cabinet) when not in use.

5. The needle must be installed according to directions under "Pickup and Top-Loading Needle Socket" for proper operation of this instrument.

6. The two red mounting bolts which hold the Automatic Record Player solid for shipping must be removed before using the Automatic Record Player so it can "float" on the spring mountings.

7. LEVELING—When a record has been played the pickup moves out, another record is dropped down, and the needle is fed automatically into the starting groove of this record. If the needle fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the feet on that side. If the needle slides over a few grooves, raise the left-hand side of the cabinet in a similar manner.

8. LUBRICATION—A few drops of good quality light machine oil should be applied about once every six months at the base of the spindle below the metal washer under the turntable.

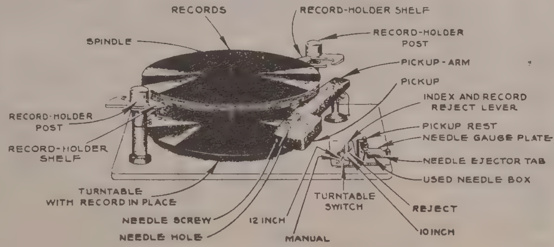


Fig. 2—Top View of Automatic Record Changer

CONTROLS AND MECHANISM

INDEX AND RECORD REJECT LEVER

This lever is located near the right front corner of the motorboard with its index plate marked for four positions—"Manual", "12", "10", and "Reject" When it is desired to change record selections manually, this lever should be set in the "Manual" Position. With the lever in the "12" position, the mechanism is set to play a series of 12" records automatically. To play either a series of 10" records or 10" and 12" records mixed, the lever should be set at the "10" position. To reject a record being played, or to start the record changing cycle in case the record just played does not have the standard eccentric or spiral stopping groove, simply push the lever to the "reject" position and let go. The pickup will rise and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If a series of 12" records is to be played, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its "Manual" position when not actually playing records automatically.

TURNTABLE SWITCH

The Slide Switch located just in front of the **Index** and **Record Reject Lever** controls the current to the turntable motor. To start the turntable, push the switch to the "On" position. To stop the turntable, push the switch to the "Off" position.

NEEDLES

The use of high grade long playing needles is absolutely essential for the proper operation of this instrument, as the regular needles are only good for one or at the most two records. If any needle is used too long, distortion and poor quality will be obtained and also the records will be damaged.

PICKUP AND TOP-LOADING NEEDLE SOCKET

The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved out to the right beyond the turntable and placed at rest on the support with the edge of the pickup arm in the groove and the pickup over the needle gauge plate. The pickup must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle plate and then tighten the needle screw.

NEEDLE EJECTOR

The extending tab on the needle gauge plate of the needle box operates the needle ejector. To change a needle, place pickup in rest position, loosen needle screw and press the extending tab on the needle gauge plate to drop the used needle into the box below. Release tab allowing the needle gauge plate to swing back, and then insert a new needle in the pickup as described above.

RECORD HOLDER SHELVES

To place a record on the turntable or to remove records, raise the record holder shelves by lifting with the fingers under the shelf, and swing clear of the outer edge of record. Also push back vertical lever adjacent to the rear record holder post. The turntable is now accessible. Before loading the magazine for **automatic operation,** swing the record holder shelves back into position.

AUTOMATIC OPERATION

1. See that the pickup is over the needle gauge plate with the needle properly in place. If not, complete a "cycle" as explained in the first paragraph under "Operation".

2. With the **Index** and **Record Reject Lever at "Manual",** place the first of the series of records on the turntable and the remainder of the series (up to seven 10" or six 12" records) on the record holder posts (as shown in Fig. 2). The records should be arranged in the desired order with the desired selection face up and the last selection on top.

3. Set the **Index** and **Record Reject Lever** to the proper position. (See **Controls: Index and Record Reject Lever.**)

4. Push the turntable switch to the left—**"On"** turntable should commence to revolve.

5. When the turntable has attained speed, lift pickup and lower gently on to the record so that the needle point enters the outside groove.

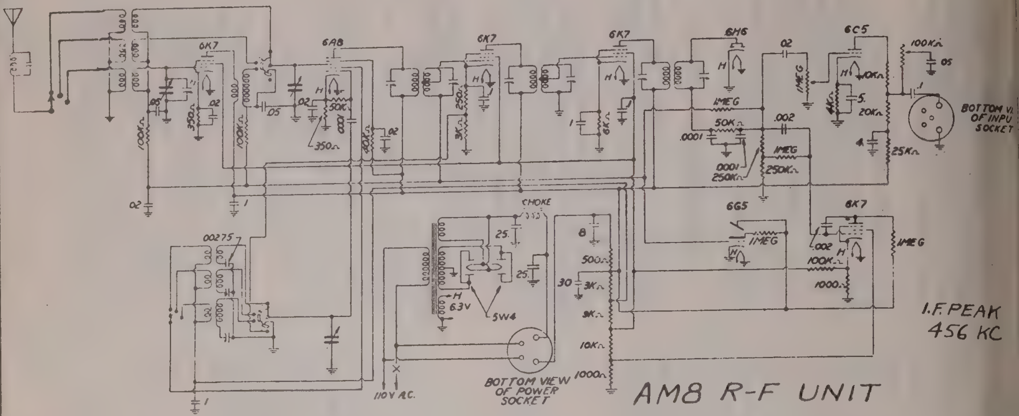
6. Adjust volume control to the desired intensity and tone control to the preferred setting.

7. Close the lid of the cabinet to eliminate mechanical reproduction of sound by the needle.

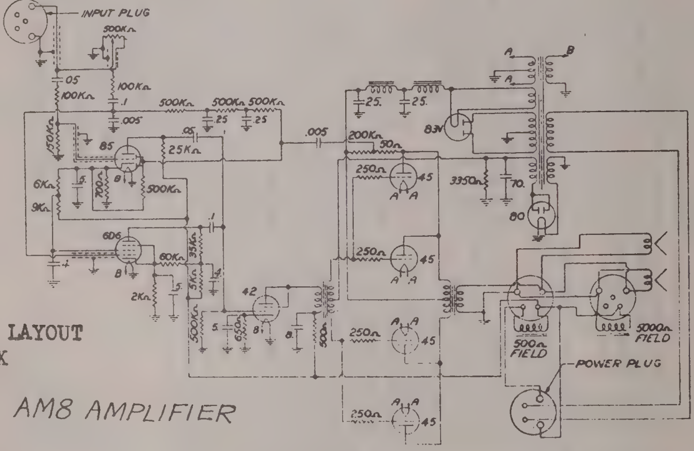
The whole series of records will now play without further attention, and the last record will repeat until the **Turntable Switch** is turned off. Allow the record-changing mechanism to complete its cycle before the turntable is stopped. Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with the pickup over the needle gauge plate. The record player is then ready for reloading, or for manual operation.

MODEL AM8
Schematic
Amplifier Layout

CONTINENTAL RADIO & TELEV. CORP.

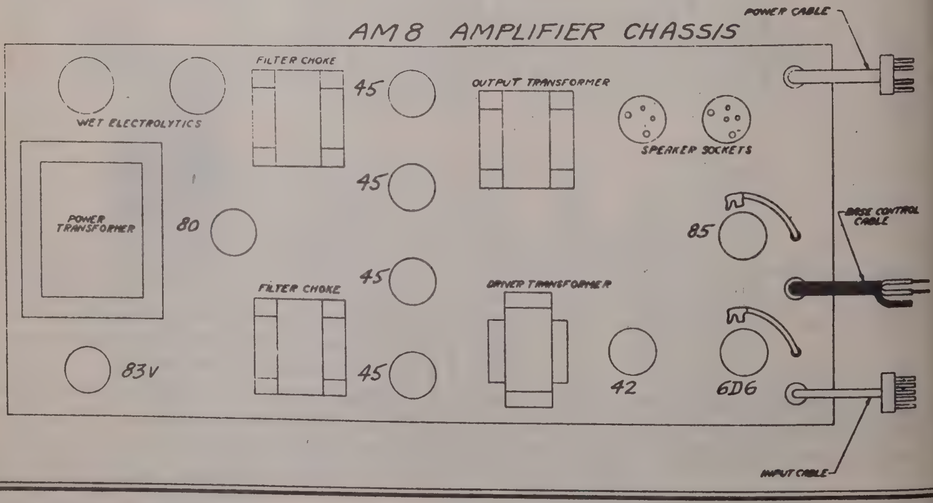


AM8 R-F UNIT



FOR R-F UNIT LAYOUT SEE INDEX

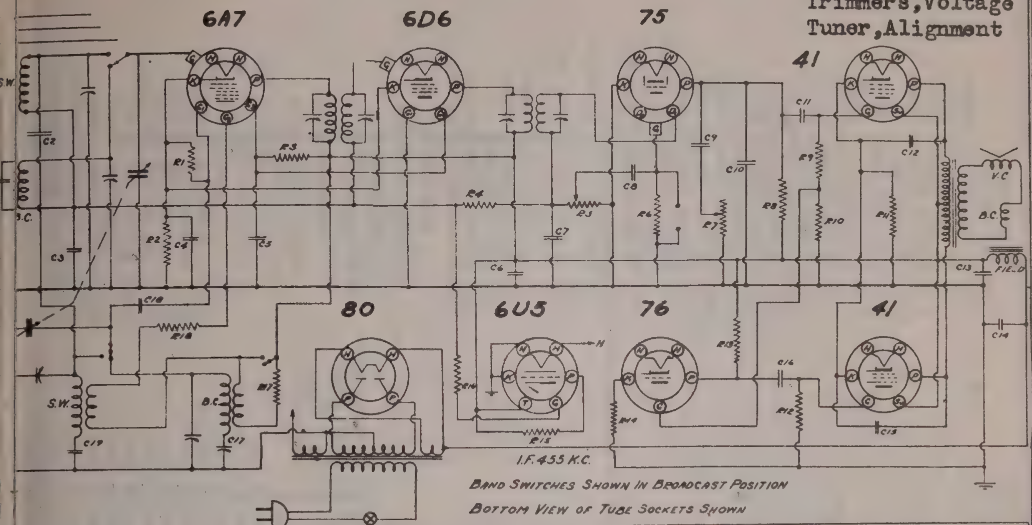
AM8 AMPLIFIER



AM8 AMPLIFIER CHASSIS

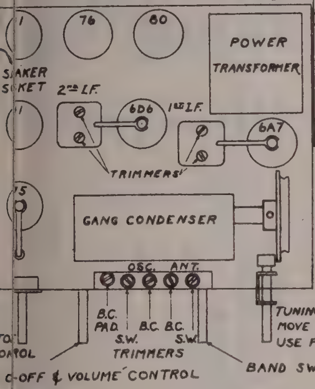
CONTINENTAL RADIO & TELEV. CORP.

MODEL 8C
Schematic, Socket
Trimmers, Voltage
Tuner, Alignment



BAND SWITCHES SHOWN IN BROADCAST POSITION

BOTTOM VIEW OF TUBE SOCKETS SHOWN



RESISTORS					
No.	OHMS	WATTS	No.	OHMS	WATTS
R1	50,000	½	R11	300	½
R2	200	½	R12	½ Meg	⅛
R3	20,000	½	R13	50,000	½
R4	2 Meg.	½	R14	3,000	½
R5	½ "	V.C.	R15	1 Meg	¼
R6	3 "	½	R16	1 "	⅓
R7	½ "	T.C.	R17	1000	½
R8	¼ "	½	R18	250	½
R9	400,000	½			
R10	100,000	½			

CAPACITORS					
No.	MFDS.	VOLTS.	No.	MFDS.	VOLTS
C1	.0001	MICA	C11	.01	400
C2	GIMMICK		C12	.005	600
C3	.05	200	C13	10.0	350
C4	.25	200	C14	10.0	350
C5	.05	400	C15	.005	600
C6	.05	400	C16	.01	400
C7	.00025	MICA	C17	.0003-.0006	PADDER
C8	.01	400	C18	.0001	MICA
C9	.005	600	C19	.004 ± 5%	
C10	.00025	MICA			

IF PEAK 455 KC FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION OF VOLUME VIII.

ALIGNMENT

BROADCAST BAND

TRIM B.C. OSC. AT 1730 KC
TRIM B.C. ANT. AT 1400 KC
PAD B.C. PAD AT 600 KC

SHORT WAVE BAND

TRIM S.W. OSC. AT 18100 KC
TRIM S.W. ANT. AT 16000 KC

EAKER (Part No. P3499) 6" Dynamic

Field resistance	1500 ohms
D.C. voice coil resistance	3.2 ohms
Voice coil impedance at 400 cycles	3.8 ohms

tages—Line 115 volts A.C. Power consumption 5 watts. Volume control maximum. Meter 1000 ns per volt.

7 tube

Plate (P) to ground	195 volts
Screen grid (G3) to ground	95 volts
Anode grid (G2) to ground	187 volts
Cathode (K) to ground	3½ volts

6 tube

Plate (P) to ground	195 volts
Screen grid (G2) to ground	95 volts
Cathode (K) to ground	3½ volts

tube

Plate (P) to ground	75 volts

tube

Plate (P) to ground	100 volts
Cathode (K) to ground	5 volts

41 tube

Plate (P) to ground	184 volts
Screen grid (G2) to ground	196 volts
Cathode (K) to ground	13.5 volts

80 tube

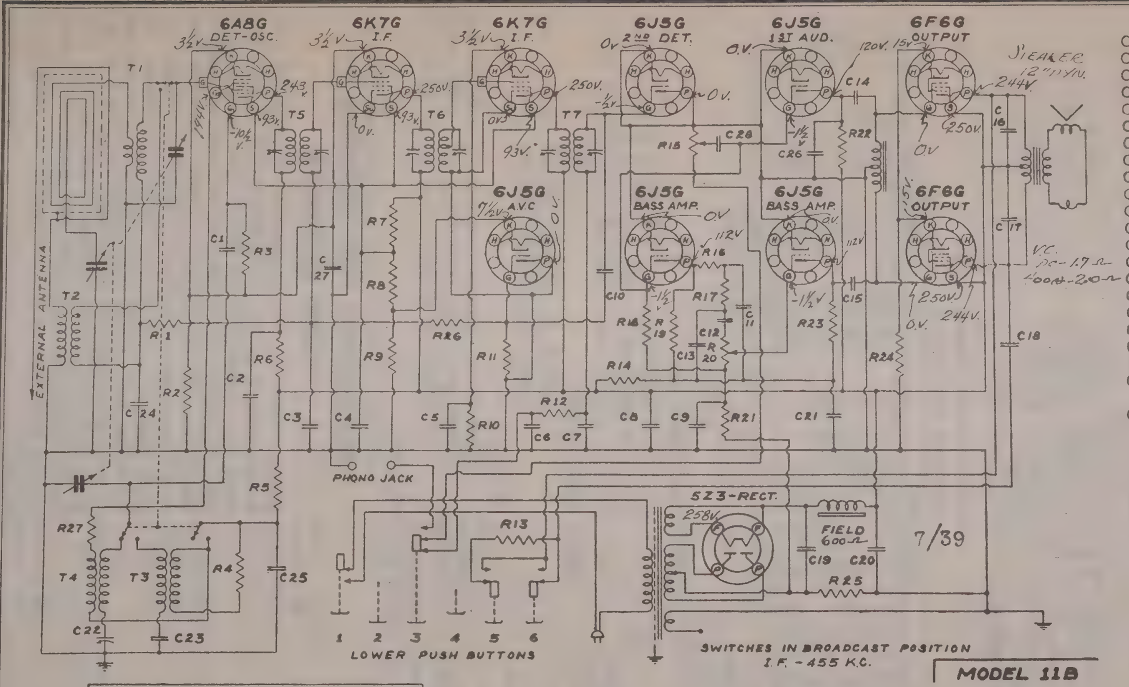
Filament (F) to ground	302 volts

PROCEDURE FOR SETTING UP PUSH BUTTONS

Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector knob. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

MODELS 11B,11B-PH
Schematic,Socket
Trimmers,Voltage
Alignment

CONTINENTAL RADIO & TELEV. CORP.



	CONDENSERS
C 1–	.0001 mfd. mica
C 2–	.05 mfd. 400 volt tubular
C 3–	.05 mfd. 200 volt tubular
C 4–	.25 mfd. 200 volt tubular
C 5–	.05 mfd. 200 volt tubular
C 6–	.0001 mfd. mica
C 7–	.0001 mfd. mica
C 8–	.05 mfd. 400 volt tubular
C 9–	.25 mfd. 200 volt tubular
C10–	.00005 mfd. mica
C11–	.05 mfd. 400 volt tubular
C12–	.1 mfd. 400 volt tubular
C13–	.1 mfd. 400 volt tubular
C14–	.15 mfd. 400 volt tubular
C15–	.15 mfd. 400 volt tubular
C16–	.002 mfd. 600 volt tubular
C17–	.002 mfd. 600 volt tubular
C18–	.02 mfd. 400 volt tubular
C19–	25 mfd. 475 volt wet electrolytic
C20	20 mfd. 450 volt dry electrolytic
C21	15 mfd. 450 volt dry electrolytic
C22–	300—600 mmfd., B. C. pad
C23–	.004 mfd. mica, 5% S.W. pad
C24–	.05 mfd. 200 volt tubular
C25–	.05 mfd. 400 volt tubular
C26–	00025 mfd. mica
C27–	25 mfd. 200 volt tubular
C28–	.01 mfd. 400 volt tubular

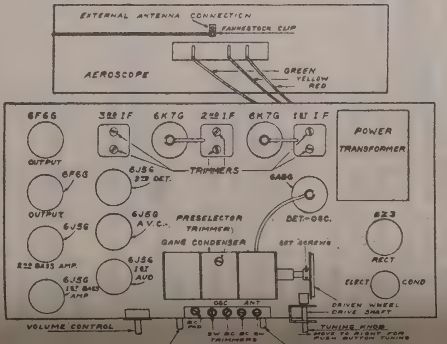
ALIGNMENT

BROADCAST BAND

Pad-600 kc
Trim osc-1550 kc
" ant-1400 kc

SHORTWAVE BAND

Trim osc- 18,100 kc
" ant- 16,000 kc

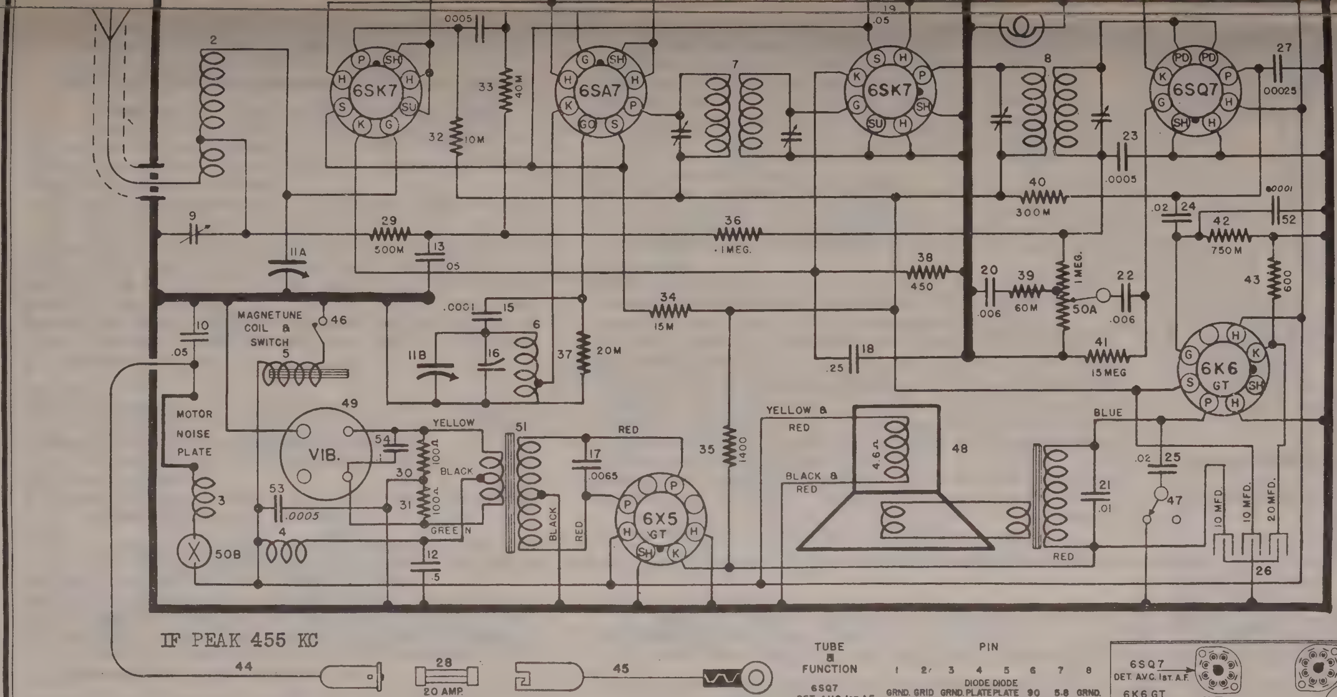


I.F. 455 KC
FOR CONVENTIONAL
ALIGNMENT SEE SPECIAL
SECTION OF VOL.VIII

AT LEFT
TOP VIEW OF CHASSIS

VOLTAGES;- FROM POINT INDICATED TO GROUND. LINE 115 V AC. DC 125W

	RESISTORS
R 1—	250,000 ohm ½ watt
R 2—	170 ohm 1/3 watt 10%
R 3—	50,000 ohm ½ watt
R 4—	1,000 ohm ½ watt
R 5—	10,000 ohm ½ watt
R 6—	3,000 ohm ½ watt
R 7—	20,000 ohm 2 watt
R 8—	30,000 ohm ½ watt
R 9—	3,000 ohm ½ watt
R10—	500 ohm ½ watt
R11—	1,000,000 ohm ½ watt
R12—	20,000 ohm ½ watt
R13—	10,000 ohm 1 watt
R14—	5,000 ohm ½ watt
R15—	500,000 ohm vol. control
R16—	10,000 ohm ½ watt
R17—	20,000 ohm ½ watt
R18—	1,000,000 ohm ½ watt
R19—	25,000 ohm ½ watt
R20—	500,000 ohm bass control
R21—	500,000 ohm ½ watt
R22—	30,000 ohm ½ watt
R23—	25 000 ohm ½ watt
R24—	220 ohm 2 watt 10%
R25—	30 ohm (wire wound) ½ watt
R26—	250,000 ohm ½ watt
R27—	150 ohm ½ watt



MODEL A-169 SPECIFICATIONS

This model Crosley is a six tube single unit automobile receiver. It incorporates an unusual electric push button tuning system of simple, rugged mechanical and electrical construction. The tubes used and their functions are as follows: one 6SK7 as resistance coupled R-F amplifier, one 6SA7 as oscillator-modulator, one 6SK7 as I-F amplifier, one 6SQ7 as detector, A.V.C., 1st audio, one 6K6GT as power output and one 6X5GT as rectifier.

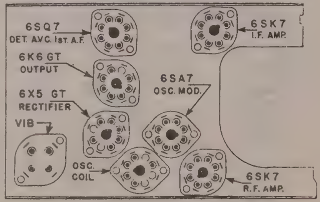
Improvements to be noted in the circuit are, the resistance coupled R-F stage and the method of connecting oscillator coil and variable level bass compensation. Bias voltage for the 6SK7 R-F amplifier and the 6SK7 I-F amplifier is developed across item 38, a 450 ohm resistor. Bias voltage for the 6K6GT is developed across item 43, a 600 ohm resistor. The 6SQ7 is operated at zero bias. A.V.C. is applied to 6SK7 (R-F) and the 6SA7. The volume control serves as the A.V.C. load and items 29 and 36, ½ and 1 megohms respectively, act as filters. Item 16 is a chemical condenser which automatically compensates for temperature differences, preventing station drift. The filter circuit is similar to that of Model A-259 using a resistive circuit.

TUBE & FUNCTION	PIN 1	2	3	4	5	6	7	8
6SQ7 DET. A.V.C. 1st. A.F.	GRND.	GRID	GRND.	DIODE PLATE	DIODE PLATE	90	5.8	GRND.
6SK7 I.F. AMP.	GRND.	GRND	GRND.	GRID.	3.5	80	5.8	215
6K6 GT OUTPUT	J.B.	5.8	235	215	GRID	J.B	GRND.	15.5
6X5 GT RECTIFIER	GRND.	GRND.	A.C. 265	J.B.	A.C 265.	N.C.	5.8	250
6SA7 OSC. MOD.	GRND.	GRND.	215	80	OSC. GRID.	CATH.	5.8	GRID
6SK7 R.F. AMP.	GRND.	GRND.	GRND.	GRID	3.5	80	5.8	215

Battery drain at 6 volts = 7 amps

VOLTAGES MEASURED WITH 1000Ω PER VOLT VOLTMETER FROM CHASSIS TO TUBE PRONG AND MAY VARY PLUS OR MINUS 10 % OF VALUES GIVEN

N.C. -- NO CONNECTION



	PIN 1	2	3	4	5	6	7	8
OSC. COIL	N.C.	CATH.	J.B.	GRID	J.B.	N.C	GRID RET.	N.C.

J.B. -- JUNCTION BLOCK

FOR ALIGNMENT AND TUNER DATA, SEE INDEX

JANUARY, 1940

MODEL A169
MODEL A259
Alignment,Trimmers
Tuner

THE CROSLEY CORP.

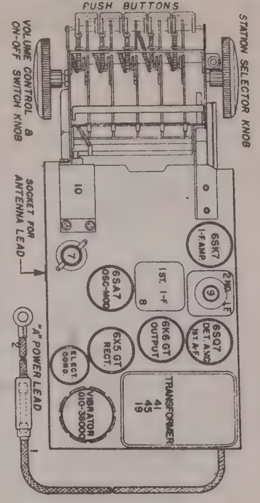


Fig. 2-A—Top View A-259

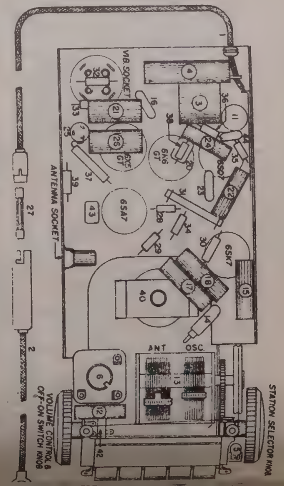


Fig. 3-A—Bottom View A-259

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, such as when an I-F assembly has been changed and etc., the circuit can best be properly aligned with the use of a MODULATED SIGNAL GENERATOR and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6K6GT output tube. Be sure the meter is protected from D.C. by connecting a condenser (0.1 mf. or larger—not electrolytic) in series with one of the meter leads.

1. Aligning the I-F to 455 Kilocycles

(a) Connect the ground lead from the signal generator to the chassis frame. Connect the high side of generator through an .02 mf. condenser to the grid (pin No. 8) of the 6SA7 oscillator-modulator. Care should be exercised to keep signal generator leads as far as possible from the other grid leads.

(b) Open gang condenser all the way (minimum) turn volume control to maximum and then set signal generator to 455 kilocycles.

(c) Adjust both 2nd I-F trimmers for maximum output. Trimmers are accessible from bottom of the chassis between the 6SQ7 and 6SK7 sockets.

(d) Adjust both 1st I-F trimmers for maximum output. Trimmers accessible from bottom of the chassis.

(e) Repeat (c) and (d) with as low an output as gives a reasonable indication on output meter for more accurate adjustment.

2. Aligning the R-F

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "ANT" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser on Model A-169 only.

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser, located near antenna receptacle, for maximum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

(f) Tune in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune in a WEAK station between 55 and 65 on the dial.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

4. Setting the Push Buttons

The push buttons are easily and accurately set from the front of the case without removing any panels, etc.

To set push buttons, lift up on push button and the setting screw is easily accessible. Loosen the screws of the buttons to be set, two or three turns to the left. It is not necessary that all the buttons be set at the same time.

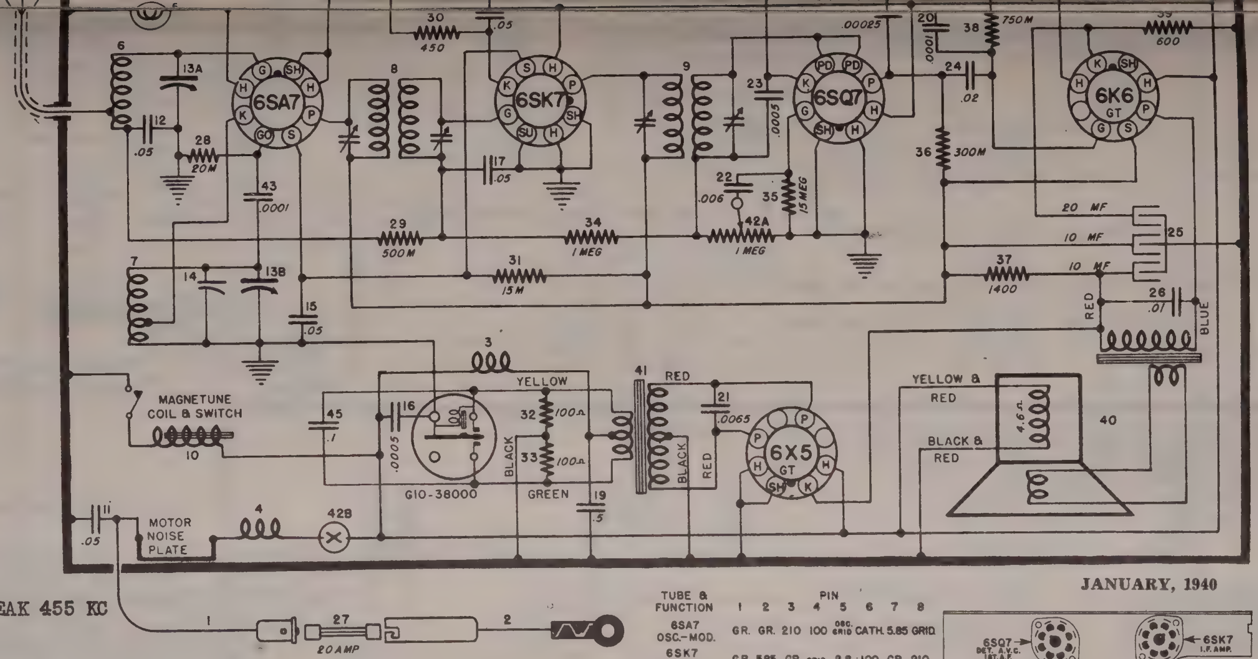
Determine the five favorite stations whose call letters are to be placed in the call letter holder (holder enclosed in the instruction envelope). Place the call letters in the holder in the order of their frequency (kilocycles), that is, the station that is tuned-in nearest the 150 marking on the dial, should be placed in the right-hand opening, etc. After call letters have been placed in the holder, break off the celluloid strip five pieces to insert in front of the call letters to protect and hold them in place.

With the special screws provided (two, enclosed in the instruction envelope) mount the call letter holder in place above the push buttons.

By means of the manual tuning knob tune-in AS ACCURATELY AS POSSIBLE, the station whose call letter has been placed in the right-hand opening. REMEMBER: the accuracy of the push buttons depends upon how accurate YOU tune-in the station when setting them.

Lift up the right-hand push button and with a small screw driver push the key all the way down. While holding the key down, securely tighten the setting screw. It is essential that you apply pressure while tightening the setting screw, in order to keep mechanism lined up with station tuned-in.

Remove screw driver and the first button is set, follow through with the same procedure to set the rest of the push buttons.



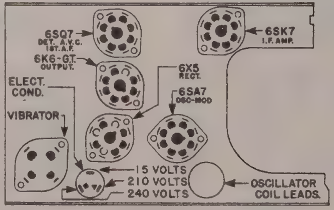
IF PEAK 455 KC

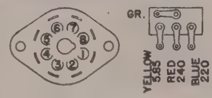
TUBE & FUNCTION	PIN 1	2	3	4	5	6	7	8
6SA7 OSC.-MOD.	GR.	GR.	210	100	OSC. GRID	CATH.	5.85	GRID
6SK7 I.F. AMP.	GR.	5.85	GR.	GRID	2.8	100	GR.	210
6SQ7 DET.-AVC.-1st.A.F.	GR.	GRID	GR.	DIODE PLATE	DIODE PLATE	28*	5.85	GR.
6K6-GT. OUTPUT.	GR.	5.85	220	210	GRID	J.B.	GR.	1.5
6X5 RECT.	GR.	GR.	⊕256	OPEN	⊕256	5.9 J.B.	5.9	240

* 50 VOLT SCALE, 1000 OHMS PER VOLT.
⊕ A.C., TO GROUND

6.5 AMPERES AT 6 VOLTS, NORMAL OPERATING CURRENT.
7.0 AMPERES AT 6 VOLTS, SOLENOID OPERATING CURRENT.

VOLTAGES MEASURED WITH 1000-Ω PER VOLT VOLTMETER FROM TUBE PRONG TO CHASSIS AND MAY VARY PLUS OR MINUS 10% OF VALUES GIVEN. GR.-GROUND.
OPEN-NO CONNECTION. J.B.-JUNCTION BLOCK.



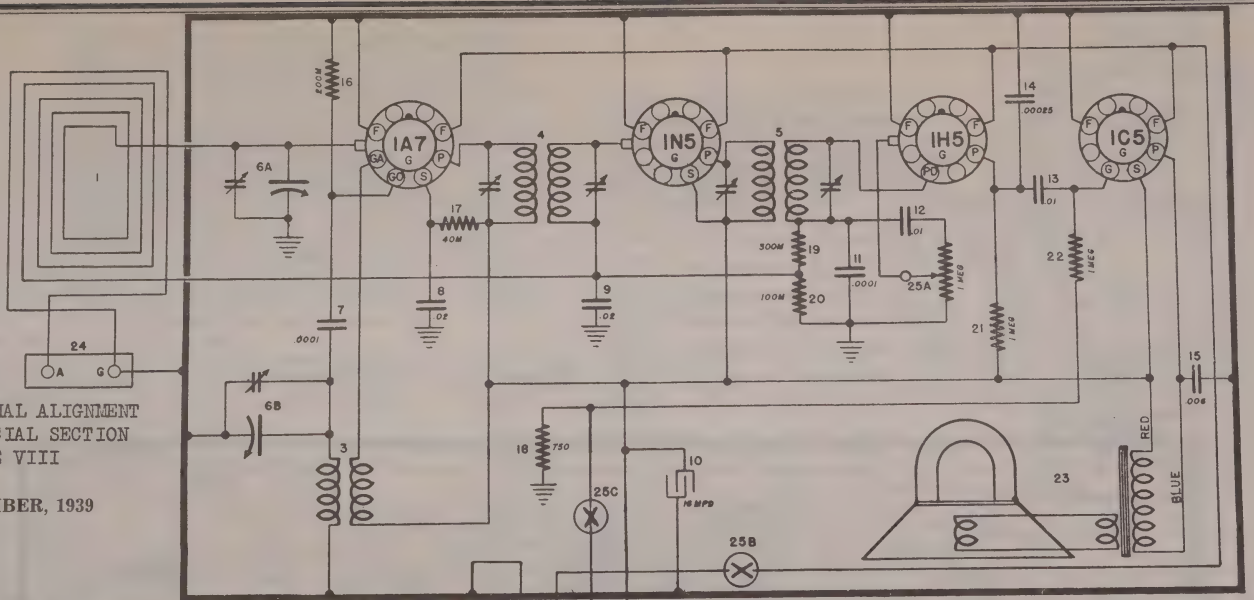


MODEL A-259 SPECIFICATIONS

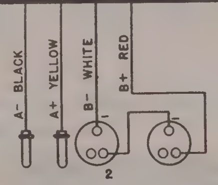
This model Crosley Roamio is a single unit five tube superheterodyne receiver. It incorporates an unusual electric push button tuning system of simple, rugged mechanical and electrical construction. The tubes used and their functions are as follows: one 6SA7 as oscillator-modulator, one 6SK7 I-F amplifier, one 6SQ7 as diode detector, A.V.C., and 1st audio, one 6K6GT as pentode output and one 6X5GT as rectifier. The 6SA7 oscillator circuit is unusual in that the cathode is tied to a tap on the oscillator coil which is several turns above ground. Bias for the 6SK7 is obtained from the drop across item 30, a 450 ohm resistor and bias for the 6K6GT is obtained from the drop across item 39, a 600 ohm resistor. The 6SQ7 is operated at zero bias. A.V.C. is supplied to the 6SA7 and 6SK7 through item 29, a 500,000 ohm filter and item 34, a 1 megohm filter respectively. The B circuit is filtered by means of item 37, a 1,400 ohm resistor, and the two 10 mf. sections of item 25, a three section electrolytic condenser. Item 14 is a chemical temperature compensating condenser used in the oscillator circuit to prevent station drift.

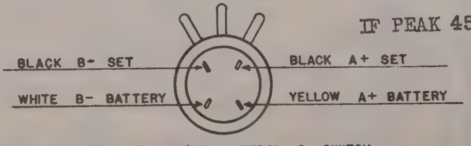
MODEL 429
Schematic,Socket,Voltage
Trimmers,Alignment,Chassis

THE CROSLEY CORP.



IF PEAK 455 KC

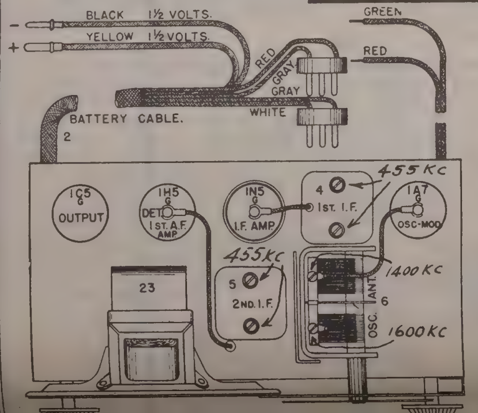


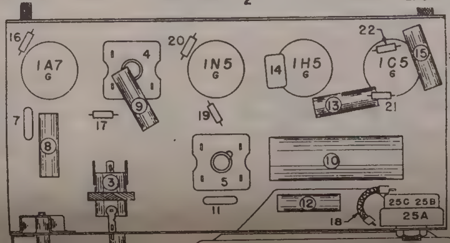


BACK VIEW OF VOLUME CONTROL & SWITCH

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

NOVEMBER, 1939



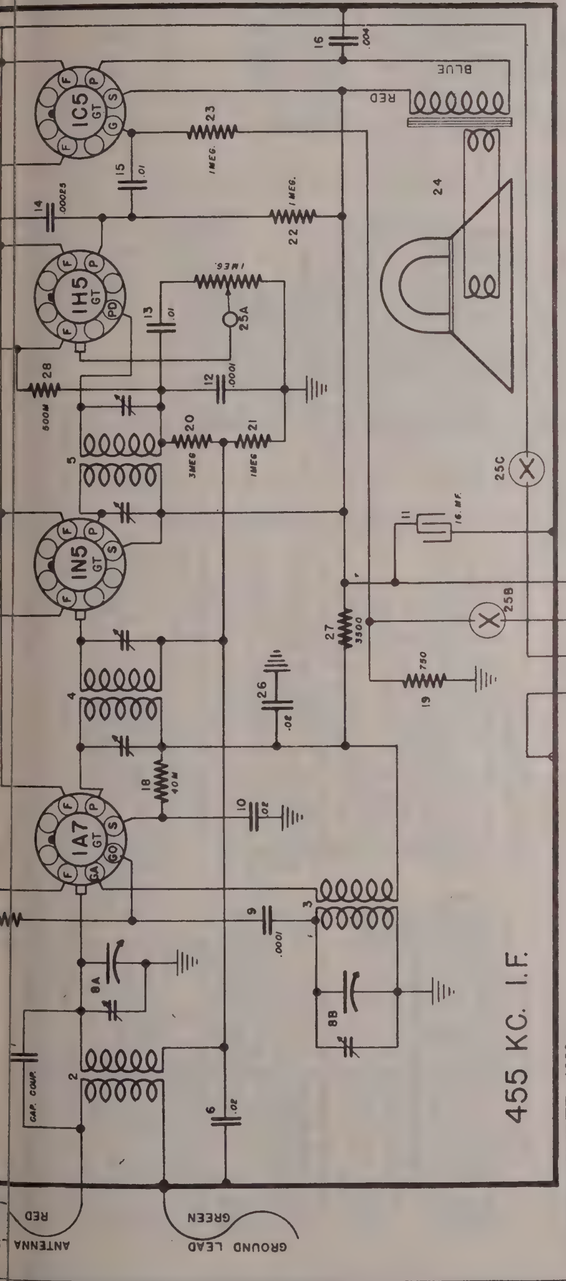


Tube	Function	H	P	S	G	Ga
1A7-G	Oscillator-Modulator	1.5	82	48	0	82
1N5-G	I-F Amplifier	1.5	82	82	0	—
1H5-G	Detector & 1st A-F Amp.	1.5	17	—	0	—
1C5-G	Output	1.5	78	82	6*	—

Power Output approximately .5 Watt.
"A" Battery Drain approximately .25 Ampere at 1.5 Volts.
"B" Battery Drain approximately 8.5 Milliamperes at 90 Volts.
*Measured across item 18.

THE CROSLEY CORP.

MODELS 449,459
Schematic,Socket,Trimmers
Chassis



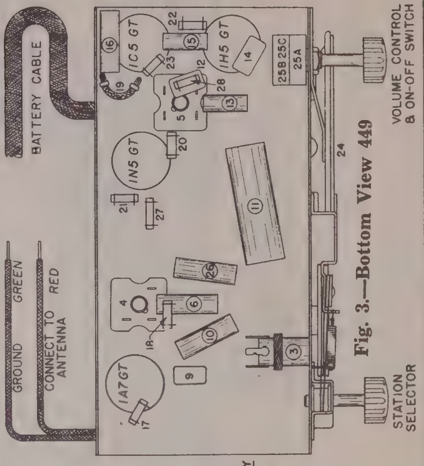
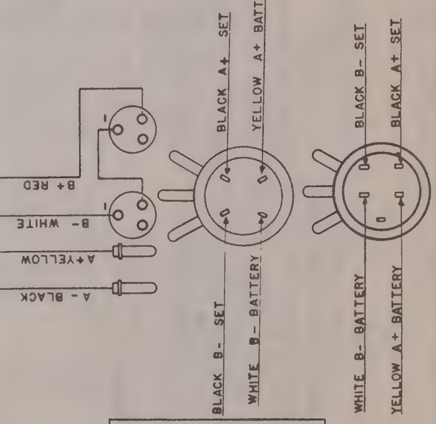


Fig. 3.—Bottom View 449



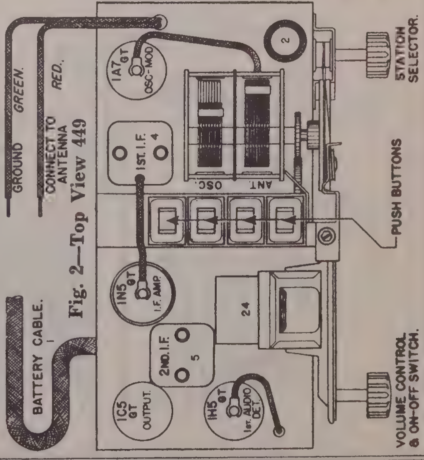


Fig. 2—Top View 449

NOVEMBER, 1939

THE CROSLEY CORP.

SPECIFICATIONS

The Crosley Model 449 and 459 radio is a four-tube superheterodyne receiver designed for operation from batteries. The method of connecting the battery cable to the batteries is shown on the Wiring Diagram. The batteries required are: one Crosley A & B Battery Pack No. CR28 or one 1.5 volt "A" (EVEREADY NO. 740 or equivalent) and two plug-in type 45 volt "B" batteries.

TUBES AND VOLTAGE LIMITS

The following table gives the function of the tubes used, together with the voltage reading between the tube socket contacts and the chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and the volume control full on and no signal input. The filament voltages should be measured with an accurate low range DC voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	Ga	Go
1A7-G	Oscillator-Modulator	1.5	72	30	—	72	—
1N5-G	I-F Amplifier	1.5	82	82	—	—	—
1H5-G	Detector & 1st A-F Amp.	1.5	10	—	—	—	—
1C5-G	Output	1.5	80	82	8*	—	—

Power Output approximately .5 Watt.
"A" Battery Drain approximately .25 Ampere at 1.5 Volts.
"B" Battery Drain approximately 9 Milliamperes at 90 Volts.
*Measured at No. 8 Socket Lug and Chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter across the "P" and "S" terminals of the 1C5G output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 1A7G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the GREEN lead of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely in mesh and turn the volume control knob to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I-F trimmers for maximum reading on the output meter. (Fig. 2).

(e) Adjust both trimmers on the 1st I-F transformer for maximum output. (Fig. 2).

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0002 mfd. condenser to the RED lead of the receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) Open the condenser gang all the way.

(c) Adjust the "OSC" trimmer condenser on gang for maximum output.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).

(f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.

(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

If any of the circuits have been re re-adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

Remove push buttons by pulling straight up. With a small screw driver loosen the set screw a turn or two. With the manual tuning knob tune-in as ACCURATELY AS POSSIBLE the station for which the button is to be set. Then push the button key all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the push button. Use same procedure in resetting or adjusting the rest of the push buttons.

PARTS LIST — MODEL 449 & 459

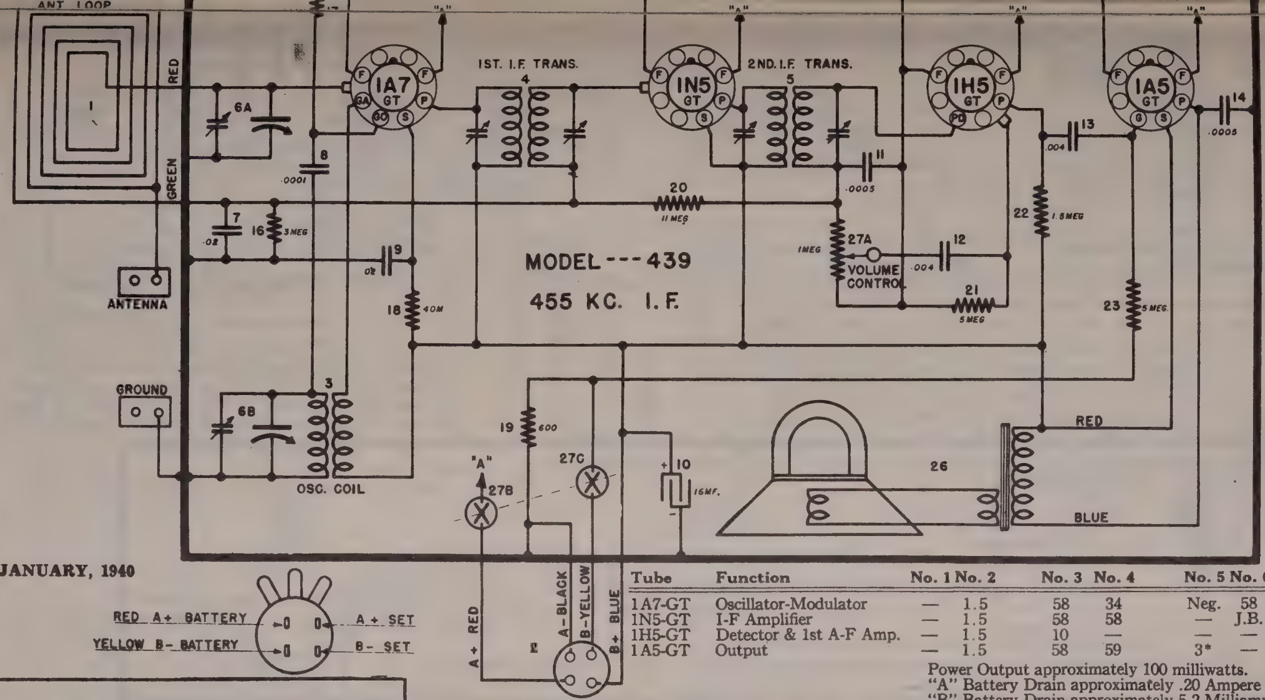
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	C —46433A	Battery Cable (449)
1	C —47061	Battery Cable (459)
2	G185—32002	Antenna Coil
3	G201—32002	Oscillator Coil
4	G194—32004	1st I. F. Transformer
5	G195—32004	2nd I. F. Transformer
6	W —28621	Condenser, .02 Mf. 200 V. Paper
7	G6 —50640	Condenser Capacity Coupling
8A 8B	G66 —33001	2 Gang Var. Cond. Antenna Section Oscillator Section
	MG12—46750	Riveted Back Plate
	G15 —43564	Pulley and Hub Assembly
	B —46830	Dial Face Back
	—45808	No. 8 x 5/16" H. H. P. K. Screw (Dial Face Back) (Drive Shaft Brkt.)
	W —46831A	Dial Pointer
	—48160	Drive Shaft
	W —43542B	Drive Shaft Bracket
	G13 —41582	Drive Cord (30")
	W —46087	Drive Spring
	W —46290	Drive Cord Clamp
	W —23877	No. 8—32 x 5/16" Set Screw (Pulley and Hub Assembly)
	G4 —41582	Guide Cord (9")
	W —46848	Guide Cord Spring
	C —46815A	Dial Glass
	W —46321	Speed Nut (2 Req.) (8AK, 8AH and 8AG) (849 Only)
9	G2 —34002	Condenser, .0001 Mf. Molded
10	W —28621	Condenser, .02 Mf. 200 V. Paper
11	W —48122	Condenser, 16 Mf. 250 V. Elect.
12	G2 —34002	Condenser, .0001 Mf. Molded
13	W —30323	Condenser, .01 Mf. 200 V. Paper
14	G1 —34002	Condenser, .00025 Mf. Molded
15	W —30323	Condenser, .01 Mf. 200 V. Paper
16	W —28904	Condenser, .004 Mf. 200 V. Paper
17	—34018	Resistor, 200,000 Ohms 1/3W. Carb.
18	—21453	Resistor, 40,000 Ohms 1/3W. Carb.
19	W —22514	Resistor, 750 Ohms 1/2W. Flex.
20	—26577	Resistor, 3 Megohms 1/3W. Carb.
21	—21454	Resistor, 1 Megohm 1/3W. Carb.
22	—21454	Resistor, 1 Megohm 1/3W. Carb.
23	—21454	Resistor, 1 Megohm 1/3W. Carb.
24	274-PL-8-"B"	Speaker, Spec. (Model 449)
	—47292	Output Transformer
24	274-PLS-8-"B"	Speaker, Spec. (Model 459)
	—47292	Output Transformer
25A 25B 25C	—48327	Volume Control Switch "B" Supply Switch "A" Supply
25A 25B 25C	—48155	Volume Control Switch "B" Supply Switch "A" Supply
	W —46662	3/8" Pal Nut (Volume Control)
26	W —28621	Condenser, .02 Mf. 200 V. Paper
27	—30137	Resistor, 3,500 Ohms 1/3W. Carb.
28	—23785	Resistor, 500,000 Ohms 1/3W. Carb.

Part No.	Description
W —46447	Tube Shield
G178—36400	8 Prong Socket, No Marking
	PUSH BUTTON PARTS
G33 —45683	Push Button Unit Assembly
G26 —45683	Riveted Key Assembly
G62 —45683	Rocker Plate Assembly
W —50542E	Key Clip (4 Req.)
W —45646B	Adjusting Clip (1 Req.)
W —50547	Key Plate
W —50561	No. 6—40 x 1/8" Fil. Hd. Screw (Rocker Plate Bearing)
W —50588B	Adjusting Clip (3 Req.)
W —50607C	Key Return Spring (4 Req.)
—31388	No 8—32 x 3/16" W. Hd. Mach. Screw (Key Plate)
—2046	No. 8 Shakeproof Washer (Key Plate)
—45717	Adjusting Screw (4 Req.)
	MODEL 449 ONLY
—8AK	Cabinet
—8AH	Cabinet, Ivory
—8AG	Cabinet, Red
—9FA	Cabinet
—46838	Carton (8AK, 8AH, 8AG Cabinet)
—46841A	Push Buttons (4 Req) (8AK and 9FA)
—46879A	Push Buttons (4 Req.) (8AH and 8AG)
—46816	Rubber Bottom Machine Screw (8AK, 8AH, 8AG) (Chassis Mounting)
R —159	No. 8—32 x 5/8" R. H. Mach. Screw (Chassis Mounting) (9FA)
W —30409	Flat Washer (Chassis Mounting) (9FA)
—46953	Knob (2 Req.) (8AK)
—44552	Knob (2 Req.) (8AH and 8AG)
W —47483	Knob (2 Req.) (9FA)
MG31—47899	Instruction, Env. Assy. (B-449-A and B-449-D)
MG32—47899	Instruction, Env. Assy. (B-449-B and B-449-C)
	MODEL 459 ONLY
—9DC	Cabinet
—48151A	Carton (9DC)
—46953	Knob (2 Req.)
—46841A	Push Button (4 Req.)
R —159	No. 8—32 x 5/8" Rd. Hd. Mach. Screw (4 Req.) (Chassis Mtg.)
W —30409	Flat Washer (4 Req.) (Chassis Mtg.)
MG26—47926	Instruction, Env. Assy.
CR28	Crosley "A" and "B" Battery Pack (459 or 449)

MODEL 439
Schematic, Voltage
Socket, Trimmers, Chassis
Alignment

THE CROSLEY CORP.



JANUARY, 1940

Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1A7-GT	Oscillator-Modulator	—	1.5	58	34	Neg.	58	—	—
1N5-GT	I-F Amplifier	—	1.5	58	58	—	J.B.	—	—
1H5-GT	Detector & 1st A-F Amp.	—	1.5	10	—	—	—	—	—
1A5-GT	Output	—	1.5	58	59	3*	—	—	J.B.

Power Output approximately 100 milliwatts.
"A" Battery Drain approximately .20 Ampere at 1.5 Volts.
"B" Battery Drain approximately 5.2 Milliamperes at 61.5 Volts.
*Measured across item 19.
J.B. = Junction Block.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0001 mfd. condenser to the "ANT" terminal (right-hand bracket used to fasten back) of the receiver. (Check dial pointer to see that it covers complete range.

(a) Set the signal generator to 1500 kilocycles.
(b) Open the condenser gang all the way.
(c) Adjust the "OSC" trimmer condenser on gang for maximum output.
(d) Set the signal generator to 1400 kilocycles.
(e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).
(f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.
(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

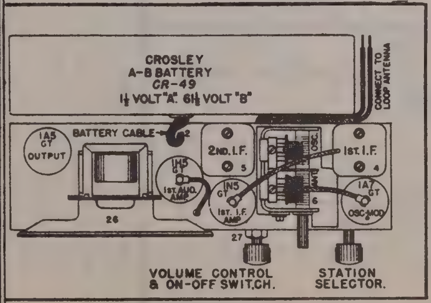


Fig. 2—Top View Model 439

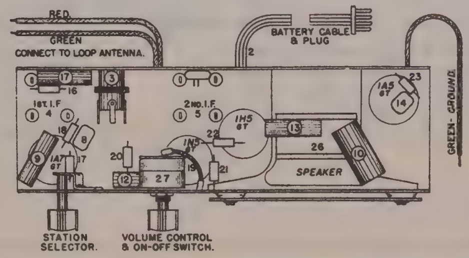
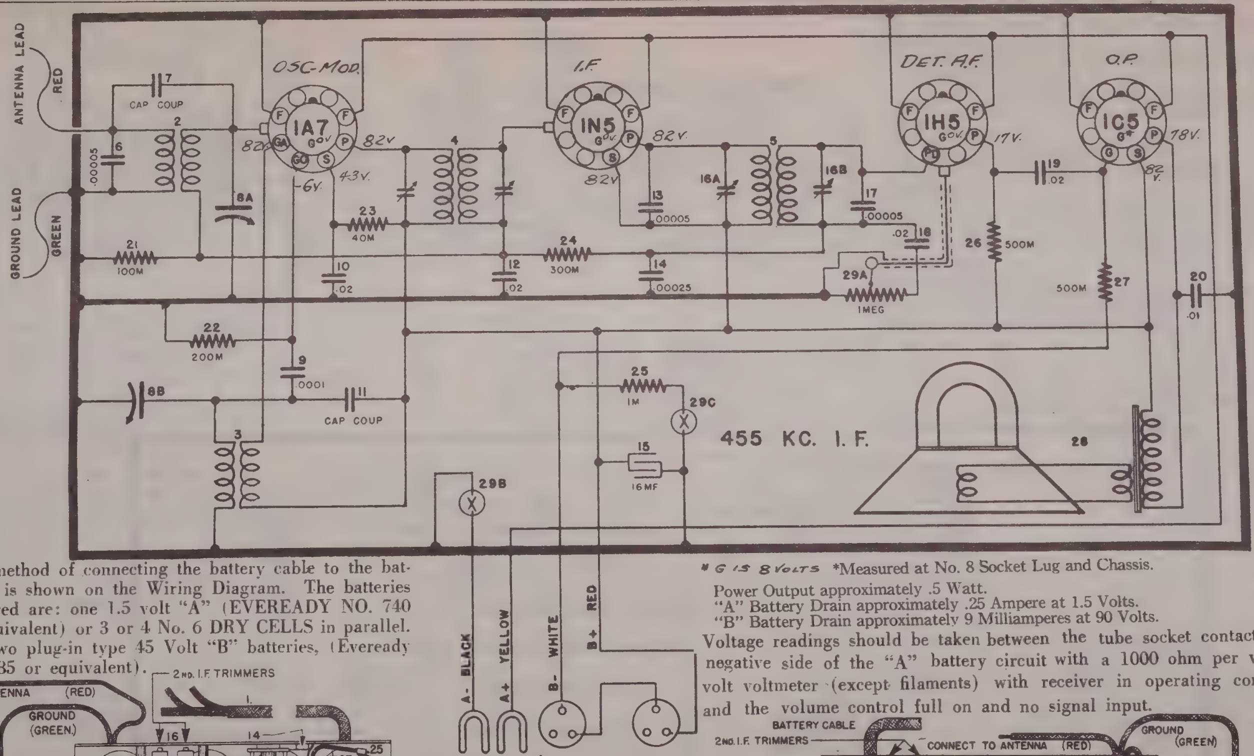


Fig. 3—Bottom View Model 439

MODEL 468
Schematic, Socket
Trimmers, Chassis
Notes

THE CROSLEY CORP.

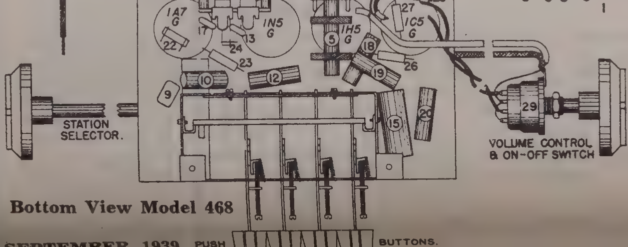


* G IS 8 VOLTS *Measured at No. 8 Socket Lug and Chassis.

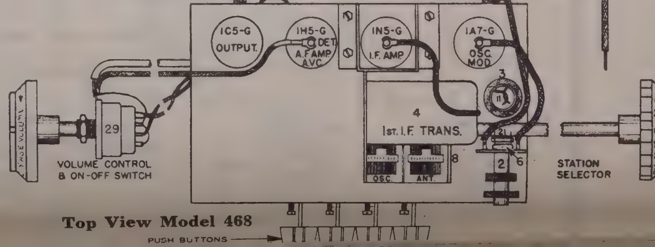
Power Output approximately .5 Watt.
"A" Battery Drain approximately .25 Ampere at 1.5 Volts.
"B" Battery Drain approximately 9 Milliamperes at 90 Volts.

Voltage readings should be taken between the tube socket contacts and the negative side of the "A" battery circuit with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and the volume control full on and no signal input.

The method of connecting the battery cable to the batteries is shown on the Wiring Diagram. The batteries required are: one 1.5 volt "A" (EVEREADY NO. 740 or equivalent) or 3 or 4 No. 6 DRY CELLS in parallel. and two plug-in type 45 Volt "B" batteries, (Eveready No. 485 or equivalent).



Bottom View Model 468



Top View Model 468

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CHASSIS MODEL 468

ALIGNMENT PROCEDURE

CONNECTING OUTPUT METER

Connect the output meter across the "P" and "S" terminals of the 1C5G output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 1A7G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely in mesh and turn the volume control knob to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I-F trimmers (located through rear of chassis flange) for maximum reading on the output meter. (Fig. 3).

(e) Adjust both trimmers located on the 1st I-F transformer (right end) for maximum output. (Fig. 2).

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

2. Aligning the R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0002 mfd. condenser to the "ANT" terminal of the receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) Open the condenser gang all the way.

(c) Adjust the "OSC" trimmer condenser on gang for maximum output.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).

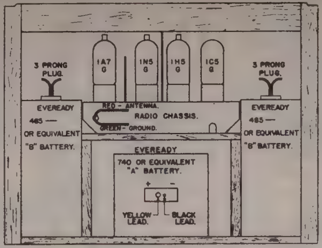
(f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.

(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

If any of the circuits have been adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

With a small screw driver or pen knife remove celluloid cover and the call letters. Insert screw driver in the hole in the front of the button and loosen the set screw a turn or two. With the manual tuning knob tune-in as ACCURATELY AS POSSIBLE the station for which the button is to be set. Then push the button all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the call letter and call letter cover. Use same procedure in resetting or adjusting the rest of the push buttons.



Rear View Model 468

CHASSIS MODELS 518 & 6518 (FOREIGN)

SPECIFICATIONS

These models are five-tube superheterodyne receivers designed for operation on A.C. circuits as specified on the Model Label. The 518 and 6518 chassis are identical electrically but differ slightly in mechanical parts due to various cabinet combinations.

CIRCUIT DESCRIPTION

Five glass (octal) tubes are used and their functions are as follows: one 6A8G as oscillator-modulator, one 6U7G as I-F amplifier, one 6Q7G as diode detector, A. V. C., and first audio amplifier, one 6K6G as power output and one 5Y3G as a half-wave rectifier. The bias for the 6K6G is obtained from the drop across item 29 a 375 ohm resistor which is in series with the speaker field (700 ohms) that is in the negative leg of the power supply.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given

MODELS 518 & 6518

ALIGNMENT PROCEDURE

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6K6G Output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).

(c) Turn the band selector switch to the Broadcast Band.

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. (Item 5, Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F transformer for maximum output. (Item 4, Fig. 2).

(g) Check operations (e) and (f) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator is connected to the antenna (A) terminal of the receiver. For both bands a 100 mmf. condenser should be connected in series with the output lead of the signal generator.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh and the band selector switch set for the band being aligned, adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL (C) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT signal is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. DO NOT READJUST THE OSCILLATOR TRIMMER.

NOTE: When shunt aligning the Short Wave Band care should be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator 10 times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram (item 42).

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a 100 mmf. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

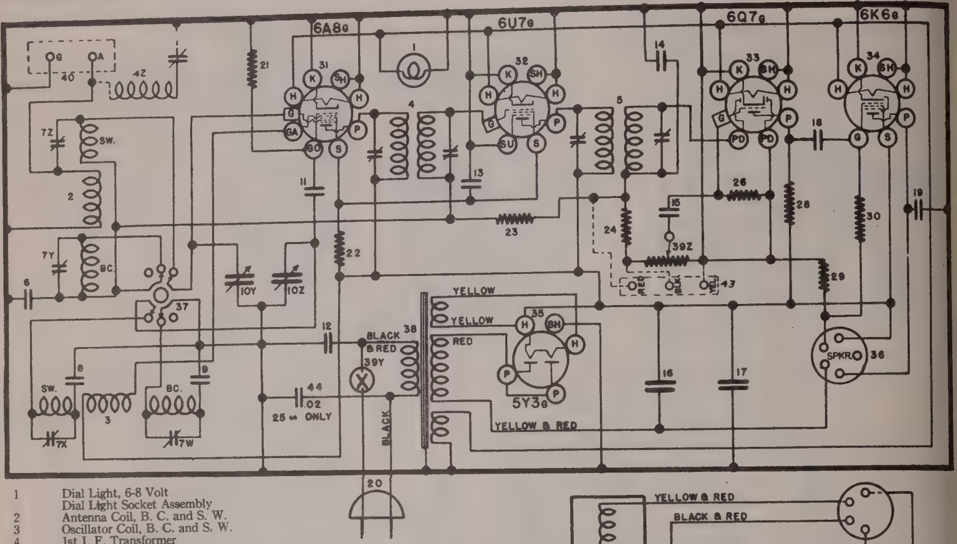
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Ga	Go
6A8G	Oscillator-Modulator	6.3	165	95	—	—	165	—
6U7G	I-F Amplifier	6.3	165	95	—	—	—	
6Q7G	Det.—A. V. C. 1st A-F	6.3	72	—	—	—	—	—
6K6G	Power Output	6.3	155	165	—	-14.5	—	—
5Y3G	Rectifier	2.2	—	—	—	—	—	—

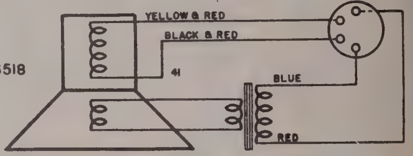
Voltage drop across speaker field 25 volts.
Maximum power output approximately 2 watts.
Power consumption at 117.5 volts approximately 37 watts.

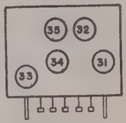
MODELS 518,6518
Schematic,Socket
Trimmers,Chassis
Parts

THE CROSLEY CORP.



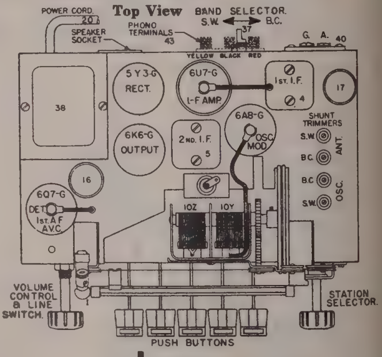
MODEL 518, 6518
455 KC. I.F.

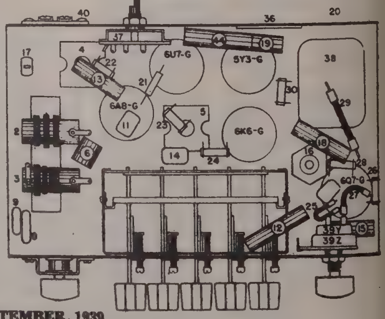




1	Dial Light, 6-8 Volt	
	Dial Light Socket Assembly	
2	Antenna Coil, B. C. and S. W.	
3	Oscillator Coil, B. C. and S. W.	
4	1st I. F. Transformer	
5	2nd I. F. Transformer	
6	Condenser, .02 Mf. 160 V.	
7Z	Trimmer Condenser	S. W. Antenna
7Y		B. C. Antenna
7X		S. W. Osc.
7W		B. C. Osc.
8	Condenser, .0014 Mf. Molded	
9	Condenser, .0004 Mf. Molded	
10Y	2 Section Gang Condenser	Ant.
10Z		Osc.
	Dial Glass	
	Dial Mask (Polished Metal)	
	Dial Glass Clip, L. H.	
	Dial Glass Clip, R. H.	
	Dial Glass Cushion	
	Dial Pointer (White Celluloid)	
	Dial Hand Guide	
	3/16"—No. 6 x 32 R. H. Screw for Dial Hand Guide	
	Felt Strip	
	5/16"—No. 8 P. K. Screw (Dial Glass Clips)	
	Riveted Dial Support, R. H.	
	Riveted Dial Support, L. H.	
	Drive Shaft (Manual)	
	Drive Shaft Bracket	
	3/16"—No. 8 P. K. Screws for Drive Shaft Bracket	
	Drive Cord (44 Inches Long)	
	Drive Pulley Assembly	
	5/16"—No. 8 x 32 Set Screw for Drive Pulley (2 Req.)	
	Spring Cord Tension	
11	Condenser, .00005 Mf. Molded	
12	Condenser, .01 Mf. 400 V.	
13	Condenser, .02 Mf. 200 V.	
14	Condenser, .00025 Mf. Molded	
15	Condenser, .006 Mf. 200 V	
16	Condenser, 16 Mf. 250 V. Elect. (60 Cycle)	
	Condenser, 30 Mf. 250 V. Elect. (25 Cycle only)	
17	Condenser, 16 Mf. 250 V. Elect.	
18	Condenser, .02 Mf. 200 V.	
19	Condenser, .006 Mf. 400 V.	
20	Power Cord	
21	Resistor, 40,000 Ohms 1/4W. Ins.	
22	Resistor, 20,000 Ohms 1/3W. Carb.	
23	Resistor, 3 Megohms 1/3W. Carb.	
24	Resistor, 100,000 Ohms 1/3W. Carb.	
25	Resistor, 60 Ohms 1/2W. Flex.	
26	Resistor, 3 Megohms 1/3W. Carb.	
27	Resistor, 40 Ohms 3/4W. Flex.	
28	Resistor, 300,000 Ohms 1/3W Carb.	
29	Resistor, 275 Ohms 1W. Flex.	
30	Resistor, 500,000 Ohms 1/8W. Carb.	
13	8 Prong Socket	
32		
33		
34		
35		
36	5 Prong Socket (Speaker)	
	Tube Shield	
37	Band Change Switch	
38	Power Transformer, 110 V. 25 Cycle	
	Power Transformer, 220 V. 25 Cycle	
	Power Transformer, Universal	
39Z	Volume Control	6518
39Y	On-Off Switch	
39Z	Volume Control, 1 Megohm	518
39Y	On-Off Switch	
40	Terminal Strip, A-G	
41	Speaker, Spec. S-5274-J-5	
	Speaker Cone Assy.	
	Cardboard Ring	
	Output Transformer	
	Push Button Assembly	
	Key Assembly (6518)	
	Key Assembly (518)	
	Key Clip	
	1 7/16"—No. 6 x 32 Screw (Clamp)	
	Spring (Key Return)	
	Adjusting Clip	
	5/16"—No. 8 P. K Screw (Clip Mtg.)	
	Key Plate (Rear Guide)	
	Rocker Plate Assembly	
	1/8"—No. 6 x 40 Fil. Hed. Screw (Rocker Plate Bearing)	
	Push Button (Black)	
	Push Button (Brown)	
	Celluloid Cover	
	Call Letter Sheet (U. S. A. Stations)	
	Knob Tuning (Black)	
	Knob Tuning (Brown)	
	Knob, Vol. and Switch (Black)	
	Knob, Vol. and Switch (Brown)	
	8A Cabinet (Black)	
	8AA Cabinet (Brown)	
42	Wave Trap	
43	Phono Terminal	
44	Condenser, .02 Mf. 400 V. (25 Cycle only)	
	Speaker Plug Clamp	
	Call Letter Sheet (European)	
	Escutcheon (6518 only)	
	Screw (Escutcheon Mtg.)	
	Cabinet (6518)	
	Knob (6518 only) (2 Req.)	
	Knob (6518) (Band Switch)	

Top View





CIRCUIT CHANGES

SEPTEMBER, 1939

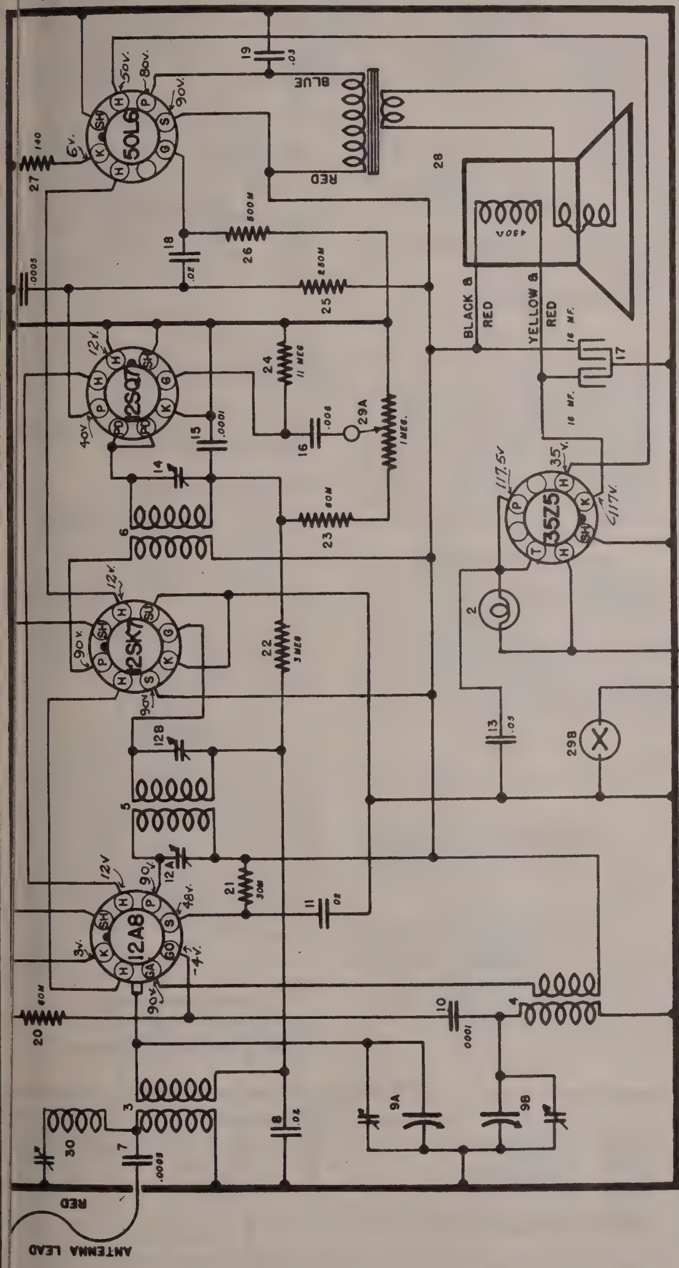
Item 22 was a 30,000 ohm resistor. Item 25, a 60 ohm 1/2 watt flexible resistor added from 607 cathode to ground. Item 26 should be 3 megohm resistor not 11 megs. Item 27, a 40 ohm 3/4 watt resistor should connect from the junction of items 26 and 29 at one end to low side of volume control. Item 29, a 275 resistor was a 375 ohm resistor.

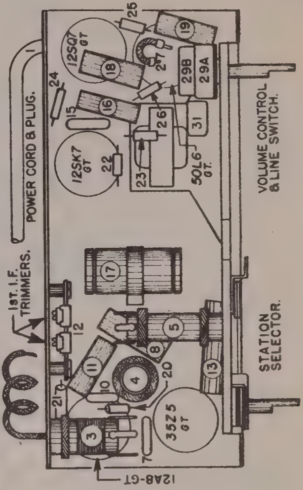
Bottom View

THE CROSLEY CORP.

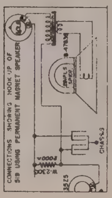
MODELS 519,529
Schematic,Socket
Trimmers,Chassis

P ver output approximately 2 watts.
P ver consumption approximately 27 watts.
V tage drop across speaker field 25 volts.
A voltages except filaments will be approximately
1 % lower if measured on 117.5 volts DC power supply.
V tage readings between the tube socket contacts and chassis.

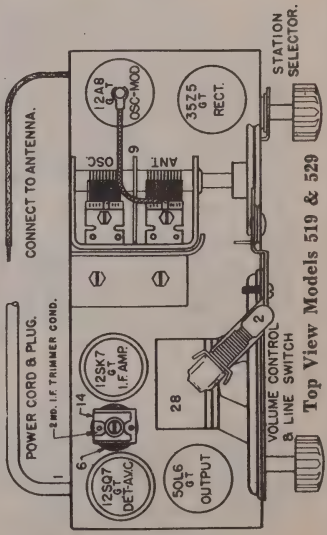




Bottom View Models 519 & 529


CONNECTIONS SHOWING HOOK UP OF 519 USING PERMANENT MAGNET SPEAKER

455 KC. I.F.



Top View Models 519 & 529

SEPTEMBER, 1939

MODELS 519,529
Alignment
MODEL 668
Wavetrap Data,Notes
Tuner

THE CROSLEY CORP.

MODELS 548,558,554
Alignment,Voltage
Tuner,Chassis

CHASSIS NO. 519 & 529

ALIGNMENT PROCEDURE
CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 50L6GT output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Disconnect the antenna roll from the receiver and connect the output of the signal generator through a 50 mmf. condenser to the antenna connection on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condenser, Item 14, located on top of coil (Fig. 2) for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers located on the rear of chassis for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

MODELS 519 & 529, 668.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram.

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a 100 mmf. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

CHASSIS MODEL 668

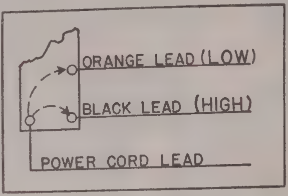
This model is a six-tube superheterodyne, phono combination receiver. The tuning range is from 540 to 1725 kilocycles. The Phono Assembly consists of a sensitive crystal pickup, a small efficient self-starting motor and a separate switch for changing from radio to phono operation.

For adapting the phono-motor to 50 cycle operation it is only necessary to change the rubber drive bushing on the motor shaft, using pulley No. 46991.

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts.



The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

SETTING THE PUSH BUTTONS

With a small screw driver or pen knife remove celluloid cover and the call letters. Insert screw driver in the hole in the front of the button and loosen the set screw a turn or two. With the manual tuning knob, tune-in as ACCURATELY AS POSSIBLE the station whose call letters were in the button or that station for which the button is to be set. Then push the button all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the call letters and call letter cover. Use same procedure in resetting or adjusting the rest of the push buttons.

MODELS 548 & 5548, 558.

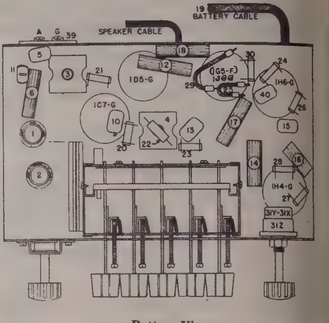
ALIGNMENT PROCEDURE
CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 1G5G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger condenser to the top cap of the 1C7G Osc-Mod tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).



Bottom View

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. Fig. 2.

(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

2. Aligning the R-F Amplifier.

(a) Connect the output lead from the signal generator through a .0001 mfd. condenser to the "ANT." terminal of the receiver. Connect generator ground lead to the chassis.

(b) Set signal generator to 1725 kilocycles.

(c) Open condenser gang all the way.

(d) Adjust "OSC." trimmer on gang to 1725 kc. signal, the gang does not have to tune through this signal.

(e) Set signal generator to 1400 kilocycles.

(f) Tune-in 1400 kc. signal with station selector, should be approximately 140 on dial.

(g) Adjust "ANT." trimmer on gang for maximum output. Do not readjust "OSC" trimmer. Repeat above operations for more accurate adjustments.

SETTING THE PUSH BUTTONS

If any of the circuits have been readjusted it may be necessary to reset the push button tuning system.

Remove the call letters from the buttons or remove the complete button. Loosen set screws a turn or two by turning to the left. Then tune-in as accurately as possible the station to which the button is to be set. With the screw driver inserted in adjustment screw slot push the key all the way down and while holding in that position securely tighten the adjusting screw. It should be remembered that when tightening the adjusting screw in this manner, to all apply a steady pressure when tightening the screw in order to keep the key aligned with the station tuned-in.

Repeat the above procedure for resetting the rest of the buttons.

NOTE:
The schematic,socket layout,
and parts list of Models 548
and 5548 will be found on
Crosley page 9-38 in Volume IX.

MODELS 548 — 3 & 558

TUBE SOCKET VOLTAGE READINGS

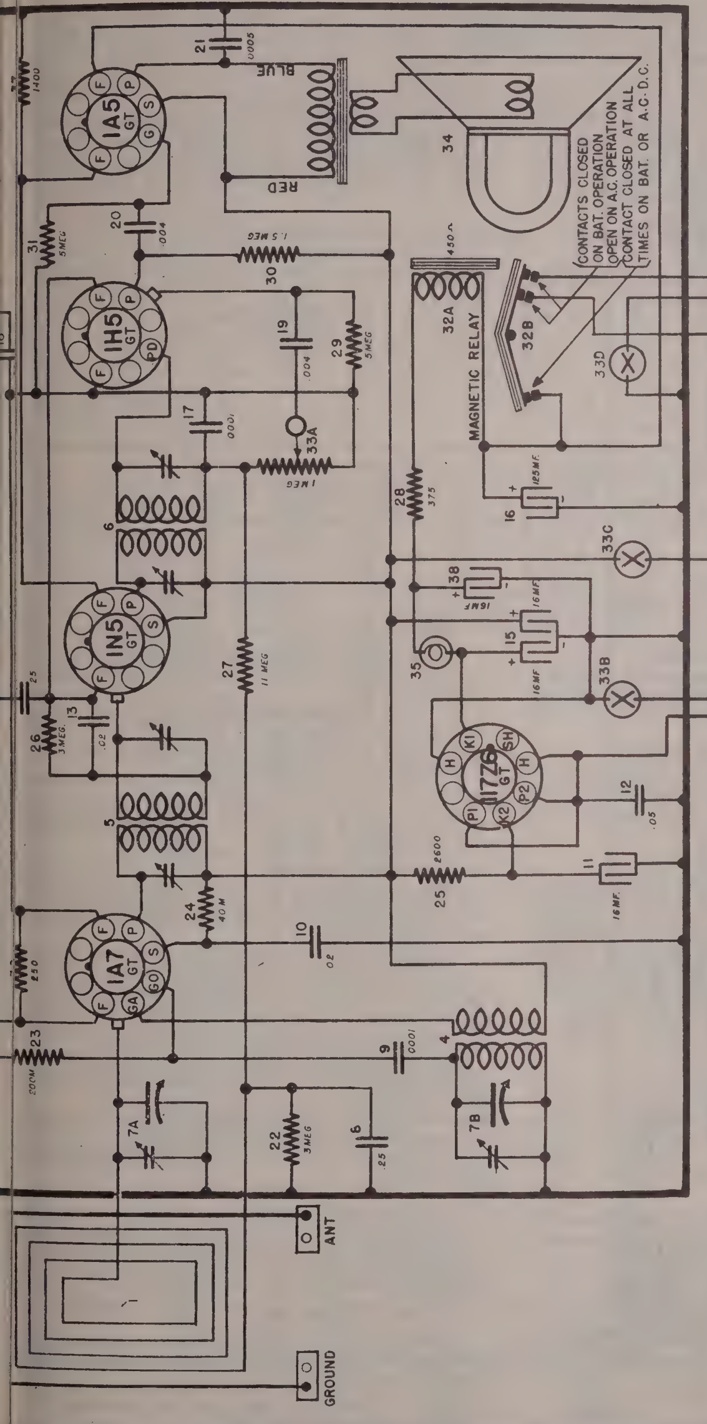
Tube	Function	H	P	S	C	Ga	Go
1C7-G	Oscillator-Modulator	2.0	120	40	0	120	-3
1D5-G	I-F Amplifier	2.0	120	40	0	—	—
1H6-G	Detector & 1st A-F Amp.	2.0	50	—	0	—	—
1H4-G	2nd A-F Amplifier	2.0	50	—	0	—	—
1G5-G	Output	2.0	123	129	-6	—	—

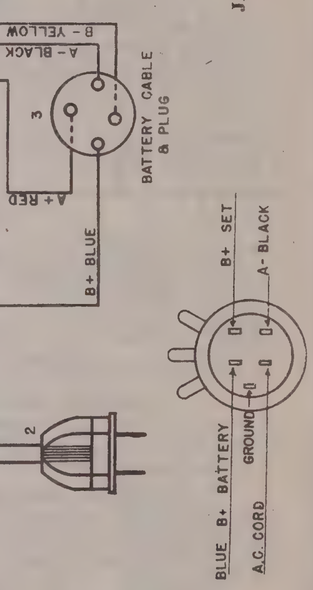
Power Output approximately .750 Watt. 2 W FOR MODEL 558
"A" Battery Drain approximately .42 Ampere at 2 Volts. PLUS 120MA FOR MODEL 558
"B" Battery Drain approximately 18 Milliamperes at 135 Volts.

Voltage readings should be taken between the tube socket contacts and the negative side of the "A" battery circuit.

THE CROSLEY CORP.

MODEL 549
Schematic,Chassis





MODEL --- 549

455 K C. I.F.

JANUARY, 1940

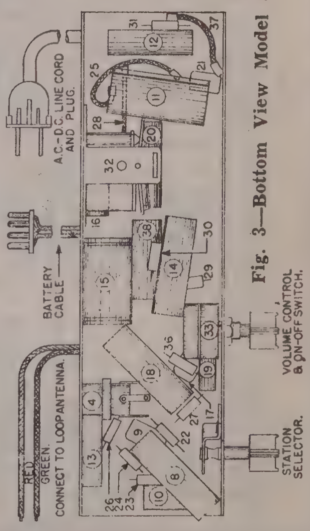


Fig. 3—Bottom View Model 549

THE CROSLEY CORP.

The circuit is a conventional superheterodyne with a tuned loop antenna stage. Four 1.4 volt tubes and one 117Z6GT tube are employed as follows: one 1A7GT as oscillator-modulator, one 1N5GT as 455 kc. I-F amplifier, one 1H5GT as diode detector, A.V.C. and first audio, one 1A5GT as power output and the 117Z6GT as rectifier (used only when plugged into 110 volt power circuits).

The filaments of the 1.4 volt tubes are connected in series and have plate current compensating resistors one, item 36, a 250 ohm resistor across the 1A7GT filament and the other, item 37, a 1,400 ohm resistor from the negative leg of the 1A5GT to chassis.

When used on 110 volt power circuits one half the 117Z6GT supplies the filament voltage and the other half the B voltage. The rectified voltage for the filament string is well filtered by the following, item 35, which is a 7½ watt 110 volt miniature lamp and does triple duty—, 1, regulates the voltage—2, acts as a filter—3, as an ON-OFF indicator; item 28 a 375 ohm resistor and item 32A, the relay coil which serves as a choke and their associated electrolytic condensers, i.e., item 15, 16 mf.—item 38, 16 mf. and item 16, 125 mf. The above mentioned miniature lamp (item 35) should always be replaced with an exact duplicate should replacement become necessary.

The "b" voltage is filtered by means of item 25, a 2,600 ohm resistor and item 11—a 16 mf. electrolytic and one section of item 15 (twin electrolytic) 16 mf. condenser.

The relay automatically disconnects the batteries from the circuit when the receiver is operated on 110 volt circuits.

VOLTAGE READINGS—WITH CR649 BATTERY PACK

Tube	Tube Socket Function	PIN NUMBER No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1A7GT	Oscillator-Modulator	0	1.5	70	40	Neg.	70	0	0
1N5GT	I-F Amplifier	0	4.5	70	70	1.5	—	3	0
1H5GT	Det, AVC, 1st Audio	0	3.0	11	11	—	0	1.5	6
1A5GT	Output	0	6.0	68	70	—	6	4.5	1.5
117Z6GT	Rectifier	0	0	0	68	0	0	0	6.0

Power Output approximately 100 M. W.
"A" Battery Drain 50 M. A.
"B" Battery Drain 5.2 M. A.

VOLTAGE READINGS—@ 117.5 VOLT LINE (A.C.)

Tube	Tube Socket Function	PIN NUMBER No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1A7GT	Oscillator-Modulator	0	1.4	102	56	-3	102	0	0
1N5GT	I-F Amplifier	0	4.5	102	102	1.5	—	3.0	0
1H5GT	Det, AVC, 1st Audio	0	3.0	17	17	—	0	1.5	45
1A5GT	Output	0	6.0	98	102	—	28	4.5	1.5
117Z6GT	Rectifier	58 5 A.C.	117.5 A.C.	117.5 A.C.	142	117.5 A.C.	0	0	126

Power Output approximately 200 M. W.

Watts @ 117.5 volts 20 watts.
Above readings will be approximately 10% less when checked on D.C. power circuit.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 1A5GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of the 1A7GT oscillator-modulator tube leaving th. tubes' grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

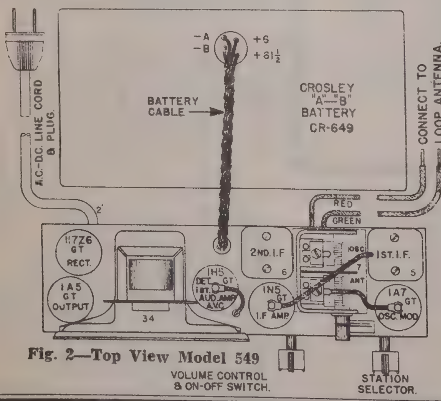


Fig. 2—Top View Model 549

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers for maximum reading on the output meter.

(e) Adjust the trimmer condensers located on the 1st I-F transformer for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0001 mf. condenser to "A" terminal and the ground lead to the "G" terminal on the back of the cabinet.

It is essential that the following alignment be made with the receiver in the cabinet and the battery and back in position. Trimmer adjustments may be made on the two luggage type carrying cases through the two holes in the top, beneath the carrying handle. On the walnut cabinet model the oscillator will have to be aligned before placing chassis in the cabinet and then adjust the antenna trimmer provided on the back.

Before aligning receiver check the position of the pointer by opening gang all the way, the pointer should then split the 1600 kilocycle calibration point.

(a) Set signal generator to 1400 kilocycles.

(b) Tune gang to 140 on the dial, then adjust oscillator trimmer (rear section of gang) for maximum output.

(c) Adjust antenna trimmer (front section of gang) for maximum output.

RELAY

The receiver, when plugged into 110 volt circuit, will operate on the batteries until rectifier warms up and trips the relay. When relay trips there should be no decrease or dead spot in output as rectifier should be warmed up sufficiently to carry load and give a slight increase in output due to higher plate voltage available.

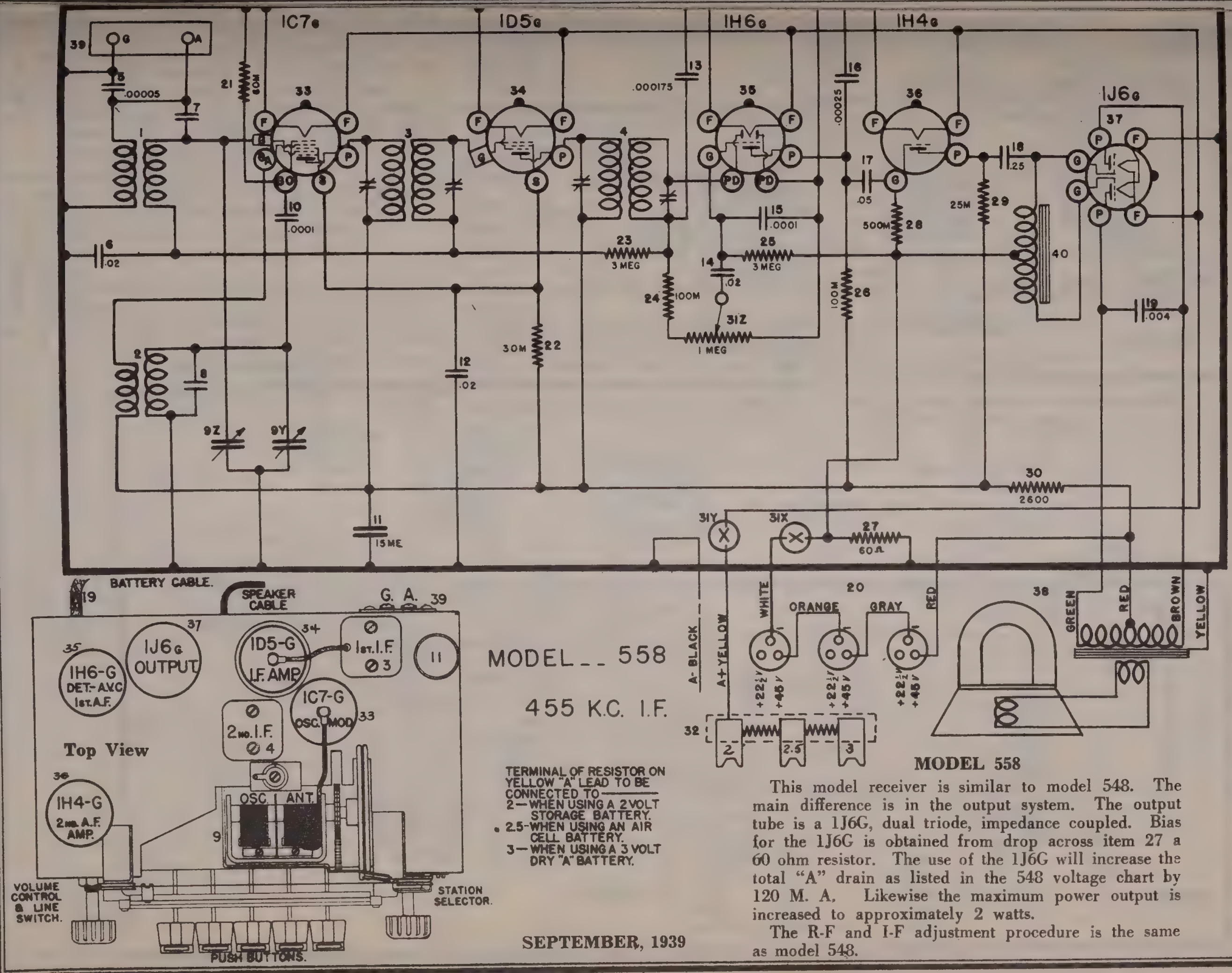
The relay is insulated from the chassis and care should be exercised when probing so as not to short it.

In earlier models the relays have three sets of contacts and the single side must make contact at all times. The double side must make contact when batteries are used and both contacts (double contact side) must break when operated on 110 volt circuits. Later models the single contact side was omitted and a flexible braid connection used instead.

THE CROSLEY CORP

MODEL 558
Schematic, Socket
Trimmers, Notes

FOR ALIGNMENT
SEE INDEX



MODEL 558

This model receiver is similar to model 548. The main difference is in the output system. The output tube is a 1J6G, dual triode, impedance coupled. Bias for the 1J6G is obtained from drop across item 27 a 60 ohm resistor. The use of the 1J6G will increase the total "A" drain as listed in the 548 voltage chart by 120 M. A. Likewise the maximum power output is increased to approximately 2 watts.

The R-F and I-F adjustment procedure is the same as model 548.

SEPTEMBER, 1939

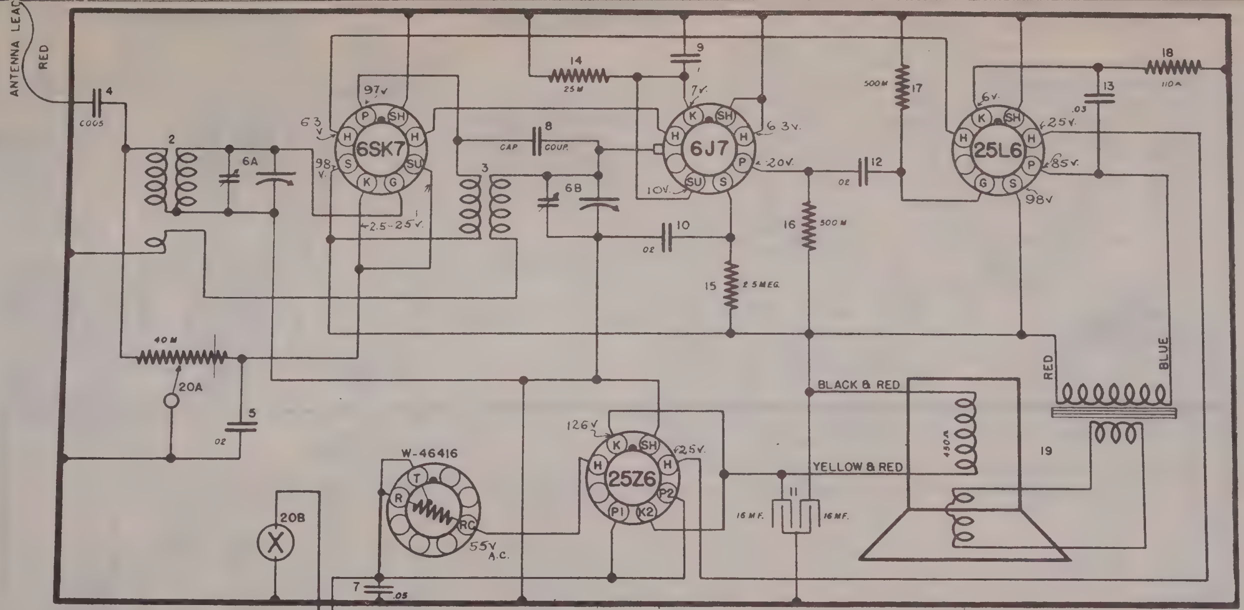
MODEL 599
Schematic, Socket

THE CROSLEY CORP.

Trimmers, Chassis
Alignment, Voltage

Power output approximately 2 watts.
Power consumption at 117.5 volts line 45 watts (A.C.).
All readings except filaments will be approximately 10% lower on 117.5 D. C.

Drop across field 28 volts.



Voltage readings between the tube socket contacts and chassis.

MODEL 599

SEPTEMBER, 1939

ALIGNMENT PROCEDURE

(a) Connect the output lead of the signal generator through a .0001 mf. condenser to the antenna lead on the receiver. The ground lead of the generator should be connected through a .001 mf. condenser to the chassis.

(b) Open the gang condenser all the way.

(c) Set the generator to 1725 kilocycles.

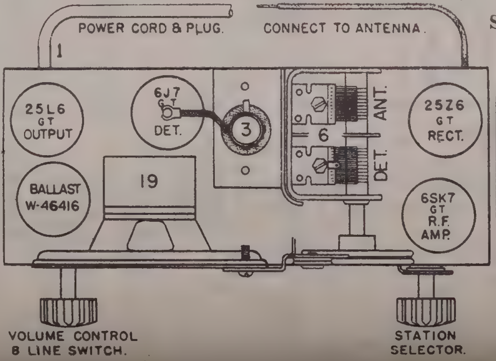
(d) Adjust the trimmer condensers on the gang until the 1725 kc. signal is heard. The gang does not have to tune through this signal.

(e) Set the generator to 1400 kc.

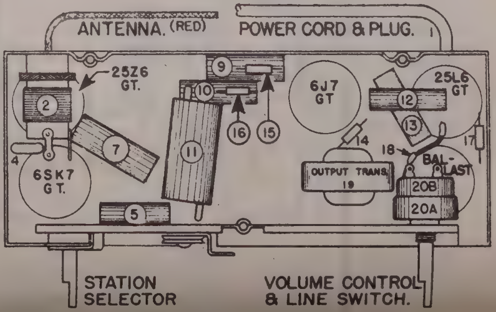
(f) Tune the set to the 1400 kc. signal, then alternately adjust the trimmers on the gang until no further improvement can be noticed on the output meter.

NOTE: Always use the lowest signal generator output that will give a reasonable indication on the output meter.

Keep the two grid leads as far as possible from each other.



Top View Model 599



Bottom View Model 599

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THE CROSLEY CORP.

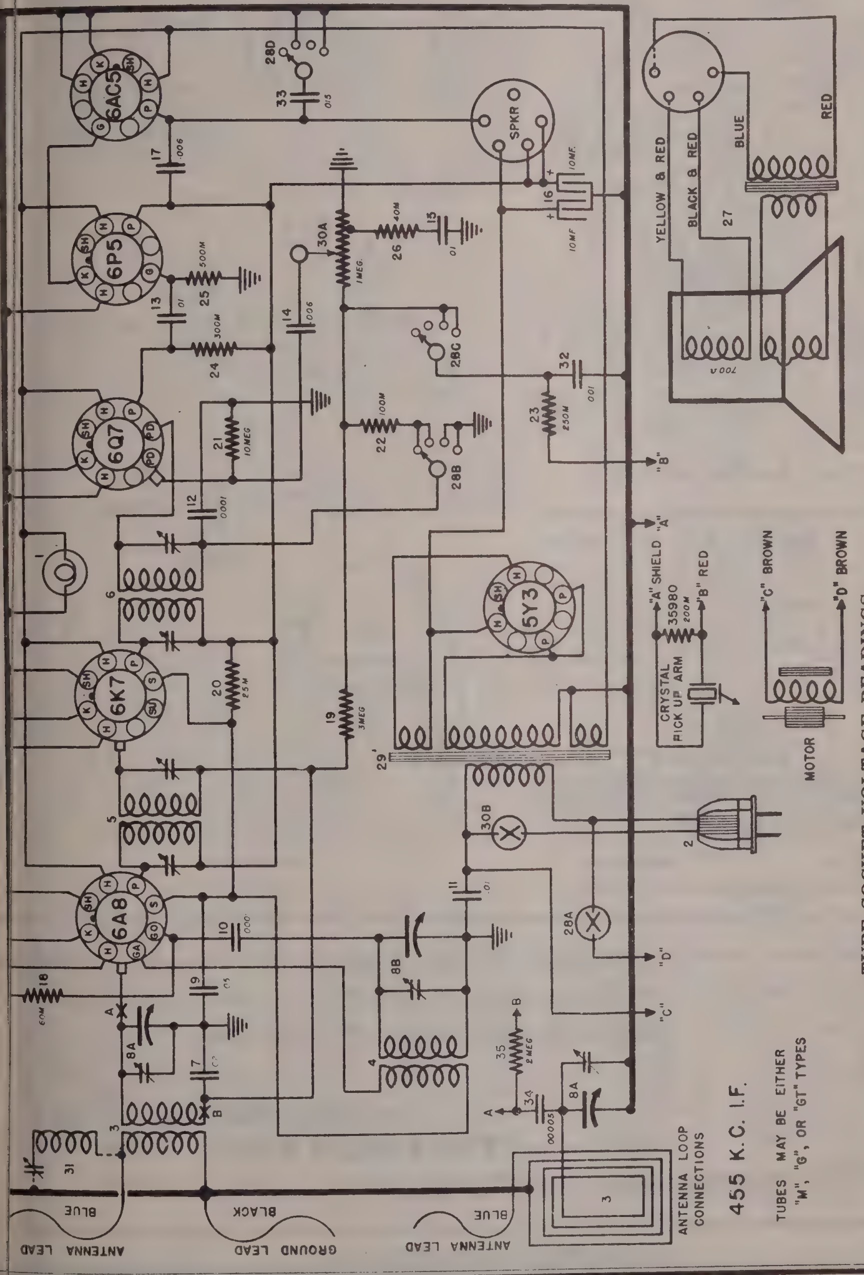
MODEL 639
Schematic, Voltage

CIRCUIT DESCRIPTION

ix glass (octal) tubes are used and their functions a as follows: one 6A8G as oscillator-modulator, one 6 7G as I-F amplifier, one 6Q7G as diode detector a A. V. C., and 1st audio, one 6P5G as 2nd audio a plifier, one 6AC5G dynamic coupled power output a one 5Y3G as a half-wave rectifier.

This model is a six-tube superheterodyne, phono combination receiver with Automatic Record Changer. The tuning range is from 540 to 1725 kilocycles.

For adapting the phono-motor to 50 cycle operation it is only necessary to change the drive pulley on the motor shaft, using pulley No. 48536.



NOVEMBER, 1939

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Ga	Go
6A8G	Oscillator-Modulator	6.3	230	68	—	—	68	Neg.
6K7G	I-F Amplifier	6.3	230	68	—	—	—	—
6Q7G	Detector—A. V. C.—1st A-F	6.3	74	—	—	—		
6P5G	Driver	6.3	230	—	+13	—		
6AC5G	Power Output	6.3	225	—	—	+13		
5Y3G	Rectifier	5.0	—	—	—	—		

Voltage drop across speaker field 44 volts.
Maximum power output approximately 5 watts.
Power consumption at 117.5 volts approximately 85 watts with phono operating.

MODEL 639
Socket, Trimmers
Phono Assembly

THE CROSLEY CORP.

FIGURE 1

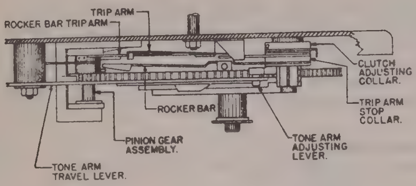
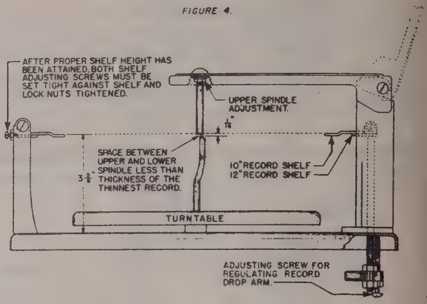


FIGURE 4.


AFTER PROPER SHELF HEIGHT HAS BEEN ATTAINED, BOTH SHELF ADJUSTING SCREWS MUST BE SET TIGHT AGAINST SHELF AND LOCK NUTS TIGHTENED.
UPPER SPINDLE ADJUSTMENT.
1/16"
SPACE BETWEEN UPPER AND LOWER SPINDLE LESS THAN THICKNESS OF THE THINNEST RECORD.
3 3/8"
10" RECORD SHELF
12" RECORD SHELF
TURNTABLE
ADJUSTING SCREW FOR REGULATING RECORD DROP ARM.

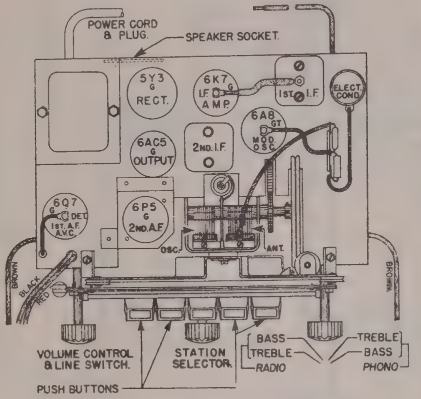
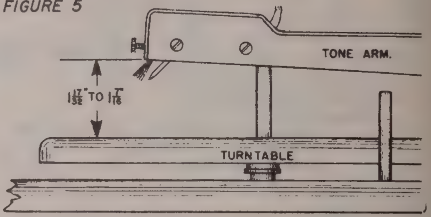


Fig. 2—Top View Model 639

FIGURE 5



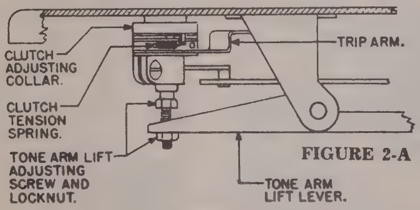


FIGURE 2-A

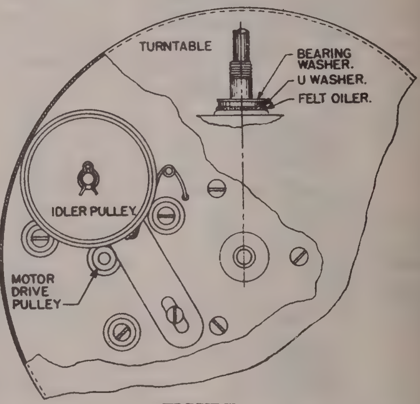
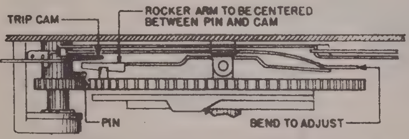
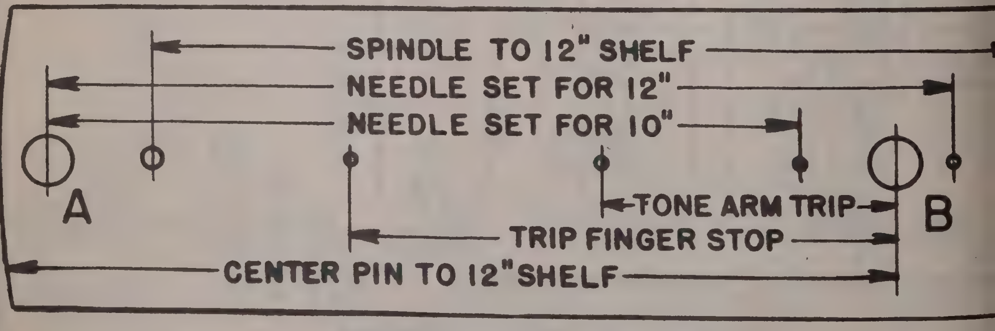


FIGURE 6

FIGURE 3



POSITION OF TRIP ARM WHEN RECORD IS PLAYING.



ADJUSTING GAUGE TEMPLATE

MODEL 639
Alignment
Record Changer Data

ALIGNMENT PROCEDURE

Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. (Item 6, Fig. 2).

(e) Adjust both trimmets located on top of the 1st I-F transformer for maximum output. (Item 5, Fig. 2).

(f) Check operations (d) and (e) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning R. F. Amplifier.

When aligning the R. F. amplifier the output lead from the signal generator is connected to the antenna lead of the receiver, a 100 mmf. condenser should be connected in series with the output lead of the signal generator.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL ¶ (C) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT signal is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. DO NOT READJUST THE OSCILLATOR TRIMMER.

If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

Remove push buttons and with a small screw driver loosen the set screws a turn or two. With the manual tuning knob, tune-in as ACCURATELY AS POSSIBLE the station whose call letters were in the button or that station for which the button is to be set. Then push the key all the way down and while you hold it in that position SECURELY TIGHTEN the set screw.

(C) SIGNAL INPUT FREQUENCIES

I-F Alignment Signal	Minimum Capacity Signal	Shunt Alignment Signal
455 Kilocycles	1,725 Kilocycles	1.400 Kilocycles

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram (item 31).

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a 100 mmf. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser closed and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

AUTOMATIC RECORD CHANGER

This record changer is mounted on a heavy metal base which is rubber mounted to the cabinet. The turntable is rim driven and in turn drives the automatic changing mechanism. Each changer is thoroughly tested before it leaves the factory and should not need any further adjustments. It is possible that due to wide variations in types of records used, minor adjustments in settings may have to be made. Under the following headings are listed effects, possible cause and method of correcting.

A word of caution when checking for quality.

1. Make sure that all the packing has been removed, around motor, turntable, etc.

2. See that the changer unit does not touch the cabinet, it must float on the four rubber mountings. The four screws which mount base to cabinet should be removed (AFTER RECEIVER IS IN POSITION).

3. ALWAYS USE A GOOD NEEDLE AND SEE THAT IT IS SEATED AND THAT THE NEEDLE SCREW IS TIGHT.

1. Motor Will Not Start.

1. Plug not in receptacle, house fuse blown, defective outlet.

2. Defective switch (Phono-Radio), open motor winding or leads.

3. Motor stopped in an overload position, i. e., record drop cam and cam roller at point where roller is just about to LOWER shelf. Turn the turntable (clockwise) two or three revolutions by hand.

NOTE: The turntable screws down on the record spindle. To remove, turn in clockwise direction by hand until the curve on the spindle is toward the loading rack, then lock small drive pinion in that position. Spindle must NOT turn. Unscrew turntable (counter clockwise).

4. Friction drive pulley stuck, friction drive pulley not touching turntable rim or bushing on motor shaft not touching friction drive pulley. Oil on friction drive pulley.

5. Center pinion shaft stuck or tight. Free and oil. When replacing be very careful so as not to bend or spring the friction drive pulley which will have to be pushed under the edge while screwing the turntable in position.

2. Tone Arm Does Not Drop In Correct Position.

1. 10 inch or 12 inch lever not in correct position for record being played. Check setting of lever.

2. Tone arm drop not set correctly to meet record variations. Records may vary as much as ½-inch in diameter. Adjust for average conditions.

To adjust tone arm drop, place gauge on turntable, large hole (A) over spindle, place needle in tone arm and then place tone arm so the needle sets in small hole marked "NEEDLE SET FOR 10". Throw 10" record lever in correct position. The tone arm adjusting lever, see Fig. 7, must have its stud in contact with the tone arm travel lever, this lever must be in contact with die cast cam and gear. Loosen screw in adjusting lever and adjust lever, then tighten. Check operation and repeat until tone arm drops in correct position.

To adjust for 12-inch records, throw lever to left for 12-inch records. With gauge in place on turntable place tone arm in position marked "NEEDLE SET FOR 12". Loosen lock nut on tone arm travel lever and adjust screw to stop. Tighten lock nut and check. Repeat until needle drops in correct position.

For the above adjustments use a small cotter pin instead of a needle. This prevents any scratching or marring of records or turntable surface.

3. Trips Before Record Is Finished.

This condition invariably is caused by the clutch being too tight. This clutch is the friction type and when the pickup moves at an increased speed toward the center of the record, sufficient torque is developed to cause the tripping arm to act. To remedy it is necessary to have a No. 6 Bristol wrench to loosen the special set screw in the collar nearest the base of changer, see Fig. 1. Loosen set screw and turn collar a fraction of an inch to the left (counter clockwise) tighten set screw. Check and repeat until record plays to end.

4. Does Not Trip After Record Is Finished.

1. Center groove on record does not have sufficient pitch to develop enough torque to actuate clutch. This may result from improperly cut trip groove in record or loose clutch setting.

2. It may be possible that the trip arm may have jumped to the wrong side of the rocker bar trip arm, see Fig. 7. It should be on the same side as reject arm.

3. To check the trip action adjustment, place the gauge (hole marked B) on the lower spindle and set needle or cotter pin in hole marked TONE ARM TRIP (1⅞" centers). When in this position the cam on the center pinion shaft should be pointing toward tone arm. With cam as stated, the starting lever should be touching cam when cam and starting lever are in this position. The tone arm tripping lever should be in contact with the starting lever. Likewise the rocker bar (Fig. 3) (bar which engages pin in pinion gear shaft causing large cam gear to engage pinion gear) must be in contact (beneath) the end of the starting lever (Fig. 3) The end of starting lever may be bent sufficiently to make contact. The end of starting lever must not be bent any more than that which is necessary to center the other end of the rocker bar between the cam and the pin on the small pinion gear (Fig. 3) (running position).

After the above has been checked and adjusted the trip arm (while unit is running) should come in contact with the starting lever when the needle is about 3½ inches from the center line of the spindle. This may be adjusted by loosening the Bristol set screw in tripping lever stop collar (Fig. 1) and turning collar a fraction of an inch to the left. Check operation after tightening set screw.

4. The clutch may be too loose, thereby not developing sufficient torque. To adjust loosen Bristol set screw in clutch collar, rotate collar (Fig. 1) to the right a fraction of an inch. Tighten set screw. Check operation.

5. Records Do Not Drop.

1. Record hole tight or record warped.

2. Shelf height not correct. To adjust see Fig. 4 for correct height; adjust for 10" records first.

3. Spindles may not be in correct relation. See Fig. 4, for correct alignment. Top spindle adjustable

4. Record drop cam roller out of adjustment. Set correct shelf height (10" shelf) by loosening lock nut and turning screw; tighten locknut.

6. Drops More Than One Record.

1. Warped record.

2. Spindle alignment and etc. Same procedure as listed under 5.

7. Tone Arm Drags On Record.

1. Too many records on the turntable.

2. Records may be thicker than average or warped.

3. Needle too long or not properly seated.

4. Tone arm lift adjusting screw loose or out of adjustment.

To check the tone arm for correct lift, rotate turntable (clockwise) by hand and push reject button in order to actuate trip. Turn slowly until tone arm reaches maximum height and starts to travel toward tone arm rest, then stop when the arm is approximately one inch from edge of turntable. Check the height of the tone arm from the surface of the turntable as indicated in Figure 5. From the lower edge of the tone arm to the top of the turntable the distance should be between 1 7/16" and 1 17/32". To adjust the tone arm lift screw (Fig. 2-A) loosen locknut and adjust screw until arm is within above tolerance, then tighten locknut.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

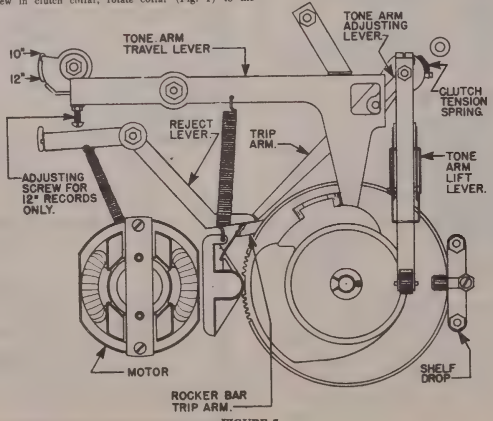
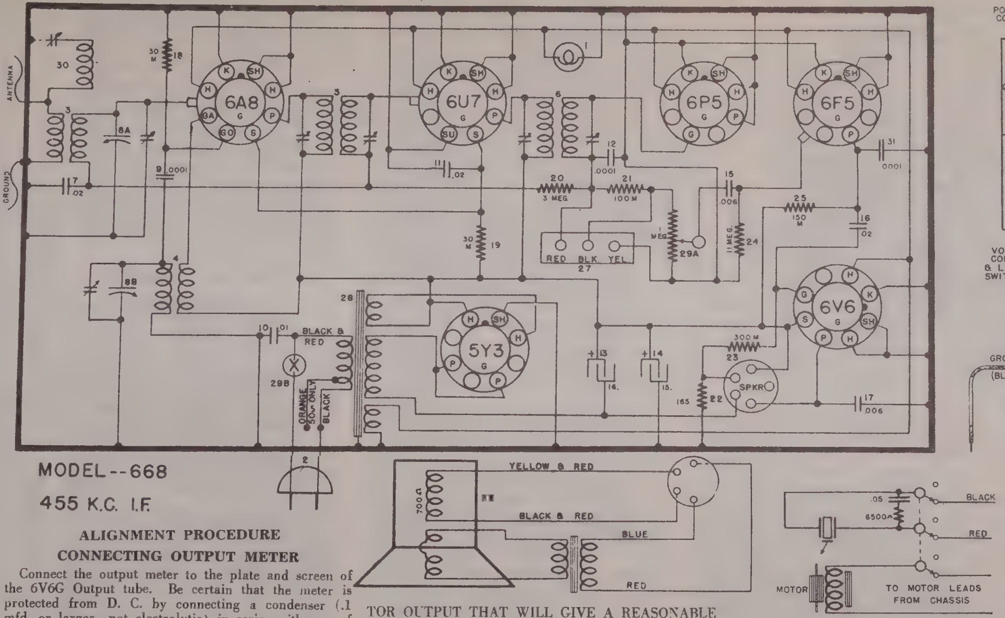


FIGURE 7

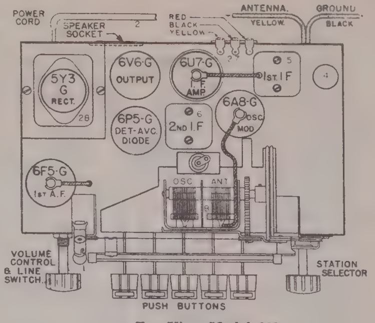
MODEL 668
Schematic, Voltage
Socket, Trimmers
Chassis

THE CROSLEY CORP

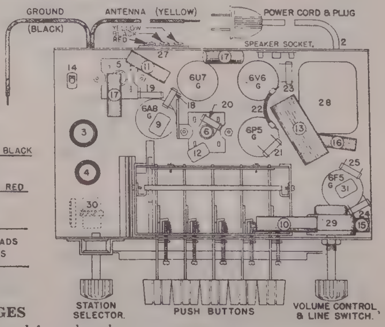


MODEL--668

455 K.C. I.F.



Top View Model 668



Bottom View Model 668

SEPTEMBER, 1939

ALIGNMENT PROCEDURE

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6V6G Output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON)

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. (Item 6, Fig. 2).

(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output. (Item 5, Fig. 2).

(f) Check operations (d) and (e) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator is connected to the antenna lead of the receiver, a 100 mmf. condenser should be connected in series with the output lead of the signal generator.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL ¶ (C) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT signal is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. DO NOT READJUST THE OSCILLATOR TRIMMER.

If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

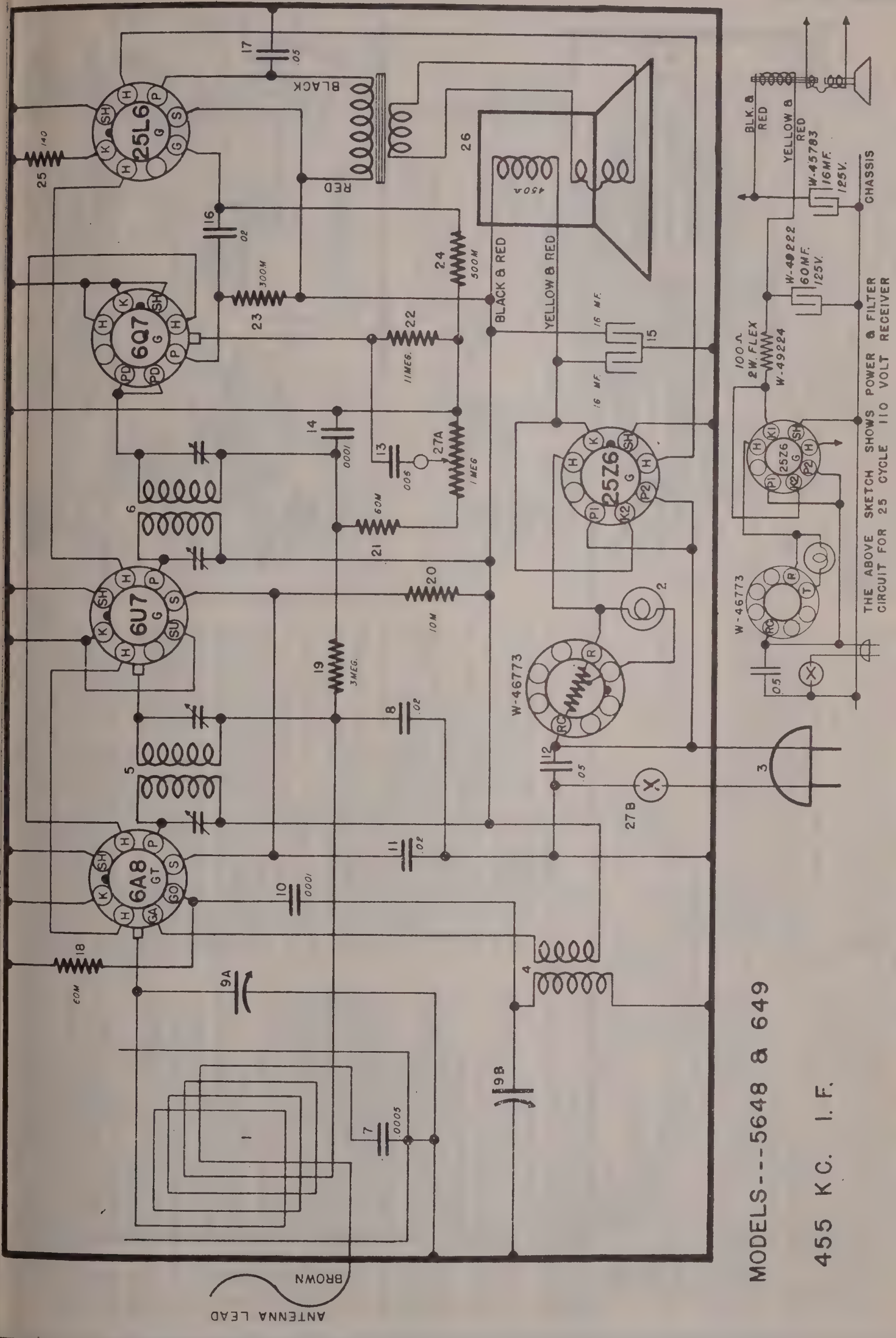
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Ga	Go
6A8G	Oscillator-Modulator	6.3	186	70	—	–	186	-15
6U7G	I-F Amplifier	6.3	186	70	—	—	—	—
6P5G	Detector—A. V. C.	6.3	—	—	—	—	—	—
6F5G	1st A-F Amplifier	6.3	93	—	—	—	—	—
6V6G	Power Output	6.3	180	186	—	–9.5	—	—
5Y3G	Rectifier	5	—	—	—	—	—	—

Voltage drop across speaker field 50 volts, using 396-BP-12 speaker.
Maximum power output approximately 3 watts.
Power consumption at 117.5 volts approximately 63 watts with phono operating.

THE CROSLEY CORP.

MODELS 649,5648
Schematic



MODELS---5648 & 649

455 KC. I.F.

JANUARY, 1940

MODELS 649,5648
Voltage,Chassis
Socket,Trimmers
Alignment,Tuner

THE CROSLEY CORP.

SPECIFICATIONS

Crosley radios, Models 5648 and 649, are designed for operation on 100-125 volts A.C. (50-60 cycles) or D.C. electric circuits. The tuning range of Model 5648 is from 1550 to 540 kilocycles. The tuning range of Model 649 is from 1725 to 540 kilocycles.

The difference between Models 5648 and 649 lies in the design and mounting of the built in loop antenna. Model 5648 has the rectangular loop mounted on the back of the receiver and includes an electrostatic shield. Model 649 loop antenna is a newly developed spider form which mounts on the end of the chassis, making for a more compact design.

CIRCUIT DESCRIPTION

Five G or GT tubes and one metal Ballast tube are employed in a superheterodyne circuit which consists of a combination oscillator-modulator tube, 455 kilocycle I-F amplifier, Beam Power output and power supply. The 6Q7 tube serves as the detector and 1st A-F amplifier and supplies A.V.C. voltage to the grid of the 6A8-G and 6U7-G tubes. The bias for the 25L6-G tube is obtained from item 25 a 140 ohm resistor. A Ballast tube is used to provide the proper heater voltage to the tubes. The filaments of the tubes are wired in series. A .05 mfd. condenser, item 11, is connected across the power supply leads to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1,000 ohm per volt, 250 volt voltmeter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. When measured on a 117.5 volt A.C. line voltage limits may vary plus or minus 10% of the values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6A8GT	Oscillator-Modulator	6.3	105	70	—	—	-10	105
6U7G	I-F Amplifier	6.3	105	70	—	—	—	—
6Q7G	Det, AVC, A-F Amplifier	6.3	35	—	—	—	—	—
25L6G	Output	25.1	100	105	—	6	—	—
25Z6G	Rectifier	25.1	117.5 A.C.	—	—	132	—	—
W-46773	Ballast Tube	Approx. 48.4 A.C. Drop						

Power output approximately 2 watts.
Power consumption approximately 48 watts.
Voltage drop across speaker field 27 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6G output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of 6A8GT, leaving grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, Fig. 2, located on chassis between Push Button Assembly and speaker field, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier Model 5648

Connect output lead of signal generator through a .0001 mf. condenser to the antenna lead of the receiver.

(a) Set signal generator to 1550 kilocycles.

(b) With the condenser gang open all the way, adjust the "OSC" section of the gang for maximum signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune in the 1400 kc. signal with the manual tuning knob.

(e) Adjust the trimmer condenser on the "ANT" section of the gang for maximum signal.

NOTE: Do not readjust the "OSC" section at this time. Repeat (b) and (e) for more accurate adjustments.

Aligning the R-F Amplifier Model 649

Connect output of signal generator through a .0001 mf. condenser to the antenna lead of receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

If any of the circuits have been re-aligned, check push buttons to see if they need resetting.

SETTING THE PUSH BUTTONS

The push buttons are easily and accurately set from the top of the receiver. It is not necessary that all the buttons be set at the same time. Remove the push buttons to be set by grasping the button between the forefinger and thumb and pulling straight up. Loosen the set screws on the keys but do not remove them.

Determine the favorite broadcasting stations whose call letters are to be placed in the buttons. By means of the manual tuning knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is the station that is tuned-in nearest the 1500 Kc. end of the dial. Then push the front key all the way down, and while you hold it in that position SECURELY TIGHTEN THE SET SCREW. Replace push button on key.

The push button tuning system is now correctly set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles). Detach the call letters of the favorite stations from the list supplied with your receiver and press them into the openings in the front of the push buttons. Thin pieces of clear celluloid are supplied in a small envelope and should be snapped in place over the call letters to protect and hold them in place.

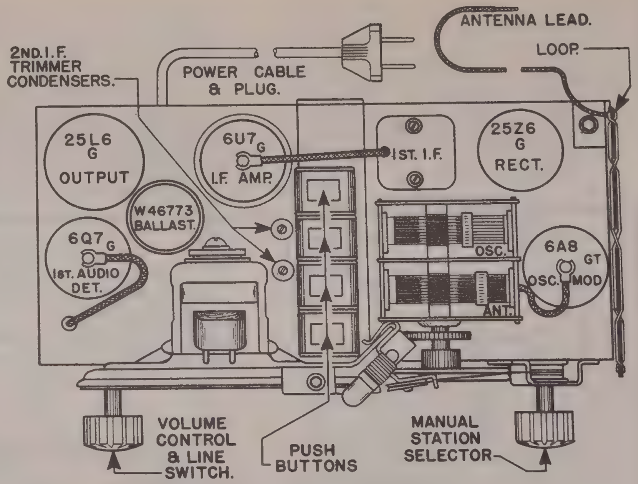


Fig. 2—Top View Model 649

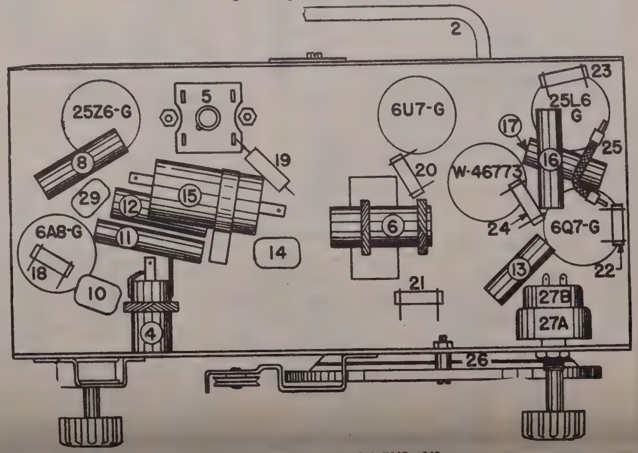
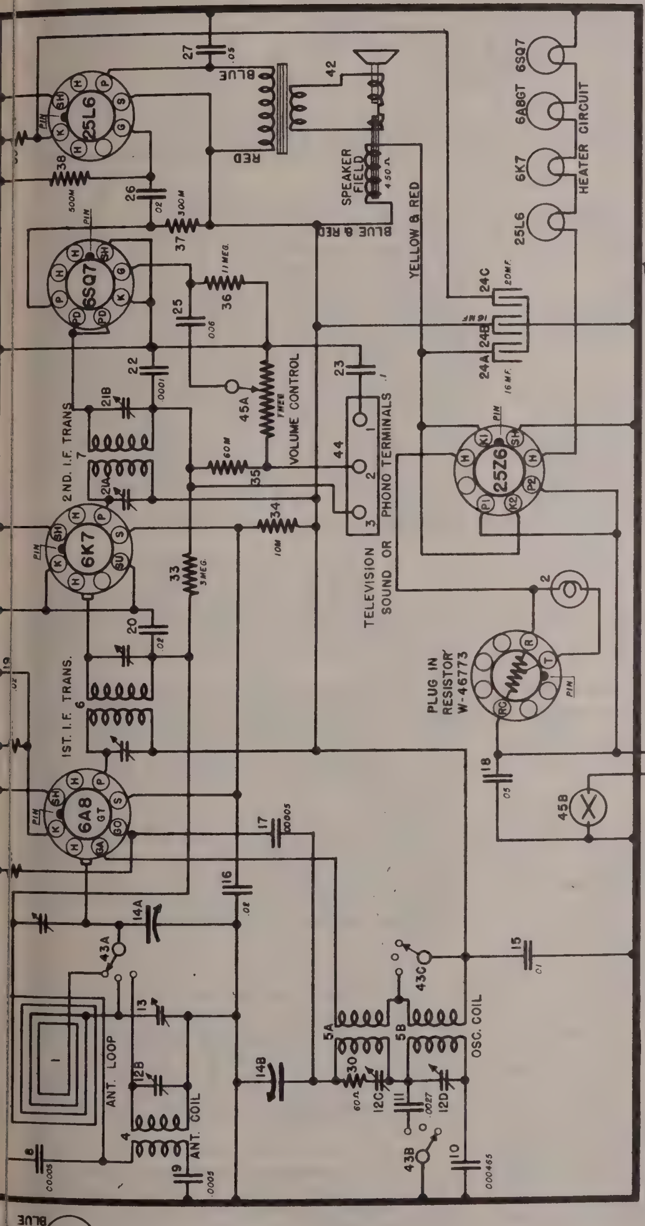


Fig. 3—Bottom View Model 5648—649

THE CROSLEY CORP.

MODEL 689
Schematic,Chassis
Socket,Trimmers



JANUARY, 1940

MODEL -- 689

TUBES MAY BE G OR GT TYPES EXCEPT 6A8

455 KC. I.F.

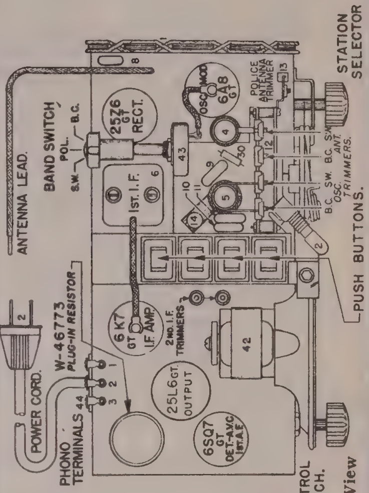


Fig. 2—Top View

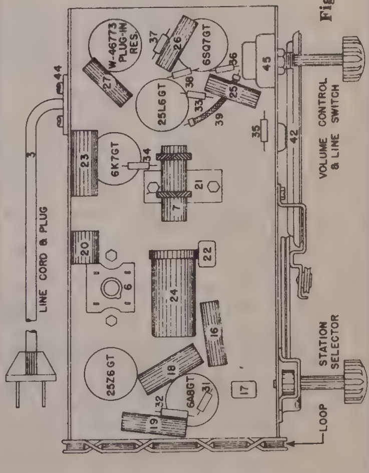


Fig. 3—Bottom View

THE CROSLEY CORP.

MODEL 689

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6A8GT	Oscillator-Modulator	6.3	105	70	—	—	-10	105
6K7GT	I-F Amplifier	6.3	105	70	—	—	—	—
6SQ7GT	Det, AVC, A-F Amplifier	6.3	35	—	—	—	—	—
25L6GT	Output	25.1	100	105	—	6	—	—
25Z6GT	Rectifier	25.1	117.5 A.C.	—	—	132	—	—
W-46773	Ballast Tube	Approx. 48.4 A.C. Drop						

Power output approximately 2 watts.
Power consumption approximately 48 watts.
Voltage drop across speaker field 27 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier to 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of 6A8GT, leaving grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh, turn the volume control to the right (ON), and turn the band switch to the right (B.C.).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, Fig. 2, located between Push Button Assembly and speaker field, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier

When aligning the R-F amplifier the output lead of the signal generator should be connected, through a dummy antenna, to the BLUE lead extending from the rear of the chassis. For the standard Broadcast Band and special police band use a .0001 mf. condenser and for the short wave band a 250 ohm carbon resistor instead of the condenser.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position and band switch turned to B.C. position, adjust the B.C. "OSC" trimmer condenser of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser B.C. "ANT" for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

(g) Set signal generator to 2.5 megacycles and turn band switch to special police band (middle position).

(h) Tune in 2.5 signal on receiver and then adjust POL. "ANT" trimmer condenser (Fig. 2) for maximum output. There is no "OSC" adjustment for this band.

(i) Set signal generator to 18.3 megacycles, turn band switch to S.W. position (left) and open gang all the way.

(j) Adjust S.W. "OSC" trimmer condenser for maximum output.

(k) Set signal generator to 18 megacycles.

(l) Tune in 18 mc. signal on receiver, then adjust the S.W. "ANT" trimmer condenser for maximum output.

(m) Repeat (i) to (l) for more accurate adjustments.

NOTE: When shunt aligning the short wave band care should be exercised so that the circuits will be aligned on the correct frequency (fundamental) rather than on the image frequency which is approximately 910 kilocycles more than the fundamental. To check on this, increase the signal generator output approximately 10 times or more, and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. (18.0 mc. fundamental 17.09 mc. image). If circuits have been properly aligned the signal can be tuned in at both positions but with a much stronger signal on the fundamental.

A few of the earlier releases of this model used a 6Q7GT in place of the 6SQ7GT. This change was made to improve performance especially on the short wave band.

If any of the circuits have been re-aligned, check push buttons to see if they need resetting.

SETTING THE PUSH BUTTONS

The push buttons are easily and accurately set from the top of the receiver. It is not necessary that all the buttons be se- at the same time. Remove the push buttons to be set by grasping the button between the forefinger and thumb and pulling straight up. Loosen the set screws on the keys but do not remove them.

Determine the favorite broadcasting stations whose call letters are to be placed in the buttons. By means of the manual tuning knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is the station that is tuned-in nearest the 1500 Kc. end of the dial. Then push the front key all the way down, and while you hold it in that position SECURELY TIGHTEN THE SET SCREW. Replace push button on key.

The push button tuning system is now correctly set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles). Detach the call letters of the favorite stations from the list supplied with your receiver and press them into the openings in the front of the push buttons. Thin pieces of clear celluloid are supplied in a small envelope and should be snapped in place over the call letters to protect and hold them in place.

TUBES AND VOLTAGE LIMITS

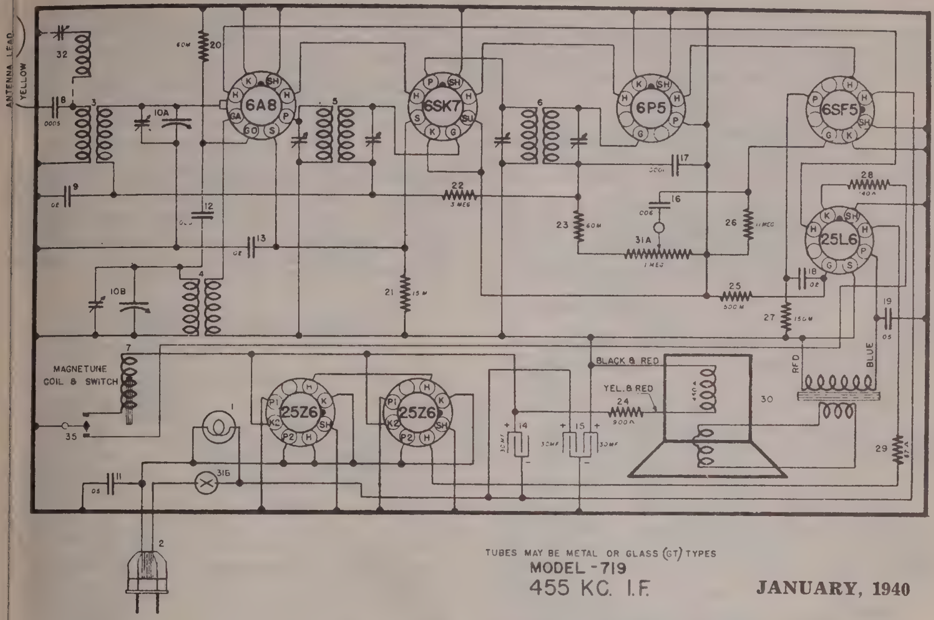
The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1,000 ohm per volt, 250 volt volt-meter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. When measured on a 117.5 volt A.C. line voltage limits may vary plus or minus 10% of the values given.

SPECIFICATIONS

This model Crosley receiver is a three band superheterodyne receiver designed for operation on 110 volt A.C. (50-60 cycles) or D.C. power circuits.

The receiver incorporates an improved mechanical push button tuning system, built in loop antenna, A.V.C., terminals for phono or television sound and many improved circuit developments.

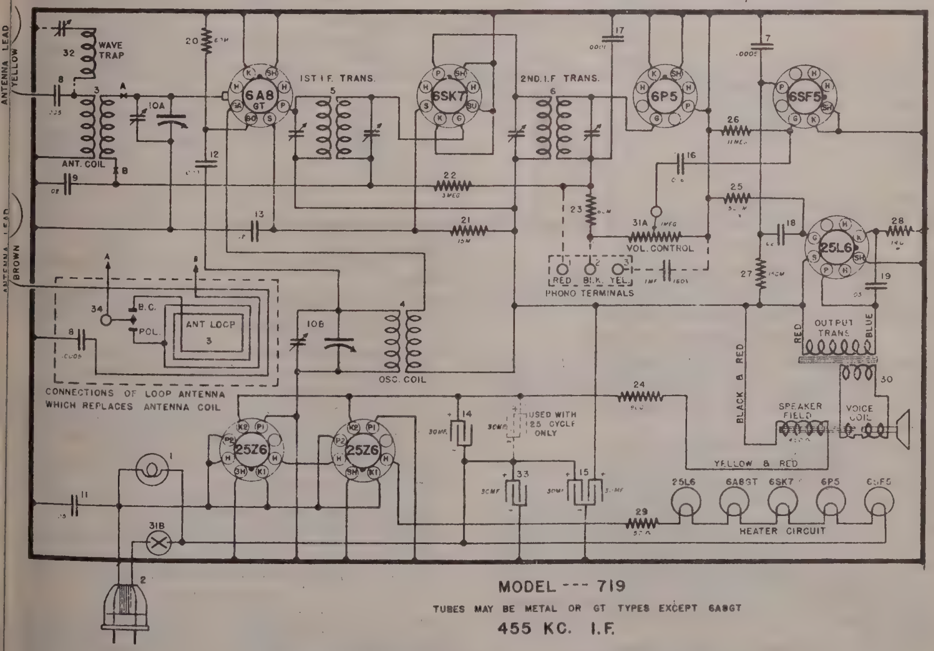
MODEL 719 (3 Types)
Schematics



TUBES MAY BE METAL OR GLASS (GT) TYPES
MODEL - 719
455 KC. I.F.

JANUARY, 1940

FIG. 1-A—WIRING DIAGRAM—MODEL 719



MODEL --- 719
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT
455 KC. I.F.

FIG. 1-B—WIRING DIAGRAM—MODEL 719

MODEL 719
Voltage,Circuit Data
Socket,Trimmers,Alignment

THE CROSLEY CORP.

SPECIFICATIONS

This model Crosley is a seven tube superheterodyne receiver designed for operation on 110 volt—50 or 60 cycle power circuits. It may be adapted for 25 cycle operation by the addition of another filter condenser as indicated in wiring diagram.

CIRCUIT DESCRIPTION

There are three versions of this model in the field namely: one version with an improved mechanical push button tuning system; one version with mechanical push button tuning and loop antenna, and one version has the Magnetune electric push button tuning system.

The circuit is a conventional super with no regeneration. Item 23, a 60,000 ohm resistor in series with the volume control form the A.V.C. load. Item 22, a 3 megohm resistor acts as a filter for the A.V.C. voltage applied to the 6A8GT and the 6SK7. Bias for the 25L6GT is obtained from the voltage drop across item 28, a 140 ohm resistor. The two 25Z6GT rectifie are in parallel and connected for voltage doubling

The B voltage is filtered with the 900 ohm resistor, item 2 the speaker field (450 ohms) item 15, a twin 30 mf. electrolyti and item 14, a single 30 mf. electrolytic.

The filaments of the tubes are wired in series. A .05 mf condenser, item 11, is connected across the power supply lea to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes use together with the voltage readings between the tube socket co tacts and chassis. Voltage readings should be taken with 1,000 ohm per volt, 250 volt volt-meter (except filaments) wi the volume control full "ON" and no signal input. The filame voltages should be measured with an accurate low range vol meter. When measured on a 117.5 volt A.C. line voltage limi may vary plus or minus 10% of the values given.

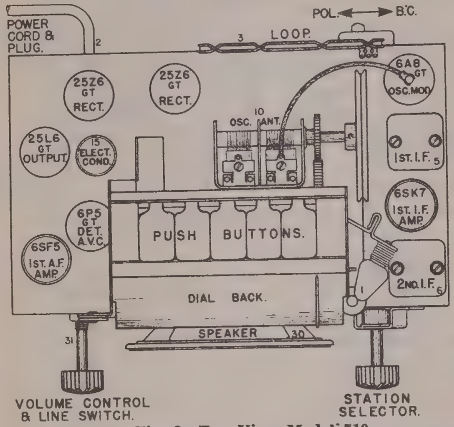


Fig. 2—Top View Model 719

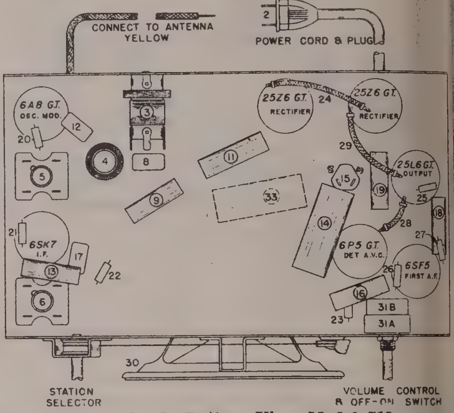


Fig. 3—Bottom View Model 719

TUBE SOCKET VOLTAGE READING

		PIN NUMBER							
Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6A8GT	Oscillator-Modulator	—	H	130	70	–17	130	H	—
6SK7	I-F Amplifier	—	H	—	—	—	70	H	130
6P5	Det. AVC Diode	—	H	—	J.B.	—	J.B.	H	—
6SF5	1st Audio	—	—	—	—	68	—	H	H
25L6	Output	—	H	121	128	—	J.B.	H	6
2–25Z6	Rectifier	—	H	A.C.	232	—	—	H	130

Maximum power output 2.5 watts.
Drop across speaker field 40 volts.
Power consumption @ 117.5 volt line = 65 watts. Those with "Magnetune" coil 40 watts additional.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a 100 mmf. condenser to the antenna lead on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, item 6, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers, item 5, for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjus ments.

ALWAYS USE THE LOWEST SIGNAL GENERATO OUTPUT THAT WILL GIVE A REASONABLE READIN ON THE OUTPUT METER.

Aligning the R-F Amplifier

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capaci position, adjust the trimmer condenser on the "OSC" section the gang so that the 1725 kilocycle signal is heard. It is n necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 1 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "AN section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

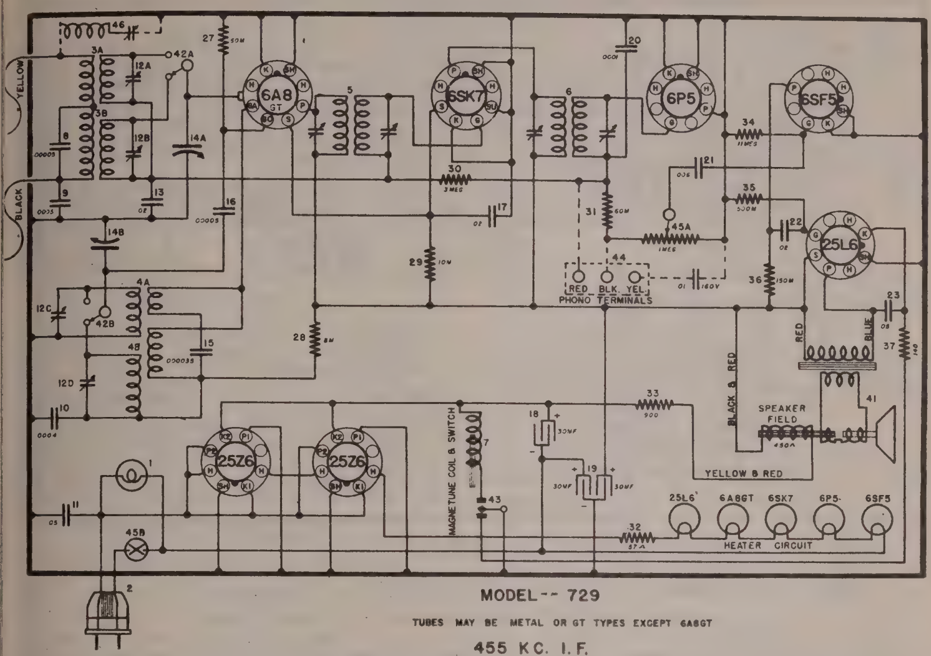
(f) Repeat operations (d) and (e) for more accurate adju ments.

The special police band has no provisions for alignment.

WAVE TRAP

Some chassis of this model may be equipped with a wave tr for the purpose of eliminating interference from code statio which operate on a frequency of approximately 455 kilocycl This assembly is located on the top side of the chassis and co sists of a coil and a condenser as illustrated by dotted lines in t Wiring Diagram, Fig. 1A.

THE CROSLEY CORP. MODEL 729 (Types 1 and 2)
Schematics

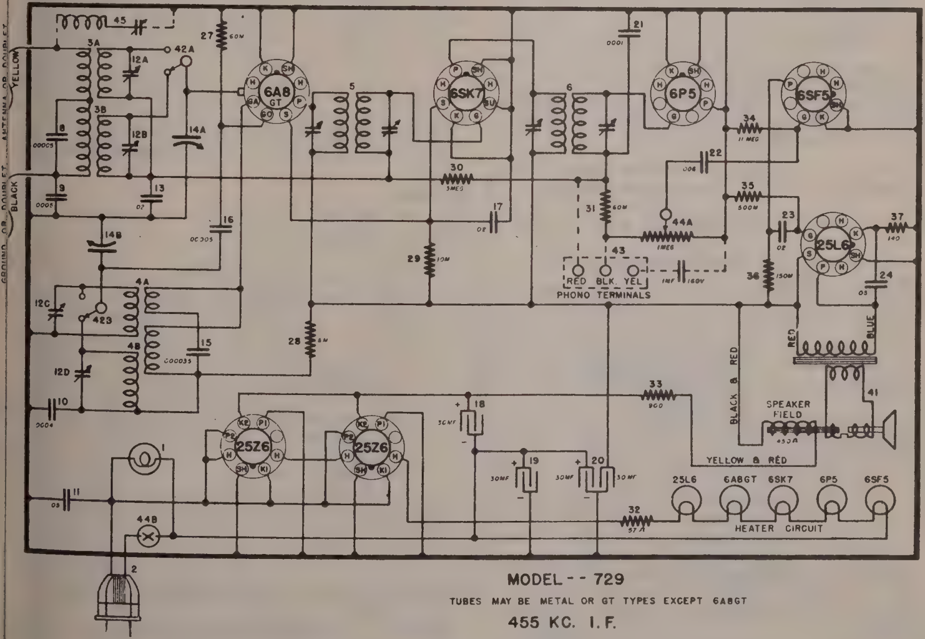


MODEL -- 729

TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT

455 KC. I.F.

FIG. 1-A—WIRING DIAGRAM—MODEL 729 (MAGNETUNE)



MODEL -- 729

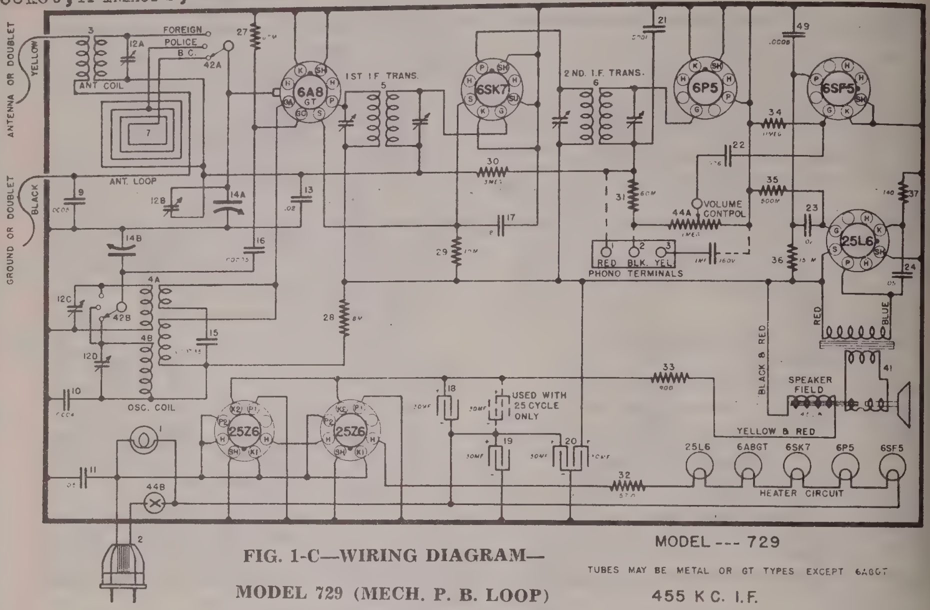
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT

455 KC. I.F.

FIG. 1-B—WIRING DIAGRAM—MODEL 729 (MECH. P. B.—TWO BAND)

MODEL 729 (Type 3)
Schematic, Voltage
Socket, Trimmers, Chassis

THE CROSLEY CORP.



MODEL --- 729

TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT

FIG. 1-C—WIRING DIAGRAM—

MODEL 729 (MECH. P. B. LOOP)

455 K C. I.F.

SOCKET VOLTAGE READINGS AT 117.5 VOLT LINE

Tube	Purpose	PIN NUMBER No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
6A8GT	Oscillator-Modulator	—	H	125	74	Osc. Grid	130	H
6SK7	I-F Amplifier	—	H	—	Grid	—	74	H
6P5	Diode	—	H	—	—	Grid	—	H
6SF5	1st Audio	—	—	Grid	—	65	—	H
25L6	Output	—	H	120	125	Grid	—	H
2–25Z6	Rectifier	—	H	117.5 A.C.	232	—	—	H

Drop across speaker field 35 volts.
Drop across Item 33 72 volts.
Maximum power output 4.3 watts @ 125 volts line.
Power consumption @ 117.5 volts line—60 watts.
J.B. = junction block

H = heater.

JANUARY, 1940

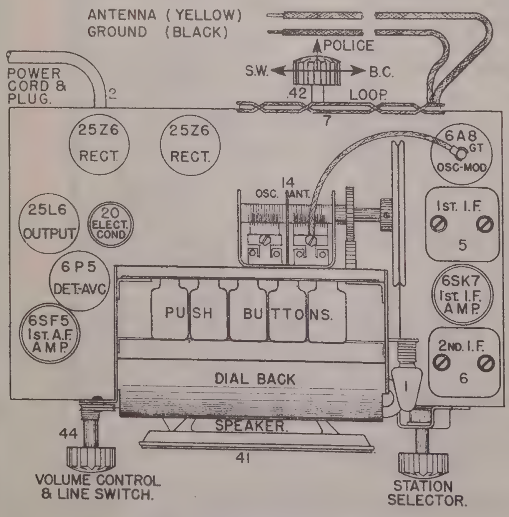


Fig. 1—Top View Model 729

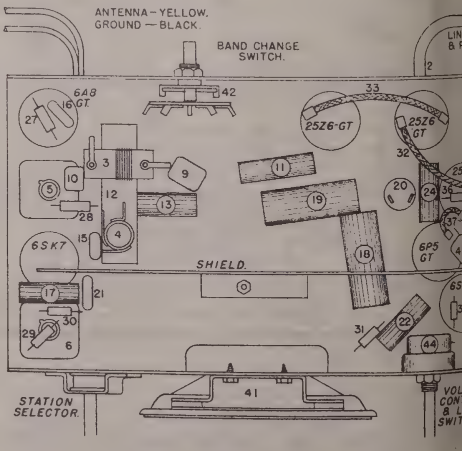


Fig. 3—Bottom View Model 729

THE CROSLEY CORP.

MODEL NO. 729

his model Crosley receiver is designed for operation on 110 vo 50 or 60 cycle electric circuits. There are three versions of th model in the field which include; one version which is a two ba l super with a mechanical push button tuning system; one ve ion which is a two band super with the "Magnetune" electric pu button tuning system; one version which is a three band su r with a loop antenna and a mechanical push button tuning sy em.

he circuit is a conventional superheterodyne with the excep- ti of the three band series which is novel in the method in w h the special police band is covered. This special band makes use of the image frequency (2 x I-F frequency more than fundamental) and the tap on the loop which is resonated at 2.4 megacycles.

The 6A8GT, 6SK7, and 6SF5 are operated at zero bias and the 25L6 bias is obtained from voltage drop across item 37, a 140 ohm ½ watt resistor. A.V.C. voltage is applied to the 6A8GT and the 6SK7 through filter resistor item 30 (3 megohms). Item 31, a 60,000 ohm resistor and item 45A, a 1 megohm volume control, serve as the A.V.C. load. The two 25Z6 rectifiers are hooked in parallel and connected voltage doubling. The speaker field (450 ohms) and item 33, a 900 ohm 7 watt resistor with condensers items 18 and 19 filter the B supply.

ALIGNMENT PROCEDURE

l circuits have been accurately adjusted at the factory and no ally should need no further adjustment. However, if it is de itely known that an adjustment is necessary the circuits ca best be properly aligned with the use of a modulated signal ge rator and an output meter.

OTE: The circuit of this receiver is such that if the signal ge rator has one side of the line connected to the case or ground si and the generator and receiver are plugged into the same in serious damage may result to either or both instruments. A WAYS ISOLATE SIGNAL GENERATOR GROUND L D BY INSERTING A .01 mf. OR SMALLER CON- D NSER IN SERIES WITH THE LEAD BEFORE CON- N CTING TO THE CHASSIS.

CONNECTING OUTPUT METER

ne terminal of the output meter should be connected to the pl e (No. 3 pin) and the other terminal to the screen (No. 4 pin) of he 25L6GT output tube. Be sure the meter is protected fr D.C. by connecting a .25 mf. condenser in series with one of e leads.

1 I-F Amplifier Alignment

) Connect the output lead of the signal generator through a 2 mf. condenser to the top (GRID) cap of the 6A8GT tube l ving the tubes grid connector in place).

) Connect the ground lead of the signal generator through a 1 mf. (or smaller .001 mf.) condenser to the chassis.

) Adjust station selector so that the rotor plates of the g are completely disengaged, turn band to B.C. position and t the volume control to maximum.

) Set the signal generator to 455 kc.

) Adjust the trimmer condensers on the 2nd I-F trans- o er for maximum output.

) Adjust the trimmer condensers on the 1st I-F transformer o maximum output.

) Repeat (e) and (f) for more accurate adjustments. IN D ER TO PREVENT A.V.C. ACTION, ALWAYS USE T E LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

(2) Aligning R-F Amplifier

(a) Connect the signal generator output lead through a .0001 mf. condenser to the antenna lead (YELLOW) and the generator ground lead to the Black lead of the receiver. Turn band switch to B.C. band, open gang all the way and turn volume control on full.

(b) Set signal generator to 1725 kilocycles.

(c) Adjust B.C. oscillator trimmer for maximum output (receiver does not have to tune through this signal).

(d) Set signal generator to 1400 kilocycles.

(e) Tune in generator signal on receiver by means of manual tuning knob.

(f) Adjust B.C. antenna trimmer for maximum output. DO NOT readjust oscillator trimmer.

(g) Repeat above procedure for more accurate adjustments.

(h) Connect the signal generator output lead through a 250 ohm carbon resistor to the antenna lead of the receiver. Turn band switch to S.W. position, open gang condenser all the way, and turn volume on full.

(i) Set signal generator to 18.3 megacycles.

(j) Adjust S.W. oscillator trimmer for maximum output.

(k) Set signal generator to 18 megacycles.

(l) Tune in 18 mc. signal with manual control, then adjust the S.W. antenna trimmer condenser for maximum output.

Check to see that receiver is aligned on the fundamental and not the image frequency. Increase signal generator output approximately 10 times and tune in image frequency (2 x 455 kc. + fundamental) which will be approximately 910 kilocycles less than 18 mc. as indicated by the dial calibrations (17.1 mc.). If correctly aligned, the image will come in as stated but will be much weaker than the fundamental.

The special police band in some models covering 2.3 to 2.5 mc. has no adjustments but can be checked by using a .0001 mf. condenser in series with the signal generator output lead, turning band switch to POL. position, set signal generator to 2.5 mc. and then tune in generator signal, which should come in with the dial pointer near the end of that band.

PARTS LIST—MODEL 729

Figures in first column refer to parts in Diagrams.

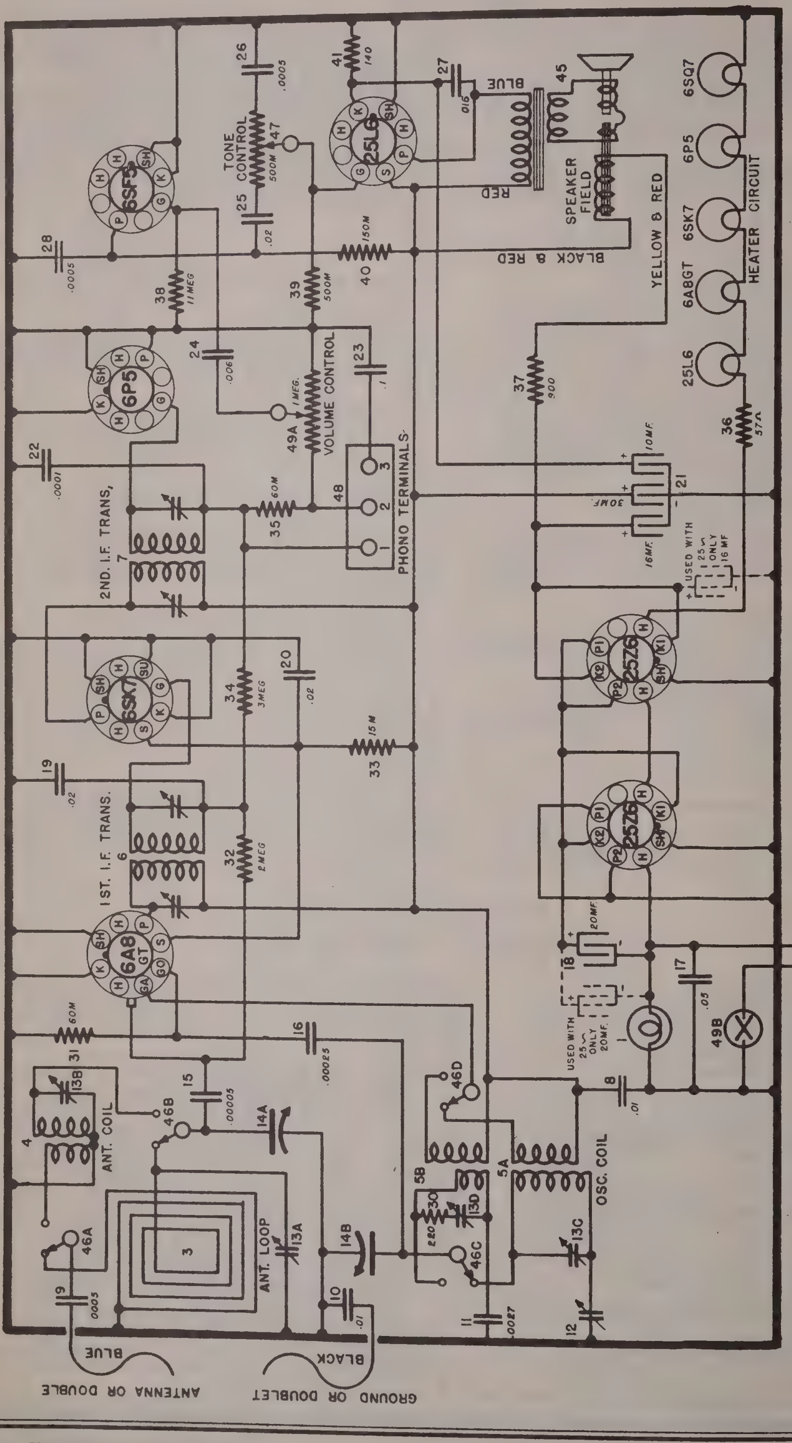
em No.	Part No.	Description
1	W —47977	Dial Light Bulb, 110 Volt
	W —47946	Dial Light Bracket Assembly
	W —48169	Dial Light Cover
2	B —45769A	Power Cord and Plug
3	G214—32000	Antenna Coil, Foreign
4A 4B	G206—32002	Oscillator Coil { Foreign Broadcast
5	G221—32004	1st I-F. Transformer Assembly
6	G188—32004	2nd I-F. Transformer Assembly
7	G6 —47673	Loop Antenna
8	G2 —47909	Solenoid Coil Assembly
9	G3 —34002	Condenser, .0005 Mf. Molded
0	G18 —34002	Condenser, .0004 Mf. Molded
1	W —45782B	Condenser, .05 Mf. 120 Volts Paper
2A 2B 2C 2D	W —41247A	Trimmer Condenser { Antenna, Foreign Antenna, B. C. Oscillator, Foreign Oscillator, B. C.
	W —47574	Spacers, (2 Req.) (4 Sect. Trimmer)
3	W —45780	Condenser, .02 Mf. 160 Volts Paper
4A 4B	G80 —33001	2 Sect. Var. Cond. { Antenna Section Oscillator Section
	MG18—47860	Riveted Mtg. Bracket, R. H.
	MG18—47860	Riveted Mtg. Bracket, L. H.
	MG20—47860	Idler Support Bracket
	W —47875	Dial Back Face
	G8 —48762	Push Button Unit Assembly
	G12 —43564	Pulley and Hub Assembly
5	G13 —34002	Condenser, .00003 Mf. Molded
6	G5 —34002	Condenser, .00005 Mf. Molded
7	W —45780	Condenser, .02 Mf. 160 Volts Paper
8	W —47702A	Condenser, 30 Mf. 150 Volts Elect.
9	W —47702A	Condenser, 30 Mf. 150 Volts Elect.
9	W —47892	Condenser, 30-30 Ohms 135 Volts Elect. (Magnetune only)

Item No.	Part No.	Description
20	W —47892	Condenser, 30-30 Ohms 135 Volts Elect.
20	G2 —34002	Condenser, .0001 Mf. Molded (Magnetune only)
21	G2 —34002	Condenser, .0001 Mf. Molded
21	W —45810B	Condenser, .006 Mf. 160 Volts Paper (Magnetune only)
22	W —45810B	Condenser, .006 Mf. 160 Volts Paper
22	W —45780B	Condenser, .02 Mf. 160 Volts Paper (Magnetune only)
23	W —45780B	Condenser, .02 Mf. 160 Volts Paper
23	W —45817B	Condenser, .05 Mf. 160 Volts Paper (Magnetune only)
24	W —45817B	Condenser, .05 Mf. 160 Volts Paper
27	—21237A	Resistor, 60,000 Ohms ⅓ Watt Carb.
28	—37905	Resistor, 8,000 Ohms ¼ Watt Ins.
29	—36317	Resistor, 10,000 Ohms ¼ Watt Ins.
30	—26577	Resistor, 3 Megohms ⅓ Watt Carb.
31	—21237A	Resistor, 60,000 Ohms ⅓ Watt Carb.
32	W —47857	Resistor, 57 Ohms 7 Watt Flex.
33	W —47873	Resistor, 900 Ohms 7 Watt Flex.
34	—46497	Resistor, 11 Megohms ⅓ Watt Carb.
35	—23785	Resistor, 500,000 Ohms ⅓ Watt Carb.
36	—23403	Resistor, 150,000 Ohms ⅓ Watt Carb.
37	W —47512	Resistor, 140 Ohms ¾ Watt Flex.
41	281-BL-7-"B"	Speaker, Spec. 55-WA-43
	—47290	V. C. and Cone Assembly
	—46686	Field Coil, 450 Ohms 60 M. A.
	—46687	Output Transformer

Part No.	Description
MG36—47861	Push Button and Hinge Assembly (9GA, 9GC)
MG37—47861	Push Button and Hinge Assembly (9GB, 9GE, 9GF, 9GG)
MG21 —47860	Riveted Hinge Assembly
W —48730B	Insert (5 Req.) (P. B. and Hinge Assembly)
W —47947A	Push Button Hinge
W —48017C	Push Button Hinge Spring

MODEL 739(Loop Type)
Schematic

THE CROSLEY CORP.



MODEL --- 739

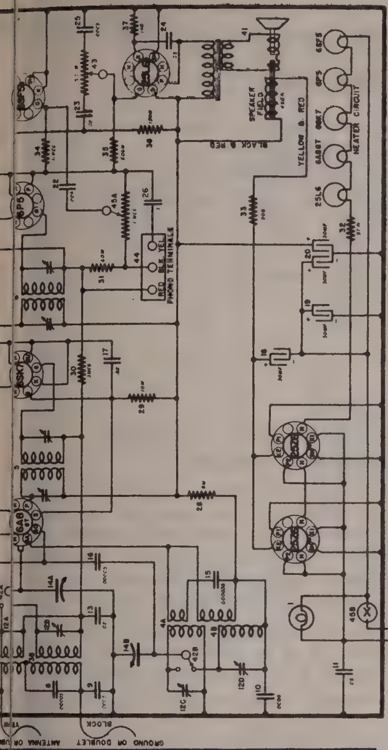
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8

455 KC. I.F.

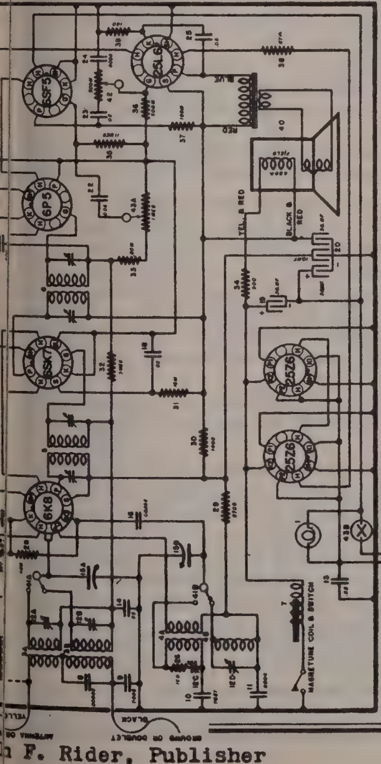
FIG. 1-A—MODEL 739 (MECHANICAL, P. B. & LOOP)

THE CROSLEY CORP.

MODELS 739(2 Types),
7739 (2 Types)
Schematics

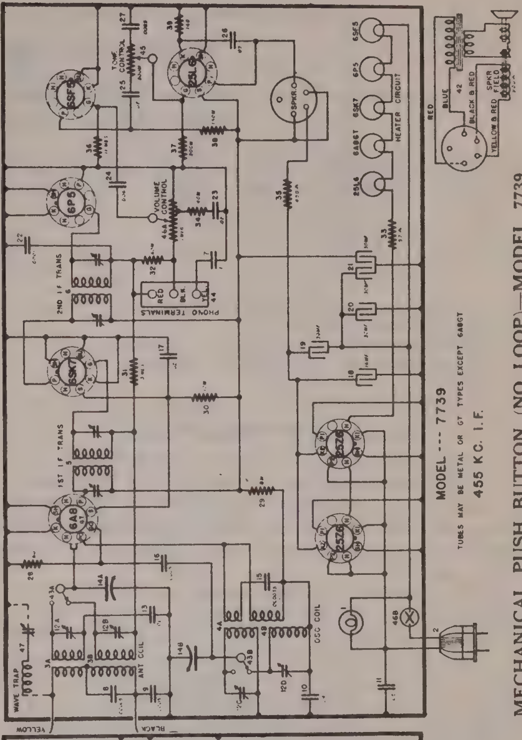


MECHANICAL PUSH BUTTON (NO LOOP)—MODEL 739
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT
455 KC. I. F.



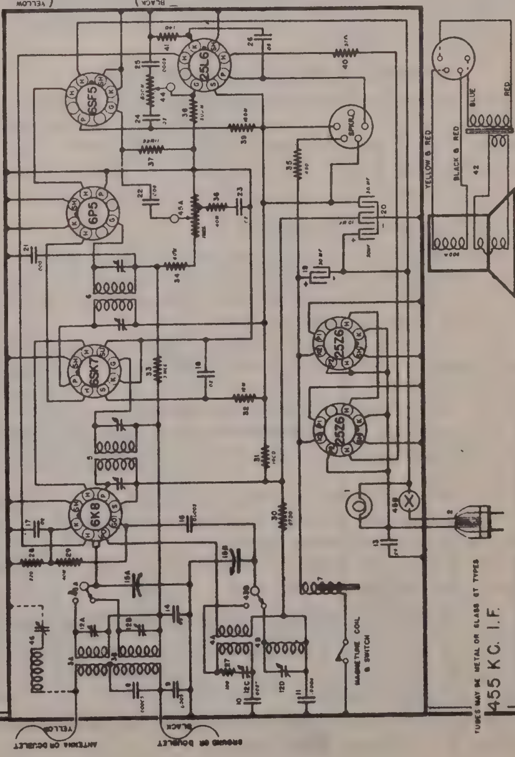
"MAGNETUNE"—MODEL 739

MODEL-739
TUBES MAY BE METAL OR GLASS GT TYPES
455 KC. I.F.



MODEL --- 7739
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT
455 KC. I.F.

MECHANICAL PUSH BUTTON (NO LOOP)—MODEL 7739



"MAGNETUNE"—MODEL 7739—
455 KC. I.F.
TUBES MAY BE METAL OR GLASS GT TYPES

MODELS 739, 7739, J-739 AND J-7739

SOCKET VOLTAGE READINGS AT 117.5 VOLT LINE

		PIN NUMBER						
Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
6A8GT	Oscillator-Modulator	—	H	123	80	−11	123	H
6SK7	I-F. Amplifier	—	H	—	Grid	—	80	H
6P5	Diode	—	H	—	—	Grid	—	H
6SF5	1st Audio	—	—	Grid	V.C.	68	—	H
25L6	Output	—	H	115	123	Grid	—	H
2–25Z6	Rectifier	—	H	117.5 A.C.	220	—	—	H

Drop across speaker field 35 volts, 739—65 volts on 7739.
Drop across Item 33—72 volts.
Maximum power outout 4.3 watts @ 125 volts line.
Power consumption @ 117.5 volts line—63 watts.
H = heater.

ALIGNMENT PROCEDURE

All circuits have been accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

NOTE: The circuit of this receiver is such that if the signal generator has one side of the line connected to the case or ground side and the generator and receiver are plugged into the same line, serious damage may result to either or both instruments. ALWAYS ISOLATE SIGNAL GENERATOR GROUND LEAD BY INSERTING A .01 mf. OR SMALLER CONDENSER IN SERIES WITH THE LEAD BEFORE CONNECTING TO THE CHASSIS.

CONNECTING OUTPUT METER

One terminal of the output meter should be connected to the plate (No. 3 pin) and the other terminal to the screen (No. 4 pin) of the 25L6GT output tube. Be sure the meter is protected from D. C. by connecting a .25 mf. condenser in series with one of the leads.

1.—I-F Amplifier Alignment

(a) Connect the output lead of the signal generator through a .02 mf. condenser to the top (GRID) cap of the 6A8GT tube (leaving the tubes grid connector in place) or to the antenna lead.

(b) Connect the ground lead of the signal generator through a .01 mf. (or smaller, .001 mf.) condenser to the chassis.

(c) Adjust station selector so that the rotor plates of the gang are completely disengaged, turn band to B. C. position and turn the volume control to maximum.

(d) Set the signal generator to 455 kc.

(e) Adjust the trimmer condensers on the 2nd I-F transformer for maximum output.

(f) Adjust the trimmer condensers on the 1st I-F transformer for maximum output.

(g) Repeat (e) and (f) for more accurate adjustments. IN ORDER TO PREVENT A. V. C. ACTION, ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2.—Aligning R-F Amplifier

(a) Connect the signal generator output through a .0001 mf. condenser to the antenna (YELLOW OR BLUE) and the generator ground to the Black lead of the receiver. Turn band to B. C. band, open gang all the way and turn v control on full and tone control to treble positio

(b) Set signal generator to 1725 kilocycles. erator should be set to 1620 kilocycles for Model 7

(c) Adjust B. C. oscillator trimmer for max output (receiver does not have to tune through signal).

(d) Set signal generator to 1400 kilocycles.

(e) Tune in generator signal on receiver by of manual tuning knob.

(f) Adjust B. C. antenna trimmer for maximun put. DO NOT readjust oscillator trimmer.

(g) Repeat above procedure for more accura justments.

(h) Set signal generator to 600 kilocycles.

(i) Tune in 600 kilocycle signal on receiver. rocking the gang back and forth adjust the B. C. lator series condenser for maximum output.

(j) Repeat operations (d), (e) and (f) to c any change caused by series alignment.

(k) Connect the signal generator output through a 250 ohm carbon resistor to the antenna of the receiver. Turn band switch to S. W. po open gang condenser all the way, and turn volu full, etc.

(l) Set signal generator to 18.3 megacycles.

(m) Adjust S. W. oscillator trimmer for max output.

(n) Set signal generator to 18 megacycles.

(o) Tune in 18 mc. signal with manual co then adjust the S. W. antenna trimmer condens maximum output.

Check to see that receiver is aligned on the mental and not the image frequency. Increase generator output approximately 10 times and tu image frequency (2 x 455 kc. + fundamental) will be approximately 910 kilocycles less than 1 as indicated by the dial calibrations (17.1 mc.) correctly aligned, the image will come in as state will be much weaker than the fundamental.

THE CROSLEY CORP.

MODEL 7739(Loop Type)
Schematic

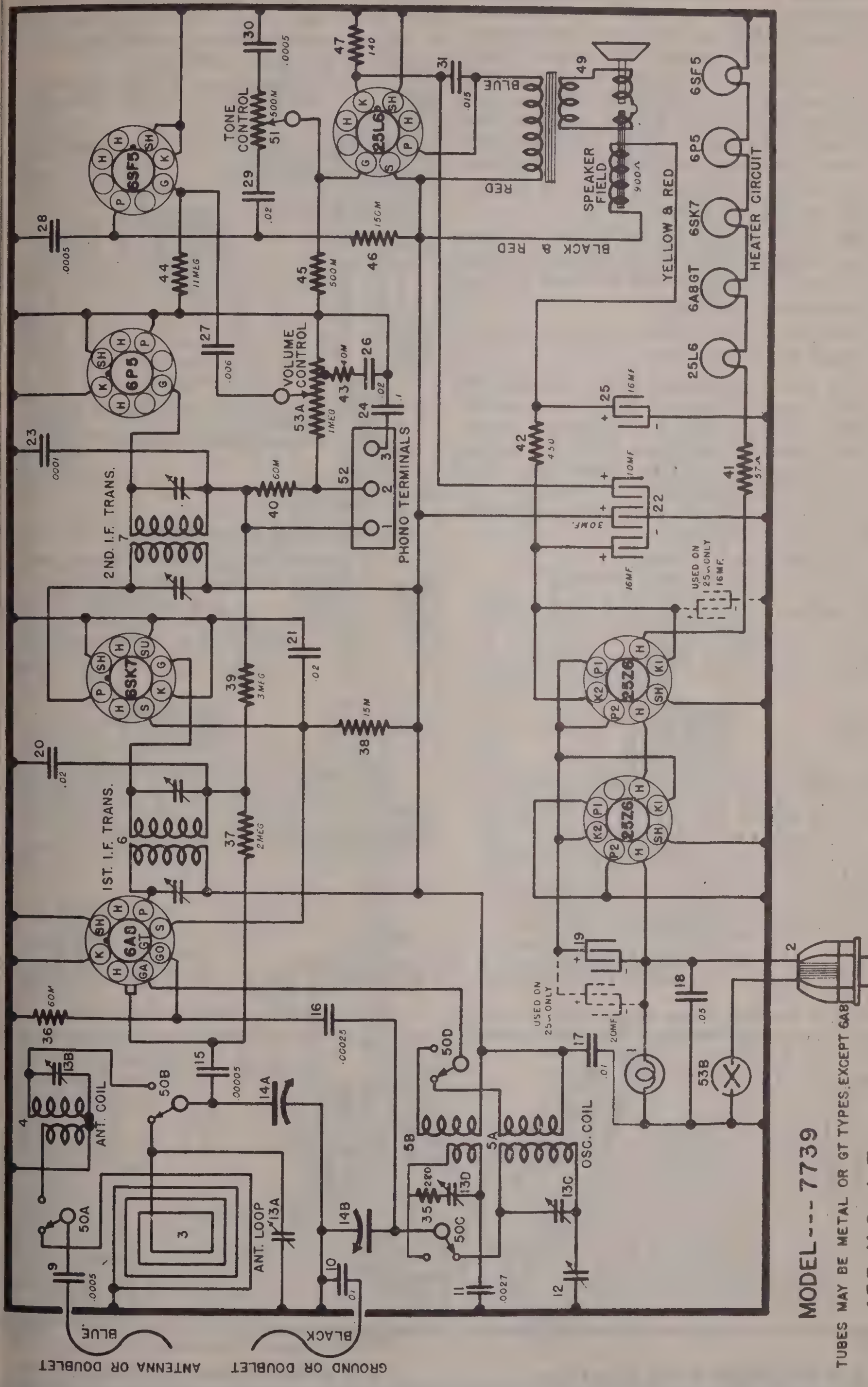


FIG. 1-B—MODEL 7739 (MECHANICAL P. B. & LOOP)

MODEL---7739

TUBES MAY BE METAL OR GT TYPES, EXCEPT 6A8

455 KC I.F.

The circuit used is a conventional superheterodyne without regeneration using a 6A8GT as Oscillator-Modulator (biased 6K8GT in some of the earlier models), a 6SK7 as I-F amplifier, a 6P5GT as diode detector, A. V. C., a 6SF5 as first audio amplifier, a 25L6GT as beam power output and two 25Z6GT rectifiers (connected for voltage doubling). A. V. C. is applied to the oscillator-modulator and I-F tubes. All tubes are operated at zero bias except the 25L6GT which obtains its bias from the voltage drop across a 140 ohm resistor between cathode and chassis.

Model 7739 uses a tapped volume control for variable level bass compensation. Models of either chassis in the later series are equipped with terminals for connecting a phonograph attachment.

Models J-739 and J-7739 are the same as models 739 and 7739 except for the following:

Model J-739 differs from Model 739 in that the negative or ground return is isolated from the chassis by a .2 mf.—160 volt condenser. For alignment procedure use same as outlined for Model 739. The voltage readings are the same as given for Model 739 except the MEASUREMENTS SHOULD BE TAKEN BETWEEN SOCKET CONTACTS AND THE LOW SIDE OF THE VOLUME CONTROL.

Model J-7739 is the same as Model 7739 except t
Model J-7739 has a 1 to 1 isolating power transforn
For alignment procedure and socket voltages use sa
as given for the Model 739 etc.

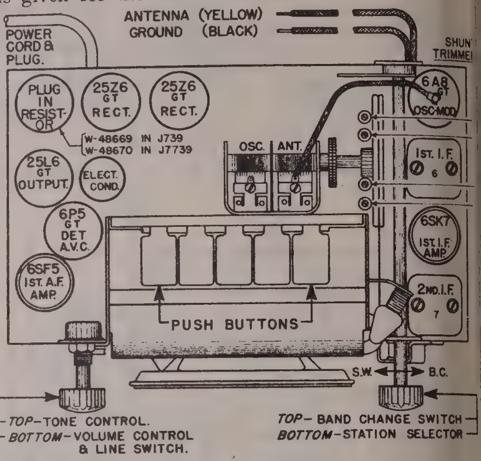


Fig. 2-C—Top View Models J-739, J-7739

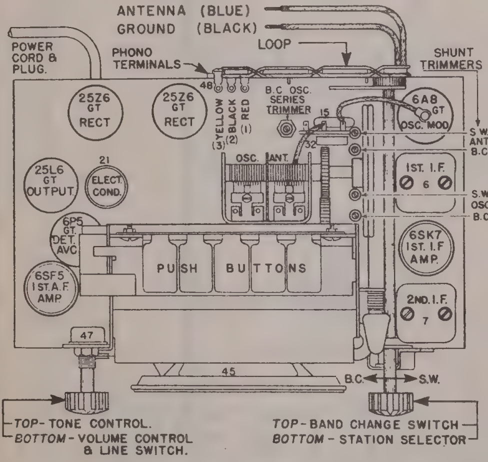


Fig. 2-A—Top View Model 739

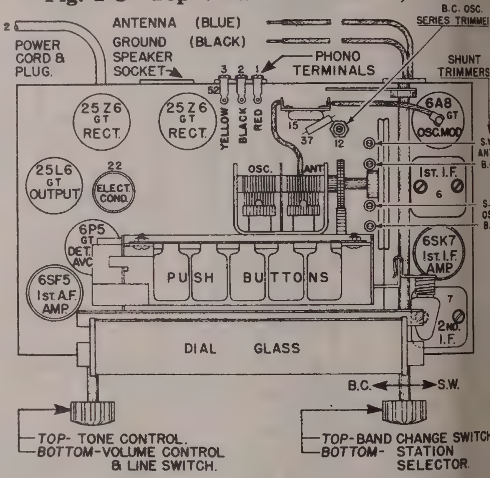


Fig. 2-B—Top View Model 7739

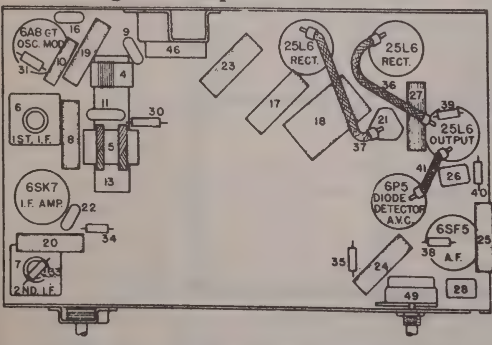


Fig. 3-A—Bottom View Model 739

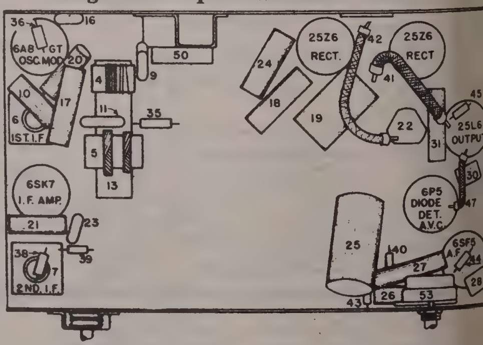
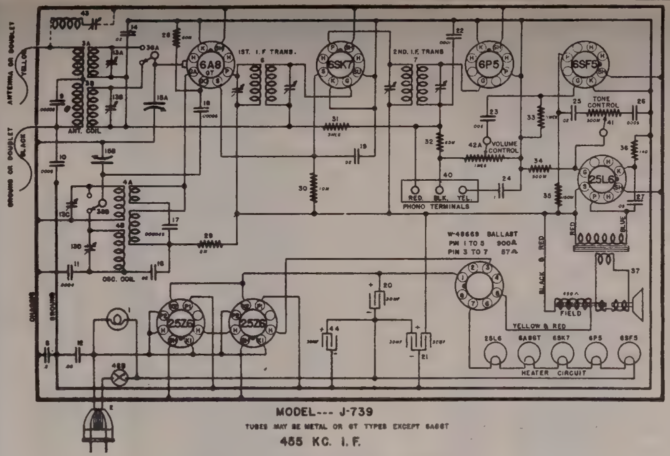


Fig. 3-B—Bottom View Model 7739

THE CROSLEY CORP.

MODELS J739,J7739
Schematics,Parts

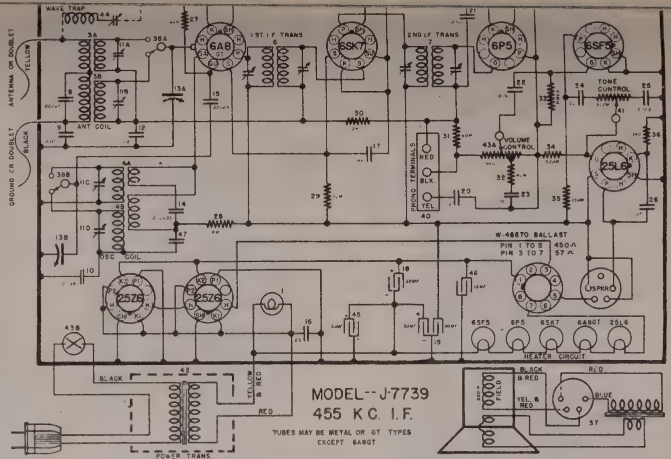


MODEL--- J-739
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT
455 KC. I.F.

MODEL J-739—WIRING DIAGRAM
PARTS LIST

1	-47977	Dial Lamp, 110 Volt	24	-50105	Condenser, .1 Mf. 160 V.
2	-45769	Power Cord and Plug	25	-45780	Condenser, .02 Mf. 160 V.
3	G201-32000	Antenna Coils Assy.	26	G3 -34002	Condenser, .0005 Mf. Mica
		A—Short Wave Antenna Coil	27	-45817	Condenser, .05 Mf. 160 V.
		B—Broadcast Antenna Coil	28	-21237	Resistor, 60,000 Ohms ⅓W.
4	G208-32002	Oscillator Coils Assy.	29	-37905	Resistor, 8,000 Ohms ¼W.
		A—Short Wave Oscillator Coil	30	-36317	Resistor, 10,000 Ohms ¼W.
		B—Broadcast Oscillator Coil	31	-26577	Resistor, 3 Megohms ⅓W.
5	None		32	-21237	Resistor, 60,000 Ohms ⅓W.
6	G221-32004	1st I-F. Assy.	33	-46497	Resistor, 11 Megohms ⅓W
7	G188-32004	2nd I-F. Assy.	34	-23785	Resistor, 500,000 Ohms ⅓W.
8	-48686	Condenser, .2 Mf. 160 V.	35	-23403	Resistor, 150,000 Ohms ⅓W.
9	G5 -34002	Condenser, .00005 Mf. Mica	36	-48753	Resistor, 140 Ohms 1W.
10	G3 -34002	Condenser, .0005 Mf. Mica	37	281-UL-7	Speaker
11	G18 -34002	Condenser, .0004 Mf. Mica	38	-47993	Band Switch (No Loop)
12	-45782	Condenser, .05 Mf. 120 V.		-49058	Band Switch (With Loop)
13	-41247	4 Sect. Shunt Trimmer Cond. Assy.	39	None	
14	-45780	Condenser, .02 Mf. 160 V.	40	G41 -26719	Phono Terminal Board
15	G80 -33001	2 Section Var. Tuning Gang Cond.	41	-48181	Tone Control, 500,000 Ohms
16	-45780	Condenser, .02 Mf. 160 V.	42	-47858	Line Sw. and Vol. Control (1 Meg.)
17	G13 -34002	Condenser, .000035 Mf. Mica	43	G193-32004	Wave Trap (Not Used on Any Loop Models)
18	G5 -34002	Condenser, .00005 Mf. Mica			
19	-45780	Condenser, .02 Mf. 160 V.	44	-47702	Condenser, 30 Mf. 125 V.
20	-47702	Condenser, 30 Mf. 125 V.		-48795	Instruction Booklet
21	-48596	Condenser, 30-30 Mf. 135 V.		MG31-48576	Instruction Envelope Assy.
22	G2 -34002	Condenser, .0001 Mf. Mica		-48669	Ballast Resistor
23	-45810	Condenser, .006 Mf. 160 V.			

For miscellaneous parts not listed use Model 739 Parts List.



MODEL--J-7739
455 KC. I.F.
TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT

MODEL J7739—WIRING DIAGRAM
PARTS LIST

1	-47977	Dial Lamp, 110 Volt	24	-45780	Condenser, .02 Mf. 160 V.
2	-45769	Power Cord and Plug	25	G3 -34002	Condenser, .0005 Mf. Mica
3	G201-32000	Antenna Coils Assy.	26	-45817	Condenser, .05 Mf. 160 V.
		A—S. W. Antenna Coil	27	-21237	Resistor, 60,000 Ohms ⅓W.
		B—B. C. Antenna Coil	28	-37905	Resistor, 8,000 Ohms ¼W.
4	G206-32002	Oscillator Coils Assy.	29	-36317	Resistor, 10,000 Ohms ¼W.
		A—S. W. Oscillator Coil	30	-26577	Resistor, 3 Megohms ⅓W.
		B—B. C. Oscillator Coil	31	-21237	Resistor, 60,000 Ohms ⅓W.
5	None		32	-21453	Resistor, 40,000 Ohms ⅓W.
6	G221-32004	1st I-F. Assy.	33	-46497	Resistor, 11 Megohms ⅓W.
7	G188-32004	2nd I-F. Assy.	34	-36322	Resistor, 500,000 Ohms ¼W.
8	G5 -34002	Condenser, .00005 Mf. Mica	35	-23403	Resistor, 150,000 Ohms ⅓W.
9	G3 -34002	Condenser, .0005 Mf. Mica	36	-48753	Resistor, 140 Ohms 1W.
10	G18 -34002	Condenser, .0004 Mf. Mica	37	495-BP-10	Speaker
11	-41247	4 Sect. Shunt Trimmer Cond. Assy.	38	-47993	Band Switch (No Loop)
12	-45780	Condenser, .02 Mf. 160 V.		-49058	Band Switch (With Loop)
13	G80 -33001	2 Section Var. Tuning Condenser	39	None	
14	G13 -34002	Condenser, .000035 Mf. Mica	40	G41 -26719	Phono Terminals
15	G5 -34002	Condenser, .00005 Mf. Mica	41	-48020	Tone Control, 500,000 Ohms
16	-45782	Condenser, .05 Mf. 120 V.	42	-48650	Power Transformer
17	-45780	Condenser, .02 Mf. 160 V.	43	-48019	Line Sw. and Vol. Control (1 Meg.)
18	-47702	Condenser, 30 Mf. 125 V.	44	G193-32004	Wave Trap
19	-48596	Condenser, 30-30 Mf. 135 V.	45	-47702	Condenser, 30 Mf. 125 V.
20	-50105	Condenser, .1 Mf. 160 V.	46	-48122	Condenser, 16 Mf. 250 V.
21	G2 -34002	Condenser, .0001 Mf. Mica	47	-45780	Condenser, .02 Mf. 160 V.
22	-45810	Condenser, .006 Mf. 160 V.		-48670	Ballast Resistor
23	-45780	Condenser, .02 Mf. 160 V.			

For miscellaneous parts not listed use Model 7739 Parts List.

FEBRUARY, 1940

MODELS 819 (2 Types), J819,1019

Parts Lists

THE CROSLEY CORP.

PARTS LIST — MODELS 819, J-819, 1019
(Model with 5Y3G Rectifiers)

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —48318	Dial Lamp—110 Volt
	G1 —48303	Socket—Dial Lamp
	—48302	Cover—For Dial Lamp
2	B —45784	Power Cord and Plug
	B —45769	Power Cord and Plug—220 Volt only and J819
3	G1 —48821	Loop Antenna—B. C.
4	G205—32000	Antenna Coil—Pol.
5	G206—32000	Antenna Coil S. W.
6	G210—32002	Oscillator Coil—B. C.
7	G211—32002	Oscillator Coil- Pol.
8	G212—32002	Oscillator Coil—S. W.
9	G12 —29535	Audio Coupling Choke
10	G222—32004	1st I-F. Assy.—455 Kc.
11	G228—32004	2nd I-F. Assy.—455 Kc.
12	C3 —34002	Condenser, .0005 Mf. Mica
13	G3 —34002	Condenser, .0005 Mf. Mica
14	G3 —34002	Condenser, .0005 Mf. Mica
15	—35951	3 Section—Shunt Trimmer Cond.
16	—45713	3 Section—Shunt Trimmer Cond.
17	G11 —34005	Condenser, .00270 Mf. Mica
18	G14 —34005	Condenser, .001185 Mf. Mica
19	—38989	Condenser, B. C. Osc. Series Trimmer
20	G85 —33001	2 Section Var. Tuning Condenser
21	G5 —34002	Condenser, .00005 Mf. Mica
22	G13 —34002	Condenser, .000035 Mf. Mica
23	—23615	Condenser, .05 Mf. 400 V.
23	—30805	Condenser, .01 Mf. 400 V.—J819
24	—46128	Condenser, 16 Mf. 250 V.
25	—32380	Condenser, .05 Mf. 200 V.
26	—23191	Condenser, .01 Mf. 400 V.
27	—47809	Condenser, 30-30-10 Mf. 135 V.
28	G2 —34002	Condenser, .0001 Mf. Mica
29	—23191	Condenser, .01 Mf. 400 V.
30	—48993	Condenser, .011 Mf. 400 V.
31	G2 —34002	Condenser, .0001 Mf. Mica
32	—23191	Condenser, .01 Mf. 400 V.
33	—23191	Condenser, .01 Mf. 400 V.
34	G2 —34002	Condenser, .0001 Mf. Mica
35	—48667	Condenser, .01 Mf. 160 V.
36	—34713	Condenser, .006 Mf. 160 V.
37	—48560	Condenser, .008 Mf. 160 V.
38	—24049	Condenser, .1 Mf. 200 V.
39	G1 —34002	Condenser, .00025 Mf. Mica
40	—48822	Single Trimmer— Loop Antenna
41	—35928	Resistor, 60,000 Ohms ¼W.
42	—35934	Resistor, 6,500 Ohms ¼W.
43	—36317	Resistor, 10,000 Ohms ¼W.
44	—35927	Resistor, 2 Megohms ¼W.
45	—36317	Resistor, 10,000 Ohms ¼W.
46	—35927	Resistor, 2 Megohms ¼W.
47	—27121	Resistor, 5,000 Ohms ⅓W.
48	—44009	Resistor, 3,000 Ohms ¼W.
49	—47815	Resistor, 500 Ohms ½W.
50	—35600	Resistor, 100,000 Ohms ¼W.
51	—35600	Resistor, 100,000 Ohms ¼W.
52	—35602	Resistor, 1 Megohm ¼W.
53	—37472	Resistor, 50,000 Ohms ⅓W.
54	—50956	Resistor, 10 Megohms ¼W.
55	—47814	Resistor, 100 Ohms 1½W.
56	—48241	Band Change Switch
57	594-BP-15"M"	Speaker—Mfg. Spec. No. 1-D-1581
	—48891	V. C. and Cone Assy.—"M" only
	—43678	Cardboard Ring—Cone Mtg.
	—48892	Field Coil (700 Ohms) "M"
	—48893	Output Transformer
	594-BP-15"R"	Speaker—Mfg. Spec. No. F-5735
	—48622	V. C. and Cone Assy.—"R"
	—43979	Cardboard Ring—Cone Mtg.
	—48624	Field Coil (700 Ohms) "R"
	—48623	Output Transformer
	—44682	5 Prong Plug—Speaker
58	G48 —26719	Terminal Board—For Loop Connections
59	G41 —26719	Phono Terminal Board
60	—48243	Tone Control Switch
61	—48242	Switch and Volume Control—1 Meg. Tapped

Item No.	Part No.	Description
62	—48902	Power Trans., 110 V.—60 Cycle
	—49018	Power Trans., 110 V.—50-60 Cycle
	—49067	Power Trans., 110 V.—25-60 Cycle
	—49019	Power Trans., 220 V.—50-60 Cycle
62	—48996	Power Trans., 110 V.—60 Cycle—J819
	—49706	Push Button Tuning Unit
	G32 —47880	Riveted Key Assy.
	G31 —48762	Rocker Plate and Gear Assy.
	—50561	Screws—Rocker Plate Bearing
	—47877	Adjusting Screw
	48769	Shafts (End of Adjusting Screw)
	—38056	No. 8—32 x ⅛" Headless Set Screw
	—48826	Spring—Push Button Return
	MG27—47849	Bracket—Dial Support
	—48857	Glass Dial
	—48187	R. H. Clip—Dial Mtg. (1 Req.)
	—46020	L. H. Clip Dial Mtg. (1 Req.)
	—48280	Clip—Dial Mtg. (2 Req.)
	—48301	Cushion—Dial Mtg
	—48285	Pointer—Dial Hand
	G21 —43564	Pulley and Hub Assy.
	—48292	Drive Shaft and Pulley
	—43878	Bracket—Drive Shaft Mtg.
	—51071	"C" Washer—Shaft Retaining
	G34 —41582	Drive Cord (85½")
	—46290	Cord Clamp
	—50590	Spring—Cord Tension
	—48402	Felt Light Guard
	—49285	Guide—Cord on Pulley
	9HM	Cabinet
	—47854	Shipping Carton
	—48284	Cabinet Back
	—46464	Thumb Screws—Back Mtg.
	—47843	Screw—Escutcheon Mtg.—FS18
	—48185	Escutcheon
	MG32—47811	Riveted Push Button Hinge
	—48277	Rod—Button to Hinge Mtg.
	—48729	Push Button—Mech. Unit
	—48766	Light Deflector Felt—Escutcheon
	—48751	Call Letter Tabs
	—48749	Celluloid Cover—Call Tab
	—49440	Escutcheon Mtg. Strip
	—48297	Knob—Band Switch
	—48999	Knob—Tone Control
	—48298	Knob—V. C.—Tuning
	—47843	Bristol Screw—Escut. Mtg.—FS18
	—48283	Speaker Baffle
	—48393	Dust Cloth—Speaker Baffle
	—47217	Grommet—Baffle Mtg.
	—47219	Headed Bushing—Baffle Mtg.
	MG31—47811	Instruction Envelope Assy.

1019 MISCELLANEOUS

Item No.	Part No.	Description
	9HP	Cabinet
	—47854	Shipping Carton
	—48284	Cabinet Back
	—46464	Thumb Screws—Back Mtg.
	—47843	Screw—Escut. Mtg.—FS18 (Bristol)
	—48275	Screw—Escutcheon Mtg. (Mach.)
	—49143	Escutcheon
	MG32—47811	Riveted Push Button Hinge
	—48277	Rod—Button to Hinge Mtg.
	—49125	Push Button
	—48751	Call Letter Sheet
	—48749	Celluloid Cover—Call Letter
	—49440	Escutcheon Mtg. Strip
	—49123	Knob—Vol. Control—Tuning
	—49130	Knob—Tone Control
	—49131	Knob—Band Switch
	MG31—49106	Instruction Envelope Assy.
	—44772	Screw—Chassis Mtg.—FS58
	—45579	Washer—Chassis Mtg.

PARTS LIST—MODEL 819
(Series Using 25Z6 Rectifiers)

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	—48318	Dial Lamp—110 Volt
	G1 —48303	Socket—Dial Lamp
	—48302	Cover—For Dial Lamp
2	—45784	Power Cord and Plug
3	G198—32000	Antenna Coil, H. F.
4	G197—32000	Antenna Coil, Pol.
5	G196—32000	Antenna Coil, B. C.
6	G199—32002	Oscillator Coil, H. F.
7	G198—32002	Oscillator Coil, Pol.
8	G197—32002	Oscillator Coil, B. C.
9	G4 —47909	Solenoid Tuning Coil
10	G12 —29535	Audio Input Choke
11	G222—32004	1st I-F. Assy.—455 Kc.
12	G228—32004	2nd I-F. Assy.—455 Kc.
13	G3 —34002	Condenser, .0005 Mf. Mica
14	G3 —34002	Condenser, .0005 Mf. Mica
15	—35951A	3 Section Ant. Shunt Trimmer
16	—35936	Condenser, .05 Mf. 200 V.
17	—45713	3 Section Osc. Shunt Trimmer
18	G11 —34005	Condenser, .0027 Mf. Mica
19	G14 —34005	Condenser, .001185 Mf. Mica
20	G14 —34002	Condenser, .0004 Mf. Mica
21	G77 —33001	2 Section Var. Tuning Condenser
22	G13 —34002	Condenser, .000035 Mf. Mica
23	—32380	Condenser, .05 Mf. 200 V.
24	—23615	Condenser, .05 Mf. 400 V.
25	—23191A	Condenser, .01 Mf. 400 V.
26	—47702	Condenser, 30 Mf. 125 V.
27	G2 —34002	Condenser, .0001 Mf. Mica
28	—47809	Condenser, 30-30-10 Mf. 135 V.
29	—23191A	Condenser, .01 Mf. 400 V.
30	—23191A	Condenser, .01 Mf. 400 V.
31	—23191A	Condenser, .01 Mf. 400 V.
32	G2 —34002	Condenser, .0001 Mf. Mica
33	—24049C	Condenser, .1 Mf. 200 V.
34	—48667	Condenser, .01 Mf. 160 V.
35	G2 —34002	Condenser, .0001 Mf. 200 V.
36	—34713	Condenser, .006 Mf. 160 V.
37	—48560	Condenser, .008 Mf. 160 V.
38	—24049C	Condenser, .1 Mf. 200 V.
39	G1 —34002	Condenser, .00025 Mf. Mica
40	—35928	Resistor, 60,000 Ohms ¼W. Ins.
41	—36317	Resistor, 10,000 Ohms ¼W. Ins.
42	—35934	Resistor, 6,500 Ohms ¼W. Ins.
43	—35600	Resistor, 100,000 Ohms ¼W. Ins.
44	—44009	Resistor, 3,000 Ohms ¼W. Ins.
45	—27121	Resistor, 5,000 Ohms ⅓W. Carb.
46	—27121	Resistor, 5,000 Ohms ⅓W. Carb.
47	—35927	Resistor, 2 Megohms ¼W. Ins.
48	—47815	Resistor, 500 Ohms ½W. W. W.
49	—35600	Resistor, 100,000 Ohms ¼W. Ins.
50	—35600	Resistor, 100,000 Ohms ¼W. Ins.
51	—35602	Resistor, 1 Megohm ¼W. Ins.
52	—37472	Resistor, 50,000 Ohms ⅓W. Carb.
53	—50956	Resistor, 10 Megohms ¼W. Ins.
54	—47814	Resistor, 100 Ohms 1½W. W. W.
55	594-BP-15"M"	Speaker—Mfg. Spec. No. 1-D-1581
	—48891	V. C. and Cone Assy.—"M" only
	—48892	Field Coil (700 Ohms) "M"
	—48893	Output Transformer—"M"
	—43678	Cardboard Ring—Cone Mounting
	—44682	5 Prong Speaker Plug
	594-BP-15"R"	Speaker—Mfg. Spec. No. F-5735

Item No.	Part No.	Description
	—48622	V. C. and Cone Assy.—"R"
	—43979	Cardboard Ring—Cone Mounting
	—48624	Field Coil (700 Ohms) "R"
	—48623	Output Transformer
56	—48241	Band Change Switch
57	G41 —26719	Phono Terminal Board Assy.
58	—48243	Tone Control Switch
59	—48242	Switch and Volume Control—1 Meg. tapped
60	G193—32004	455 Kc. Wave Trap
61	G8 —47866	Switch—Push Button
	—44635	Spring—Switch Blade
	G2 —47866	Contact and Blade Assy.
	G3 —47866	Bottom and Contact Assy. (Switch)
	G2 —47880	Push Button Tuning Unit—Complete
	G32 —47880	Riveted Key Assy.
	G29 —47880	Rocker Plate and Gear Assy.
	MG23 —47810	Riveted Switch Rocker Bar
	G27 —47880	Armature and Pin Assy.
	—48263	Magnet Mtg. Plate
	—48368	Push Button Shaft
	—48652	Magnet Rocker Plate
	—47849C	Glass Dial
	MG27—47810	Bracket—Dial Support
	—48187	R. H. Clip—Dial Mtg.
	—46020	L. H. Clip—Dial Mtg.
	—48280	Clip—Dial Mtg.
	—48301	Cushion—Dial Glass
	—48285A	Pointer—Dial Hand
	G21 —43564	Pulley and Hub Assy.
	—48292	Drive Shaft and Pulley
	—43878A	Bracket—Shaft Mtg.
	—51071	"C" Washer—Shaft Retaining
	34—41582	Drive Cord (85½" Long)
	—46290	Cord Clamp—Drive Cord
	—50590	Spring—Cord Tension
	—48402	Felt Light Guard
	—49285A	Guide—Cord on Pulley
	9HM	Cabinet
	—47854	Shipping Carton
	MG32—47811	Push Button Hinge Assy.
	—47767	Push Button—Magnetune
	—48277	Rod—Push Button Mtg.
	—48284	Cabinet Back
	—48185	Escutcheon
	—46464	Thumb Screw—Back Mtg.
	—48283	Speaker Baffle
	—47217	Grommet—Speaker Baffle
	—47219	Headed Bushing—Speaker Baffle
	—48393	Dust Cloth—Speaker Baffle
	—49440	Escutcheon Mtg. Strip
	—47843	Escutcheon Mtg. Screw, FS-18
	MG31—47811	Instruction Envelope Assy.
	—48751	Call Letter Sheet
	—48749	Celluloid Call Letter Cover
	—48297	Knob—Band Switch
	—48999	Knob—Tone Control
	—48298	Knob—V. C.—Tuning
	—45056	Grommet—Chassis Mtg.
	—44772	Chassis Hold Down Screw, FS-58
	—45579	Chassis Hold Down Washer, FS-58

THE CROSLEY CORP. MODELS 819,1019(Loop Type)
Schematic

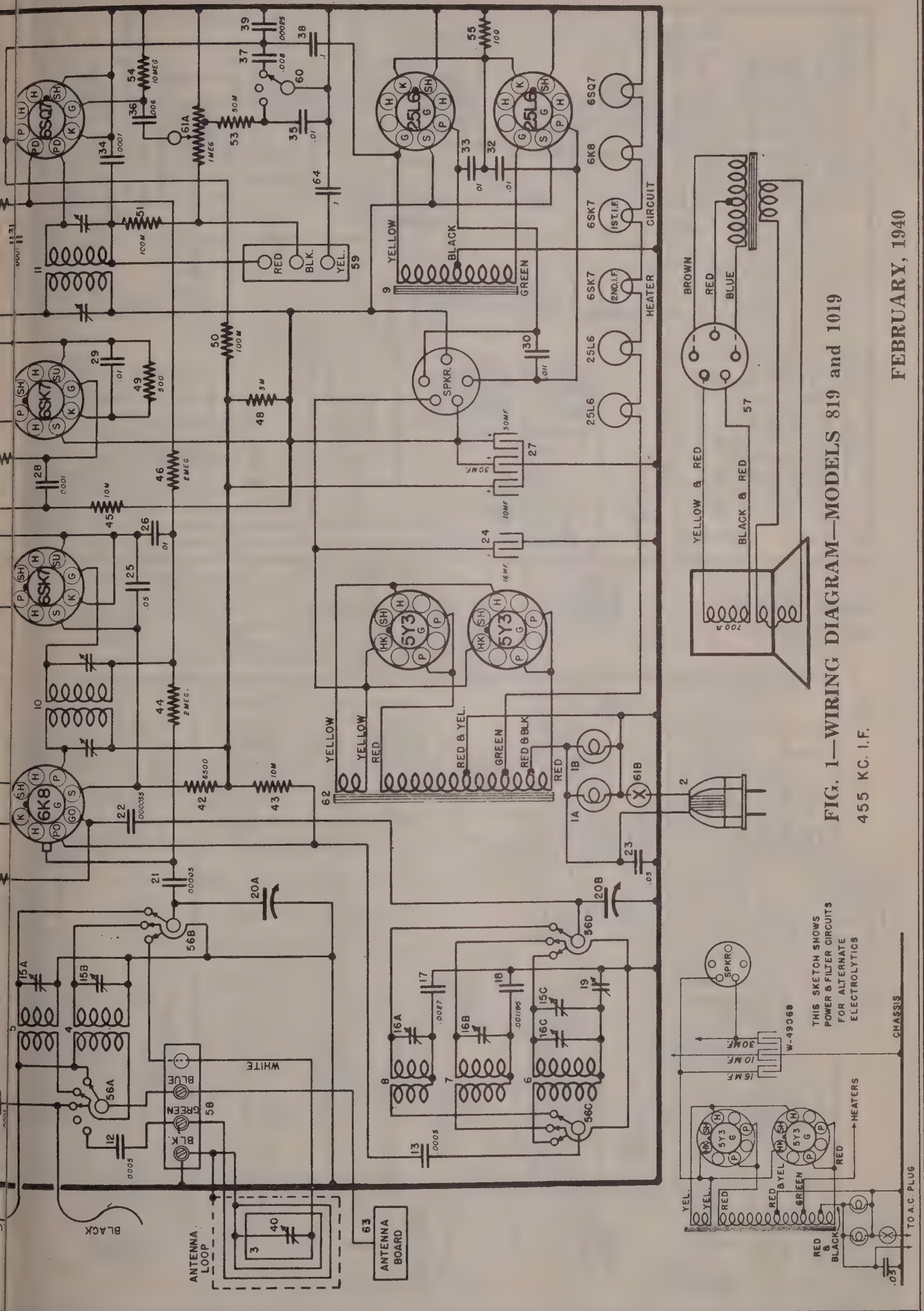


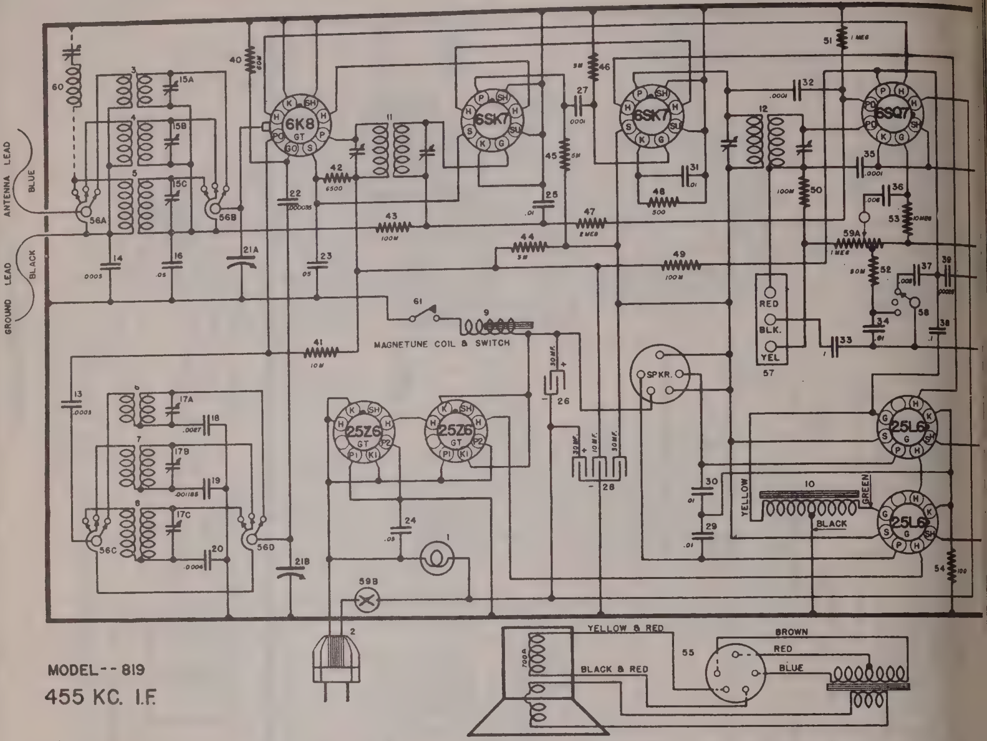
FIG. 1—WIRING DIAGRAM—MODELS 819 and 1019

455 KC. I.F.

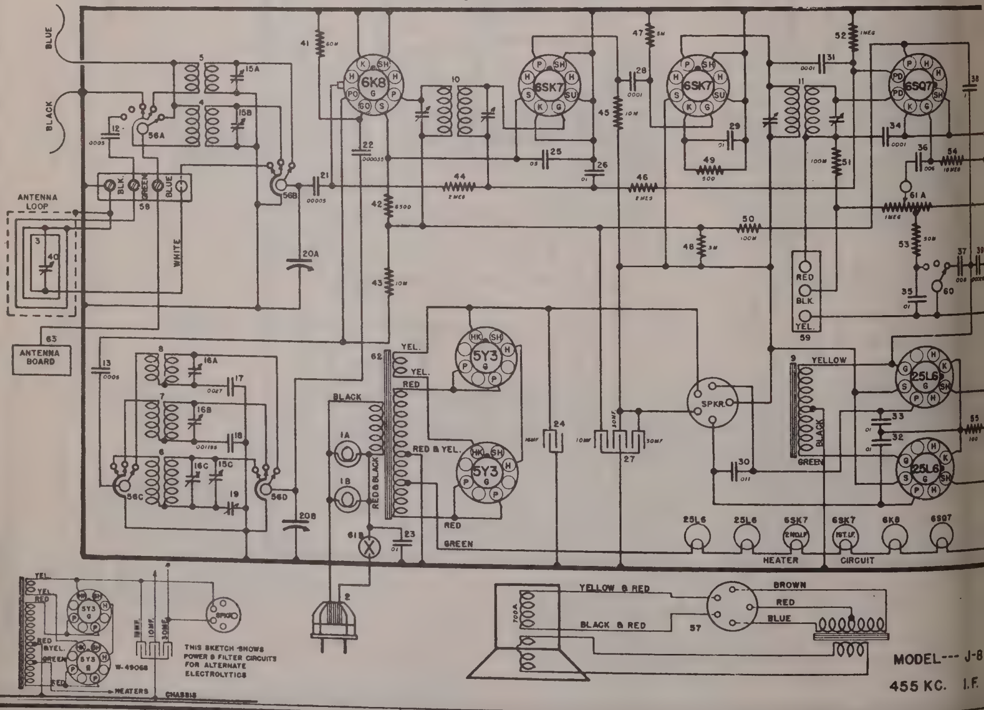
FEBRUARY, 1940

MODELS 819,J819
Schematics

THE CROSLEY CORP.



MODEL--819
455 KC. I.F.



MODEL--- J-8
455 KC. I.F.

THE CROSLEY CORP.

MODELS 819,J819,1019
Socket,Trimmers,Chassis

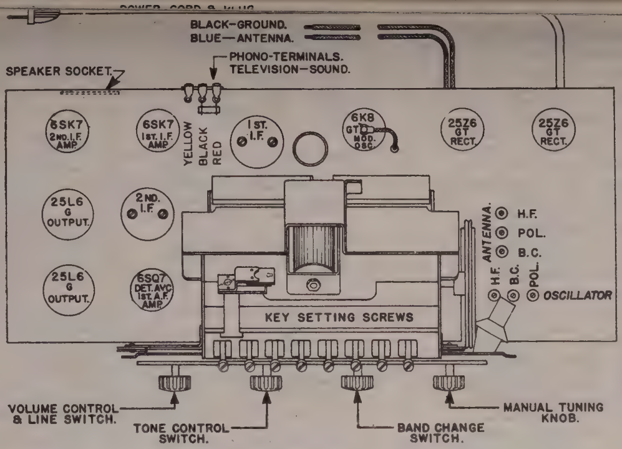


Fig. 3-A—Top View Model 819 (No Loop)

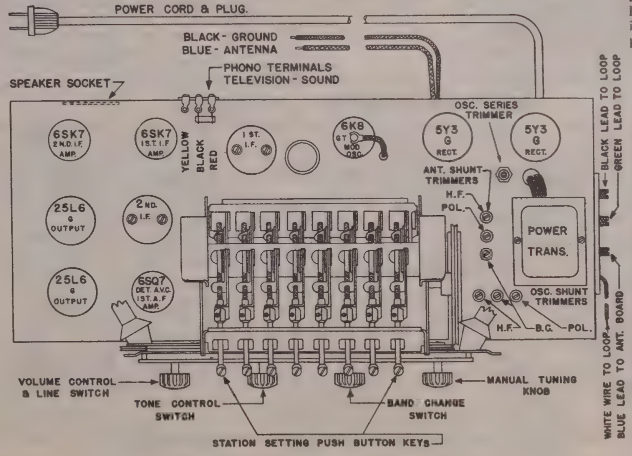


Fig. 2-B—Top View Models 819 and 1019

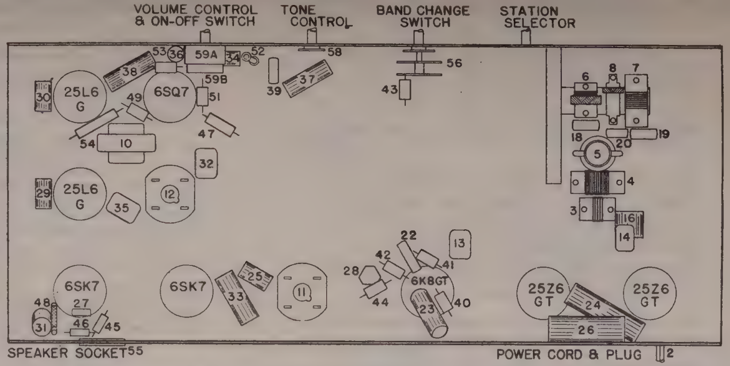


Fig. 3-A—Bottom View Model 819 (No Loop)

The circuit is a conventional superheterodyne with no regeneration, having two stages of I-F amplification, the first of which is resistance coupled, variable level bass compensation, a three position tone control and impedance coupled push pull beam power output. No power transformers were used on those chassis which used two 25Z6GT Rectifiers. The power transformer used on the later versions having two 5Y3G Rectifiers is quite different from the regular type power transformer used in Model J-819, and care should be exercised when checking its voltages.

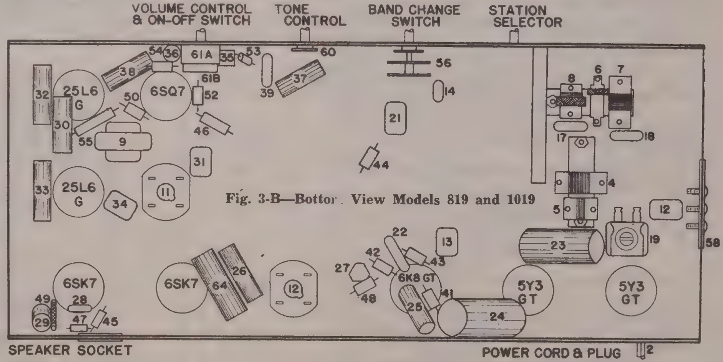
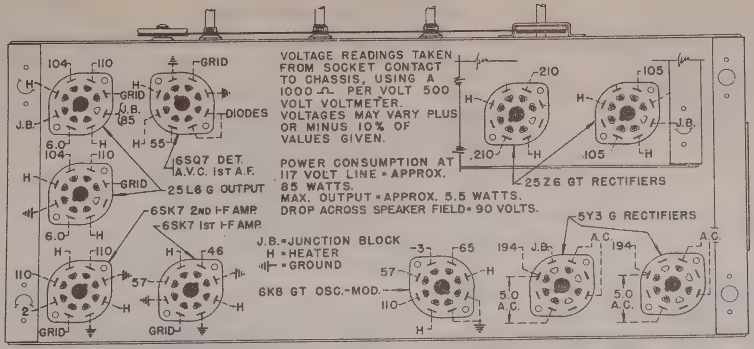


Fig. 3-B—Bottom View Models 819 and 1019

Model 1019 is the same as model 819 except for the cabinet, dial, escutcheon and knobs used. There are two versions of the model 819 in the field. The first few releases had an electrical (magnetune) push button tuning system and two 2526GT Rectifier tubes. The later releases had a mechanical push button tuning system, loop antenna, two 5Y3G Rectifier tubes and a power transformer. Models J-819 and 1019 falls in this group.



VOLTAGE READINGS TAKEN FROM SOCKET CONTACT TO CHASSIS, USING A 1000 Ω PER VOLT 500 VOLT VOLTMETER. VOLTAGES MAY VARY PLUS OR MINUS 10% OF VALUES GIVEN.

POWER CONSUMPTION AT 117 VOLT LINE = APPROX. 85 WATTS.
MAX. OUTPUT = APPROX. 5.5 WATTS.
DROP ACROSS SPEAKER FIELD = 90 VOLTS.

J.B. = JUNCTION BLOCK
H = HEATER
⏚ = GROUND

Fig. 4—Socket Voltages Models 819, J-819, 1019

Aligning The I-F Amplifier To 455 Kilocycles.

(a) Connect the output lead of the signal generator through a .0002 mf. condenser to the receiver antenna lead (Blue). Connect the signal generator ground lead through a .01 mf. or smaller condenser to the receiver ground lead (Black).

(b) Set the signal generator to 455 kilocycles. Turn the receiver band switch to the Broadcast band (left), the tone control switch to the speech position (left) open the gang condenser all the way then turn the volume control on full (all the way to the right).

(c) Adjust the two trimmer condensers on the second I-F assembly for maximum output (Fig. 2).

(d) Adjust the two trimmer condensers on the first I-F assembly for maximum output. (Fig. 2).

(e) Repeat (c) and (d) for more accurate adjustments.

Aligning The R-F Amplifier.

(a) For aligning the broadcast band the setup remains the same. Using a .0002 mf. condenser for a dummy antenna and etc.

(b) For models without loop antenna set the signal generator to 1725 kilocycles. For models with a loop antenna set the signal generator to 1550 kilocycles. Open condenser gang all the way, turn band switch to left (B. C.), tone control to left (speech) and the volume control on full.

(c) For models without the loop antenna adjust B. C. oscillator shunt trimmer condenser (Fig. 2) for maximum output (gang does not have to tune through this signal). For models with a loop antenna there are two oscillator shunt trimmer condensers as will be noted in figure 2. Close the front oscillator shunt trimmer all the way, then open about ½ turn. Proceed to tune in with the other (rear) trimmer the 1550 kilocycle signal for maximum output.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune the receiver to generator signal for maximum output (approximately 140 on the dial).

(f) On models without the loop adjust the B. C. antenna shunt trimmer for maximum output, see (Fig. 2). On models with a loop a B. C. antenna shunt trimmer is located on top the loop antenna; adjust for maximum output.

Models equipped with a loop antenna have provisions for series aligning the oscillator circuit:

(1) Set signal generator to 600 kilocycles.

(2) Tune in generator signal on receiver.

(3) While rocking tuning condenser back and forth adjust oscillator series trimmer (Fig. 2) for maximum output. Then repeat (d) and (f) for more accurate alignment.

(g) Change dummy antenna from a .0002 mf. condenser to a 250 carbon resistor.

(h) For models without loop antenna set the signal generator to 5.8 megacycles. Open gang condenser, turn band switch to center position, T. C. to left (speech) and volume on full. For models with a loop antenna set signal generator to 5.0 megacycles.

(i) Adjust "Pol." oscillator shunt trimmer condenser (Fig. 2) for maximum output.

(j) For models without loop antenna set signal generator to 5.5 megacycles. For models with a loop antenna set signal generator to 4.0 megacycles.

(k) Tune in generator signal with manual control for maximum output (approximate 5.5 or 4.0 megacycles on the dial). Adjust the "Pol." antenna shunt trimmer condenser for maximum output.

(l) Set signal generator to 18.3 megacycles.

(m) With gang open and band switch turned to the right (H. F.), adjust the H. F. (high frequency) oscillator trimmer (Fig. 2) for maximum output. Care should be taken to align the oscillator on the fundamental and not the image frequency. When correctly aligned the image should be heard approximately 17.4 on the dial but will be comparatively weak compared to the fundamental signal.

(n) Set signal generator to 18.0 megacycles.

(o) Tune in the signal generator signal for maximum output; then adjust the H. F. antenna shunt trimmers for maximum output. When aligning the R-F circuits always use the lowest signal input, which will give a reasonable indication on the output meter, to prevent A.V.C. acton.

REPLACING DRIVE CORD

(1) Remove the broken drive cord, saving the small metal cord clamp, the tension spring and pointer.

(2) Carefully remove the dial glass.

(3) Cut a piece of drive cord about 85 inches long. Fasten the tension spring approximately one inch from one end.

(4) Open the condenser gang all the way. The eyelet in the large drive pulley should be near the top with the gang in this position.

(5) Hook the loose end of the tension spring on small ear formed in pulley and thread the drive cord through the eyelet in pulley rim from the inside.

(6) Bring cord forward over pulley then down to small pulley on manual drive shaft, make one complete turn around small pulley in a clockwise direction.

(7) Continue cord from the under side of drive shaft pulley over the lower left hand idler pulley, then making a half turn over left hand idler continue over to the top of pulley on drive shaft.

(8) Continue around pulley in a clockwise direction over to lower left hand idler, over lower left hand idler and up to upper left hand idler pulley, continue cord over upper left hand idler to upper right hand idler pulley.

(9) Bring cord over right hand idler pulley and down and under and around large drive pulley to eyelet.

(10) Insert end through the eyelet. Tie securely to tension spring. The cord should be so tied that the tension spring when hooked on ear formed in pulley, will be stretched to approximately 1¼ inches in length.

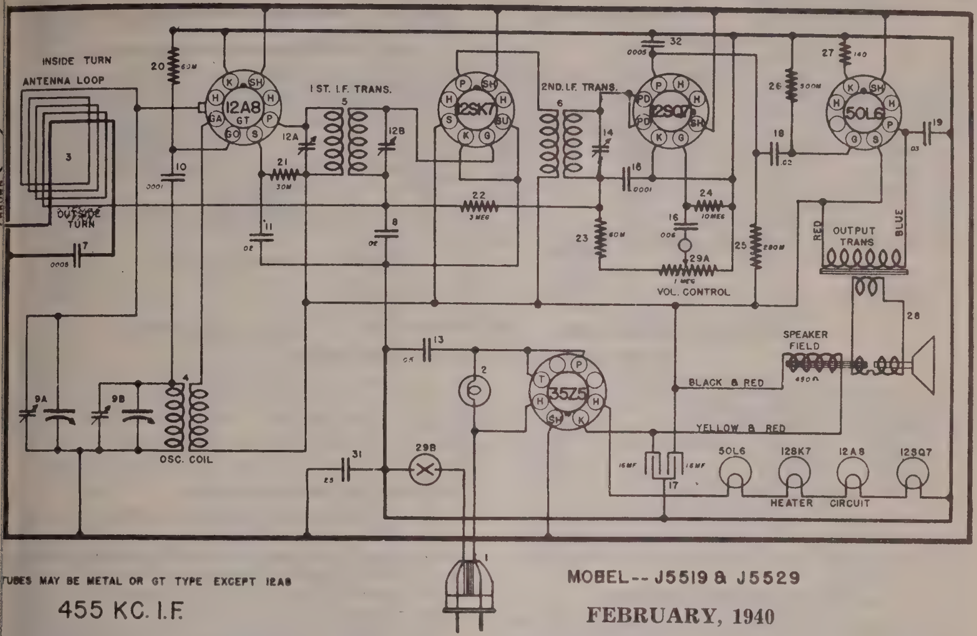
(11) Hook the pointer on drive cord, the solid end pointer to the drive cord between the upper left hand and right hand idler pulleys. The cutout end of pointer is fastened to the top cord between the lower left hand and the pulley on the drive shaft. Replace dial glass.

Before clamping pointer or cementing it to the drive cord, open gang all the way. The pointer should then split the last graduation on the dial. Check travel from end to end then fasten pointer securely.

(12) Replace the cord clamp on drive cord inside the large drive pulley. The position of clamp should be no more than 1/16" from inside end of eyelet.

THE CROSLEY CORP.

MODELS 5519,5529,6519
J5519,J5529
Schematics



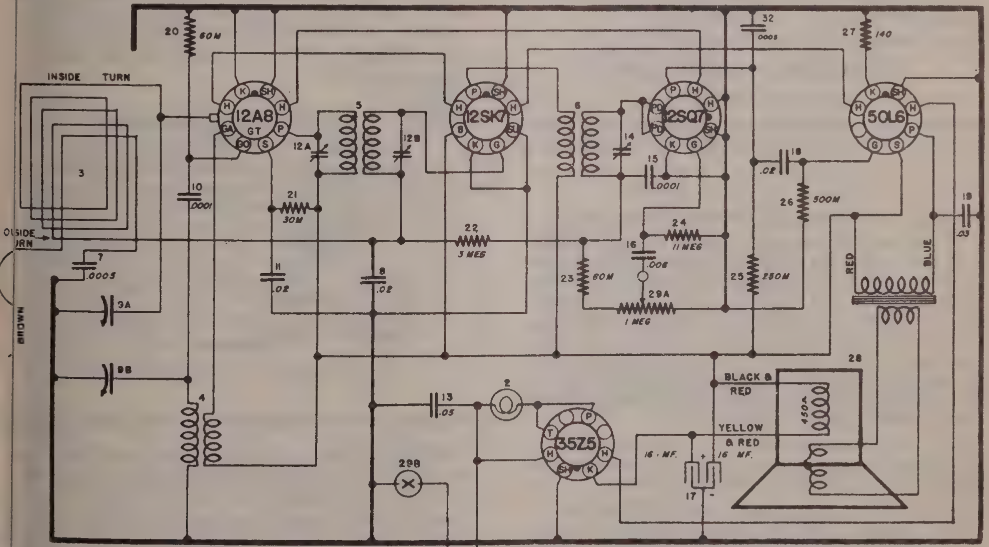
TUBES MAY BE METAL OR GT TYPE EXCEPT 12A8

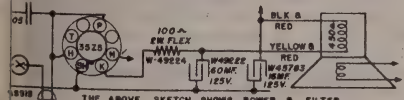
455 KC. I.F

MODEL-- J5519 & J5529

FEBRUARY, 1940

DL J-5519—Same as model 5519 except the ve“B” circuit or ground return (one side of the line) is isolated from the chassis by a .25MF. condenser.





THE ABOVE SKETCH SHOWS POWER & FILTER CIRCUIT FOR 25 CYCLE 110 VOLT RECEIVER

TUBES MAY BE METAL OR GT TYPE EXCEPT 12A8

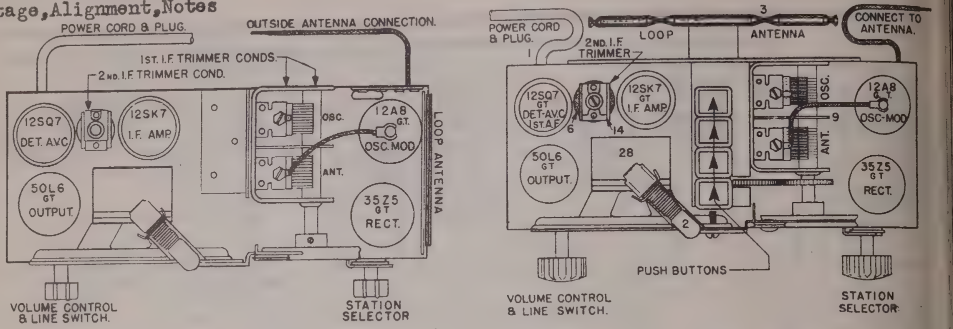
MODELS--- 5519 & 5529 & 6519

455 KC. I. F.

DL J-5529—Same as model 5529 except the v“B” or ground return circuit (one side of the line) is isolated from the chassis by a .25 mfd. condenser.

MODELS 5519,5529,6519
J5519,J5529
Socket,Trimmers,Chassis
Voltage,Alignment,Notes

THE CROSLEY CORP.



Models 5519, J-5519, 6519 **Fig. 2—Top View** **Models 5529, J-5529**

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
12A8GT	Oscillator-Modulator	12	90	48	—	3	–4	90
12SK7GT	I-F. Amplifier	12	90	90	—	—	—	—
12SQ7GT	Det, AVC, A-F Amplifier	12	40	—	—	—	—	—
50L6GT	Output	50	84	90	—	6	—	—
35Z5GT	Rectifier	35	117 5	—	—	117	—	—

Power output approximately 2 watts.
Power consumption approximately 27 watts.
Voltage drop across speaker field 25 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver. (J Models have a .25 mf. condenser isolating line from chassis).

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 50L6GT output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a 50 mmf. condenser to the antenna connection on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condenser, Item 14, located on top of coil (Fig. 2) for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers located on the rear of chassis for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

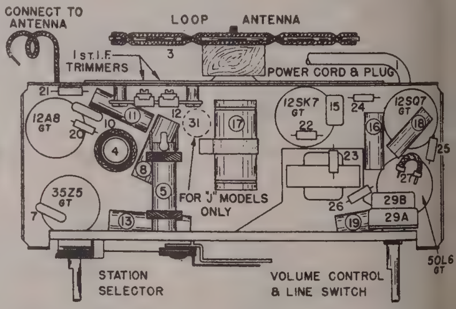


Fig. 3—Bottom View Models 5519, J-5519, 6519, 5529. J-5

MODEL 6519—Same electrically as model 5519. Has special spider loop mounted to a bracket on right side of chassis and is housed in a wood cabinet.

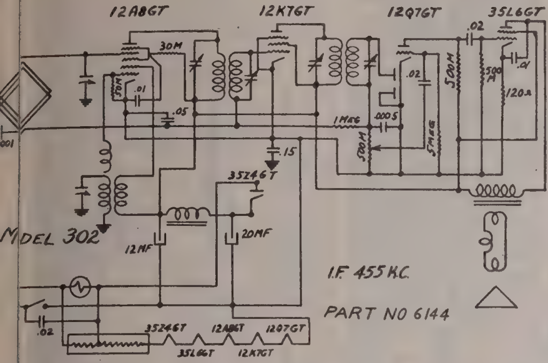
MODEL 5529—Same electrically as model 5519. Has a four station mechanical push button tuning system. There are two series of this model in the field, one series has a spider form loop antenna mounted on the BACK of the receiver and the other series has the pancake type loop mounted in the cabinet between chassis and right end of the cabinet.

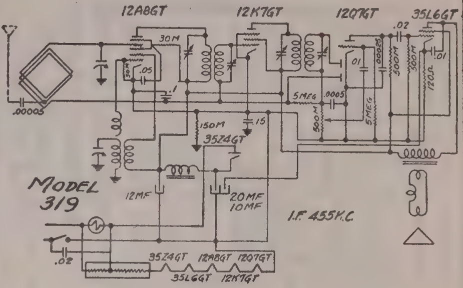
MODEL 5519—Five tube superheterodyne with a pancake type loop antenna mounted between chassis and right side of the cabinet. Has a handle on top for carrying.

hematics,Socket
lignment,Trimmers

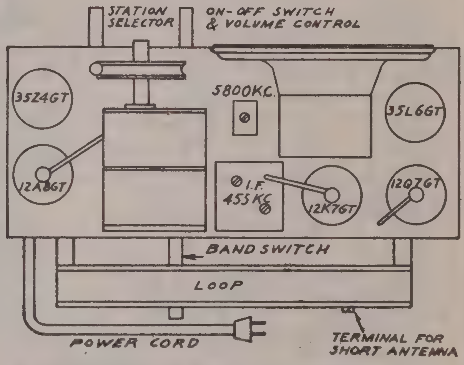
DETROLA CORP.

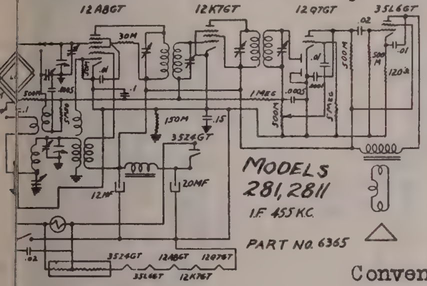
MODELS 281,2811
MODEL 293
MODEL 302
MODELS 304,3041
MODEL 319





ight:Chassis layout for Models 302,319,
l and 2811.Band switch and 5800-kc trim-
r on Models 281 and 2811 only.



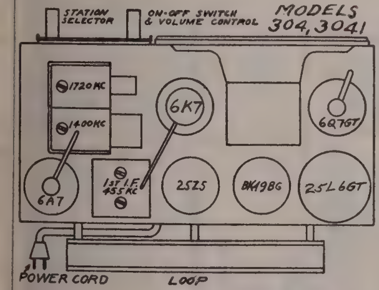


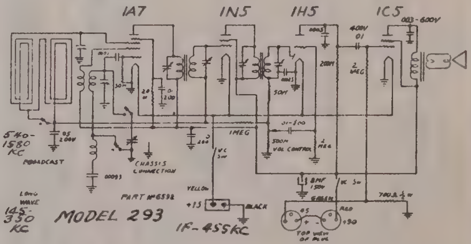
Conventional alignment for all models See Vol. VIII "How It Works"

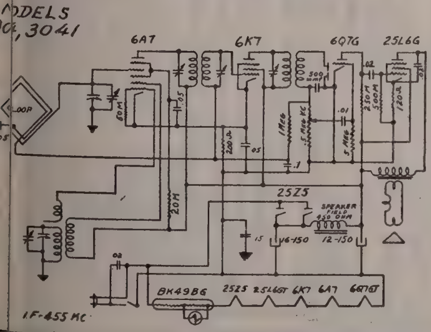
The following tubes are used in this receiver:

12A8GT	Translator	12Q7GT	Detector AVC
12K7GT	IF Amplifier	35L6GT	Output
35Z4GT	Rectifier		

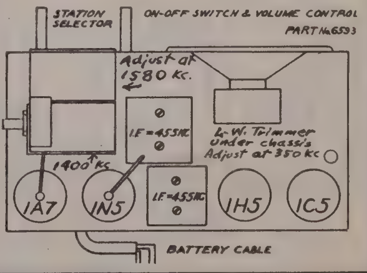
If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.





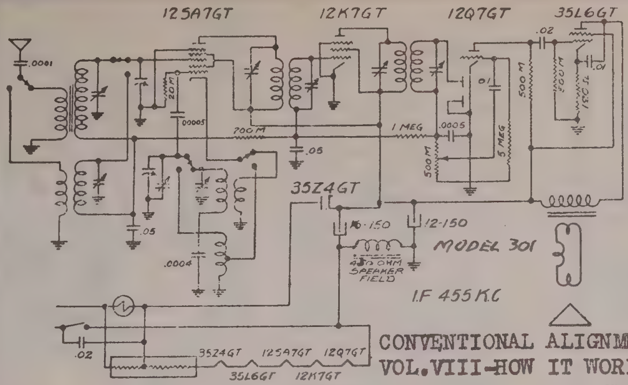


At right: Layout for Model 293

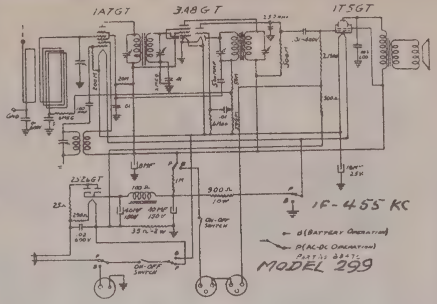


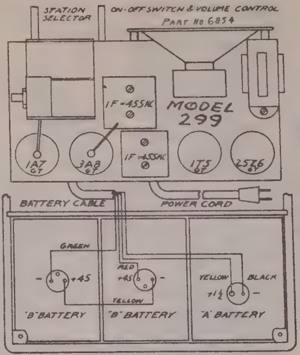
MODEL 295-1
MODEL 299
MODEL 301
MODEL 303

DETROLA CORP.



CONVENTIONAL ALIGNMENT. SEE VOL. VIII—HOW IT WORKS

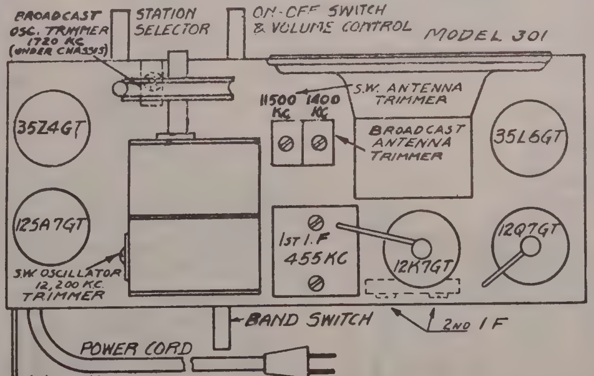


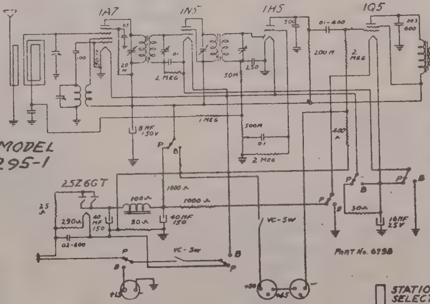


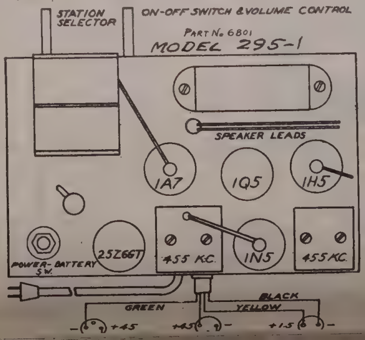
ALIGNMENT FOR MODELS 295-1 and 299

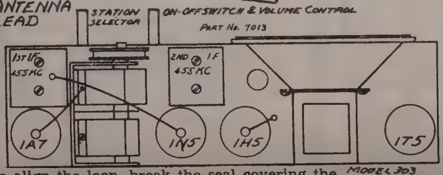
Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7 tube, and the ground side to the terminal on the back of the chassis. An output meter should be connected across the voice coil leads of the speaker to indicate resonance. Align the I.F. trimmers at 455 KC for maximum meter reading.

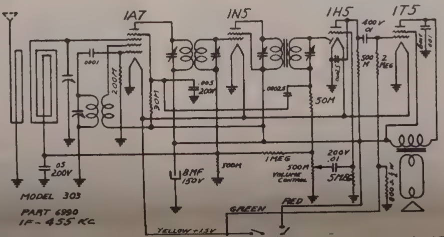
Adjust the trimmer on the back of the variable condenser at or near 1400 KC at full volume on a weak broadcast signal. When aligning the set do not set the receiver on or near a metal work bench or other large metal object, as it will affect the tracking of the receiver.







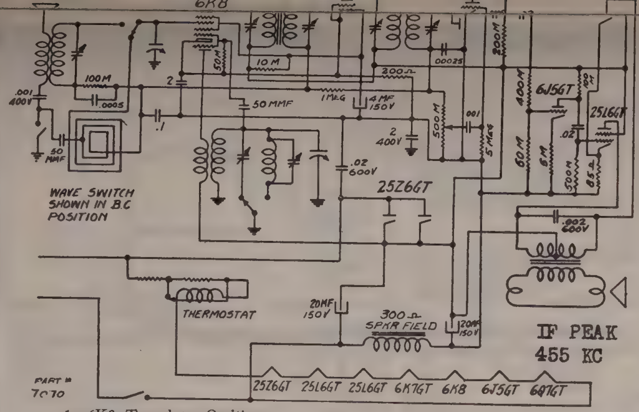




To align the loop, break the seal covering the hole on the bottom of the cabinet. Tune the set to a weak signal on or near 1400 K.C. and with the volume control on full adjust the trimmer

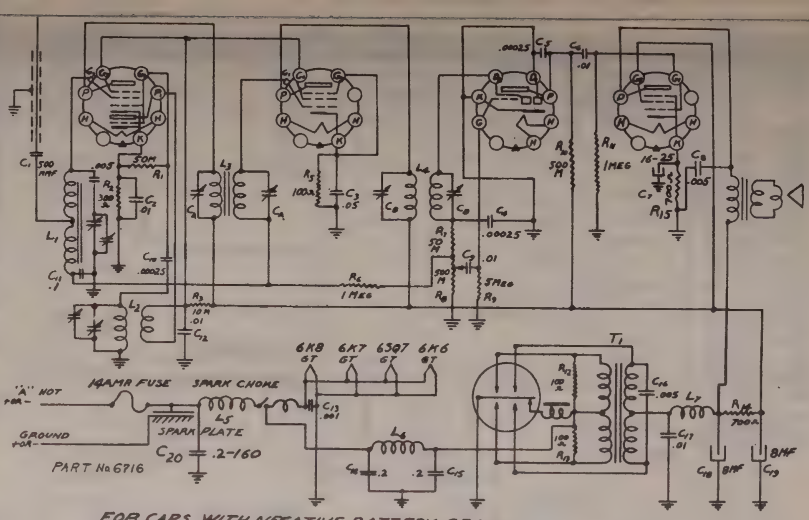
MODEL 297
MODELS 305,3051
Schematics,Socket
Alignment,Trimmers

DETROLA CORP.

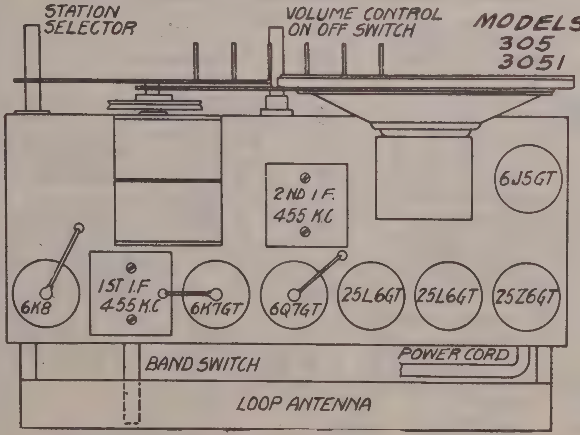


IF PEAK
455 KC

1—6K8 Translator-Oscillator
6K7GT—Intermediate Frequency Amplifier
1—6Q7GT Detector-AVC-First Audio
1—6J5GT Phase Inverter
2—25L6GT Power Output
1—25Z6GT Rectifier



MODEL 297

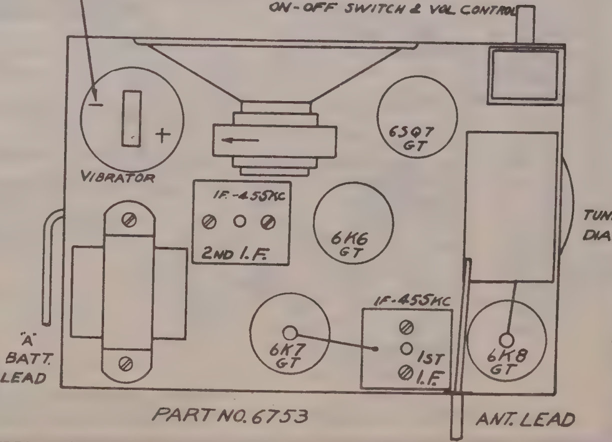


MODELS 305 3051

ALIGNMENT
FREQUENCIES:

MODELS 305, 3051
RF Osc. 1720 KC
RF Ant. 1400 KC
SW Osc. 6200 KC
SW Ant. 5000 KC
IF Peak 455 KC

MODEL 297
RF Osc. 1550 KC
RF Ant. 1400 KC
IF Peak 455 KC
Dummy Ant. 30 MMF
Input to IF .1 MF



PART NO. 6753

FOR SIMILAR PUSH BUTTON ADJUSTMENT DATA
SEE DETROLA MODEL 258 IN VOLUME X-p.10-6
FOR CONVENTIONAL ALIGNMENT SEE SPECIAL
SECTION OF VOLUME V111

MODELS 310,3101
MODELS 320,3201,3202
Schematics,Socket,Alignment,Trimmers

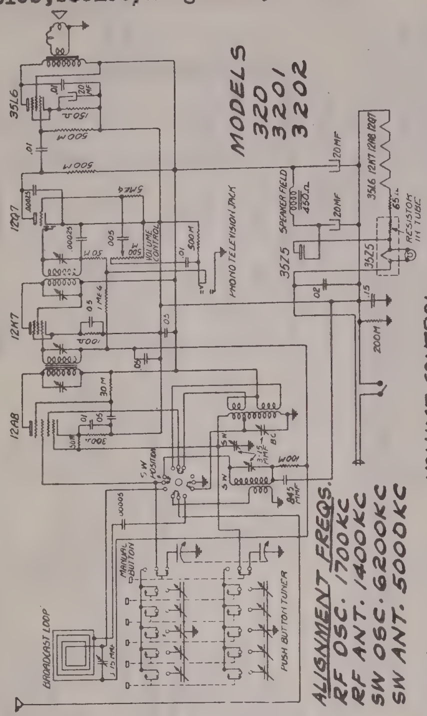
DETROLA CORP.

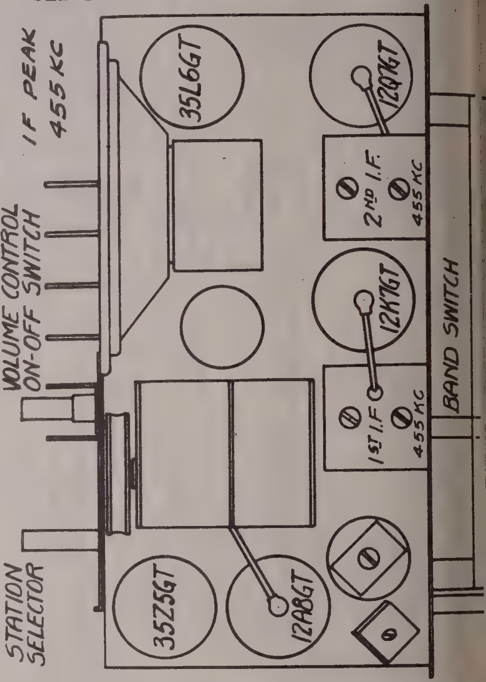
MODEL 3281
Socket,Trimm

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION OF VOLUME V111 -

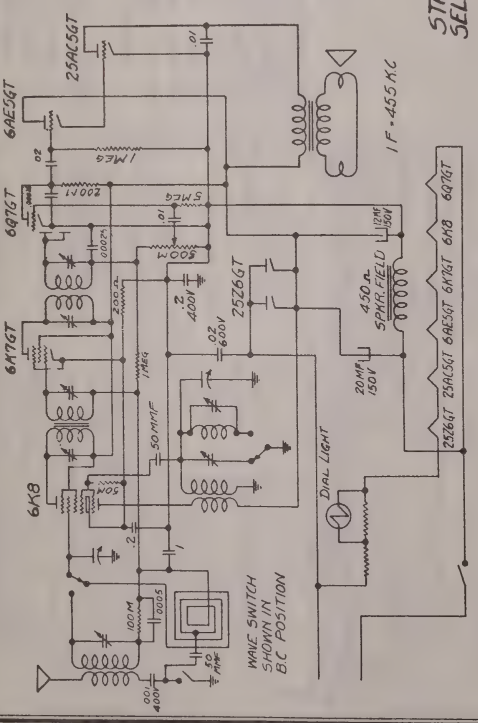
FOR SIMILAR PUSH BUTTON ADJUSTMENTS SEE DETROLA MODEL 258 in VOLUME X

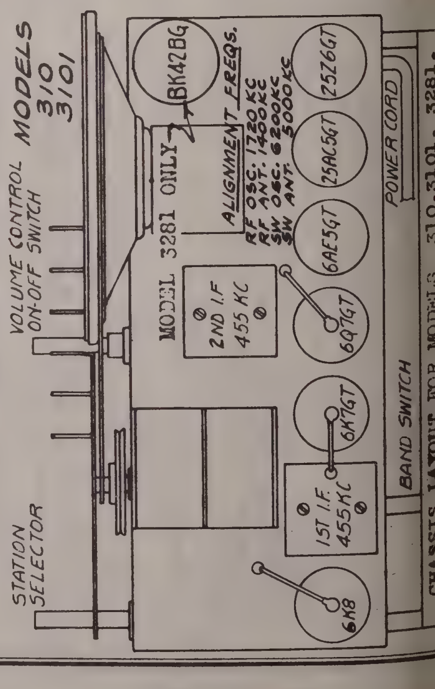
1—12A8GT Translator-Oscillator
1—12K7GT—Intermediate Frequency Amplifier
1—12Q7GT Detector-AVC-First Audio
1—35L6GT Power Output
1—35Z5GT Rectifier





Tubes required are;
1—6K8 Oscillator-Translator
1—6K7GT IF Amplifier
1—6Q7GT Detector-AVC-First Audio
1—6AE5GT Driver
1—25AC5GT Power Output
1—25Z6GT Rectifier

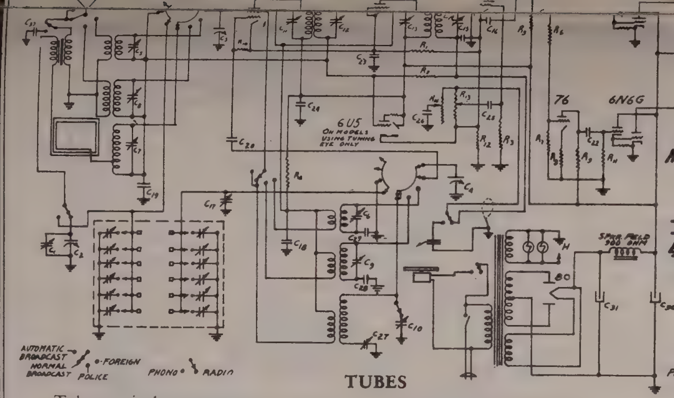




DETROLA CORP.

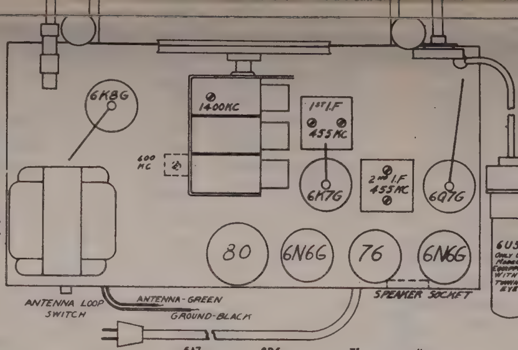
MODEL 314
MODEL 318
Schematics, Socket
Alignment, Trimmers

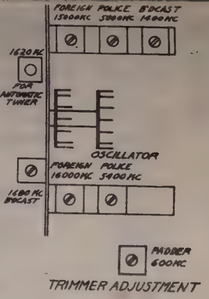
FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION OF VOLUME V111
FOR SIMILAR PUSH BUTTON ADJUSTMENTS SEE DETROLA MODEL 258 VOLUME X p.10-6



MODEL 314

IF PEAK 455 KC





TUBES

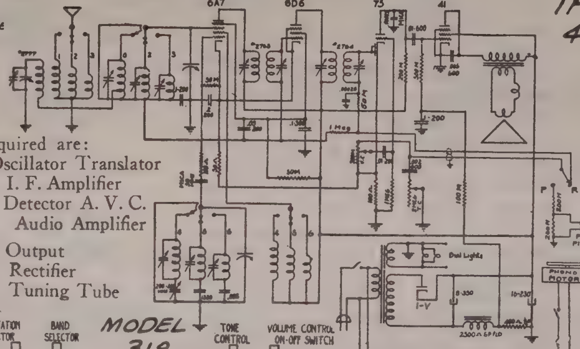
Tubes required are:
1—6K8G Oscillator-translator
1—6K7G Intermediate Frequency Amplifier
1—6Q7G Detector AVC—First Audio Amplifier
1—76 Driver—Phase Inverter
2—6N6G Power Output
1—80 Rectifier
1—6G5 Cathode Ray Tuning Tube

MODEL 314

Symbol	Description
C1	Trimmer on variable
C2, 3, 4	3-gang 362 mmdf. variable
C5, 6	3-35 mmfd. trimmer
C7, 8, 9, 10	1-10 mmfd. trimmer
C11, 12, 13, 14	I.F. Trimmers
C15, 16	.0005 mfd. 400 V. paper
C17	1-10 mmfd. isolantite trimmer
C18, 19	.1 mfd. 200 V. paper
C20	50 mmfd. Mica
C21, 22	.02 mfd. 400 V.
C23, 24	.2 mfd. 200 V.
C25	.01 mfd. 400 V.
C26	.003 mfd. 600 V.
C27	350 mmfd. Var. padder
C28	1330 mmfd. padder
C29	.006 mfd. 600 V. padder
C30	16 mfd. 400 W.V. Dry Elect.
C31	16 mfd. 400 W.V. Dry Elect.
C32	.002 mfd. 600 V. paper
C33	.00025 mfd. Mica

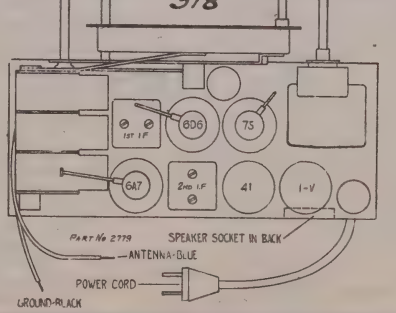
Symbol		Description
R1		200 ohm 1/3 W.
R2, 3		1 meg 1/3 W.
R4		10M ohm 1 W.
R5		200M ohm 1/3 W.
R6		400M ohm 1/3 W.
R7		100M ohm 1/3 W.
R8		5M omh 1/3 W.
R9, 10		50M ohm 1/3 W.
R11		500M ohm 1/3 W.
R12		(50 ohm 1/3 W. in models equipped with tuning eye)
R13	5100	500M ohm volume control
R14	5099	2 meg. tone control
	7226	Power transformer
T1	3463-5	1st I.F. transformer
T2	3463-6	2nd I.F. transformer
	7358	Broadcast antenna coil
	7216	Short wave antenna coils
	7217	Oscillator coils
	7231	12-inch speaker
	6249	Push button trimmer tuner
	2163	Drive cable
	5121	Call letter sheet

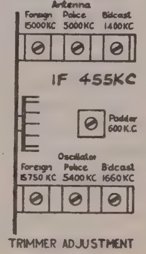
IF PEAK 455 KC



Tubes required are:
1—6A7 Oscillator Translator
1—6D6 I. F. Amplifier
1— 75 Detector A. V. C. Audio Amplifier
1— 41 Output
1— 1V Rectifier
1—6U5 Tuning Tube

MODEL 318





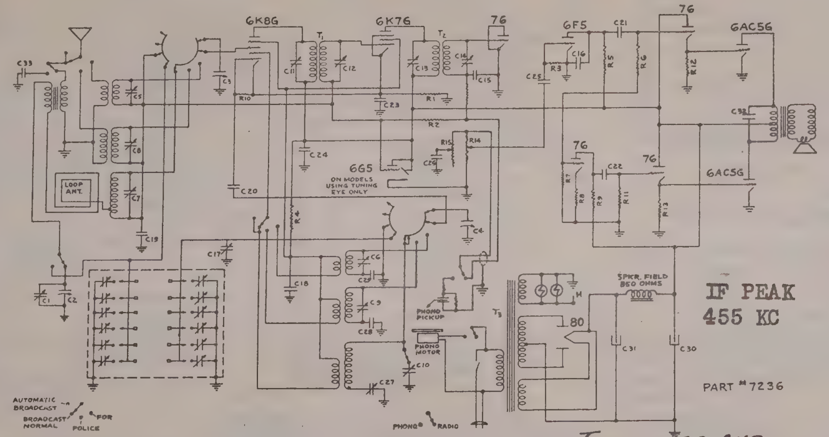
MODEL 315
Schematic, Socket,
Alignment, Trimmers, Parts

DETROLA CORP.

MODEL 325
Socket, Trimm

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION, VOL. VIII
FOR SIMILAR PUSHBUTTON ADJUSTMENTS SEE DETROLA PAGE 10-6
IN VOL.X FOR MODEL 258.

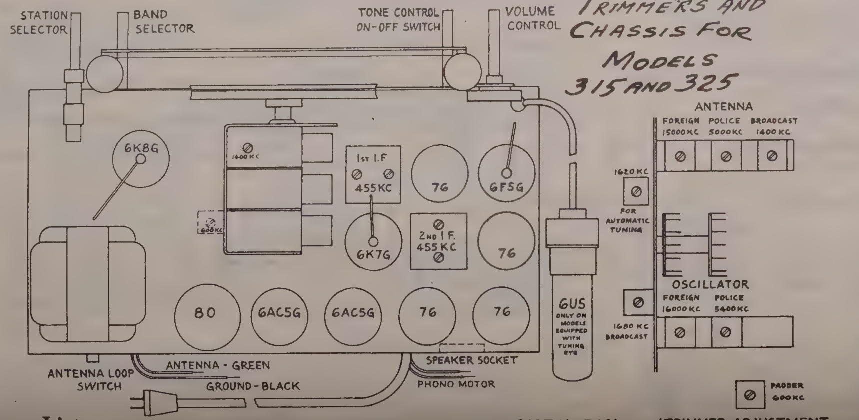
Tubes required are:
1—6K8G Oscillator Translator
1—6K7G IF Amplifier
1—76 Detector—AVC
1—76 Phase Inverter
2—76 Drivers
2—6AC5G Power Output
1—6F5 First Audio
1—80 Rectifier
1—6U5 Tuning Tube



IF PEAK
455 KC

PART #7236

TRIMMERS AND CHASSIS FOR MODELS 315 AND 325



PART No. 7431 'TRIMMER ADJUSTMENT

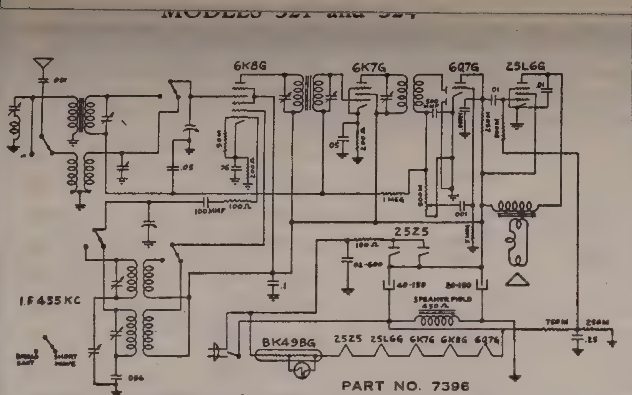
Symbol	Part No.	Description
C1		Trimmer on Tuning Condenser
C2, 3, 4	5092	Tuning Condenser
C5, 6	3157	3-35 mmf. Trimmer
C7, 8, 9, 10	5565	1-10 mmf. Trimmer
C11, 12, 13, 14		Trimmers in IF Transformers
C15, 16, 33		250 mmf. Mica
C18, 19		50 mmf. Mica
C21, 22		.02 mf. 400 volt
C23, 24		.2 mf. 200 volt
C25		.01 mf. 400 volt
C26		.003 mf. 600 volt
C27	2560	Oscillator Padding Condenser
C28	2741	1330 mmf. Mica 5%
C29		.006 mf. 600 volt
C30, 31	7113	16 mf. 400 volt electrolytic
C32		.002 mf. 600 volt
R1, 7		200 ohm 1/3 watt
R2, 11		1 meg. 1/3 watt
R4		10M 1 watt
R5		200M 1/3 watt
R6		800M 1/3 watt
R8		5M 1/3 watt
R9, 10		50M 1/3 watt
R3		5 meg. 1/3 watt
R12, 13		25M 1/3 watt
R14	5100	500M volume control
R15	5099	2 meg. tone control and switch
T1	3463-5	1st IF Transformer
T2	7241	2nd IF Transformer
T3	7242	Power Transformer

Part No.	Description	Part No.	Description
7358	Antenna Coil		
7216	Preselector Coil	7247	Escutcheon
7217	Oscillator Coil	7230	Tuning Tube Escutcheon
7219	Dial Chart	4732	Tuning Knob
5112	Pointer	4733	Volume Knob
4830	Dial Light Socket	4735	Tone Knob
6249	Push Button Tuning Unit	4734	Band Switch Knob
2981	Tuning Tube Cable	3466	Radio-Phono Knob
5129	Push Buttons	5241	Phono-Radio Plate
7181	Cabinet		

Parts List

All resistors and mica condensers in this chassis are marked with standard color code. All paper condensers

MODELS 321 and 324



PART NO. 7396

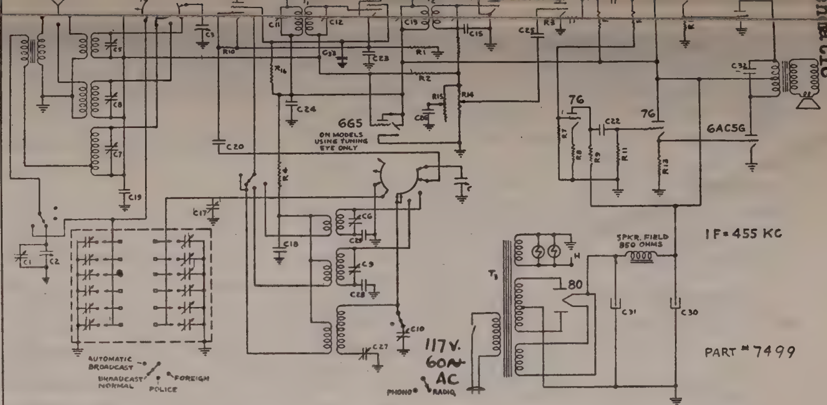
IF PEAK 455 KC

The following tubes are used in this receiver:

6K8G—Oscillator, Translator
6K7G—I.F. Amplifier
6Q7G—Detector, Audio Amplifier, AVC.
25L6G—Power Output
25Z5—Rectifier
BK49BG—Ballast

ALIGN. FREQ.

I.F.	455KC
WAVE TRAP	455KC
B.C. OSC.	1720KC
B.C. ANT.	1400KC
B.C. PAD.	600KC
S.W. OSC.	18200KC
S. W. ANT.	17000KC

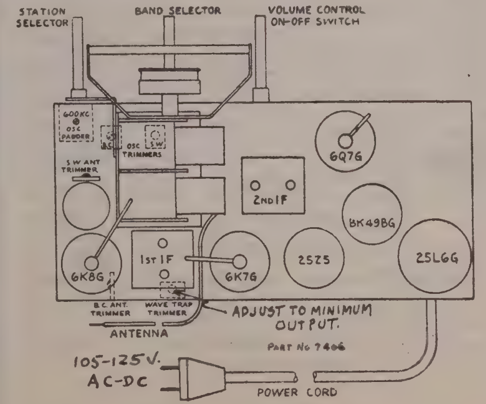


IF=455 KC

PART # 7499

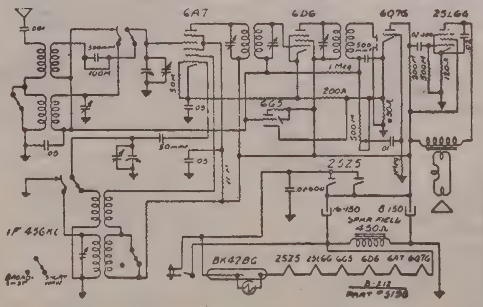
C-1	TRIMMER ON VARIABLE CONDENSER
C-2 3 4	VARIABLE CONDENSER
C-5,6	3-35 MMFD TRIMMER
C-7,8,9,10	1-10 MMFD TRIMMER
C-11,12,13,14	I F TRIMMERS
C-15,16,33	.00025 MICA
C-17	1-10 MMF TRIMMER, ISOLANTITE
C-18,19	.1 - 200V
C-20	50 MMF MICA
C-21,22	.02 - 400V
C-23,24	.2 - 200V
C-25	.01 - 400V
C-26	.003 - 600V
C-27	350 MMFD VAR. PADDER
C-28	1330 MMFD PADDER
C-29	.006 - 600V PADDER
C-30	16 MFD - 400V ELECTROLYTIC
C-31	16 MFD - 400V ELECTRLYTIC
C-32	.002 - 600V
R-1	200 OHMS
R-2,3,11	1 MEG 1/3 WATT
R-4	10 OHMS 1 W
R-5,7	200 M OHMS 1/3 W
R-6	800 M OHMS 1/3 W
R-8	5000 OHMS 1/3 W
R-9,10	50 M OHMS 1/3 W
R-12,13	25 M 1/3 W
R-14	500 M OHMS VOL. CONTROL
R-15	2 MEG TONE CONTROL

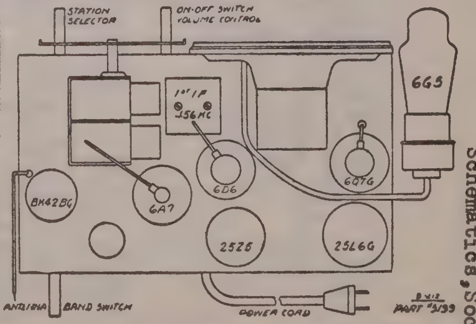
MODEL 325



SERIES 322

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VC JUME VIII.





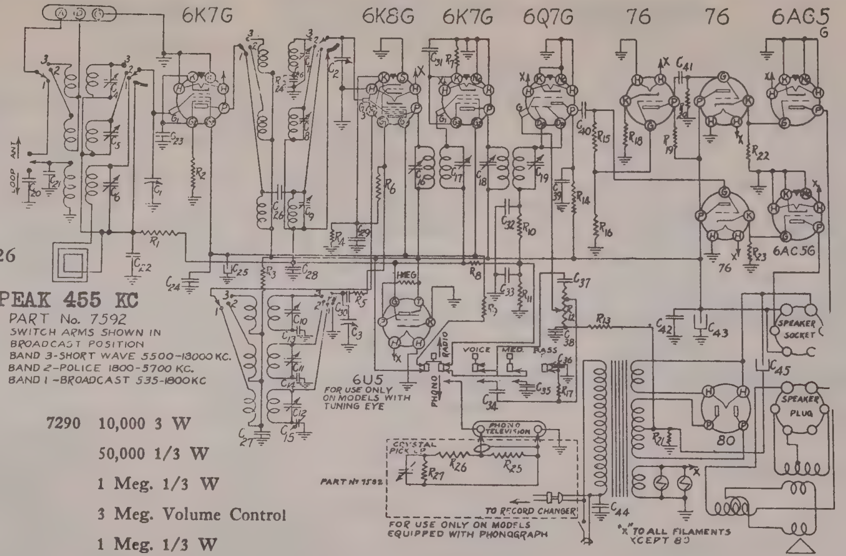
The following tubes are used in this receiver:

6A7—Oscillator, Translator
6D6—I. F. Amplifier
6Q7G—Detector, Audio Amplifier
25L6G—Power Output
25Z5—Rectifier
BK42BG—Ballast
6G5—Tuning Eye

IF PEAK 456 KC

MODEL 326
Schematic, Socket
Trimmers, Parts

DETROLA CORP.

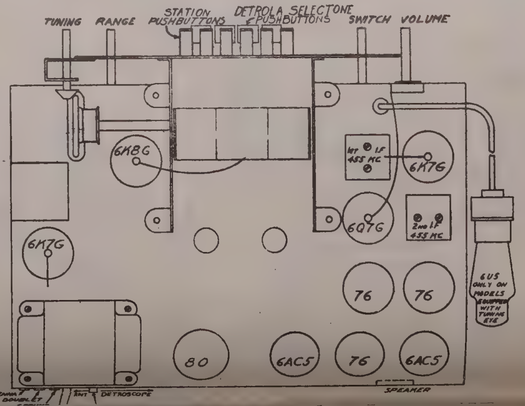


SERIES 326

IF PEAK 455 KC

PART No. 7592
SWITCH ARMS SHOWN IN
BROADCAST POSITION
BAND 3-SHORT WAVE 5500-13000 KC.
BAND 2-POLICE 1800-5700 KC.
BAND 1-BROADCAST 535-1800 KC

Symbol	Part No.	Description
C1,2,3	7591	Tuning Condenser
C4 to C12	7197	Trimmer Condensers, 3-20 mmf.
C13	7721	.007 mfd. plus or minus 5%
C14	7312	1440 mmf. plus or minus 3%
C15	7314	Condenser Padder Adj.
C20,34	1286	250 mmf. Mica
C21,30	2780	50 mmf. Mica
C22,23,28,46	580	.05-200
C24	575	.1-400
C25	5780	20 mmfd., 150 V. Electrolytic
C26	7473	2.5 mmf.
C27	2600	02-600V
C29,31,38	572	.1-200V
C32,33	1285	100 mmf.
C35,36,37	824	.002-600V
C39	1285	100 mmf.
C40,41	2782	.005-600
C42	3352	.2-400
C43,45	7400	16 mfd. 400 V Electrolytic
C44		.0012 Mica
R1		10,000 1/3 W
R2,4		300 1/3 W
R3		20,000 1/2 W
R5		200 1/3 W
R6,19		50,000 1/3 W
R7		400 1/3 W
R8		2 Meg. 1/3 W
R9	7290	10,000 3 W
R10		50,000 1/3 W
R11		1 Meg. 1/3 W
R12		3 Meg. Volume Control
R13		1 Meg. 1/3 W
R14,17		200,000 1/3 W
R15		400,000 1/3 W
R16		100,000 1/3 W
R18		5000 1/3 W
R20		500,000 1/3 W
R21	2965	20 1/2 Flexohm
R22,23		25,000 1/3 W
R24		75,000 1/3 W
R25,26		500,000 1/3 W
R27		200,000 1/3 W



ANTENNA-GROUND CONNECTIONS

The antenna and ground leads to the receiver are attached to a terminal strip at the rear of the chassis. The terminals on this strip are marked "A," "D," and "G," which are the abbreviations for "Antenna," "Doublet" and "Ground" respectively.

The receiver is normally shipped from the factory with a wire connecting terminal "D" to terminal "G." In such a condition the receiver is ready for a normal antenna and a ground wire to be attached to the terminals "A" and "G" respectively. If a doublet is used, the wire connecting terminal "D" to terminal "G" should be removed and the two leads from the doublet antenna connected to terminals "A" and "D." For

DETROLA CORP.

MODEL 326
Voltage,Alignment

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

1. An all W. Signal Generator which will provide an accurately calibrated signal at the frequencies listed.
2. An Output Meter.
3. A non-metallic screwdriver.
4. Dummy Antenna—.1 mfd., 200 mmf., 400 ohms.

Set the volume control near the maximum position, connect the signal generator ground to the receiver chassis, connect the proper value of dummy antenna between the high side of the generator output and the point in the receiver indicated in the table below. Connect the output meter either across the primary of the output transformer or across the speaker voice coil. Allow the signal generator and the chassis to heat for several minutes.

BAND	SIGNAL FREQUENCY SETTING	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER FUNCTION	ADJUSTMENT
I.F.	455 kc.	Grid of 6K7G(I.F.)	.1 mmfd.	Short wave	Minimum capacity	2nd I.F.	Adjust to maximum output
I.F.	455 kc.	Grid of 6K8G	.1 mmfd.	Short wave	Minimum capacity	1st I.F.	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	Set pointer to indicate 1400 kc.	Broadcast oscillator	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	As above	Broadcast RF amplifier	Adjust to maximum output
BROAD-CAST BAND	1400 kc.	Antenna terminal	200 mmf.	Broadcast	As above	Broadcast antenna	Adjust to maximum output
BROAD-CAST BAND	600 kc. approx.	Antenna terminal	200 mmf.	Broadcast	Tune in signal	Broadcast padder	Adjust to maximum output while rocking gang condenser
REPEAT ABOVE BROADCAST ALIGNING PROCEDURE AT LEAST ONCE MORE							
MIDDLE WAVE BAND	5,000 exact	Antenna Terminal	400 ohms	Middle	Set pointer to indicate 5000 kc.	Middle wave oscillator	Adjust to maximum output.
MIDDLE WAVE BAND	5,000 kc. exact	Antenna Terminal	400 ohms	Middle	As above	Middle wave RF.	Adjust to maximum output.
MIDDLE WAVE BAND	5,000 kc. exact	Ant. Terminal	400 ohms	Middle	As above	Middle wave Ant.	Adjust to maximum output.
SHORT WAVE BAND	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	Set pointer to indicate 16,000 kc.	Short wave oscillator	Adjust to maximum output. *See note 1
SHORT WAVE BAND	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Short wave RF. amplifier	Adjust to maximum output while rocking the tuning-condenser slightly.
SHORT WAVE BAND	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Short wave Antenna	Adjust to maximum output while rocking the tuning-condenser slightly.

REPEAT ABOVE PROCEDURE AS FINAL CHECK

NOTE 1.—Exercise care to see that the oscillator is tuned to a frequency higher than the signal since it is very easy to mistakenly set the oscillator on the wrong side of the signal at this high frequency.

TUBES:

1—6K7G RF Amplifier.
1—6K8G Converter (Oscillator and First Detector).
1—6K7G IF Amplifier
1—6Q7G Second Detector and First Audio Amplifier.
2—76 Driver Tubes.
1—76 Phase Inverter.
2—6AC5 Output Tubes.
1—80 Rectifier.
1—6U5 Tuning Indicator.

POWER TRANSFORMERS

Power transformer are available and receivers are sometimes equipped with them for operation on 25 or 40 cycles.

SERVICE SUGGESTIONS

Be *sure* that antenna and ground connections are made according to instructions.

See that all tubes are in the proper sockets, that they are in good operating condition, and that clips are attached to the small caps on tops of those tubes requiring them. Make sure that the tube shields are not shorting the clips to the chassis.

Be sure that the Band Selector Switch and "Ant-Loop" Switch is in the proper position for the type of reception desired.

See that all plugs are making proper contact.

If the receiver remains inoperative after the above suggestions have been tried, *turn the Power Switch "Off."* Never leave the switch turned on when signs of abnormal heating are present. A minor circuit trouble may cause an expensive repair bill if the set is allowed to run for any length of time after the trouble develops.

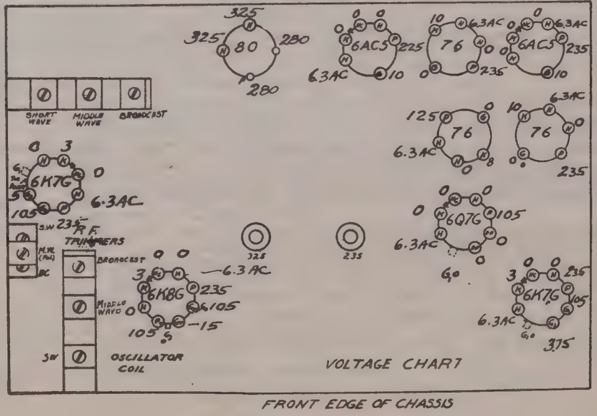
Occasionally a loud hum will be heard as stations are tuned in. Reverse the power supply plug. If the hum persists, remove the cause by properly grounding other sets or appliances in the house.

The receiver is perfectly conventional in all respects, therefore servicing should not present any particular problems to the professional service man. The normal methods of locating trouble applies in this set as in any other.

1. Suspected open condensers may most easily be checked by shunting each suspected unit with another condenser of the same capacity known to be good.

2. Suspected shorted condensers can usually be most easily detected by resistance checks. The condensers usually bypass a resistance of some finite value. A resistance check without disconnecting any wires will show a lower resistance than the color code of the resistance would indicate if the condenser is leaking or shorted. It must be remembered that some resistances vary 25% above or below the value indicated by the color code.

3. Leaky condensers in grid circuits can be checked by voltage measurement across the grid leak at no signal. If a measurable positive voltage exists at the grid end of the grid leak when measured to ground, a leaky coupling condenser probably exists. The condenser should then be disconnected and checked for resistance.



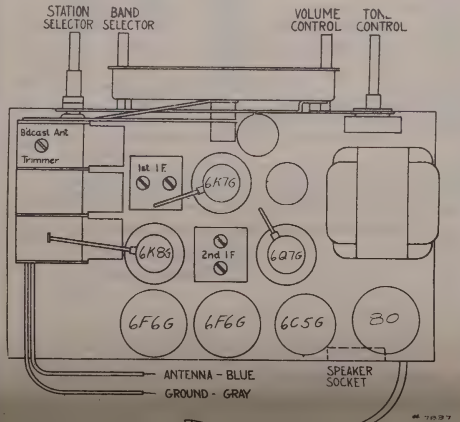
MODEL 3231 ALINEMENT PROCEDURE

Connect a high impedance AC voltmeter across the loudspeaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

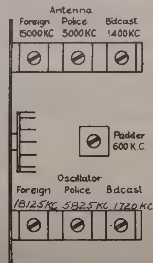
IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 455 kc. signal to the grid of the 6K7G IF amplifier tube and aline second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6K8G tube.

RF. (See diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch to position "B," tuning condenser to minimum capacity. Feed 1720 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1400-1500 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alinement.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the "P" position, adjust the oscillator top frequency for 5825 kc., then aline the antenna trimmer at about 5000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency band to 18,125 kc., and aline the antenna trimmer at about 15,000 kc. In order to make sure that the top end of the 1st band is set properly, it is best to screw the oscillator trimmer tight, then unscrew to the second peak. The antenna trimmer should be screwed down tight, then unscrewed to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.



MODEL 3231



TRIMMER ADJUSTMENT

MODELS 333 - 3281

ALINEMENT PROCEDURE

Turn the band switch to the Broadcast position.

Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF alignment: Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this postion recheck both transformers again.

Broadcast Band Alignment: Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

Short Wave Alignment: Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

NOTE: If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.

MODEL 326

PROCEDURE FOR SETTING THE STATION BUTTONS

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning. Make a list of your favorite stations, those which you tune in regularly.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next and so on.

Any buton may be used for any station you can receive, although it will be better to set the stations so that the kilocycle numbers increase from left to right.

SETTING A STATION BUTTON

Pull the button at the extreme left off the shaft. When this is done, the locking screw under the shaft will be exposed.

Loosen this screw with a small screwdriver by turning several turns in a counter-clockwise direction. Continue to press in firmly on the screwdriver, thus holding the station button shaft depressed. Select the first station button shaft depressed. Select the first station from the list you have prepared and carefully tune in this station by means of the manual tuning knob.

Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction until it is tight. The station is now set on this button.

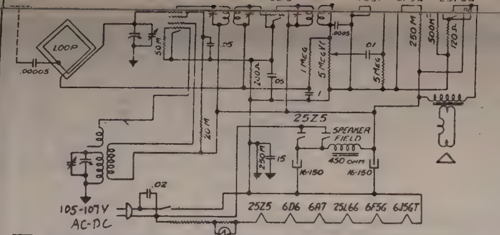
Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

Select the proper station call letter tab from the sheet provided and place it in the recess in the proper push button. Cover the call letter tab with one of the heavy celluloid retainers provided. Replace the button on the shaft. Follow the same procedure for inserting the station call letters in any other buttons.

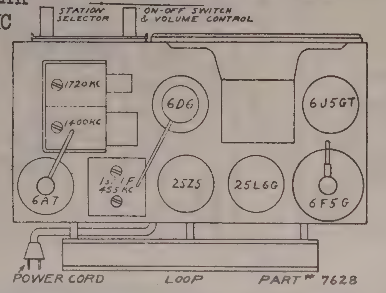
After the stations are set and the mechanism is locked, tune in each of them by depressing the proper button. If any of them does not appear to be properly tuned in after the button has been depressed, reset the station for that button following the procedure as outlined above. If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one

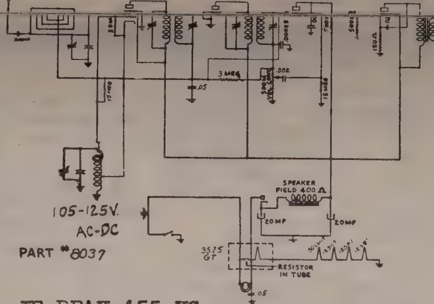
DETROLA CORP.

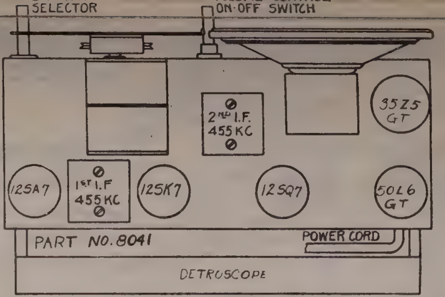
MODEL 329
MODEL 333
MODEL 342
Schematics, Socket
Trimmers



IF PEAK
455 KC







IF PEAK 455 KC

The following tubes are used in this receiver.

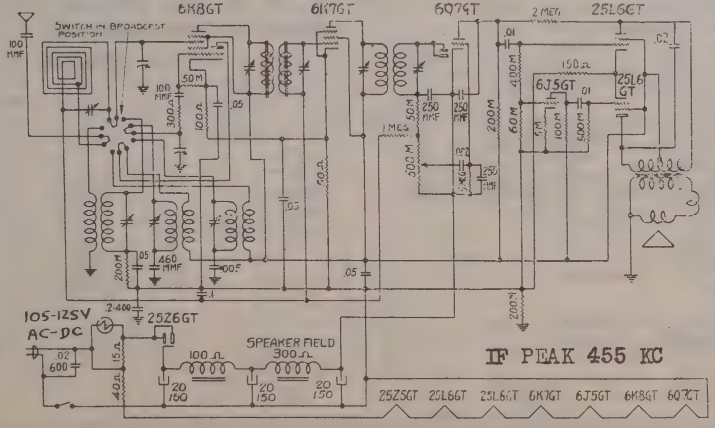
12SA7 Translator	12SQ7 Detector AVC
12SK7 IF Amplifier	50L6GT Output
35Z5GT Rectifier	

FOR CONVENTIONAL ALIGNMENT FOR THESE MODELS, SEE SPECIAL SECTION VOLUME VIII.

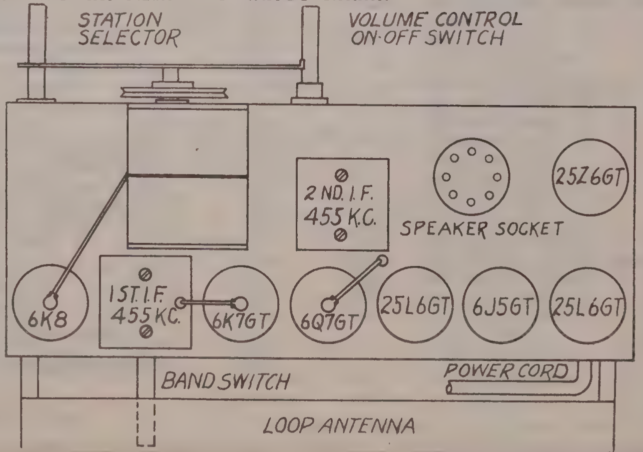
A.C.-D.C. SUPERHETERODYNE SERIES 333

TUBES

1—6K8 Translator-Oscillator
6K7GT—Intermediate Frequency Amplifier
1—6Q7GT Detector-AVC-First Audio
1—6J5GT Phase Inverter
2—25L6GT Power Output
1—25Z6GT Rectifier



IF PEAK 455 KC



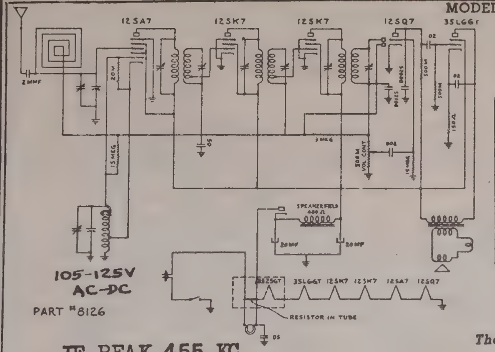
MODEL 343
Schematic, Socket
Trimmers
MODEL 3231
MODEL 3281
Schematics

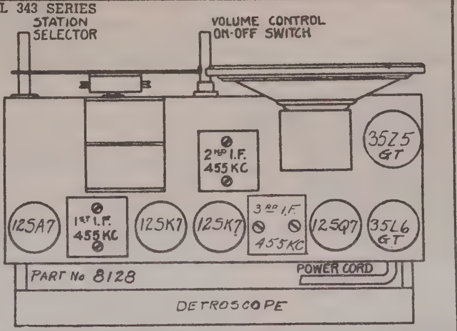
DETROLA CORP.

FOR LAYOUTS
SEE INDEX

SUPERHETERODYNE SERIES 3231

Symbol	Part No.	Description
C1,a,b,c	7483	Variable Condenser
C1,22		.1 mf 200 volt
C2		,2 mf. 200 volt
C3		50 mmf Mica
C4,5,8	2597	1-10 mmf Trimmer
C6,9	1611	3-35 mmf Trimmer
C7	3157	2-25 mmf Trimmer
C10	2560	200-500 mmf B.C. Osc Padder
C11	2471	1330 mmf 5% Mica
C12	2793	.006 600 volt 10%
C13		.1 mf 400 volt
C14		.2 mf 400 volt
C15,17		250 mmf Mica
C16		.01 mf 200 volt
C18,19		,02 mf 400 volt
C20		.002 mf 600 volt
C21		.005 mf 600 volt
C23,24	7113	16 mf 450 volt Electrolytic
R1,6,13		50 M 1/3 watt
R2,3		100 ohm 1/3 watt
R4		10 M 1/3 watt
R5,16,17		1 Meg 1/3 watt
R7	2726	500 M Volume Control & Switch
R8		200 M 1/3 watt
R9		400 M 1/3 watt
R10		250 ohm 2 watt
R11		100 M 1/3 watt
R12		5 M 1/3 watt
R14		500 M 1/3 watt
R15	2737	2 Meg Tone Control
R18		20 M 1/3 watt
R19		15 ohm 1/3 watt





The following tubes are used in this receiver.

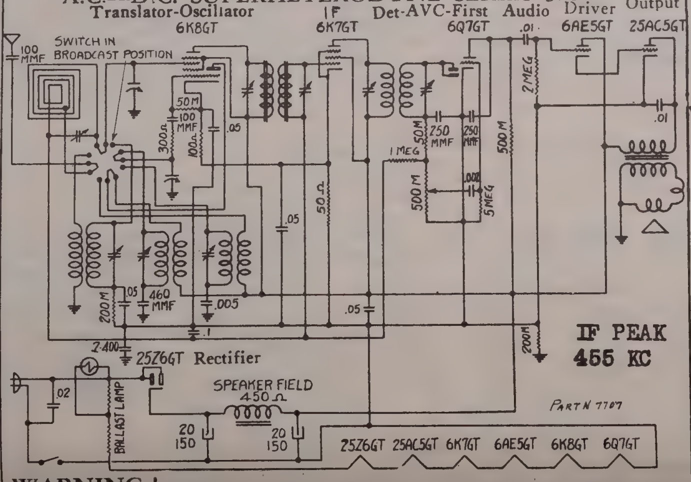
12SA7	Translator	12SQ7	Detector AVC
12SK7	1st IF Amplifier	35L6GT	Output
12SK7	2nd IF Amplifier	35Z5GT	Rectifier

IF PEAK 455 KC

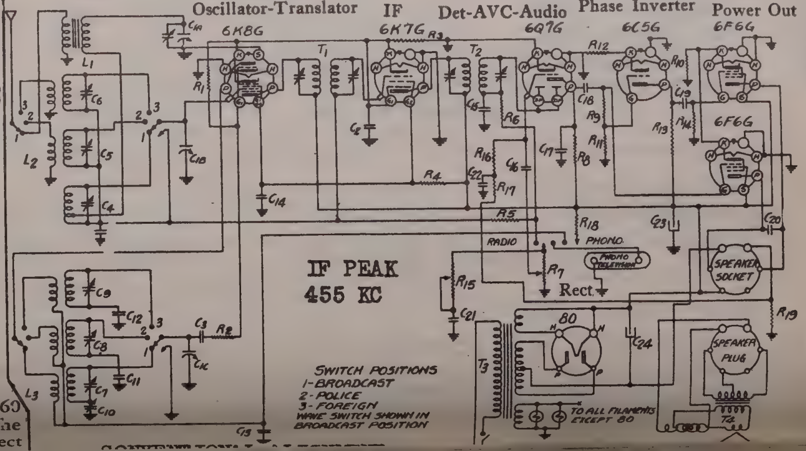
CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

A.C.—D.C. SUPERHETERODYNE SERIES 3281



IF PEAK
455 KC



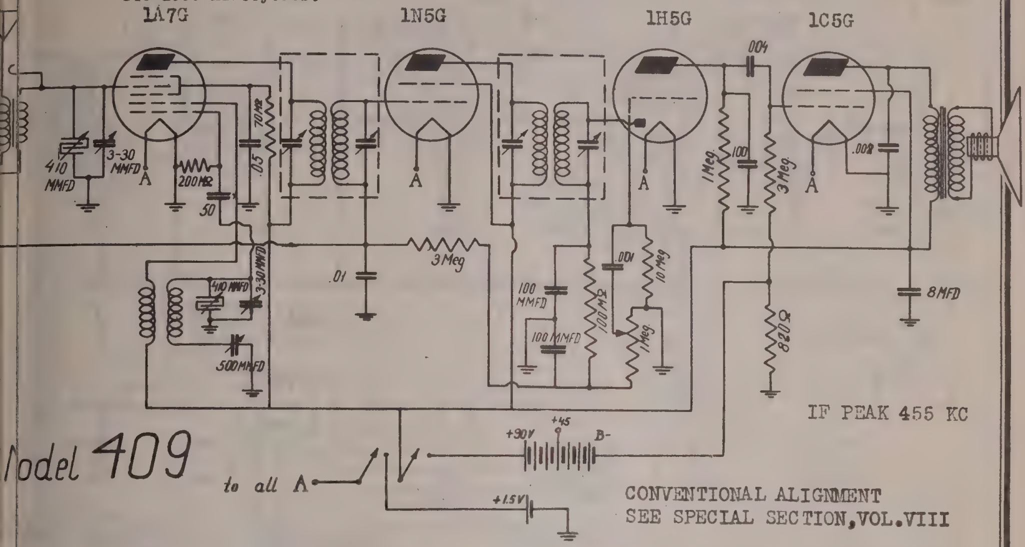
IF PEAK
455 KC

WARNING!
The clock with which this receiver is equipped will operate on 60 cycle alternating current only. A switch is provided on the back of the cabinet to disconnect the clock when the receiver is operated on direct

MODEL 409
MODELS 658,658LW,661
Schematics,Alignment

DeWALD RADIO MFG. CORP.

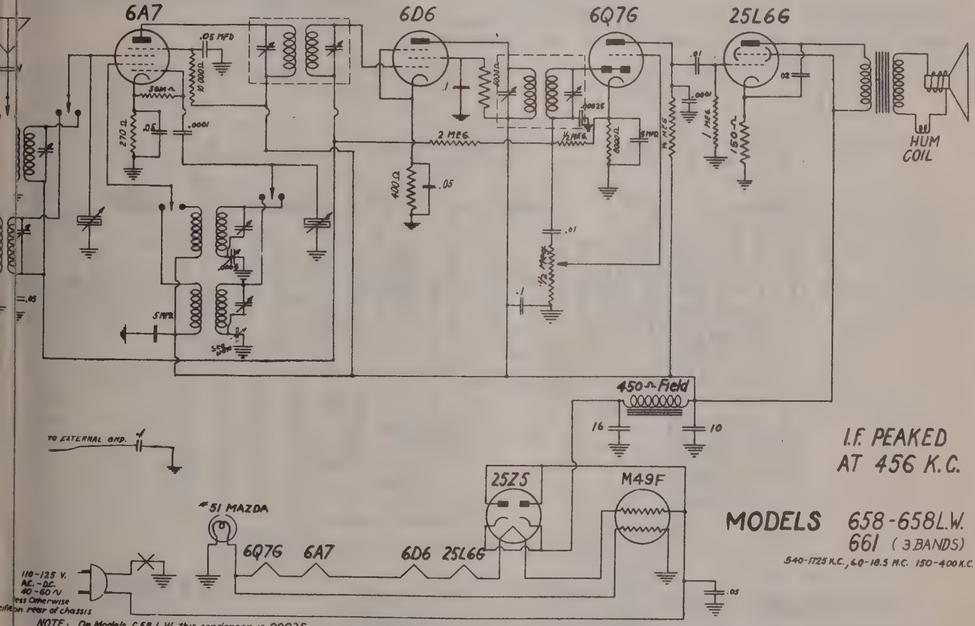
This is a battery operated superheterodyne receiver with full automatic volume control. It is designed to function with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is 540-1600 kilocycles.



Model 409

IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION,VOL.VIII



I.F. PEAKED
AT 456 K.C.

MODELS 658-658L.W.
661 (3 BANDS)
540-1725 K.C., 6.0-18.5 M.C. 150-400 K.C.

NOTE: On Models 658 L.W. this condenser is .00025

MODEL	RANGE COVERAGE		
658	555-174 meters 540-1725 K.C.	50-16 meters 6.0-18.5 M.C.	
58 L.	555-174 meters 540-1725 K.C.	2000-750 meters 150-400 K.C.	
61	555-174 meters 540-1725 K.C.	50-16 meters 6.0-18.5 M.C.	2000-750 meters 150-4000 K.C.

These models are superheterodyne receivers, with full automatic olume control on all bands. They have been designed to operate on 10-125 volts, 40-60 cycles AC or DC unless otherwise specified. A lide rule instrument type dial which simplifies tuning is featured these receivers.

TO CALIBRATE RECEIVER

.F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 456 K.C. and peak I.F. trimmers for maximum signal.

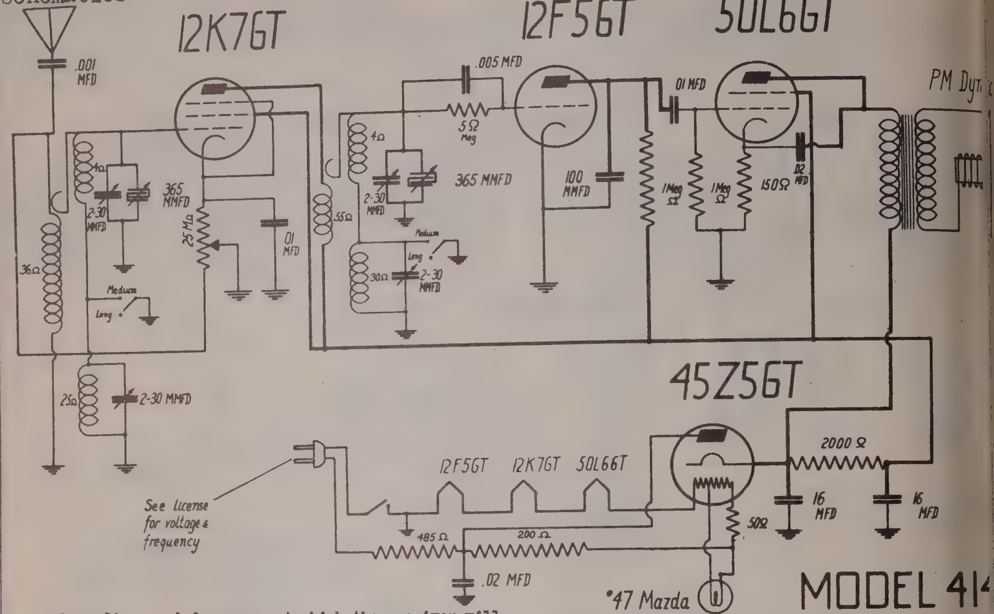
BROADCAST ALIGNMENT Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C.. peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT Turn wave band switch to the short wave band. Adjust generator and receiver to 16.0 M.C. Peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

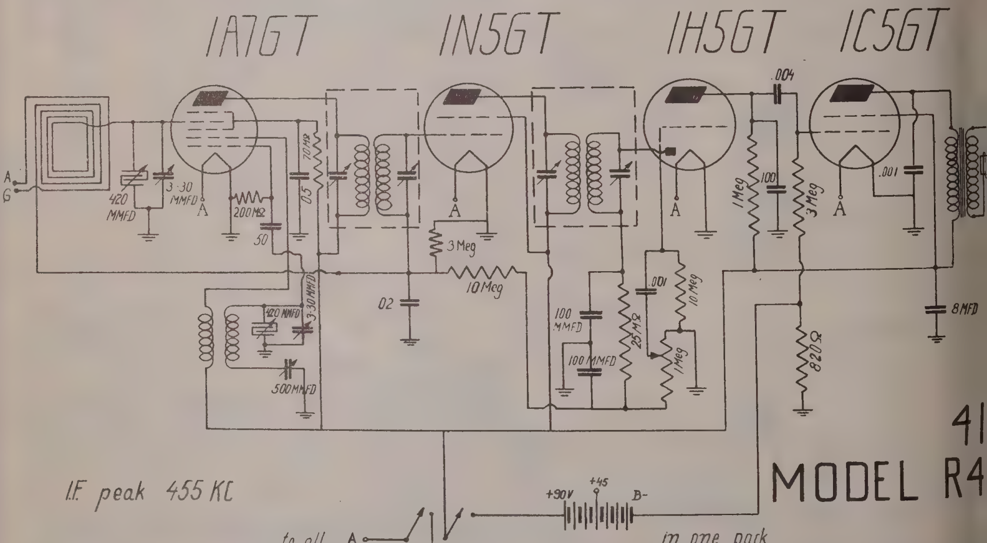
LONG WAVE ALIGNMENT Turn wave band switch to Long Wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximum signal. The variable condenser should be "rocked" during this operation. Recheck 300 K.C.

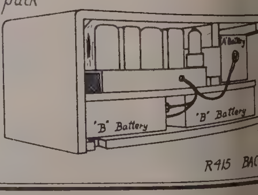
MODEL 414
MODELS 415,R415
Schematics

DeWALD RADIO MFG. CORP.



The voltage and frequency at which the receiver will operate is specified on the back of the cabinet. The broadcast range coverage is 180-560 meters. The long wave range coverage is 850-2040 meters.

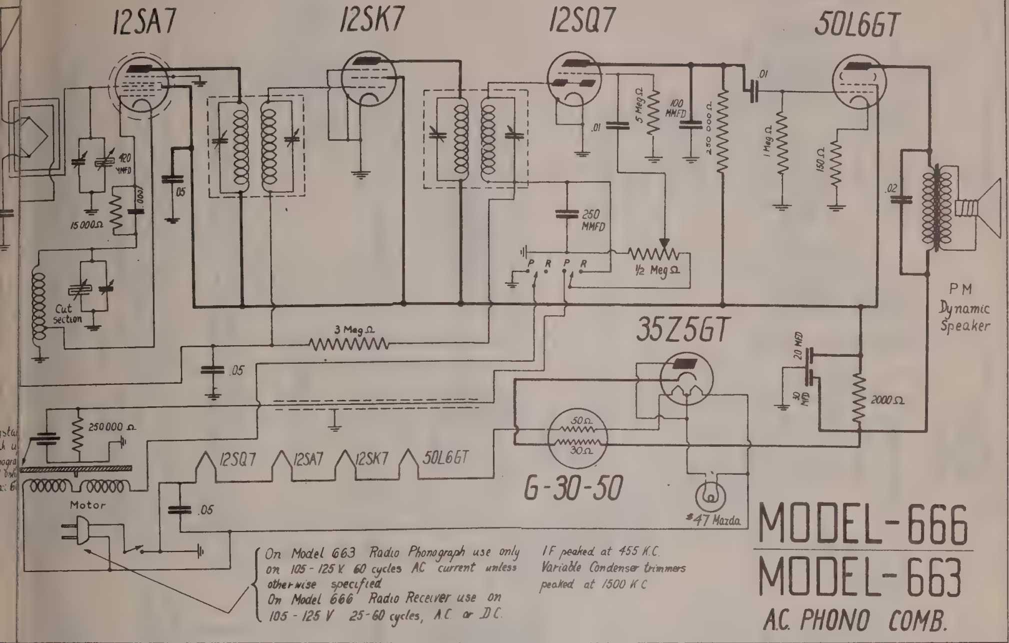




This model is a battery operated superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. It is designed to operate with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is 540 - 1600 kilocycles. For the "A" supply one Eveready #743, Burgess #6F or the equivalent may be used. For the "B" supply two Eveready #727, Burgess #A30X or the equivalent batteries may be used.

DeWALD RADIO MFG. CORP.

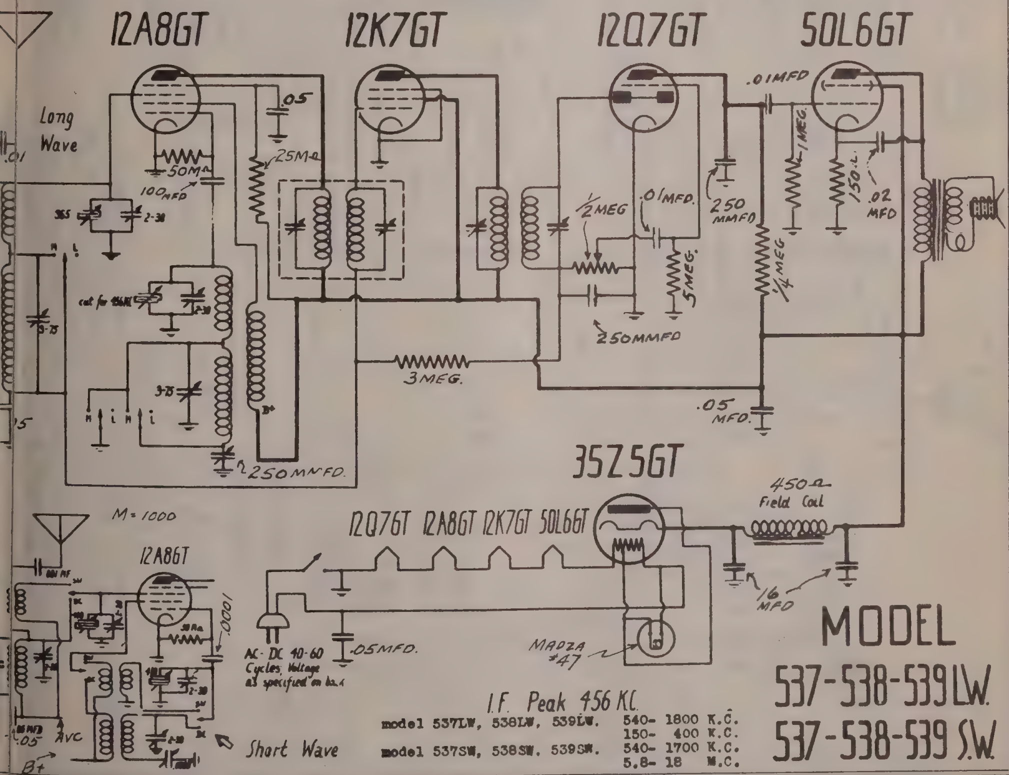
MODELS 537,538,539
LW and SW
MODELS 663,666
Schematics



On Model 663 Radio Phonograph use only on 105 - 125 V. 60 cycles AC current unless otherwise specified
On Model 666 Radio Receiver use on 105 - 125 V 25-60 cycles, A.C. or D.C.

IF peaked at 455 K.C.
Variable Condenser trimmers peaked at 1500 K C

MODEL-666
MODEL-663
A.C. PHONO COMB.



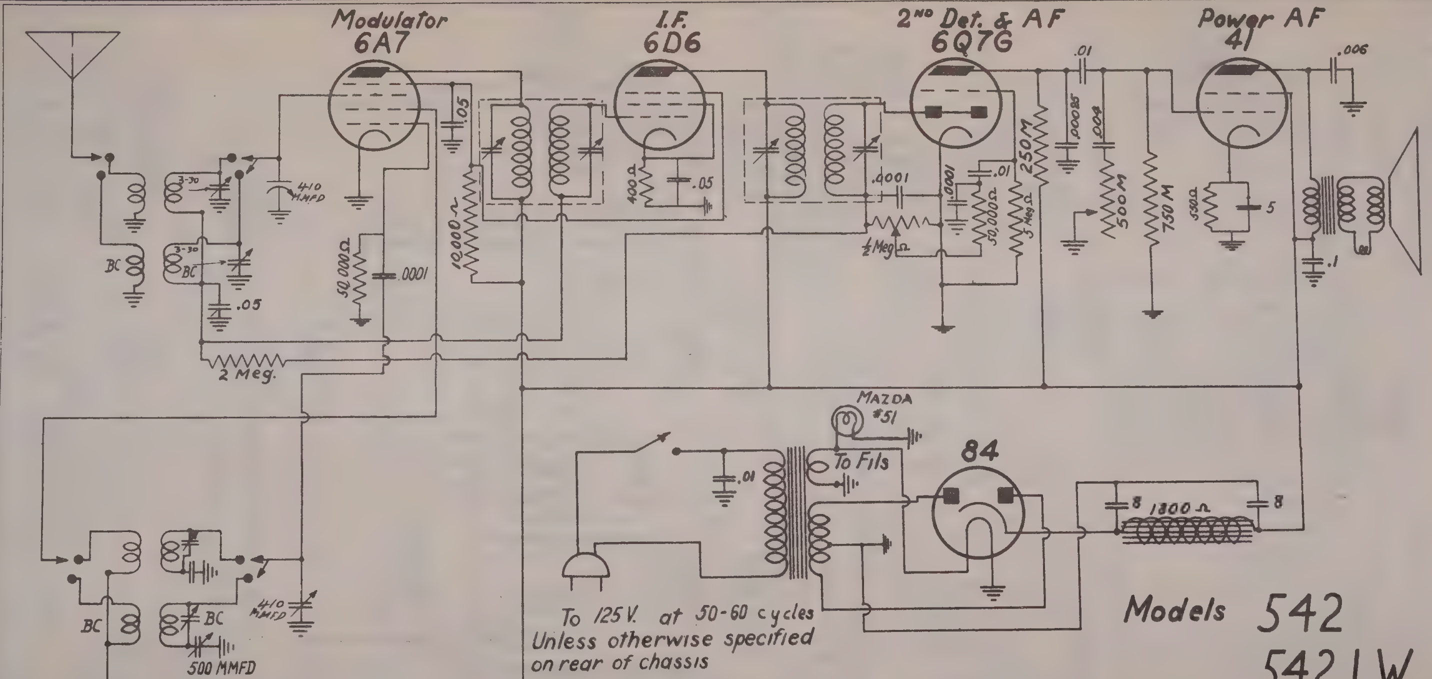
I.F. Peak 456 K.C.

model 537LW, 538LW, 539LW.	540- 1800 K.C. 150- 400 K.C.
model 537SW, 538SW, 539SW.	540- 1700 K.C. 5.8- 18 M.C.

MODEL
537-538-539 LW.
537-538-539 S.W.

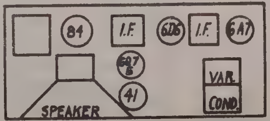
MODELS 542,542LW
Schematic,Socket
Alignment

DEWALD RADIO MFG. CORP.



IF PEAK 456 KC

MODEL	RANGE COVERAGE
542	555-174 meters, 50-16 meters 540-1725 K.C., 6.0-18.5 M.C.
542L.W.	555-174 meters, 2000-750 meters 540-1725 K.C. 150-400 K.C.



TO CALIBRATE RECEIVER

I.F. ALIGNMENT: Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 456 K.C. and peak I.F. trimmers for maximum signal.

BROADCAST ALIGNMENT: Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum

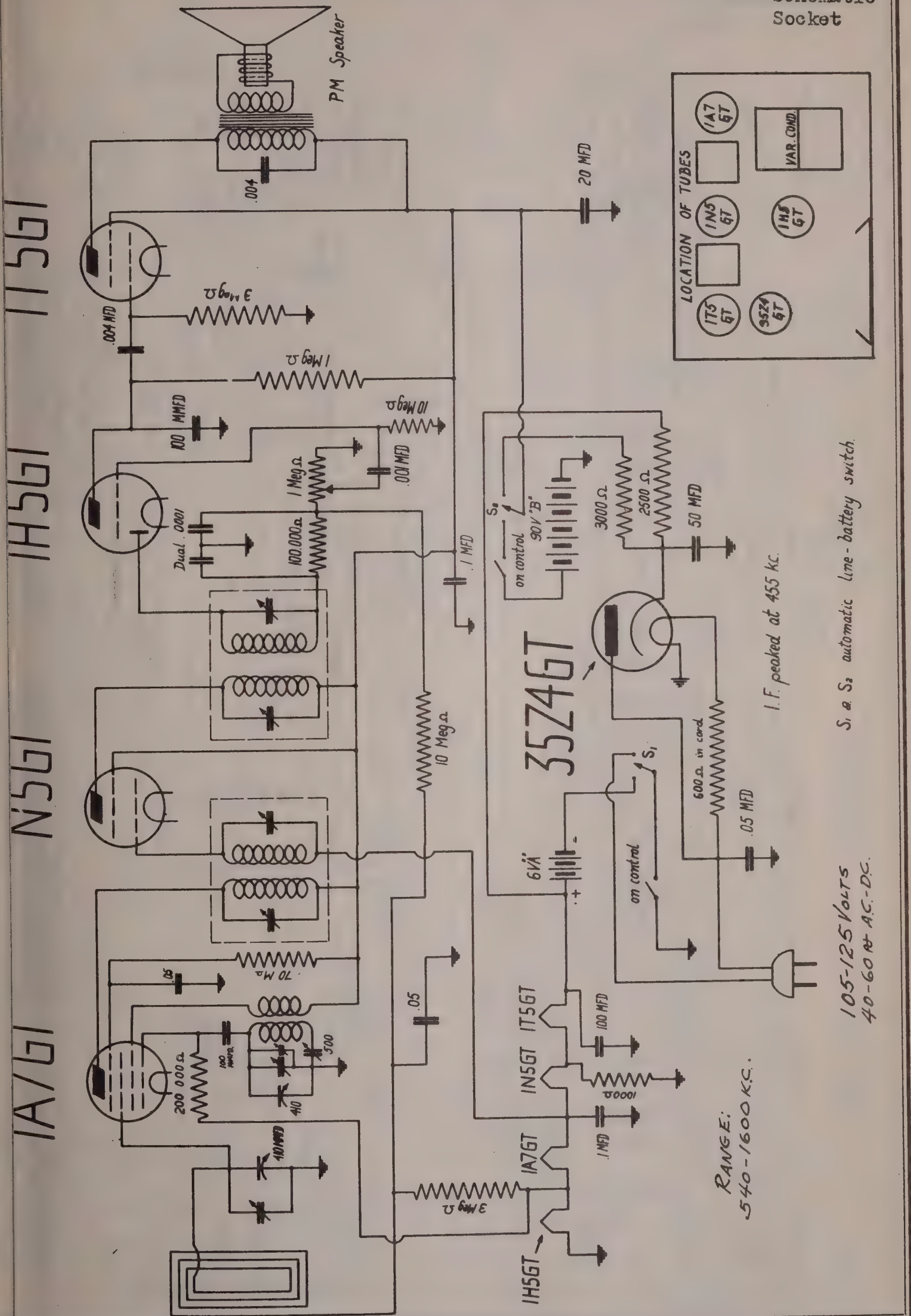
peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT: For 6.0-18.5 M.C. (Model 542) Turn wave band switch to this band. Adjust the generator and receiver to 16.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

LONG WAVE ALIGNMENT: (Model 542 L.W.) Turn wave band switch to long wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for Maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximim signal. The variable condenser should be "rocked" during this operation.

DeWALD RADIO MFG. CORP.

MODEL 544
Schematic
Socket



I.F. peaked at 455 KC.

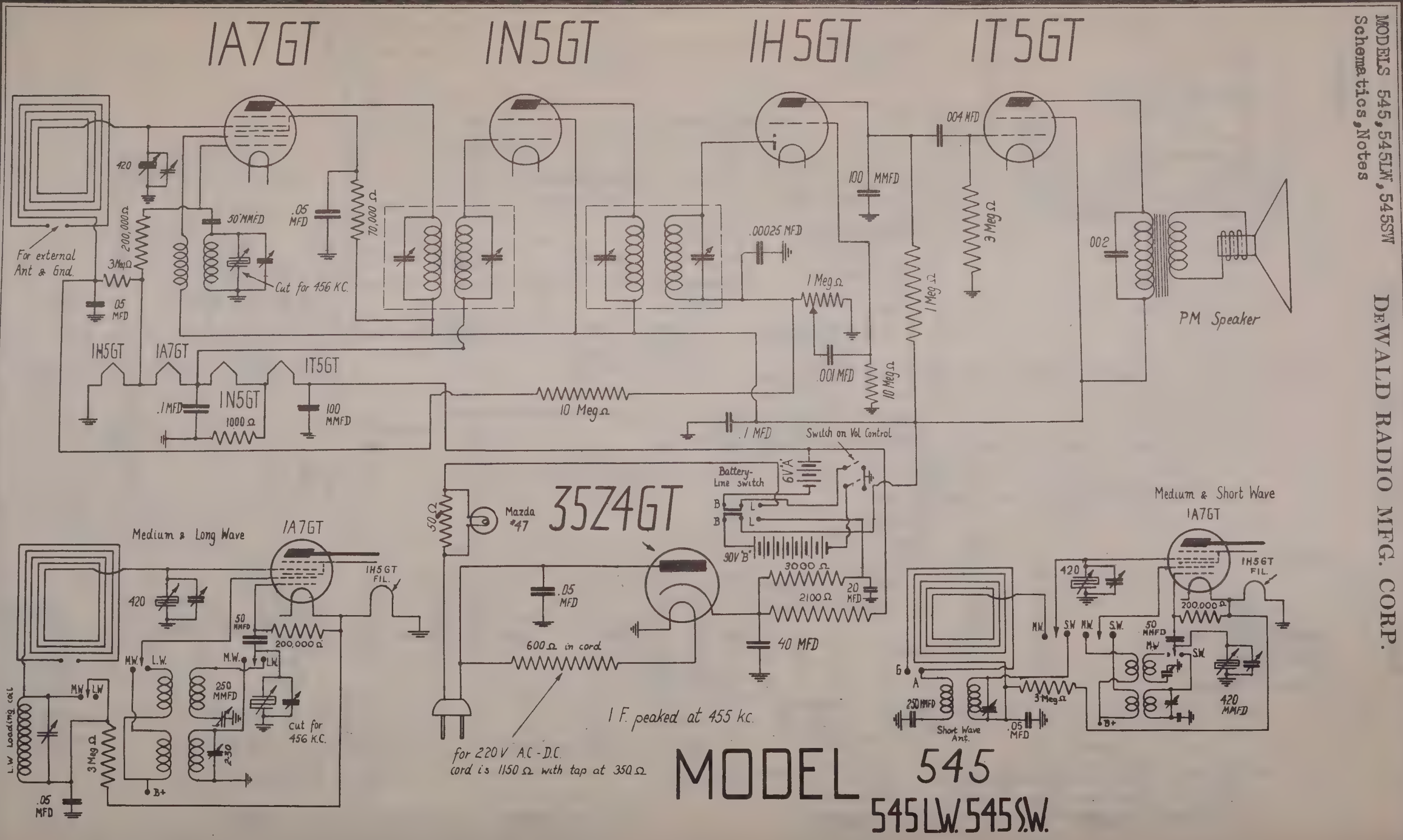
S1 & S2 automatic line-battery switch.

105-125 Volts
40-60 ~ A.C.-D.C.

RANGE:
540-1600 KC.

MODELS 545,545LW,545SW
Schematics,Notes

DeWALD RADIO MFG. CORP.



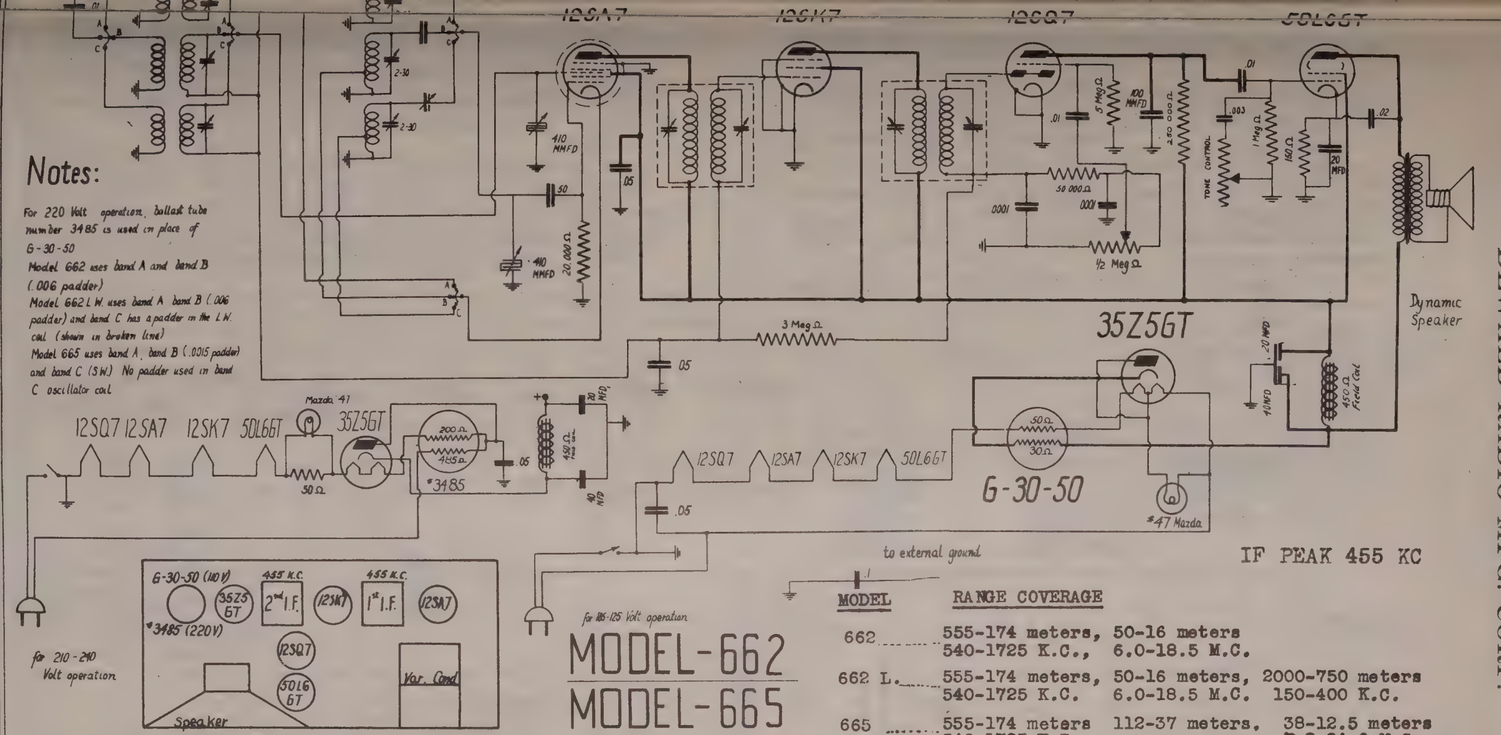
These models are portable combination battery and electric operated superheterodyne receivers with full automatic volume control. A self-contained loop is incorporated which makes the use of an outside aerial unnecessary for broadcast reception. The receivers will operate with an "A" supply of 6 volts and a "B" supply of 90 volts. They will also operate on 105-125 volts, 40-60 cycles A.C. or D.C. unless otherwise

The range coverage is as follows:

MODEL 545	1700 - 540 KC.
MODEL 545 L.W.	1700 - 540 KC. & 350 - 145 KC.
MODEL 545 S.W.	

DEWALD RADIO MFG. CORP.

MODELS 662,662L,665
Schematic,Socket
Alignment,Notes



Notes:

For 220 Volt operation, ballast tube number 3485 is used in place of G-30-50

Model 662 uses band A and band B (.006 padder)

Model 662 L.W. uses band A band B (.006 padder) and band C has a padder in the L.W. coil (shown in broken line)

Model 665 uses band A, band B (.0015 padder) and band C (S.W.) No padder used in band C oscillator coil

IF PEAK 455 KC

MODEL-662
MODEL-665
AC-D.C. Receiver

MODEL	RANGE COVERAGE		
662	555-174 meters, 540-1725 K.C.,	50-16 meters 6.0-18.5 M.C.	
662 L.	555-174 meters, 540-1725 K.C.	50-16 meters, 6.0-18.5 M.C.	2000-750 meters 150-400 K.C.
665	555-174 meters 540-1725 K.C.	112-37 meters. 2.7-8.2 M.C.	38-12.5 meters 7.8-24.0 M.C.

TO CALIBRATE RECEIVER

I.F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers for maximum signal.

BROADCAST ALIGNMENT Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C., peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT For 2.7-8.2 M.C. (Model 665). Turn wave band switch to this band. Adjust the generator and receiver to 7.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

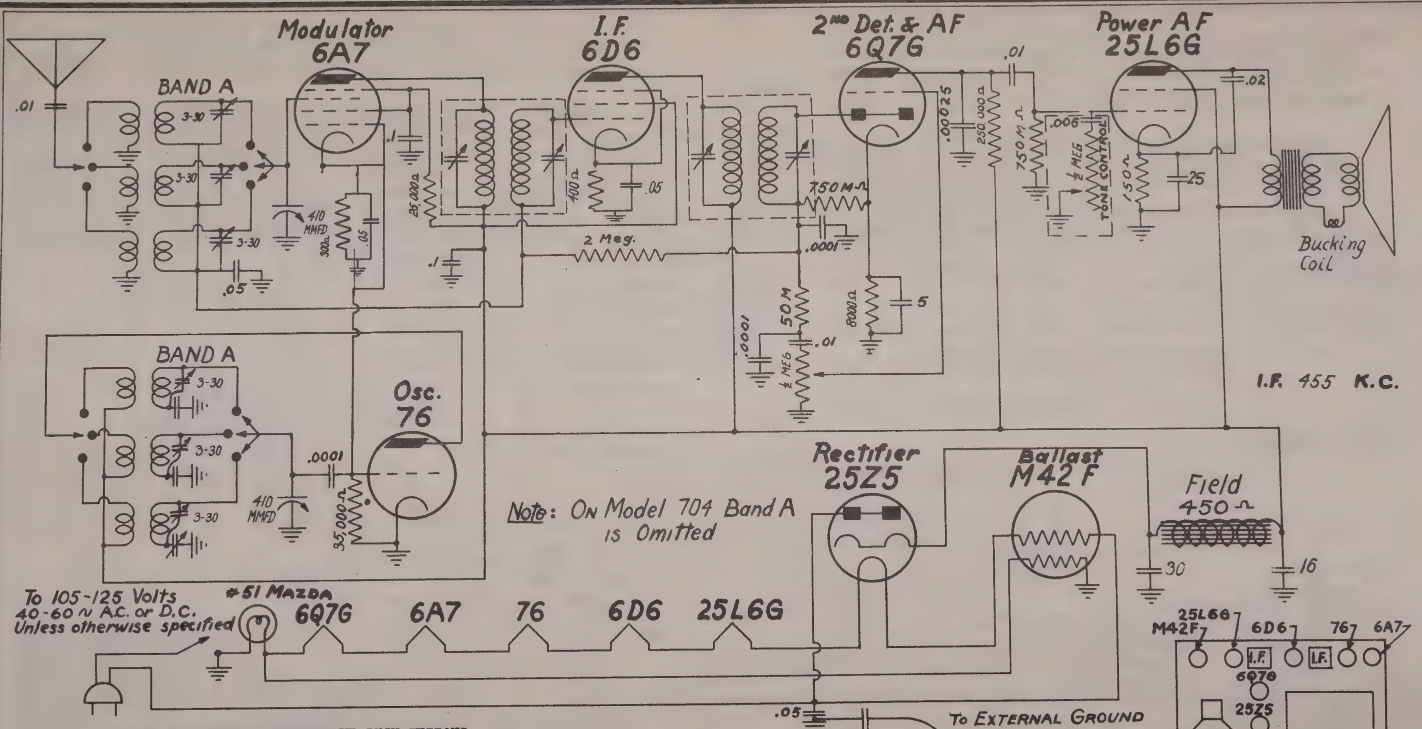
For 7.8-24.0 M.C. (Model 665) Turn wave band switch to this band. Adjust the generator and receiver to 22.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

For 6.0-18.5 M.C. (Model 662). Turn wave band switch to this band. Adjust the generator and receiver to 16.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

LONG WAVE ALIGNMENT (Model 662 L.W.) Turn wave band switch to Long Wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximum signal. The variable condenser should be "rocked" during this operation. Recheck 300 K C.

MODELS 704,704LW,705
Schematic,Socket
Tuner,Alignment

DEWALD RADIO MFG. CORP.



HOW TO ADJUST THE PUSH-BUTTONS

Tune in the desired station with the station selector knob. Determine which button is to be used to receive this station. Loosen this button by turning it in a counterclockwise direction approximately one full turn. Then push the button in as far as it will go and tighten it up by turning it clockwise. The adjustment may be checked by setting the pointer in any position, pushing the button in as far as it will go and noting if the intended station is received. After all adjustments have been made the station tabs may be placed in the escutcheon recess.

TO CALIBRATE RECEIVER

I.F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers for maximum signal.

BROADCAST ALIGNMENT Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C., peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT For 2.7-8.2 M.C. (Model 705). Turn wave band switch to this band. Adjust the generator and receiver to 7.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

For 7.8-24.0 M.C. (Model 705) Turn wave band switch to this band. Adjust the generator and receiver to 22.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

For 6.0-18.5 M.C. (Model 704). Turn wave band switch to this band. Adjust the generator and receiver to 16.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

LONG WAVE ALIGNMENT (Model 704L.W.) Turn wave band switch to Long Wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximum signal. The variable condenser should be "rocked" during this operation. Recheck 300 K.C.

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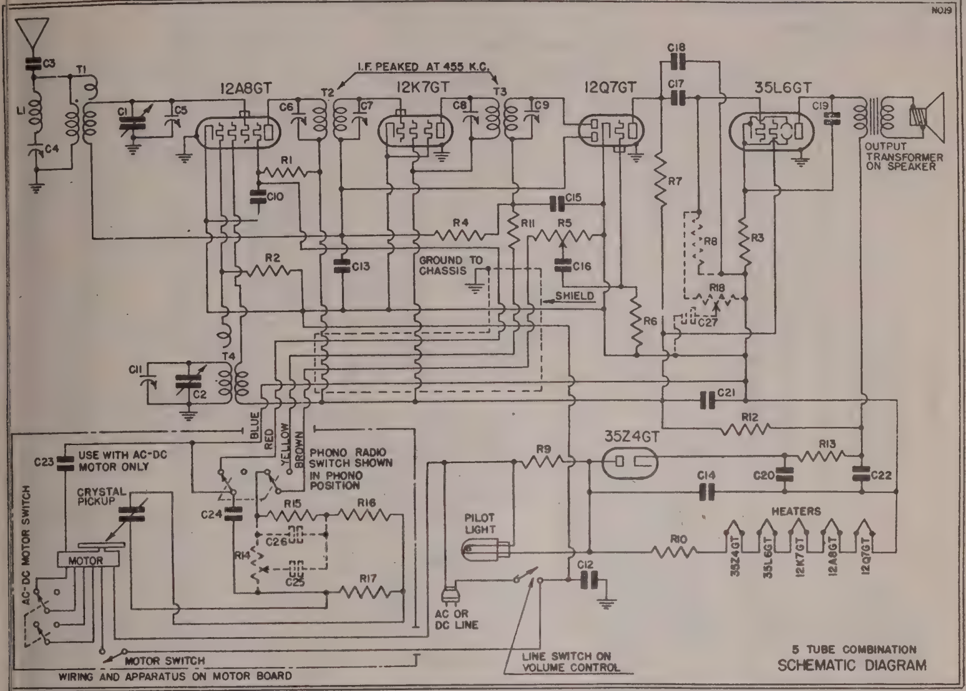
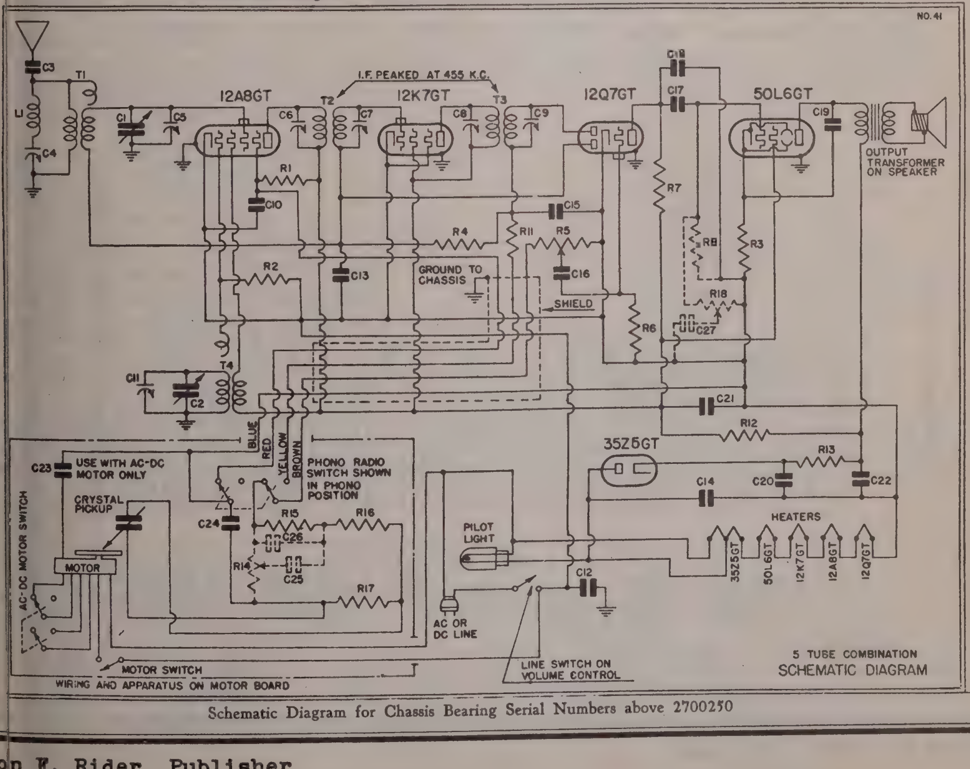
EMERSON RADIO & PHONOGRAPH CORP.

MODELS CJ221,CJ232 AC,
CJ1-221,CJ1-232 AC-DC
Chassis CJ,CJ1,Early,Late
Schematics



Schematic Diagram for Chassis Bearing Serial Numbers below 2700250 Nov. 1, 1939



Schematic Diagram for Chassis Bearing Serial Numbers above 2700250

MODELS CJ221,CJ232 AC
CJ1-221,CJ1-232 AC-DC
Chassis CJ,CJ1
Voltage,Alignment,Parts
Changes,Coil Data

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS

List Price ea.
Effective as of
July 1, 1939
(Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
L1, T1	4XT-432	Antenna coil with adjustable 455 kc wave-trap	$ .90
T4	6JT-467A	Oscillator coil. (See production change no. 2)	.35
T2	6JT-466U or 6JT-466AU	Double-tuned 455 kc first i-f transformer	1.10
T3	4XT-435CU	Double-tuned 455 kc second i-f transformer	.85
R1	2CR-193	30,000 ohm 1/2 watt carbon resistor	.16
R2	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R3	3FR-293	140 ohm 1/2 watt wire-wound resistor	.16
R4	HR-42	2 megohm 1/4 watt carbon resistor	.16
R5	4XR-335	Volume control .25 megohm with line switch	.90
R6	4XR-327	15 megohm 1/4 watt carbon resistor	.16
R7, R8, R17	KR-56	500,000 ohm 1/4 watt carbon resistor. (See production change no. 1)	.16
R9, R10	6JR-353	Tapped metal-clad wire-wound resistor. (See production change no. 3) R9—35 ohms; R10—70 ohms; (Each section—2watts)	.25
R11	KR-54	100,000 ohm 1/4 watt carbon resistor	.16
R12	4XR-334	2,500 ohm 1 watt carbon resistor	.16
R13	4ZR-325	175 ohm 1 watt wire-wound resistor	.16
C1, C2	4XC-391C	Two-gang variable condenser (for CJ-221)	2.40
C1,C2	4XC-412	Two-gang variable condenser (for CJ-232)	2.75
C3	4XC-401	0.00055 mf mica condenser	.20
†C4		Trimmer, part of wave-trap assembly.	
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10, C13, C24	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	AC-6	0.1 mf, 200 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15, C18	4XC-394A	0.00022 mf mica condenser	.20
C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17, C19	6JC-425	0.024 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426U or 6JC-426AU	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C22	4XC-404	20 mf, 135 volt dry electrolytic condenser	.65
C23	KC-58	0.01 mf, 400 volt tubular condenser (for AC-DC motors only)	.20
	6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda No. 47	.20
	6JD-74	Dial face	.35
	4YZ-772	Drive cord	.02
	5JZ-824	Drive cord spring	.05
	6JH-24	Drive shaft	.05
	4MZ-588B	Dial pointer	.20
	4XM-367	Drive pulley	.10

ADDITIONAL PARTS USED ON CJ-221

*Item	Part No.	DESCRIPTION	PRICE
R14	4LR-312B	Tone control .5 megohm with line switch	1.05
R15, R16	KR-57	1 megohm 1/4 watt carbon resistor	.16
C25	IC-47A	0.0005 mf mica condenser	.20
	3LM-253	Phonograph needle cup	.20
	4XPM-20A	117 volt a.c. phonograph motor (for 221 a.c.)	12.00
	3GPM-1	117 volt a.c.-d.c. phonograph motor (for 221 a.c.-d.c.)	43.20
	4XC-418A	Crystal pick up	8.10
	6JS-386	6" permanent magnet dynamic speaker	6.20
	6JS-385	Phono-radio switch	.65
	4XE-3A	Dial crystal	.20

ADDITIONAL PARTS USED ON CJ-232

*Item	Part No.	DESCRIPTION	PRICE
R15, R16	KR-56	.5 megohm 1/4 watt carbon resistor	.16
R18	4XR-342	Tone control .5 megohm	.70
C26	4UC-371A	0.0003 mf mica condenser	.20
C27	HC-34	0.006 mf 600 volt tubular condenser	.20
	4XPM-19A	117 volt, a.c.-d.c. phonograph motor (for 232 a.c.-d.c.)	66.00
	4XPM-19	117 volt a.c. phonograph motor (for 232 a.c.)	42.60
	4XC-406	Crystal pick up	9.85
	4PS-303A	6" permanent magnet dynamic speaker	6.70
	TTS-111S	Phono-radio switch	.55
	4XE-3	Dial crystal	.20
	4XW-130	Record holder block	.60

When ordering replacement parts specify part number.

*Item number locates the article on the schematic diagram.
†Not supplied separately.

PRODUCTION CHANGES

1. In CJ chassis bearing serial numbers below 2,700,250; R7, the 12Q7G plate resistor, is 250,000 ohms.
2. CJ chassis also use oscillator coil 4XT-458 or 6JT-467. For correct lug connections to any of these coils see illustration.
3. R9, R10 is not used on CJ chassis above serial number 2,700,250.
4. CJ-221 chassis uses dotted portion R8, R14, and C25.

CJ-232 chassis uses dotted portion R18, C26, and C27

Tube Data

For serial numbers below 2,700,250:		*For serial numbers above 2,700,250*
1—12A8 or 12A8GT	pentagrid oscillator modulator	1—12A8 or 12A8GT
1—12K7 or 12K7GT	first i-f amplifier	1—12K7 or 12K7GT
1—12Q7 or 12Q7GT	diode detector, a-f amplifier, a.v.c.	1—12SQ7 or 12SQ7GT
1—35L6 or 35L6GT	beam power output	1—50L6 or 50L6GT
1—35Z4 or 35Z4GT	half-wave rectifier	1—35Z5 or 35Z5GT

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch, with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8GT	65	40	0	65	12
12K7GT	65	65	0	—	12
12SQ7GT	40	—	0	—	12
50L6GT	100	65	5.7	—	50

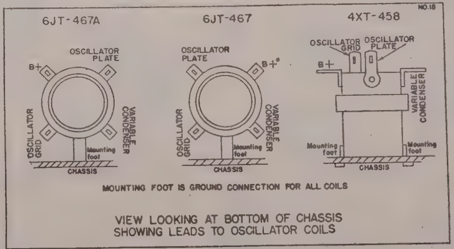
Voltage at 35Z5 cathode—110 volts.

Voltage across pilot light—4.5 volts.

† In chassis using 35Z4GT and 35L6GT plate and screen voltage readings will be slightly higher.

CHASSIS MODEL CJ

Voltage rating .... 105-125 volts
Power consumption... 30 watts for receiver
20 watts for 221 a.c. or 232 a.c. motor
30 watts for 221 and 232 a.c.-d.c. motors
Frequency range .... 540-1730 kc.



VIEW LOOKING AT BOTTOM OF CHASSIS
SHOWING LEADS TO OSCILLATOR COILS

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil between the 12K7 and 35Z5 tubes. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

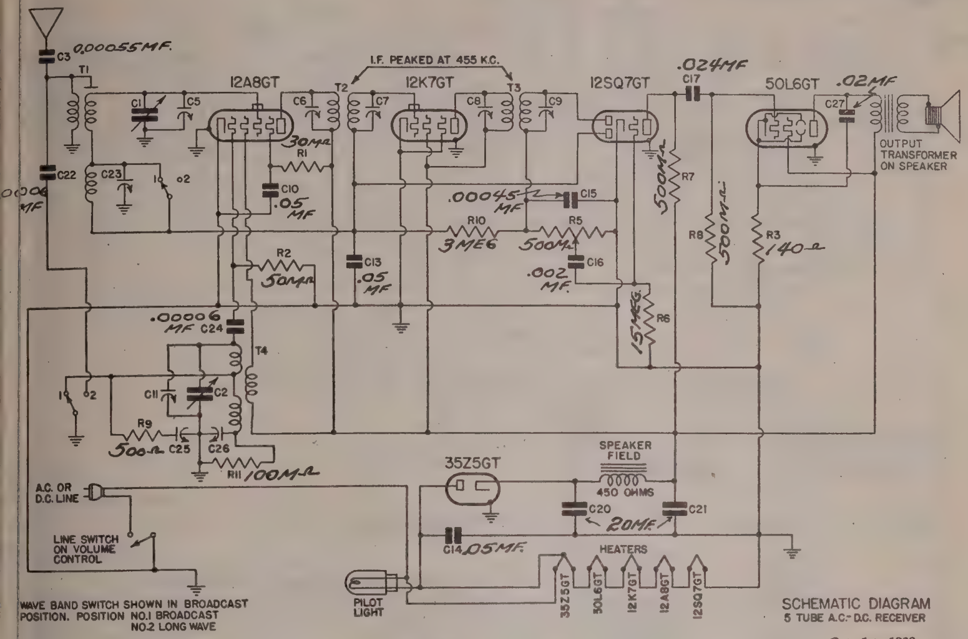
Swing the variable condenser to the maximum capacity position.. Feed 455 kc to the grid-cap of the 12A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 4.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

EMERSON RADIO & PHONOGRAPH CORP

MODELS CRLW261,CRLW262
CRLW274,Chassis CRLW
Schematic,Voltage
Alignment,Trimmers



SCHEMATIC DIAGRAM
5 TUBE A.C.-D.C. RECEIVER

Oct. 1st, 1939

ilot light, 6.3 volt, .15 amp., Mazda No. 47

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

TAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (itch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. w be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
2A8GT—pentagrid oscillator modulator....	88	45	0	88	12
2K7GT—first i-f amplifier...............	88	88	0	—	12
2SQ7GT—diode detector, a-f amplifier, a.v.c.	40	—	0	—	12
L6GT—beam power output..............	82	88	5.7	—	50

ltage at 35Z5 cathode—115 volts.

ltage across speaker field—27 volts.

ltage across pilot light—4.5 volts.

Voltage rating	105 to 125 volts, a.c. or d.c.
Power consumption	30 watts
Frequency ranges	538 to 1650 kc (558 to 182 meters) 157 to 375 kc (1905 to 804 meters)

ion of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the speaker. The trimmers are access- through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are essible through holes in the top of the chassis directly beneath the variable condenser.

The two-band antenna coil is located to the left of the speaker. The trimmer for the broadcast antenna coil is ated on the front section of the variable condenser. The trimmer for the long-wave antenna coil is mounted on the of the antenna coil form. The two-band oscillator coil is located underneath the chassis below the antenna coil. The nmer for the broadcast oscillator coil is located on the rear section of the variable condenser. The trimmer and series lder (condensers C25 and C26 resp.) for the long-wave oscillator coil are located beneath the chassis and can be reached m the bottom only. The section toward the rear of the chassis is C25, the shunt trimmer. The section toward the front the chassis is C26, the series padding condenser.

ment

Turn the band switch clockwise to broadcast position and swing the variable condenser to the maximum capacity ition. Feed 455 kc to the grid-cap of the 12A8GT tube through a .01 mf condenser and adjust the four i-f trimmers maximum response.

With the band switch in broadcast position set the dial pointer at 200 meters. Feed 1500 kc through a .0001 mf denser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the tenna trimmer (on front section of variable condenser) for maximum response.

Turn the band switch counter-clockwise to the long-wave position. With the dial pointer set at 850 meters, feed kc through a .0001 mf condenser to the antenna and adjust first the oscillator trimmer (rear trimmer beneath the ssis), then the antenna trimmer (on antenna coil) for maximum response. Move the pointer to 1750 meters, feed kc, and adjust the series padder (front trimmer beneath the chassis), rocking the variable condenser back and forth ile adjusting for maximum response. Return to 350 kc and repeat alignment.

MODELS CULW261,CULW262
CULW265,CULW274
Chassis CULW
Schematic,Voltage,Parts
Alignment

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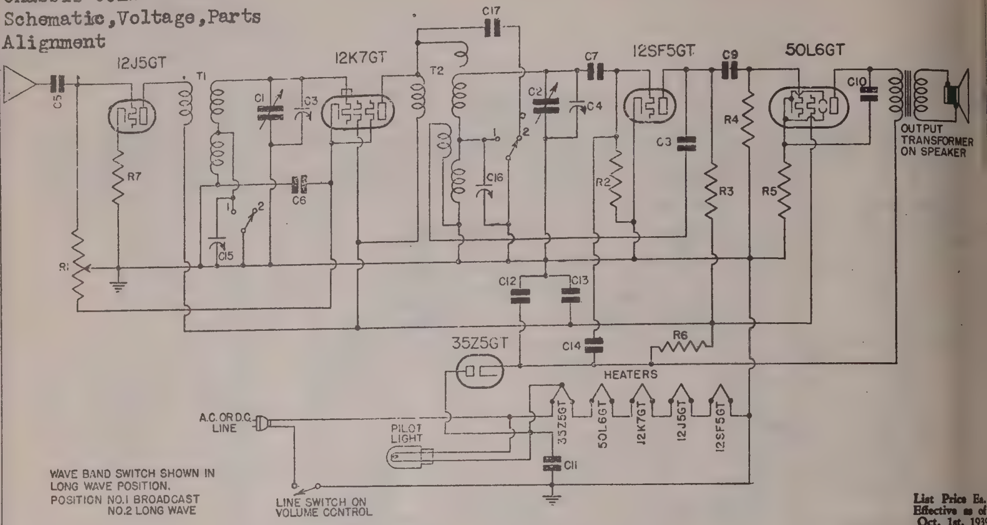


List Price Ea.
Effective as of
Oct. 1st, 1939
(Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRIC
T1	6UT-517	Two-band r-f coil	$ .6
T2	6UT-518	Two-band detector coil	1.1
R1	6UR-360	Volume control 75,000 ohms with 200 ohm bias stop and line switch	.8
R2	3RR-275	10 megohm ¼ watt carbon resistor	.1
R3, R4	KR-56	500,000 ohm ¼ watt carbon resistor	.1
R5	3FR-293	140 ohm ½ watt wire-wound resistor	.1
R6	6FR-348	2,400 ohm ½ watt carbon resistor	.1
R7	KR-50	500 ohm ¼ watt carbon resistor	.1
C1, C2	6UC-439	Two-gang variable condenser	2.3
†C3, C4		Trimmers, part of variable condenser.	
C5, C8	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.2
C6	BC-12	0.05 mf, 200 volt tubular condenser	.2
C7	KC-58	0.01 mf, 400 volt tubular condenser	.2
C9	LC-65	0.02 mf, 400 volt tubular condenser	.2
C10	5JC-417	0.035 mf, 400 volt tubular condenser	.2
C11	LC-64	0.05 mf, 400 volt tubular condenser	.2
C12, C13	6UC-447	Multiple 30 and 10 mf, 150 volt dry electrolytic condenser	.9
C14	6UC-440A	0.000002 mf mica condenser	.2
C15, C16	3AC-278	Trimmer	.1
C17	4VC-371A	0.0003 mf mica condenser	.2
	6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda No. 47	

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to groun (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lowe

Tube	*Plate*	*Screen*	*Cathode*	*Heater*
12J5GT, first r-f amplifier	85	—	2.3	12
12K7GT, second r-f amplifier	85	85	1.6	12
12SF5GT, grid leak detector	25	—	0	12
50L6GT, beam power output	110	85	6	50

Voltage at rectifier cathode—120 volts.

Power consumption .... 30 watts.

ALIGNMENT PROCEDURE

An oscillator with frequencies of 1500 kc and 350 kc is required.

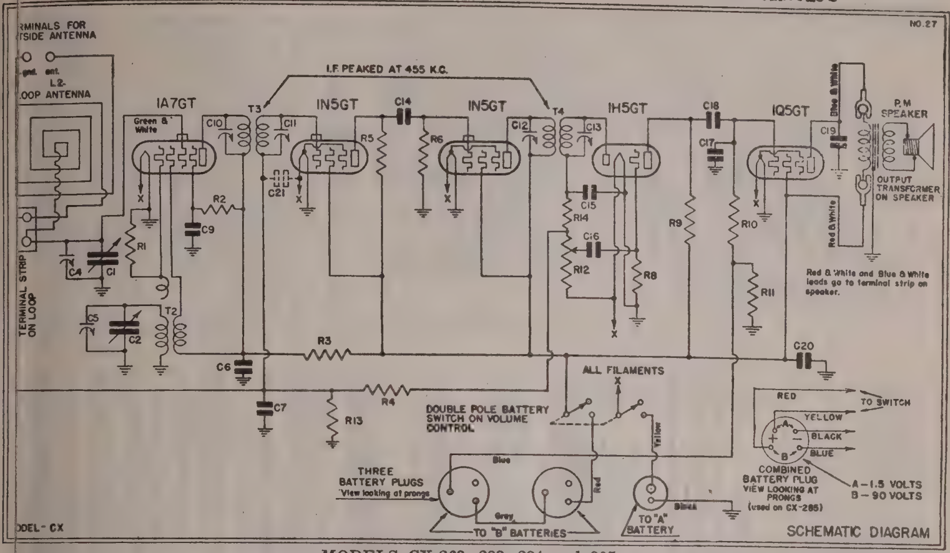
Use as weak a test signal as possible. An output meter should be used across the voice coil or output transforme for observing maximum response.

Rotate variable condenser to the maximum capacity position and set the pointer at the next calibration mark beyon 550. Rotate band-switch clockwise to broadcast (medium-wave) position. Then rotate the variable condenser until th pointer is at 200 meters, feed 1500 kc to the antenna through a .0001 mf mica condenser and adjust both trimmer condensers on the variable condenser for maximum response.

Turn wave-band switch counter-clockwise to long-wave position. Rotate variable condenser until pointer is at 85 meters and feed 350 kc to antenna. Adjust the two long-wave interstage coil trimmers for maximum output. The firs long-wave interstage coil trimmer is located on the speaker frame. The second (detector coil) long-wave trimmer i located beneath the chassis and is reached from the right end of the chassis.

EMERSON RADIO & PHONOGRAPH CORP.

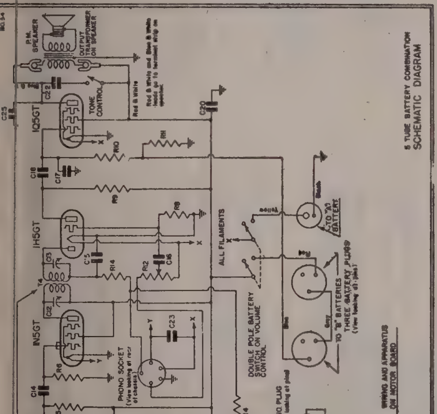
MODELS CX263,CX283,CX284
CX285,CX305,CX292
Chassis CX (3 Types)
Schematics



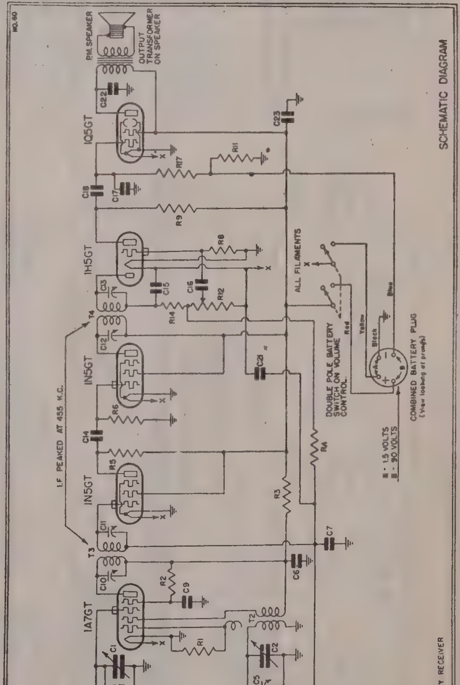
MODELS CX-263, 283, 284 and 305

Cuent drain .... "A" battery—0.3 amps.
"B" battery—0.10 amps. with no signal

Fruency range .. All Models except CX-285—540 to 1600 kc
Model CX-285—540 to 1730 kc


5 TUBE BATTERY COMBINATION SCHEMATIC DIAGRAM
P.M. SPEAKER
OUTPUT TRANSFORMER ON SPEAKER
TONE CONTROL
1Q5GT
1H5GT
1N5GT
1N5GT
1A7GT
ALL FILAMENTS
DOUBLE POLE BATTERY SWITCH ON VOLUME CONTROL
TO "A" BATTERY
TO "B" BATTERIES THREE BATTERY PLUGS (View looking at pins)
PHONO SOCKET
PHONO PLUG
WIRING AND APPARATUS ON MOTOR BOARD
CRYSTAL PICKUP
SPRING DRIVEN MOTOR
PHONO. RADIO SWITCH SHOWN IN RADIO POSITION
L2 LOOP ANTENNA
TERMINAL STRIP ON LOOP
TERMINALS FOR OUTSIDE ANTENNA

MODEL CX-292



MODEL CX-285

MODELS CX263,CX283,CX284
CX285,CX292,CX305
Voltage,Alignment,Parts
Batt.Data,Changes

EMERSON RADIO & PHONOGRAPH CORP.

GENERAL NOTES

1. Batteries: The Model CX is designed to house the complete set of batteries within the cabinet. The battery complement should be as follows:

Type Battery	No. Req.	Eveready Part No.	Rayovac Part No.	Burgess Part No.
FOR MODELS CX-263, CX-283, CX284, CX-292 AND CX-305				
1½ volt "A"	1	741 (plug-in type)	P-96A (plug-in type)	8F (plug-in type)
45 volt "B"	2	762 (plug-in type)	P-5303 (plug-in type)	B30-P1 (plug-in type)
FOR MODEL CX-285				
"A" and "B" Pack	1	748 (plug-in type)	AB82 (plug-in type)	17G-D60 (plug-in type)

2. The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

3. The color coding of the battery cable is as follows:

Red—B plus, 90 volts
Blue—B minus
Yellow—A plus, 1.5 volts
Black—A minus

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT oscillator-modulator	82	52	82	1.5
1N5GT 1st i-f amplifier	70	82	—	1.5
1N5GT 2nd i-f amplifier	82	82	—	1.5
1H5GT 2nd detector, a.v.c., a-f amplifier	25	—	—	1.5
1Q5GT beam power output	77	82	—	1.5

Bias for the 1Q5GT tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.0 volts.

*Item	Part No.	DESCRIPTION
T1, L1	4XT-432B	Antenna coil with 455 kc adjustable wave trap (for CX-285 only)
L2	7BW-179A	Loop antenna assembly (for CX-292)
L2	6XW-175	Loop antenna assembly (for CX-283)
L2	6XW-174	Loop antenna assembly (for CX-263, 284 and 305)
T2	6RT-476	Oscillator coil
T3	6JT-466DU	Double-tuned 455 kc first i-f transformer
T4	6XT-514	Double-tuned 455 kc diode i-f transformer
R1, R14	KR-53	50,000 ohm ¼ watt carbon resistor
R2	ZZR-196	30,000 ohm ¼ watt carbon resistor
R3	KR-50	500 ohm ¼ watt carbon resistor
R6	KR-54	100,000 ohm ¼ watt carbon resistor
R4, R8, R10, R13, R17	HR-42	2 megohm ¼ watt carbon resistor. (See production change No. 3)
R5	OR-73	25,000 ohm ¼ watt carbon resistor
R9	KR-56	0.5 megohm ¼ watt carbon resistor
R11	6ER-358	680 ohm ½ watt wire-wound resistor
R12	3HR-240C	Volume control—500,000 ohms with double pole battery switch
C1, C2	6RC-436A	Two-gang variable condenser (for CX-263, 284, 285 and 305)
C1, C2	6RC-436B	Two-gang variable condenser (for CX-283 and 292)
†C4, C5		Trimmers, part of variable condenser. (See production change No. 2.)
C6, C7, C21	BC-12	0.05 mf, 200 volt tubular condenser
C9, C18	LC-65	0.02 mf, 400 volt tubular condenser
†C10, C11, C12, C13		Trimmers, part of i-f transformer.
C14	5AC-384	0.0002 mf, 600 volt tubular or mica condenser
C15, C17	4XC-394A	0.00022 mf mica condenser
C16	KC-58	0.01 mf, 400 volt tubular condenser
C19	NNC-199	0.001 mf, 600 volt tubular condenser (for CX-283, 292 and 305) (See production change No. 1)
C20	6EC-432	8 mf, 100 volt dry electrolytic condenser
	6XS-402	4" permanent magnet dynamic speaker (for CX-283)
	6ES-367A	5" permanent magnet dynamic speaker (for CX-263)
	6XS-424	6½" permanent magnet dynamic speaker (for CX-263, 284, 285, 292 and 305)
	6XD-87	Dial face (not used on CX-285)
	6XD-94	Dial face (for CX-285 only)
	6ED-69A	Indicator dial
	6RF-52	Dial pointer
	6XE-26	Dial crystal (for CX-285 and 305)
	6XE-26A	Dial crystal (for CX-263, 283, 284 and 292)
	6RW-162	Drive cord spring
	4YZ-772	Dial drive cord
	6EW-148	Battery cable (for CX-285)
	6EW-135A	Battery cable (for CX-283, 284, 263, 292 and 305)
	6JH-24D	Dial drive shaft

PRODUCTION CHANGES

1. On CX-263, 284 and 285 condenser C19 is part no. 3VC-324 0.003 mf, 600 volt tubular condenser
2. On CX-263, 284 and 305 trimmer C4 is mounted on the loop antenna frame.
3. Chassis bearing serial numbers below 2,921,400 use .5 megohm at R10.

ADDITIONAL PARTS USED ON CX-292

R15	KR-55	0.25 megohm ¼ watt resistor
R16	HR-42	2 megohm ¼ watt carbon resistor
C22	HC-34	0.006 mf, 600 volt tubular condenser
C23	BC-12	0.05 mf, 200 volt tubular condenser
C24	6XC-458A	0.00014 mf mica condenser
C25	3VC-324	0.003 mf, 600 volt tubular condenser
	3GM-251	Phonograph needle cup
	6XPM-48	Spring-driven phonograph motor
	4XS-432	Phono-radio switch
	3GS-202B	Tone control switch

* Item number locates the article on the schematic diagram.

† Not supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maxium response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable condenser.

On Model CX-285 the antenna coil is located between the two i-f transformers. On all other CX Models the loop antenna acts as the antenna coil. The trimmer for the loop C4 is on the loop frame for Models CX-263, 284 and 305. On Models CX-283, 285 and 292, C4 is on the front section of the variable condenser.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the extreme left end of the chassis. The diode i-f transformer is just to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

I-f Alignment

Swing variable condenser to minimum capacity position. Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer for maximum response.

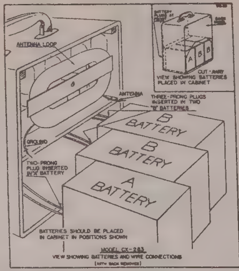
If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

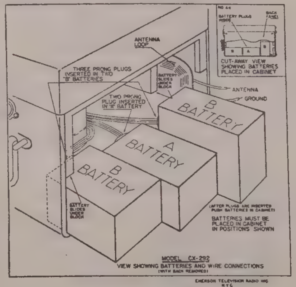
Battery Installation for Models CX-263, CX-283, CX-284, CX-292 and CX-305

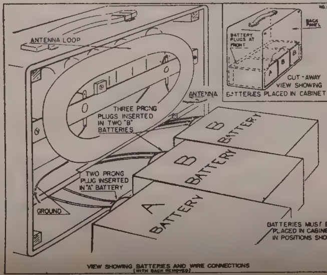
The portable cabinets contain a shelf under the receiver for housing the batteries. To install and connect the batteries observe the following procedure:

1. Remove the back panel of the cabinet by taking out the wood screws.
2. Locate the battery cable on the bottom shelf of the cabinet.
3. With the batteries out of the cabinet insert the three-prong plug on the battery cable into the two "B" batteries and the small two prong plug into the "A" battery.
4. Place the batteries in the cabinet as indicated in the illustration Note that the plug end of the battery is up against the front panel of the cabinet.
5. Replace the back panel of the cabinet and fasten it in place with the wood screws.

Battery Installation for Model CX-285: The cabinet for this model is designed to house completely the combined "A" and "B" pack. Place the battery pack in the cabinet at the rear of the receiver and insert the four-prong plug of the battery cable into the socket on the top of the battery.


ANTENNA LOOP
BATTERY PLUGS AT FRONT
BACK PANEL
A
B
B
CUT-AWAY VIEW SHOWING BATTERIES PLACED IN CABINET
ANTENNA
THREE-PRONG PLUGS INSERTED IN TWO "B" BATTERIES
B BATTERY
B BATTERY
A BATTERY
GROUND
TWO-PRONG PLUG INSERTED IN "A" BATTERY
BATTERIES SHOULD BE PLACED IN CABINET IN POSITIONS SHOWN
MODEL CX-283
VIEW SHOWING BATTERIES AND WIRE CONNECTIONS
(WITH BACK REMOVED)

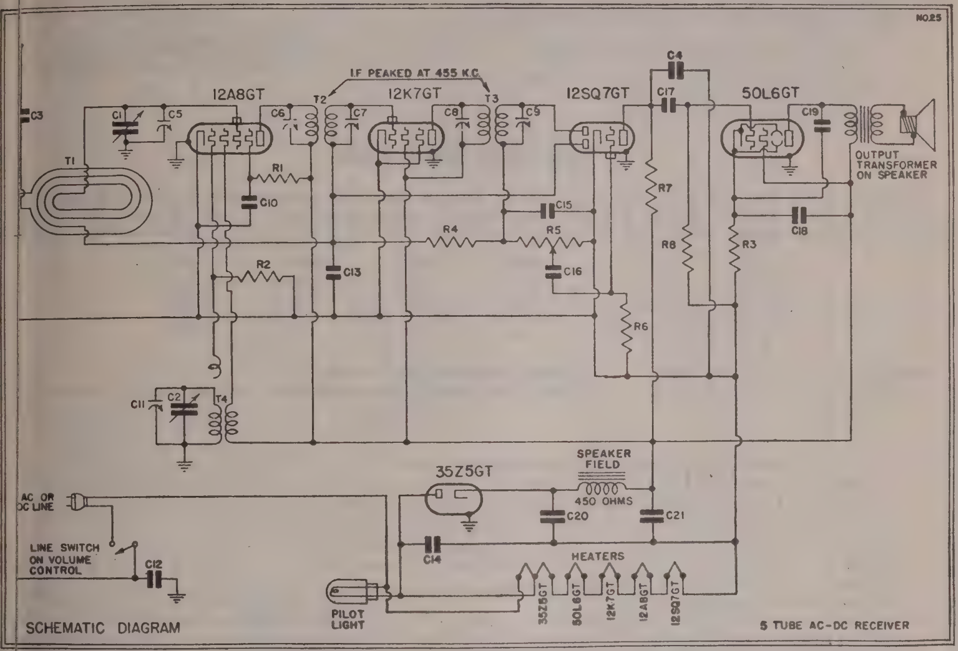

NO 44
BATTERY PLUGS INSIDE
BACK PANEL
CUT-AWAY VIEW SHOWING BATTERIES PLACED IN CABINET
ANTENNA LOOP
THREE PRONG PLUGS INSERTED IN TWO "B" BATTERIES
BATTERY SLIDES UNDER BLOCK
ANTENNA
GROUND
TWO PRONG PLUG INSERTED IN "A" BATTERY
B BATTERY
A BATTERY
B BATTERY
BATTERY SLIDES UNDER BLOCK
(AFTER PLUGS ARE INSERTED PUSH BATTERIES IN CABINET)
BATTERIES MUST BE PLACED IN CABINET IN POSITIONS SHOWN
MODEL CX-292
VIEW SHOWING BATTERIES AND WIRE CONNECTIONS
(WITH BACK REMOVED)
EMERSON TELEVISION RADIO INC N.Y.C.


ANTENNA LOOP
BACK PANEL
BATTERY PLUGS AT FRONT
B
B
A
CUT-AWAY VIEW SHOWING BATTERIES PLACED IN CABINET
ANTENNA
THREE PRONG PLUGS INSERTED IN TWO "B" BATTERIES
B BATTERY
B BATTERY
TWO PRONG PLUG INSERTED IN "A" BATTERY
GROUND
A BATTERY
BATTERIES MUST BE PLACED IN CABINET IN POSITIONS SHOWN
VIEW SHOWING BATTERIES AND WIRE CONNECTIONS
(WITH BACK REMOVED)

MODELS CX-263, 284 and 305

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CV264,CV280,CV295
CV298,CV313,CV314,CV316
Chassis CV (2 Types)
Schematics

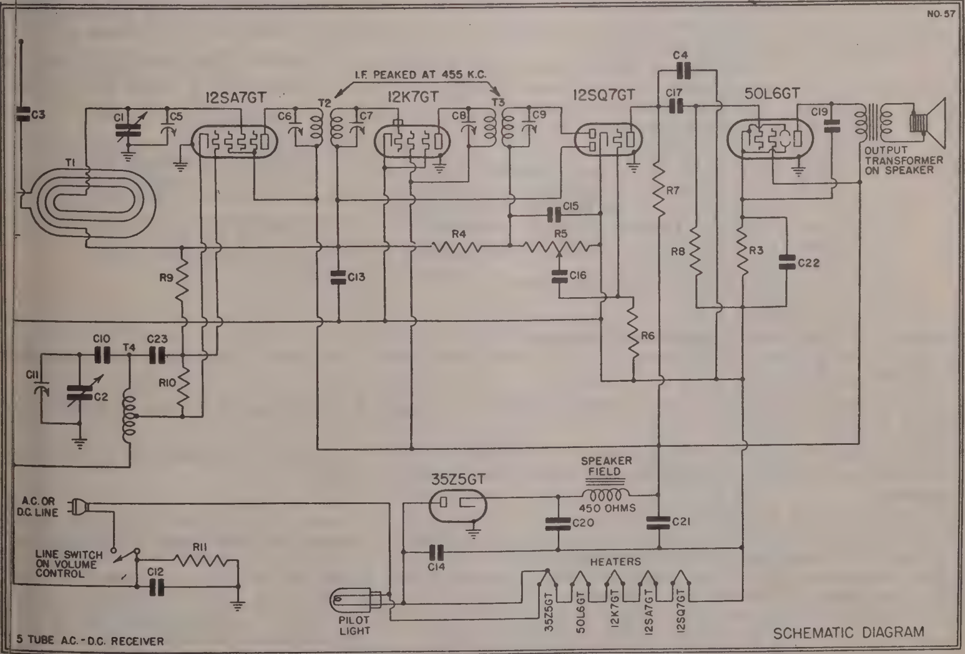


SCHEMATIC FOR CHASSIS USING 12A8GT TUBE

tag rating ....105-125 volts, a.c. or d.c.
er consumption ....30 watts.

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red



SCHEMATIC FOR CHASSIS USING 12SA7GT TUBE

MODELS CV264,CV280,CV295
CV298,CV313,CV314,CV316
Chassis CV
Voltage,Parts,Changes
Alignment,Trimmers

EMERSON RADIO & PHONOGRAPH CORP.

TUBE DATA

THE TUBE COMPLEMENT IS AS FOLLOWS:

One 12SA7GT—pentagrid oscillator modulator
One 12K7GT—first i-f amplifier
One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
One 50L6GT—beam power output
One 35Z5GT—half-wave rectifier

(NOTE: Chassis bearing serial numbers below 2920685 use 12A8GT instead of 12SA7GT)

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switcl with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readin except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those giv below.

Tube	*Plate*	*Screen*	*Cathode*	*Fil.*
†12SA7GT	88	88	0	12
12K7GT	88	88	0	12
12SQ7GT	40	—	0	12
50L6GT	82	88	5.7	50

Voltage at 35Z5 cathode—115 volts.

Voltage across speaker field—27 volts.

Voltage across pilot light—4.5 volts.

†Chassis using 12A8GT measures 88 volts at oscillator plate and 45 volts at screen

*Item	Part No.	
T1	6VW-172A	Loop antenna assembly (see production change no. 4b)
T4	7BT-486A	Oscillator coil (see production change no. 2)
T2	7BT-488C	Double-tuned 455 kc first i-f transformer (see production change no. 3a)
T3	7FT-513D	Double-tuned 455 kc second i-f transformer (see production change no. 3b)
R1	2CR-193	30,000 ohm ½ watt carbon resistor (see production change no. 1a)
R2	KR-53	50,000 ohm ¼ watt carbon resistor (see production change no. 1a)
R3	3FR-293	140 ohm ½ watt wire-wound resistor
R4	NNR-220	3 megohm ¼ watt carbon resistor.
R5	6VR-364	Volume control .25 megohm with line switch
R6	4XR-327	15 megohm ¼ watt carbon resistor.
R7, R8	KR-56	500,000 ohm ¼ watt carbon resistor.
R10	LR-60	20,000 ohm ¼ watt carbon resistor (see production change no. 1b)
R11	LR-61	200,000 ohm ¼ watt carbon resistor (see production change no. 1b)
C1, C2	6RC-436	Two-gang variable condenser
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser
C4, C15, C23	4XC-394A	0.00022 mf mica condenser
†C5, C11		Trimmers, part of variable condenser.
†C6, C7, C8, C9		Trimmers, part of i-f transformers.
C10, C13	BC-12	0.05 mf, 200 volt tubular condenser
C12	3CC-302	0.15 mf, 200 volt tubular condenser
C14	LC-64	0.05 mf, 400 volt tubular condenser
C17	6JC-425	0.024 mf, 400 volt tubular condenser.
C18	6VC-446	20 mf, 150 watt dry electrolytic condenser (see change no. 1a)
C19	LC-65	0.02 mf, 400 volt tubular condenser (see change no. 3c)
C20, C21	6JC-426B	Dual 20 mf, 150 volt dry electrolytic condenser
C22	6ZC-460	20 mf, 25 volt dry electrolytic condenser (see change no. 1b)
	6JS-368U	4″ dynamic speaker

*Item number locates the article on the schematic diagram.

†Not supplied separately.

DIAL PARTS

6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda		
6VD-82A	Dial face (see production change no. 4a		
4YZ-772	Drive cord	6JH-24B	Drive
6RW-162	Drive cord spring	6RF-52	Dial p
		6RE-20	Dial c

PRODUCTION CHANGES

1. (a) Used only in chassis using 12A8G
   (b) Used only in chassis using 12SA7
2. (a) Chassis bearing serial numbers belo 2764502 use oscillator coil 6RT-476
   (b) Chassis bearing serial numbers bet 2764502 and 2920685 use oscillato 7CT-511
3. Chassis bearing serial numbers below 29206
   (a) First i-f transformer 6RT-479A.
   (b) Second i-f transformer 7BT-489A.
   (c) Condenser C19—.03 mf—400 volt.
4. Chassis bearing serial numbers below 2764
   (a) Dial face 6VD-82.
   (b) Loop antenna 6VW-172.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the speaker. The trimmers are accessible throug holes in the top of the can.

The second i-f transformer is mounted on top of the chassis to the right of the speaker. The trimmers are accessible throug holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section for the antenna coil (loop). The oscillator coil is located directly beneath the speaker.

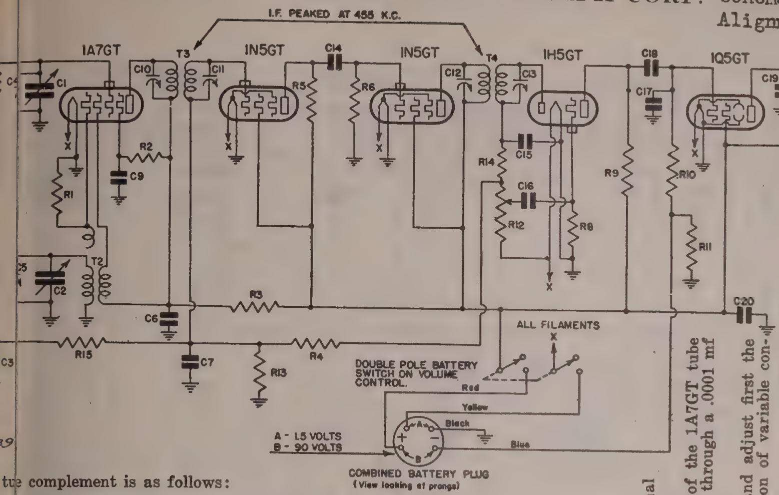
Alignment

I.F.—Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .0 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping th input lead to the stator loop of the antenna (front) section.

R.F.—Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold thi radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. If the loop antenna has been replaced it may be necessary to retrack the loop inductance. With the dial set at 60 feed 600 kc to the antenna lead. A portion of the outside may be swung to eitner side of the center to give maximum response. Repeat the trimmer alignment at 140.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL DH264,Chassis DH
Schematic,Voltage,Parts
Alignment,Trimmers



tube complement is as follows:

1—1A7GT oscillator-modulator.
1—1N5GT 1st i-f amplifier.
1—1N5GT 2nd i-f amplifier.
1—1H5GT 2nd detector, a.v.c., a-f amplifier.
1—1Q5GT beam power output.

n	Part No.	DESCRIPTION
	4XT-432A	Antenna coil with 455 kc adjustable wave-trap
	6RT-476	Oscillator coil
	6RT-479B	Double-tuned 455 kc first i-f transformer
	4XT-435D	Double-tuned 455 kc diode i-f transformer
, 14	KR-53	50,000 ohm ¼ watt carbon resistor
	ZZR-196	30,000 ohm ¼ watt carbon resistor
, 15	KR-54	100,000 ohm ¼ watt carbon resistor
	KR-50	500 ohm ¼ watt carbon resistor
, 3, R13	HR-42	2 megohm ¼ watt carbon resistor
	LR-65	10,000 ohm ¼ watt carbon resistor
, 10	KR-56	0.5 megohm ¼ watt carbon resistor
1	6ER-358	680 ohm ½ watt wire-wound resistor
2	7HR-373	Volume control—500,000 ohms with double pole battery switch
, 2	6RC-436	Two-gang variable condenser
	AC-6	0.1 mf, 200 volt tubular condenser
, 5		Trimmers, part of variable condenser.
7	BC-12	0.05 mf, 200 volt tubular condenser
, 18	LC-65	0.02 mf, 400 volt tubular condenser
,C11, C12, C13		Trimmers, part of i-f transformer.
4	5AC-384	0.0002 mf, 600 volt tubular or mica condenser
5,C17	4XC-394A	0.00022 mf mica condenser
6,C19	KC-58	0.01 mf, 400 volt tubular condenser
)	6EC-432	8 mf, 100 volt dry electrolytic condenser

Current drain "A" battery—0.3 amps.
"B" battery—0.010 amps. with no signal
Frequency range 530 to 1730 kc

Alignment

I.F.-Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 1A7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response.

RF-Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil to the left of the speaker. The trimmer for the 455 kc wave-trap is mounted on the coi' and is accessible from the left side of the chassis. The oscillator coil is located underneath the chassis, beneath the antenna coil.

VOLTAGE ANALYSIS

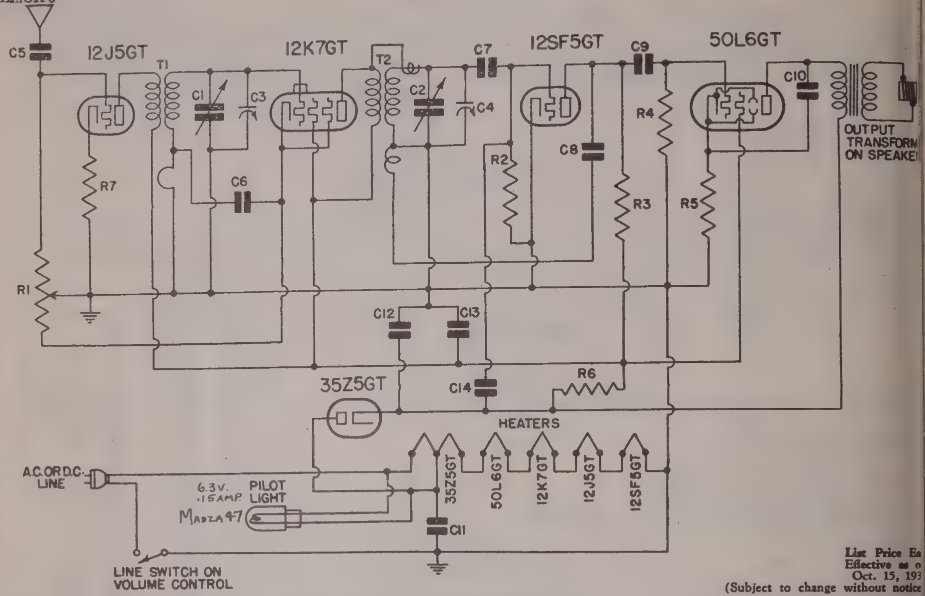
adings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	*Plate*	*Screen*	*Osc. Plate*	*Fil.*
1A7GT	82	52	82	1.5
1N5GT 1st i-f	48	82	—	1.5
1N5GT 2nd i-f	82	82	—	1.5
1H5GT	25	—	—	1.5
1Q5GT	77	82	—	1.5

as for the 1Q5GT tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.0 volts.

MODEL CU265
Chassis CU
Schematic,Voltage,Parts
Alignment

EMERSON RADIO & PHONOGRAPH CORP.



List Price Ea
Effective as o
Oct. 15, 193
(Subject to change without notice

*Item	Part No.	DESCRIPTION	PRICI
T1	6UT-478	Broadcast r-f coil	$ .4
T2	6FT-462B	Broadcast detector coil	.5
R1	6UR-360	Volume control 75,000 ohms with 200 ohm bias stop and line switch	.8
R2	3RR-275	10 megohm ¼ watt carbon resistor	.1
R3, R4	KR-56	500,000 ohm ¼ watt carbon resistor	.1
R5	3FR-293	140 ohm ½ watt wire-wound resistor	.1
R6	6FR-348	2,400 ohm ½ watt carbon resistor	.1
R7	PR-79	1000 ohm ¼ watt carbon resistor	.1
C1, C2	6UC-439	Two-gang variable condenser	2.3
C3, C4		Trimmers, part of variable condenser.	
C5, C8	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.2
C6	BC-12	0.05 mf, 200 volt tubular condenser	.2
C7	KC-58	0.01 mf, 400 volt tubular condenser	.2
C9	LC-65	0.02 mf, 400 volt tubular condenser	.2
C10	5JC-417	0.035 mf, 400 volt tubular condenser	.2
C11	LC-64	0.05 mf, 400 volt tubular condenser	.2
C12, C13	6UC-447	Multiple 30 and 10 mf, 150 volt dry electrolytic condenser	.9
C14	6UC-440A	0.000002 mf mica condenser	.2

The tube complement is as follows:

- 1—12J5GT, first r-f amplifier
- 1—12K7GT, second r-f amplifier
- 1—12SF5GT, grid leak detector
- 1—50L6GT, beam power output
- 1—35Z5GT, single half-wave rectifier

Voltage rating	105 to 125 volts, a.c. or d.c
Power consumption	30 watts.
Frequency range	540 to 1730 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to gro (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cy a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lo

Tube	*Plate*	*Screen*	*Cathode*	*Heater*
12J5GT	85	—	2.8	12
12K7GT	85	85	1.6	12
12SF5GT	25	—	0	12
50L6GT	110	85	6	50

Voltage at rectifier cathode—120 volts.

ALIGNMENT PROCEDURE

Use as weak a test signal as possible. An output meter should be connected across the voice coil or output tra- former for observing maximum output.

With the pointer set at 150 feed 1500 kc to the antenna lead through a .0001 mf condenser, and adjust the tr- mers, located on the variable condenser, for maximum response.

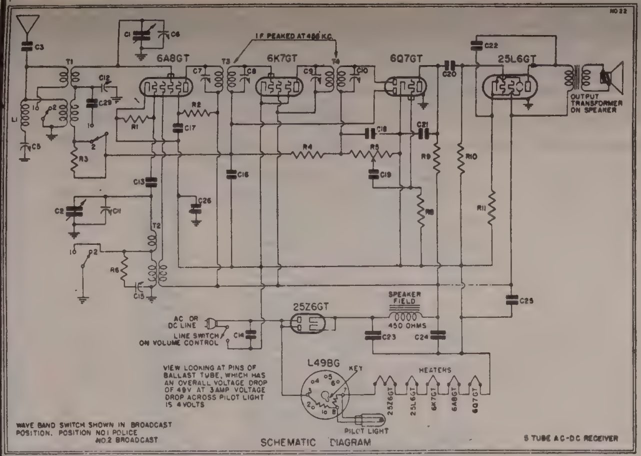
EMERSON RADIO & PHONOGRAPH CORP.

MODELS CG268,CG270,CG272
CG276,CG318 Chassis CG
CY269,CY271,CY273,CY286
CY288,CY319 Chassis CY
Schematics,Voltage

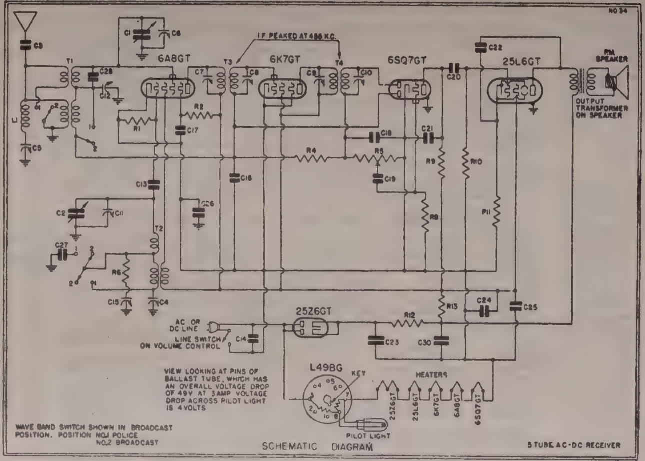
Voltage rating ..... 105 to 125 volts, a.c. or d.c.
Power consumption . 43 watts.
Frequency ranges . . 540 to 1700 kc and 2300 to 6600 kc. (Model CG)
540 to 1700 kc and 2250 to 7500 kc. (Model CY)

octal-base tubes in this receiver may be replaced with either metal or bantam-type octal-base glass tubes. The letters
"GT" at the end of the tube number indicates that the tube
same as the metal tube bearing the same number without the "GT."

- 1—6A8GT pentagrid oscillator-modulator.
- 1—6K7GT first i-f amplifier.
- †1—6SQ7GT diode detector, a-f amplifier, a.v.c. (*see note*).
- 1—25L6GT beam power output.
- 1—25Z6GT dual half-wave rectifier.


NO 22
I.F. PEAKED AT 456 K.C.
6A8GT
6K7GT
6Q7GT
25L6GT
25Z6GT
OUTPUT TRANSFORMER ON SPEAKER
SPEAKER FIELD
450 OHMS
AC OR DC LINE
LINE SWITCH ON VOLUME CONTROL
VIEW LOOKING AT PINS OF BALLAST TUBE, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V AT .3AMP VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS
L49BG
KEY
HEATERS
PILOT LIGHT
WAVE BAND SWITCH SHOWN IN BROADCAST POSITION. POSITION NO.1 POLICE NO.2 BROADCAST
SCHEMATIC DIAGRAM
5 TUBE A.C-D.C RECEIVER

SCHEMATIC DIAGRAM No. 22 FOR MODEL CG


NO 34
I.F. PEAKED AT 456 K.C.
6A8GT
6K7GT
6SQ7GT
25L6GT
25Z6GT
PM SPEAKER
OUTPUT TRANSFORMER ON SPEAKER
AC OR DC LINE
LINE SWITCH ON VOLUME CONTROL
VIEW LOOKING AT PINS OF BALLAST TUBE, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V AT .3AMP VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS
L49BG
KEY
HEATERS
PILOT LIGHT
WAVE BAND SWITCH SHOWN IN BROADCAST POSITION. POSITION NO.1 POLICE NO.2 BROADCAST
SCHEMATIC DIAGRAM
5 TUBE A.C-D.C RECEIVER

SCHEMATIC DIAGRAM No. 34 FOR MODELS CY-286 AND 288

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8GT	95	45	0	95	6.3
6K7GT	95	95	0	—	6.3
†6SQ7GT	38	—	0	—	6.3
*25L6GT	90	95	6.5	—	25.0

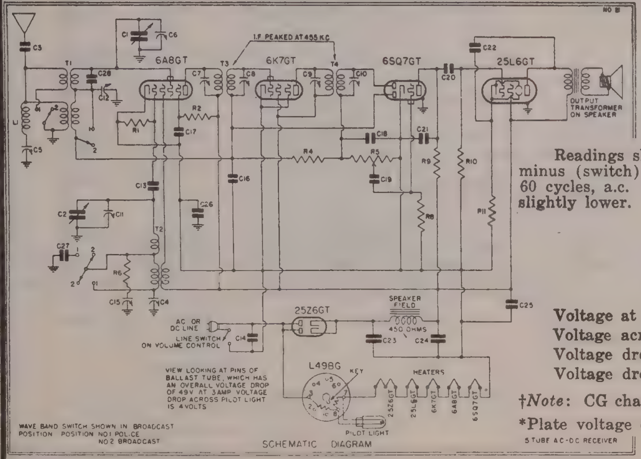
Voltage at 25Z6 cathode—125 volts.
Voltage across speaker field—28 volts.
Voltage drop across ballast resistor (pins nos. 3, 7)—49 volts.
Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

†*Note*: CG chassis bearing serial numbers below 2,616,849 use 6Q7GT.

*Plate voltage of 25L6 tube in CY-286 and 288 measures 112 volts.

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red


NO 21
I.F. PEAKED AT 455 K.C.
6A8GT
6K7GT
6SQ7GT
25L6GT
25Z6GT
OUTPUT TRANSFORMER ON SPEAKER
SPEAKER FIELD
450 OHMS
AC OR DC LINE
LINE SWITCH ON VOLUME CONTROL
VIEW LOOKING AT PINS OF BALLAST TUBE, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V AT .3AMP VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS
L49BG
KEY
HEATERS
PILOT LIGHT
WAVE BAND SWITCH SHOWN IN BROADCAST POSITION. POSITION NO.1 POLICE NO.2 BROADCAST
SCHEMATIC DIAGRAM
5 TUBE A.C-D.C RECEIVER

SCHEMATIC DIAGRAM No. 21 FOR MODELS CY-269, 271 AND 273 AND 319

6/39

CHASSIS CG and CY
Alignment, Trimmers
Parts, Tuner Data
CHASSIS CQ and CS
Tuner Data

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS LIST

List Price ea.
Effective as of
June 1st, 1939
(Subject to change without notice)

* Item	Part No.	DESCRIPTION	PRICE
T1, L1	6GT-468	Two-band antenna coil with 455 kc wave-trap (CG only)	$1.10
T1, L1	6YT-483	Two-band antenna coil with 455 kc wave-trap (CY only)	1.10
T2	6GT-469	Two-band oscilator coil (CG only)	.55
T2	6YT-484	Two-band oscillator coil (CY only)	.55
T3	4XT-434DU	455 kc first i-f transformer	1.00
T4	4XT-435U	455 kc second i-f transformer	.80
R1, R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3, R6	PR-79	1000 ohm ¼ watt carbon resistor	.16
R4	NNR-220	3 megohm ¼ watt carbon resistor	.16
R5	6SR-362	Volume control with line switch—500,000 ohms	.90
R8	4XR-327	15 megohm ¼ watt carbon resistor	.16
R9, R10	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R11	3FR-293	140 ohm ½ watt wire-wound resistor	.16
——	L-49BG	Plug-in type ballast resistor. Interchangeable with L-49B	.55
C1, C2	6GC-428	Two-gang variable condenser (CG only)	2.35
C1, C2	6YM-518	Two-gang variable condenser (complete with 4 gang push-button assembly) (for CY only)	5.45
C3	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C4	2NC-231A	Single adjustable padding condenser (CY only)	.30
†C5	——	Trimmer, part of wave-trap assembly.	
†C6, C11	——	Trimmers, part of variable condenser.	
†C7, C8	——	Trimmers, part of first i-f transformer assembly.	
†C9, C10	——	Trimmers, part of second i-f transformer assembly.	
C12, C15	6GC-430	Dual trimmer assembly	.35
C13	IIC-133A	0.000025 mf mica condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C16, C17, C25	BC-12	0.05 mf, 200 volt tubular condenser	.20
C18, C21	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C19	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C20	LC-65	0.02 mf, 400 volt tubular condenser	.20
C22	3XC-331	0.015 mf, 400 volt tubular condenser	.20
C23, C24	6JC-426U or 6JC-426AU	20 mf, 150 volt dry electrolytic condenser	.90
C26	3CC-302	0.15 mf, 200 volt tubular condenser	.20
C27	6YC-448	0.00083 mf mica condenser	.20
C28	IC-51A	0.00001 mf mica condenser	.20
C29	6GC-429	0.00064 mf mica condenser	.20
	6GS-375	Wave-band switch (CG only)	.60
	6GS-375A	Wave-band switch (CY only)	.60
	6GS-379	5″ dynamic speaker (not used on CY-286 or CY-288)	4.20
	6GD-72	Dial face (CG only)	.45
	6YD-83	Dial face (CY only)	.40
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	4XZ-811C	Dial drive shaft (CG only)	.05
	6QH-31	Dial drive shaft (CY only)	.05
	4MZ-588A	Dial pointer	.20
	5JZ-824	Drive cord spring (CG only)	.05
	6QW-169	Drive cord spring (CY only)	.02
	4YZ-772	Drive cord (CG only)	.02
	6QZ-863	Drive cord (CY only)	.04
	5FZ-758A	Dial crystal (for CG-268 and CY-269)	.25
	6GE-22A	Dial crystal (not used on CG-268 and CY-269)	.25
	6QF-50	Molded push-buttons (CY only)	.10
	6WP-135	Station name tabs (complete set) (CY only)	.25
R12	4ZR-325	175 ohm 1 watt metallized resistor	.16
R13	6YR-369	1000 ohm 1 watt carbon resistor	.16
C30	6YC-450	40 mf, 135 volt dry electrolytic condenser	.80
	6YS-418	8″ permanent magnet dynamic speaker	7.30
	5LW-125	Speaker cable	.25

If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.

The filament dropping resistor (L-49B on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.

When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.

The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.

The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1500 kc and 6000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the oscillator.

The 455 kc wave-trap is part of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for *minimum* response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead.

MODEL CG: Adjust first the oscillator trimmer (on front section of the variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

MODEL CY: Adjust first the oscillator trimmer (on left-hand section of variable condenser) then the antenna trimmer (on right-hand section of variable condenser) for maximum response.

Broadcast Alignment

MODEL CG: Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 150 and feed 1500 kc through a standard dummy antenna to the antenna lead. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of dual assembly) for maximum response.

MODEL CY: Follow identical procedure as outlined above for CG. Then feed 600 kc and adjust the variable padding condenser (reached through hole in rear wall) while rocking the variable condenser for maximum response. Return to 1500 and retrim if necessary.

PREADJUSTMENT OF AUTOMATIC TUNING KEYS

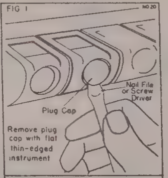
Select four nearby stations desired for automatic tuning. Choose one of these stations and any button to be adjusted for it. Follow the procedure outlined below:

1. Remove the small plug cap in the front of the tuning key by prying at its lower edge with a flat thin-edged tool such as a nail file or screw-driver. *See Fig. 1 at right.*
2. Insert a screw-driver into the hole in the tuning key. The locking screw is accessible through the tuning key hole. Seat the screw-driver in the slot of the locking screw and push in the screw-driver as far as it will go. Loosen the screw about 1 to 1½ turns. *See Fig. 2.*

   It is important to use a screw-driver in which the flat portion is not wider than $\frac{3}{16}$*". A larger screw-driver cannot be inserted.*
3. With the screw-driver seated in the screw slot, press the screw in as far as possible and holding it in firmly with one hand, tune in the desired station with the other hand, using the selector knob. *See Fig. 3.*
4. Release the selector knob and tighten screw firmly.
5. Check the adjustment by turning well past the station, using the selector knob, and then pushing down the key. The station should come back in again clearly and with maximum volume.

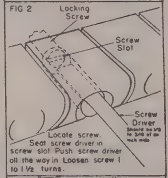
   After the adjustment is tested, check to see that the locking screw is tightened firmly.
6. Replace the plug cap in the front of the key. Remove the tab bearing the station call letters from one of the cards supplied in a separate envelope with the receiver. Moisten the tab and place it on the top of the tuning key as indicated in Fig. 4.

FIG 1



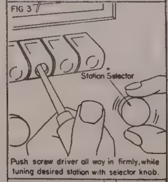
Remove plug cap with flat thin-edged instrument

FIG 2



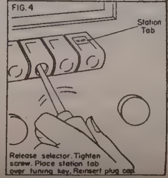
Locate screw. Seat screw driver in screw slot Push screw driver all the way in Loosen screw 1 to 1½ turns.

FIG 3



Push screw driver all way in firmly, while tuning desired station with selector knob.

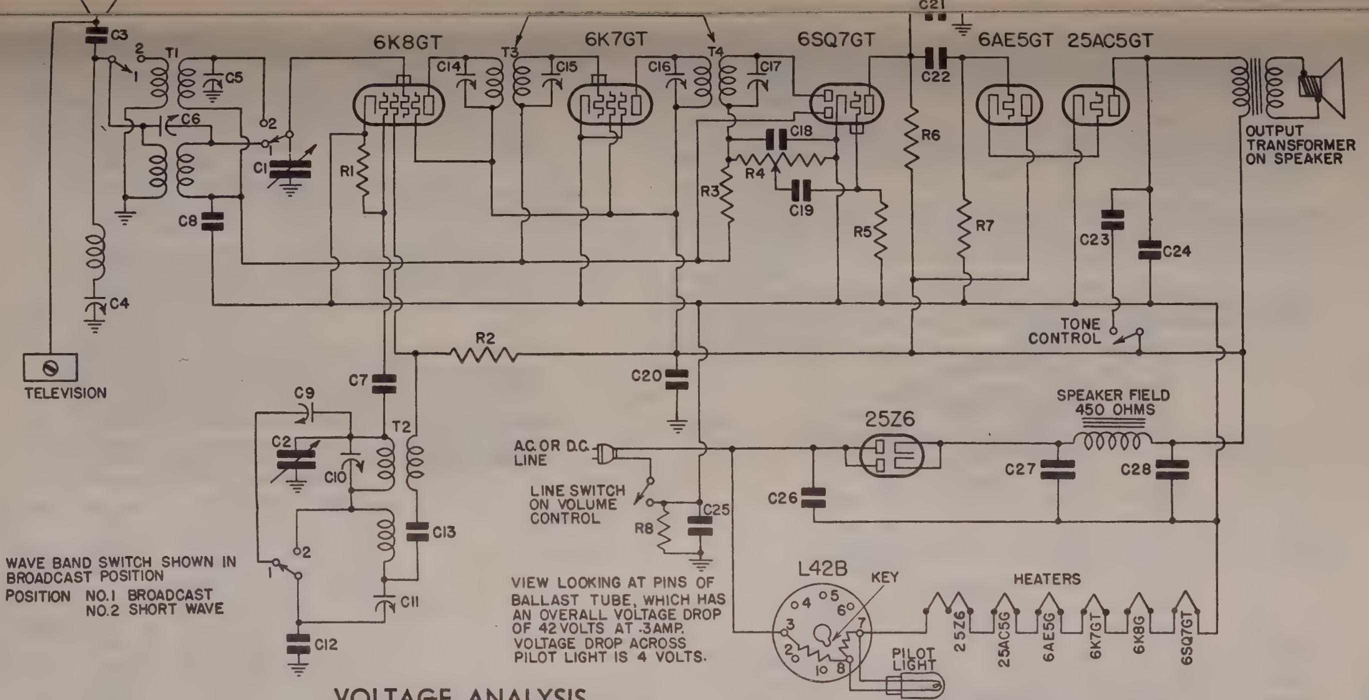
FIG. 4



Release selector. Tighten screw. Place station tab over tuning key. Reinsert plug cap

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CQ269,CQ271,CQ273
CS268,CS270,CS272,CS276
Chassis CQ, CS
Schematic,Voltage



WAVE BAND SWITCH SHOWN IN
BROADCAST POSITION
POSITION NO.1 BROADCAST
NO.2 SHORT WAVE

VIEW LOOKING AT PINS OF BALLAST TUBE, WHICH HAS AN OVERALL VOLTAGE DROP OF 42 VOLTS AT .3AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS.

Pilot light, 6.3 volt, .25 amp., Mazda No. 44

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6K8GT	95	95	0	70	6.3
6K7GT	95	95	0	—	6.3
6SQ7GT	30	—	0	—	6.3
6AE5GT	95	—	14	—	6.3
25AC5GT	90	—	0	—	25.0

Voltage at 25Z6—128 volts.

Voltage across speaker field—33 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

Voltage rating	105 to 125 volts, a.c. or d.c.
Power consumption	43 watts.
Frequency ranges	540 to 1730 kc and 5.6 to 18 m

Tube Data

1—6K8GT pentagrid oscillator-modulator.
1—6K7GT first i-f amplifier.
1—6SQ7GT diode detector, a-f amplifier, a.v.c.
1—6AE5GT audio amplifier.
1—25AC5GT dynamic coupled output.
1—25Z6GT dual half-wave rectifier.

Oct. 15, 1939

CHASSIS CQ,CS
Alignment,Trimmers
Parts
CHASSIS DA
Alignment,Socket,Trimmers

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CQ269, CQ 271, CQ 273
MODELS CS268, CS 270, CS 272 & CS 276

List Price Ea. Effective as of June 1st, 1939 (Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
T1	6QT-474 or 4RT-418	Two-band antenna coil with 455 kc wave-trap	$1.85
T2	6QT-475 or 6QT-481	Two-band oscillator coil	1.10
T3	6QT-480	455 kc first i-f transformer	1.80
T4	4XT-435D	455 kc second i-f transformer	.80
R1	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R2	LR-65	10,000 ohm ¼ watt carbon resistor	.16
R3	NNR-220	3 megohm ¼ watt carbon resistor	.16
R4	6SR-362	Volume control with line switch—500,000 ohms	.90
R5	4XR-327	15 megohm ¼ watt carbon resistor	.16
R6	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R7	KR-57	1 megohm ¼ watt carbon resistor	.16
R8	LR-61	200,000 ohm ¼ watt carbon resistor	.16
	L-42BG	Plug-in type ballast resistor. Interchangeable with L-42B	.55
C1, C2	6QM-492	Two-gang variable condenser. Complete with 4 button tuning unit (CQ only)	5.45
C1, C2	6SC-438	Two-gang variable condenser (CS only)	2.80
C3	NNC-199	0.001 mf, 600 volt tubular condenser	.20
†C4		Trimmer, part of wave-trap assembly.	
†C5, C6		Trimmers, part of antenna coil assembly.	
C7	4XC-393A	0.00006 mf mica condenser	.20
C8, C20, C23	BC-12	0.05 mf, 200 volt tubular condenser	.20
C9, C10, C11		Trimmers, part of oscillator coil assembly.	
C12	3EC-267	0.0042 mf mica condenser	.20
C13	KC-58	0.01 mf, 400 volt tubular condenser	.20
†C14, C15		Trimmers, part of first i-f transformer.	
†C16, C17		Trimmers, part of second i-f transformer.	
C18, C21	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C19	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C22	LC-65	0.02 mf, 400 volt tubular condenser	.20
C24	3XC-331	0.015 mf, 400 volt tubular condenser	.20
C25	AC-6	0.1 mf, 200 volt tubular condenser	.20
C26	LC-64	0.05 mf, 400 volt tubular condenser	.20
C27, C28	6QC-437	Dual dry electrolytic condenser, 150 volt C27—20 mf; C28—40 mf	1.10

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the antenna coil are mounted on the antenna coil assembly behind and to the right of the variable condenser The trimmer in the center is for the broadcast band and the trimmer at the bottom for the short-wave band.

The trimmers for the oscillator coil are mounted on the oscillator coil assembly, located on the rear wall underneath the chassis. The trimmer farthest from the end is for the broadcast band. The center trimmer is the broadcast series padding condenser, and the trimmer closest to the end is for the short-wave band.

The 455 kc wave-trap is part of the antenna coil assembly. The trimmer for the trap is the uppermost trimmer of the assembly.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6K8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for *minimum* response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 16 mc Feed 16,000 kc through a standard short-wave dummy antenna (a 400 ohm resistor may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer, then the antenna trimmer for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise and set the pointer at 160. Feed 1600 kc through a standard broadcast dummy antenna to the antenna lead (a .0002 mf condenser may be used as a substitute) and adjust first the broadcast oscillator trimmer and then the antenna trimmer for maximum response.

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

Six-Tube, A.C., Three-Band Superheterodyne

MODEL DA-287

CHASSIS MODEL DA

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 1800, 6000 and 20,000 kc should be used.

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast band dummy antenna, a .0001 mf condenser for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

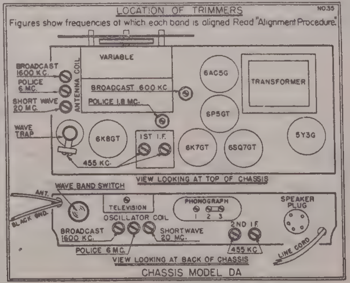
Always use as weak a test signal as possible during alignment.

The set's oscillator is higher in frequency than the signal on *all three bands*, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, *not* a loosening one.

Never leave the trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a sure source of noise, drifting, and microphonism.

In aligning antenna trimmers on the high-frequency signals there is always a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.



I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6K8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (using a standard dummy antenna) and adjust the 455 kc wave trap for minimum response (See General Notes No. 6.)

Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure. (The broadcast padder is located beneath the chassis to the left of the variable condenser.)

Polic Alignment

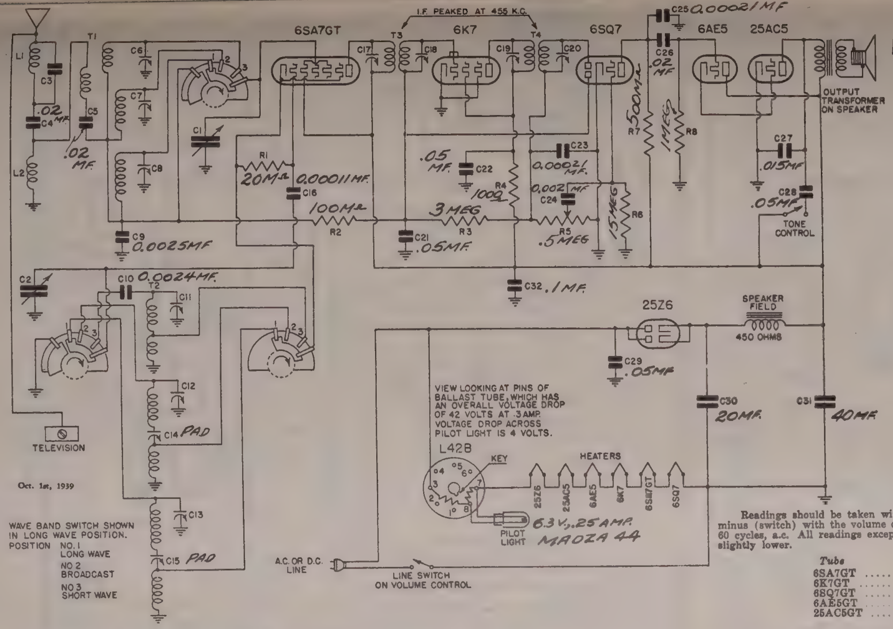
Set the wave-band switch at the police-band (central) position and the pointer at 1.8. Feed 1800 kc to the antenna (using a .0001 mf dummy antenna) and adjust the police-band series padder for maximum response. Move the pointer to 6.0, feed 6000 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Return the pointer to 1.8, feed 1800 kc to the antenna and rock the variable condensers while readjusting the series padder for maximum response. Return to 6000 kc and check alignment. If readjustment is necessary return to 1800 kc and repeat entire procedure. (The police-band padder is located beneath the chassis behind the variable condenser.)

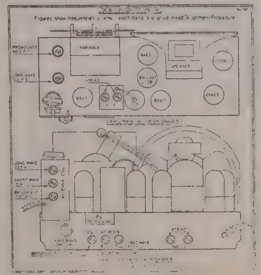
Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DD268,DD270,DD272
DD276. Chassis DD
Schematic,Voltage,Socket
Trimmers,Alignment





Three-Band, Six-Tube Superheterodyne Receiver

MODELS DD-268, DD-270, DD-272 and DD-276

CHASSIS MODEL DD

Voltage rating	105 to 125 volts, a.c. or d.c.
Power consumption	48 watts
Frequency ranges	141 to 353 kc (2130 to 850 meters) 535 to 1600 kc (560 to 187 meters) 5.6 to 18.3 mc (53.5 to 16.4 meters)

Tube Data

The tube complement is as follows:

1—6SA7GT pentagrid oscillator-modulator.
1—6K7GT first i-f amplifier.
1—6SQ7GT diode detector, a-f amplifier, a.v.c.
1—6AE5GT audio amplifier.
1—25AC5GT dynamic coupled output.
1—25Z6GT dual half-wave rectifier.

GENERAL NOTE

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube	*Plate*	*Screen*	*Cathode*	*Fil.*
6SA7GT	95	95	0	6.3
6K7GT	95	95	0	6.3
6SQ7GT	35	—	0	6.3
6AE5GT	95	—	14	6.3
25AC5GT	90	—	0	25.0

Voltage at 25Z6—130 volts.

Voltage across speaker field—85 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

ADJUSTMENTS

Television

The outlet marked "Television" at the rear of the chassis may be used in conjunction with "Television Attachments" which are designed to feed *sound intermediate frequency* to an additional receiver for amplification. This outlet is not suitable for use with Television Attachments which feed *audio* to a separate amplifier.

I-f Alignment

Rotate the wave-band switch to the broadcast (central) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7GT tube (clip signal input to stator of front variable condenser section). Adjust the four i-f trimmers for maximum response.

Long-Wave Alignment

Set the wave-band switch at the long-wave (clockwise) position and the pointer at 2000 (meters). Feed 150 kc to the antenna (using standard dummy antenna or .0002 mf condenser) and adjust the long-wave series padder for maximum response. Move the pointer to 900 (meters), feed 333 kc to the antenna, and adjust first the oscillator trimmer then the antenna trimmer for maximum response. Return to 2000 meters, feed 150 kc, and rock the variable condenser while adjusting the series padder for maximum response. Return to 900 (meters) and check alignment.

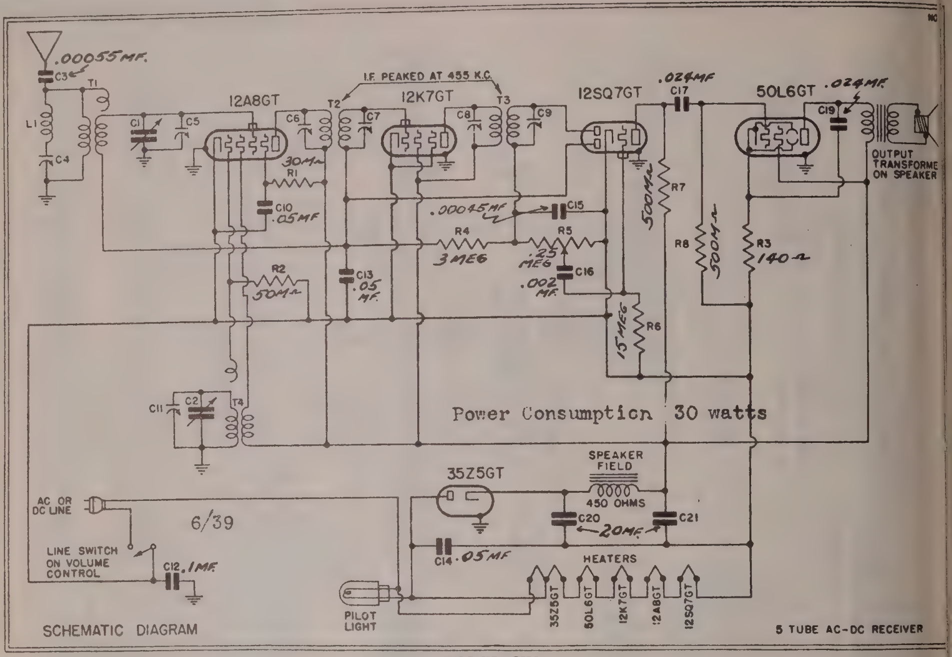
Broadcast Alignment

Set the wave-band switch at the broadcast (central) position, and the pointer at 500 (meters). Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the pointer to 200 (meters), feed 1500 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer at 500, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 200 meters and check alignment. If readjustment is necessary return to 500 meters and repeat entire procedure.

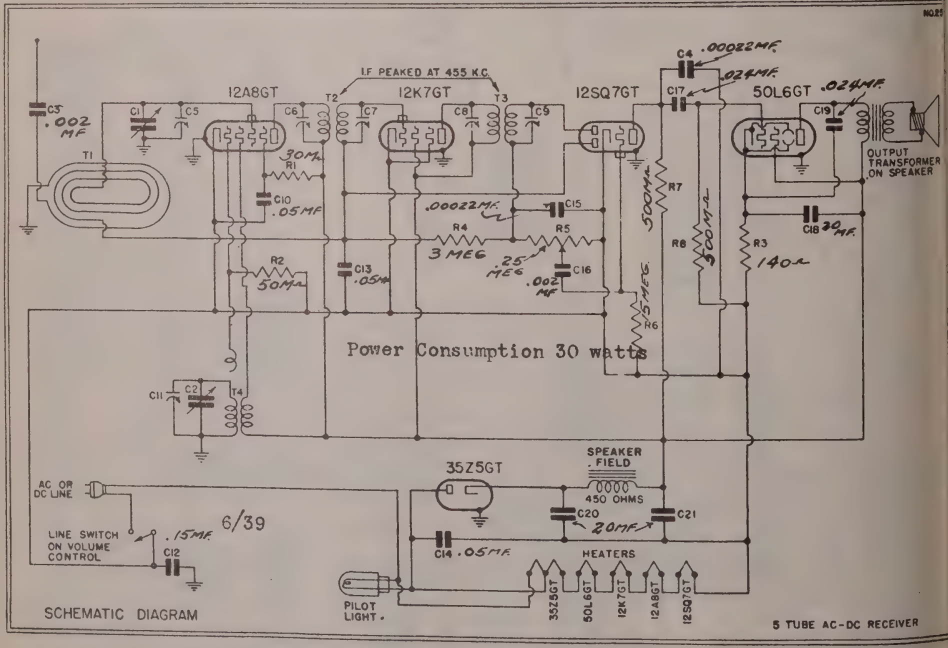
Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 (meters) and feed 15,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

EMERSON RADIO & PHONOGRAPH CORP.



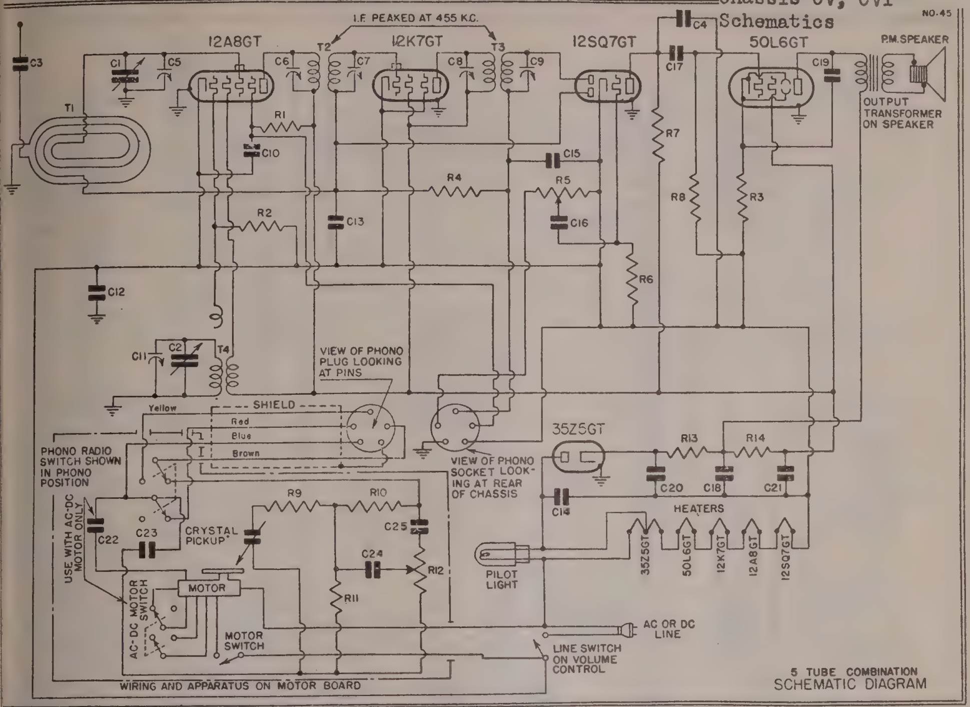
MODEL CW



MODEL CZ

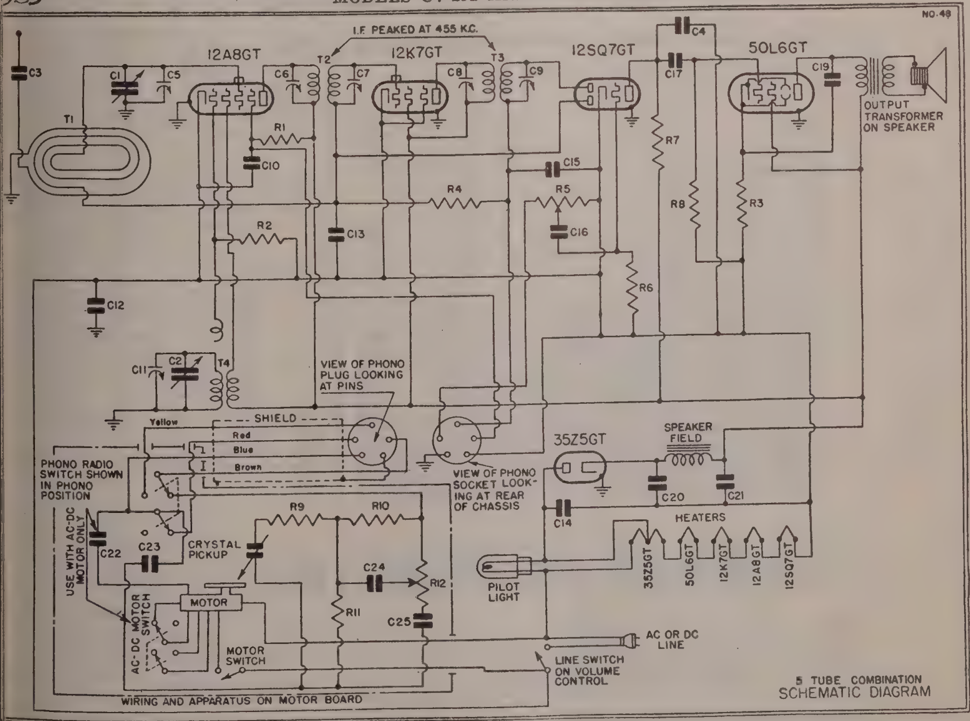
EMERSON RADIO & PHONOGRAPH CORP.

MODELS CV289,CV290,CV291
CV1-290,CV1-291
Chassis CV, CV1
Schematics



9.39

MODELS CV-291 AND CV1-291



MODELS CV-289, CV-290 AND CV1-290

CHASSIS CV,CV1
Voltage,Alignment
Trimmers,Changes,Parts

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS LIST

LIST PRICE EA.
EFFECTIVE AS OF
SEPT. 1ST, 1939
(SUBJECT TO CHANGE WITHOUT NOTICE)

*ITEM	PART NO.	DESCRIPTION	PRICE
T1	6MW-171B	Loop antenna assembly (for CV-289, CV-291 and CV1-291) (see prod. ch. No. 3)	$ .90
T1	6VW-188A	Loop antenna assembly (for CV-290 and CV1-290) (see production change No. 3)	.85
T4	7CT-511	Oscillator coil (see production change No. 3)	.40
T2	6RT-479A	Double-tuned 455 kc first i-f transformer	.95
T3	7BT-489A or 7FT-513D	Double-tuned 455 kc second i-f transformer Double-tuned 455 kc second i-f transformer	.95 .95
R1	2CR-193	30,000 ohm ½ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4	NNR-220	3 megohm ¼ watt carbon resistor	.16
R5	6VR-364	Volume control .5 megohm with line switch	.85
R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7, R8, R11	KR-56	500,000 ohm ¼ watt carbon resistor (see production change No. 2)	.16
R9, R10	KR-57	1 megohm ¼ watt carbon resistor (see production change No. 1)	.16
R12	6VR-366	Tone control, 75,000 ohm, with motor line switch	.95
R13	4ZR-325	175 ohm 1 watt metallized resistor	.16
R14	4XR-334	2,500 ohm 1 watt carbon resistor	.16
C1, C2	6RC-436	Two-gang variable condenser	2.30
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C4, C15	4XC-394A	0.00022 mf mica condenser	.20
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10, C13, C23	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	3CC-302	0.15 mf, 200 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C17	6JC-425	0.024 mf, 400 volt tubular condenser	.20
C18	4XC-404	20 mf, 150 volt dry electrolytic condenser	.60
C19	LC-65	0.02 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426B	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C22	KC-58	0.01 mf, 400 volt tubular condenser (used only with a.c.-d.c. motors)	.20
C24	IC-47A	0.0005 mf mica condenser	.20
C25	KC-59	0.006 mf, 400 volt tubular condenser	.20
	6JS-368U	4" dynamic speaker (not used on CV-291 or CV1-191)	3.85
	6JS-386	6½" permanent magnet dynamic speaker (for CV-291 and CV1-291)	6.20
	6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda No. 47	.20
	6VD-82A	Dial face (see production change No. 3)	.30
	4YZ-772	Drive cord	.02
	6RW-162	Drive cord spring	.02
	6JH-24B	Drive shaft	.05
	6RF-52	Dial pointer	.05
	6RE-20	Dial crystal	.10
	3LM-253	Phonograph needle cup (CV-289 and CV-291)	.20
	3GM-251	Phonograph needle cup (CV-290)	.75
	6JPM-46A or	117 volt a.c. rim-drive phono motor	8.70
	4XPM-20A or	117 volt a.c. phono motor	12.00
	3GPM-1	117 volt a.c.-d.c. phono motor (not used on CV-289)	43.20
	6VS-414	Phono-radio switch	.75
	4XC-418A	Crystal pick-up	8.10

GENERAL NOTES

1. **If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.**
2. **In operating the a.c.-d.c. combinations on d.c. it may be necessary to reverse the line plug for correct polarity.**
3. **The color coding of the i-f transformer leads is as follows:**

Grid—green	**Plate—blue**
Grid return—black	**B plus—red**

4. The receiver has a self-contained antenna and normally does not require additional antenna connection For permanent home installations of this model, however, in a location far removed from broadcasting stations, an additional outside antenna should be used. The outside antenna connection should be made to the flexible wire lead at the rear of the cabinet.
5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. *It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.*
6. **The receivers in these combinations are of the a.c.-d.c. type. The motors, however, in models CV-289, CV-290 and CV-291 are of the A.C. *only* type and will be damaged if the combination is used on direct current.**

PRODUCTION CHANGES

1. On CV-289 resistor R9 is .5 megohm.
2. On CV-291 and CV1-291 resistor R11 is .2 megohm.
3. CV chassis bearing serial numbers below 2,764,502 use:

T4	6RT-476	Oscillator coil	.35
	6VD-82	Dial face	.30
T1	6MW-171A	Loop antenna (for CV-289, CV-291 and CV1-291)	.90
T1	6VW-188	Loop antenna (for CV-290 and CV1-290)	.85

THE TUBE COMPLEMENT IS AS FOLLOWS:

One 12A8GT—pentagrid oscillator-modulator
One 12K7GT—first i-f amplifier
One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
One 50L6GT—beam power output
One 35Z5GT—half-wave rectifier

Voltage rating	105-125 volts
Power consumption	30 watts for receiver 20 watts for A.C. motor 30 watts for A.C.-D.C. motor
Frequency range	540 to 1600 kc

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8GT	*88	*45	0	*88	12
12K7GT	*88	*88	0	—	12
12SQ7GT	*40	—	0	—	12
50L6GT	†82	*88	5.7	—	50

Voltage at 35Z5 cathode—115 volts.
Voltage across speaker field—27 volts.
Voltage across pilot light—4.5 volts.

* These readings are approximately 10% lower on CV-291 and CV1-291.
† This reading is approximately 20% higher on CV-291 and CV1-291.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located at the extreme left end of the chassis. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is located just to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil (loop). The oscillator coil is located beneath the first i-f transformer.

I-f Alignment

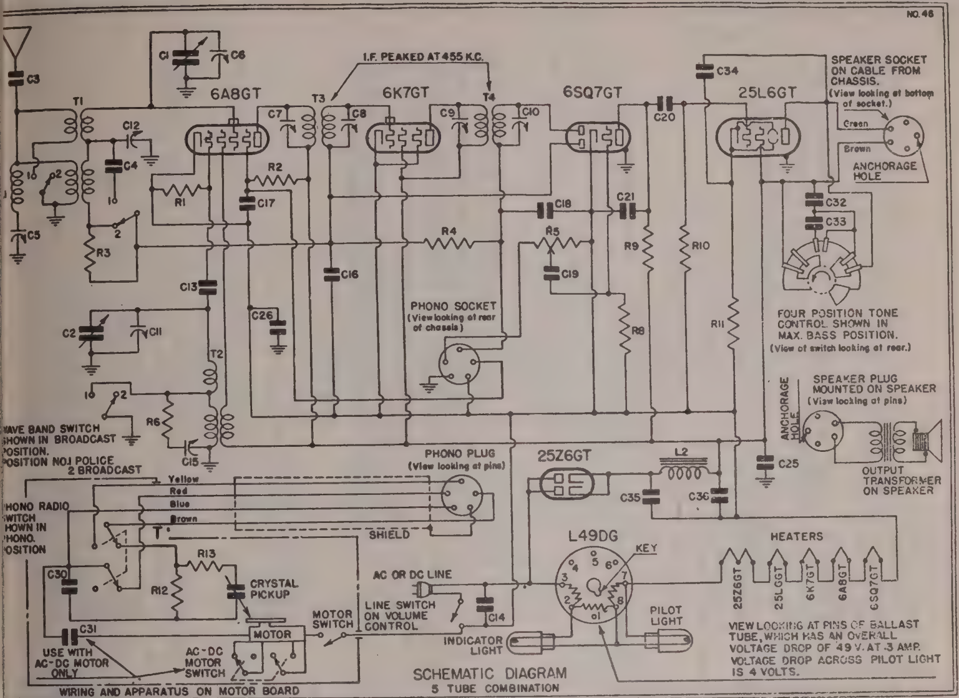
Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 12A8GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The antenna trimmer should be adjusted when the chassis is in place in the cabinet. It can be reached through a hole near the front of the motor board.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

SIS CR,CR1 **EMERSON RADIO & PHONOGRAPH CORP.** MODELS CG293,CG294,CG1-293
rd Changer Data CG1-294,Chassis CG,CG1
Schematic,Record Changer


NO.46
I.F. PEAKED AT 455 K.C.
C1
C6
C3
T1
6A8GT
T3
6K7GT
T4
6SQ7GT
25L6GT
C34
C20
C7
C8
C9
C10
C12
C4
R2
R1
C17
C18
C21
R4
R5
R9
R10
C16
C19
C5
R3
C13
C26
C2
C11
T2
R6
C15
R8
R11
SPEAKER SOCKET ON CABLE FROM CHASSIS.
(View looking at bottom of socket.)
Green
Brown
ANCHORAGE HOLE
C32
C33
FOUR POSITION TONE CONTROL SHOWN IN MAX. BASS POSITION.
(View of switch looking at rear.)
PHONO SOCKET (View looking at rear of chassis)
SPEAKER PLUG MOUNTED ON SPEAKER (View looking at pins)
ANCHORAGE HOLE
WAVE BAND SWITCH SHOWN IN BROADCAST POSITION.
POSITION NO.1 POLICE
2 BROADCAST
PHONO PLUG (View looking at pins)
25Z6GT
L2
C25
OUTPUT TRANSFORMER ON SPEAKER
Yellow
Red
Blue
Brown
PHONO RADIO SWITCH SHOWN IN PHONO. POSITION
SHIELD
C35
C36
L49DG
KEY
HEATERS
R13
C30
R12
CRYSTAL PICKUP
AC OR DC LINE
LINE SWITCH ON VOLUME CONTROL
C14
MOTOR SWITCH
MOTOR
C31
USE WITH AC-DC MOTOR ONLY
AC-DC MOTOR SWITCH
INDICATOR LIGHT
PILOT LIGHT
25Z6GT
25L6GT
6K7GT
6A8GT
6SQ7GT
VIEW LOOKING AT PINS OF BALLAST TUBE, WHICH HAS AN OVERALL VOLTAGE DROP OF 49 V. AT .3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS.
WIRING AND APPARATUS ON MOTOR BOARD

SCHEMATIC DIAGRAM
5 TUBE COMBINATION

AUTOMATIC RECORD CHANGER

)—Record Removing Lever.

A locknut provides adjustment for ising or lowering the record finger to gage the next to last record on the rntable. No adjustment is required less the motor mounting screws should osen and allow motor and turntable to ift upward or downward, or should cord finger become bent.

Raising the record removing lever to e vertical position will repeat the top cord on the turntable, either 10-inch 12-inch for as long as desired.

)—Latch Mechanism.

The latch should engage one-half the pth of the notch. This may be adjusted turning the eccentric washer.

C)—Speed Regulator.

The motor speed can be regulated for fast" or "slow" by moving lever to ther side.

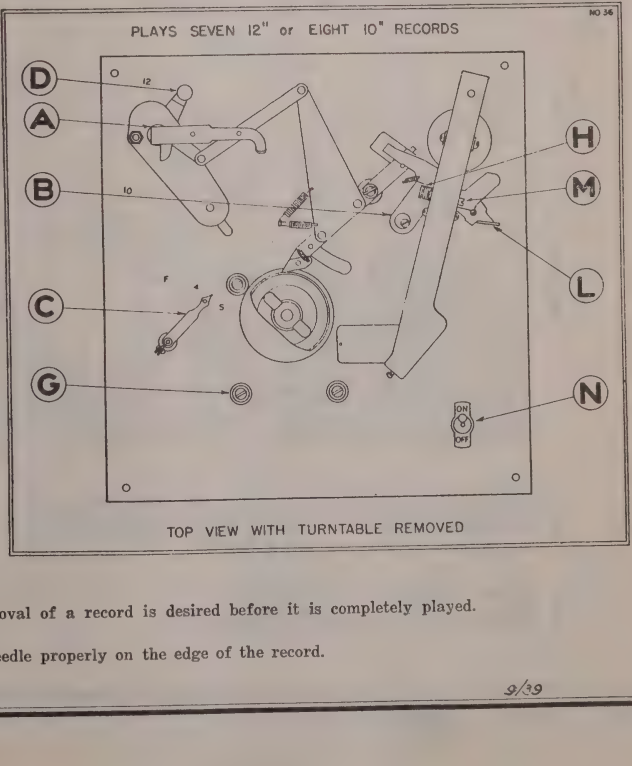
D)—Adjustment for 10-inch and 12-inch Records.

The motor panel is stamped "10" and 12." Set the change lever opposite the ze of record to be played.

G)—Motor Mounting Screws.

H)—Trip Mechanism.

All records having either the spiral or scillating type trip groove are handled utomatically by this trip mechanism. o adjustment required.



PLAYS SEVEN 12" or EIGHT 10" RECORDS

TOP VIEW WITH TURNTABLE REMOVED

L)—Record Reject Lever.

Pull the reject lever forward if removal of a record is desired before it is completely played.

M)—Pick-up and Tone Arm.

Turn screw in or out to place the needle properly on the edge of the record.

N)—On-off Switch.

On-off switch for motor.

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CHASSIS CG,CG1
Voltage,Alignment,Parts
Trimmers

EMERSON RADIO & PHONOGRAPH CORP.

List Price ea.
Effective as of
Sept. 1, 1939
(Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
T1, L1	6GT-468	Two-band antenna coil with 455 kc wave-trap	$1.10
T2	6GT-469	Two-band oscillator coil	.55
T3	4XT-434CU	455 kc first i-f transformer	1.00
T4	4XT-435CU	455 kc second i-f transformer	.80
R1, R2	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R3, R6	PR-79	1,000 ohm 1/4 watt carbon resistor	.16
R4	NNR-220	3 megohm 1/4 watt carbon resistor	.16
R5	6SR-362	Volume control—250,000 ohms with line switch	.90
R8	4XR-327	15 megohm 1/4 watt carbon resistor	.16
R9, R10	KR-56	500,000 ohm 1/4 watt carbon resistor	.16
R11	3FR-293	140 ohm 1/2 watt wire-wound resistor	.16
R12	KR-55	250,000 ohm 1/4 watt carbon resistor	.16
R13	KR-57	1 megohm 1/4 watt carbon resistor	.16
——	L-49DG	Plug-in type ballast resistor. Interchangeable with L-49D	.55
C1, C2	6GC-428	Two-gang variable condenser	2.35
C3	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C4	6GC-429	0.00064 mf mica condenser	.20
†C5	——	Trimmer, part of wave-trap assembly.	
†C6, C11	——	Trimmers, part of variable condenser.	
†C7, C8	——	Trimmers, part of first i-f transformer assembly.	
†C9, C10	——	Trimmers, part of second i-f transformer assembly.	
C12, C15	6GC-430	Dual trimmer assembly	.35
C13	IIC-133A	0.000025 mf mica condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C16, C17 C25, C30	BC-12	0.05 mf, 200 volt tubular condenser	.20
C18, C21	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C19	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C20	LC-65	0.02 mf, 400 volt tubular condenser	.20
C26	3CC-302	0.15 mf, 200 volt tubular condenser	.20
C31	KC-58	0.01 mf, 400 volt tubular condenser (for a.c.-d.c. motors only)	.20
C32, C33	ZZC-211	0.03 mf, 200 volt tubular condenser	.20
C34	XXC-207	0.005 mf, 400 volt tubular condenser	.20
C35, C36	6QC-437	Multiple 20 and 40 mf, 150 volt dry electrolytic condenser C35—20 mf C36—40 mf	1.10
	6GS-375	Wave-band switch	.60
	6GD-72	Dial face	.45
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	4XZ-811C	Dial drive shaft	.05
	4MZ-588A	Dial pointer	.20
	5JZ-824	Drive cord spring	.05
	4YZ-772	Drive cord	.02
	6GE-22A	Dial crystal	.25
	3LM-253	Phonograph needle cup	.20
	3LM-255	Needle cup cover	.15
L2	4PT-404	Iron core filter choke	1.80
	6GS-422	12" permanent magnet dynamic speaker	12.25
	6VS-414A	Phono-radio switch	.75
	6GS-406A	Tone control switch	.80

ADDITIONAL PARTS USED IN CG-294 AND CG1-294

Part No.	DESCRIPTION	PRICE
6GPM-50 or	A.C. phonograph motor (for CG-294)	34.20
6GPM-50A	A.C.-D.C. phonograph motor (for CG1-294)	51.00
6GC-452	Crystal phono pick-up	14.35

ADDITIONAL PARTS USED IN CG-293 AND CG1-293

Part No.	DESCRIPTION	PRICE
6JPM-46 or	117 volt a.c. rim-drive phonograph motor (for CG-293)	9.00
4XPM-20B or	117 volt a.c. phonograph motor (for CG-293)	12.25
3GPM-1	117 volt a.c.-d.c. phonograph motor (for CG1-293)	43.20
4XC-418A	Crystal pick-up	8.10
4RS-301	Automatic stop switch	2.50

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1500 kc and 6000 kc is required.
An output meter should be used across the voice coil or output transformer for observing maximum response.
Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the oscillator.

The 455 kc wave-trap is part of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for *minimum* response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a 400 ohm resistor to the antenna lead.

Adjust first the oscillator trimmer (on front section of the variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 150 and feed 1500 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of dual assembly) for maximum response.

Voltage rating	105 to 125 volts, a.c. or d.c.
Power consumption	43 watts for radio 20 watts for a.c. motor 30 watts for a.c.-d.c. motor
Frequency ranges	540 to 1700 kc and 2300 to 6600 kc

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. The filament dropping resistor (L49DG on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.
3. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
4. The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
5. The color coding of the i-f transformer leads is as follows:
   - Grid—green
   - Grid return—black
   - Plate—blue
   - B plus—red
6. The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
7. The receivers in these combinations are of the a.c.-d.c. type. The motors, however, used in Models CG-293 and 294 are of the *a.c. only* type and will be damaged if operated on direct current.
8. Any series of records to be played automatically should be of one size. The changer will not play intermixed sizes. Select seven 12-inch records or eight 10-inch records and place them on the turntable with the selection to be played facing upwards.
9. Adjust the lever "D" for the size of records to be played. (See illustration.) Lower the pick-up carefully so that the needle rides on the smooth surface on the outside edge of the record.
10. *On the Model CG1-293 and CG1-294 only, before turning the motor on check the a.c.-d.c. switch underneath the turntable on the motor board, making sure that it is in a position corresponding to the power supply.* To reach this switch simply remove the turntable by pulling it directly upward. If the power supply is d.c. the switch should be thrown to d.c. position and for an a.c. supply to the a.c. position. When replacing the turntable be sure it is seated all the way down over its shaft.

Tube Data

The tube complement is as follows:

1—6A8GT pentagrid oscillator-modulator.
1—6K7GT first i-f amplifier.
†1—6SQ7GT diode detector, a-f amplifier, a.v.c. (*see note*).
1—25L6GT beam power output.
1—25Z6GT dual half-wave rectifier.

Octal-base tubes in this receiver may be replaced with either metal or bantam-type octal-base glass tubes. The letters "GT" at the end of the tube number indicates that the tube has a bantam glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

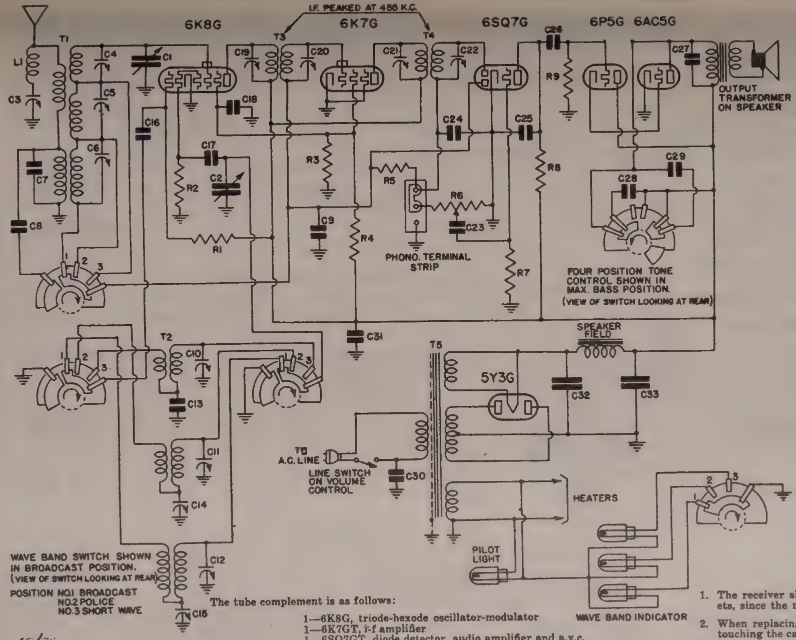
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8GT	113	45	0	113	6.3
6K7GT	113	118	0	—	6.3
†6SQ7GT	38	—	0	—	6.3
25L6GT	125	113	6.5	—	25.0

Voltage at 25Z6 cathode—125 volts.
Voltage across filter choke—12 volts.
Voltage drop across ballast resistor (pins nos. 3, 7)—49 volts.
Voltage drop across pilot light sections of ballast resistor (pins nos. 8 and 7, 2 and 8)—4 volts.

†*Note*: CG chassis bearing serial numbers below 2,616,849 use 6Q7GT.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL DA 287
Chassis DA
Schematic,Voltage,Parts
Notes



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The tube complement is as follows:

1—6K8G, triode-hexode oscillator-modulator
1—6K7GT, i-f amplifier
1—6SQ7GT, diode detector, audio amplifier and a.v.c.
1—6P5GT, audio amplifier
1—6AC5G, power output
1—5Y3G, full-wave rectifier.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 110 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6K8G	220	95	0	100	6.3 a.c.
6K7GT	220	95	0	—	6.3 a.c.
6SQ7GT	65	—	0	—	6.3 a.c.
6P5GT	220	—	12	—	6.3 a.c.
6AC5G	205	—	0	—	6.3 a.c.

Voltage at 5Y3G filament to ground—300 volts.
Voltage across speaker field—80 volts.

Voltage rating	105-125 volts, 60 cycle, a.c. (unless otherwise specified)
Power consumption	55 watts
Frequency ranges	540 to 1800 kc, 1800 to 6250 kc and 5.8 to 22 megacycles

REPLACEMENT PARTS LIST

* Item	Part No.	DESCRIPTION
L1	4DT-343A	Adjustable 455 kc wave trap
T1	7AT-485	Three-band antenna coil
T2	5RT-447A	Three-band oscillator coil
T3	7AT-490	Double tuned 455 kc first i-f transformer
T4	7AT-491	Double tuned 455 kc second i-f transformer
T5	4ZT-426B	Power transformer 117 volts, 60 cycles
R1, R3	3BR-247	40,000 ohm ¼ watt carbon resistor
R2	KR-53	50,000 ohm ¼ watt carbon resistor
R4	7AR-365	16,000 ohm 2 watt carbon resistor
R5	HR-42	2 megohm ¼ watt carbon resistor
R6	6GR-352	Volume control .25 megohm with line switch
R7	4XR-327	15 megohm ¼ watt carbon resistor
R8	KR-56	.5 megohm ¼ watt carbon resistor
R9	KR-57	1 megohm ¼ watt carbon resistor
C1, C2	7AC-442	Two-gang variable condenser
†C3		Trimmer, part of wave trap assembly
†C4, C5, C6		Trimmers, part of antenna coil assembly
C7	4XC-393A	0.00006 mf, with condenser
C8, C16	KC-58	0.01 mf, 400 volt tubular condenser
C9	BC-12	0.05 mf, 200 volt tubular condenser
C10, C11, C12		Trimmers, part of oscillator coil assembly
C13	3EC-267	0.0042 mf mica condenser
C14	2NC-231B	Single adjustable padding condenser: (range 750-1500 mmf.)
C15	2NC-231A	Single adjustable padding condenser: (range 300- 600 mmf.)
C17	4HC-395A	0.000026 mf mica condenser
C18, C31	EEC-132	0.1 mf, 400 volt tubular condenser
†C19, C20,		Trimmers, part of first i-f transformer
C21, C22		Trimmer, part of second i-f transformer
C23	3HC-274	0.002 mf, 600 volt tubular condenser
C24, C25	4XC-394A	0.00022 mf mica condenser
C26	LC-65	0.02 mf, 400 volt tubular condenser
C27	NNC-199	0.001 mf, 600 volt tubular condenser
C28	EC-23	0.03 mf, 400 volt tubular condenser
C29	3XC-331	0.15 mf, 400 volt tubular condenser
C30	3LC-297A	0.01 mf, 400 volt molded condenser
C32	7AC-443	16 mf, 450 volt dry electrolytic condenser
C33	7AC-444	16 mf, 400 volt dry electrolytic condenser

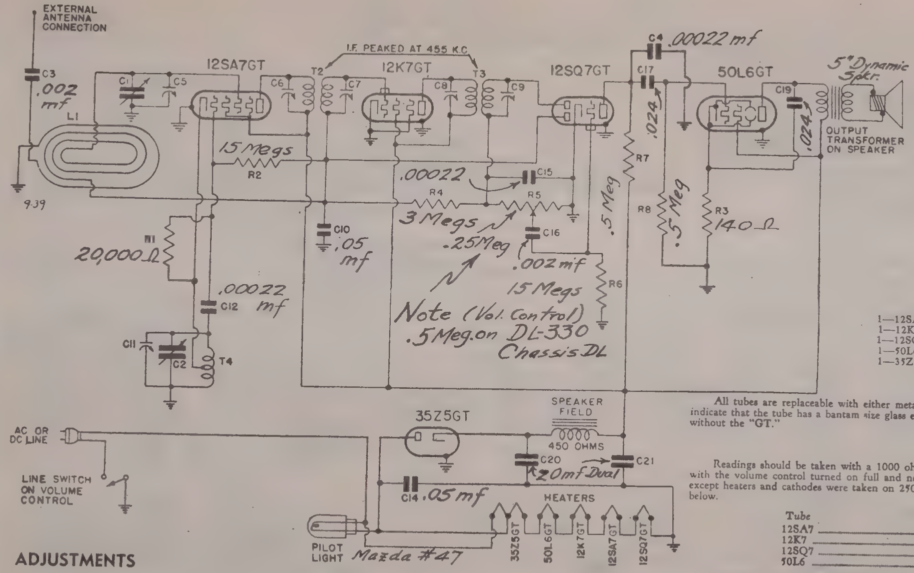
GENERAL NOTES

1. The receiver should never be turned on with either the speaker plug or the 6AC5G tube out of their respective sockets, since the rapid rise in rectifier voltage will damage the electrolytic condenser.
2. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.
3. The color coding of the i-f transformers is as follows:

Grid—green	Plate—blue.
B plus—red	Grid return—black

4. The color coding of the power transformer is as follows:
   - Primary—two black leads
   - High-voltage secondary—two red leads
   - High-voltage secondary center tap—red and yellow lead
   - 6.3 volt secondary—two green leads
   - 5 volt secondary—two yellow leads.
5. The adjustable padding condensers for the broadcast and police bands are mounted on the top of the chassis with the screw adjustment accessible through holes in the top of the chassis. The short-wave band has a fixed padder, C13 on schematic. When replacing this fixed padder be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.
6. The wave trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave trap trimmer until the response from the interfering station is at a minimum.
7. The outlet marked "Television" at rear of the chassis may be used with any "Television Attachment" which is designed to feed the sound intermediate or audio frequency to a separate amplifier. Detailed instruction for such a connection is given with any "Television Attachment."

FOR ALIGNMENT
SEE INDEX



Five-Tube A. C.-D. C., Superheterodyne Receiver

MODELS DB-296 and DB-301

CHASSIS MODEL DB

MODEL: DL-330

CHASSIS MODEL: DL

Voltage rating .... 105-125 volts, a.c. or d.c.
Power consumption .... 30 watts.
Frequency range .... 540 to 1600 kc.

TUBE DATA

THE TUBE COMPLEMENT IS AS FOLLOWS:

1—12SA7 or 12SA7GT	pentagrid oscillator modulator
1—12K7 or 12K7GT	first i-f amplifier
1—12SQ7 or 12SQ7GT	diode detector, a-f amplifier, a.v.c.
1—50L6 or 50L6GT	beam power output
1—35Z5 or 35Z5GT	half-wave rectifier

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7	88	88	0	12
12K7	88	88	0	12
12SQ7	30	—	0	12
50L6	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.

Voltage across speaker field—32 volts.

Voltage across pilot light—4.5 volts.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
3. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

4. Models DB-296 and 301 have self-contained antennas and do not require additional antenna connections. For permanent home installations of either model, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.
5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. *It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.*

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily indentified by the connection of the green lead to the loop.

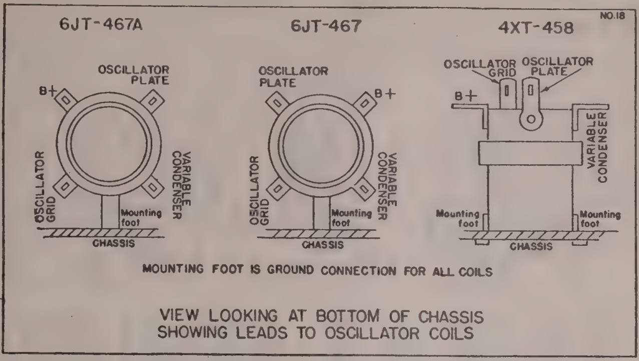
R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

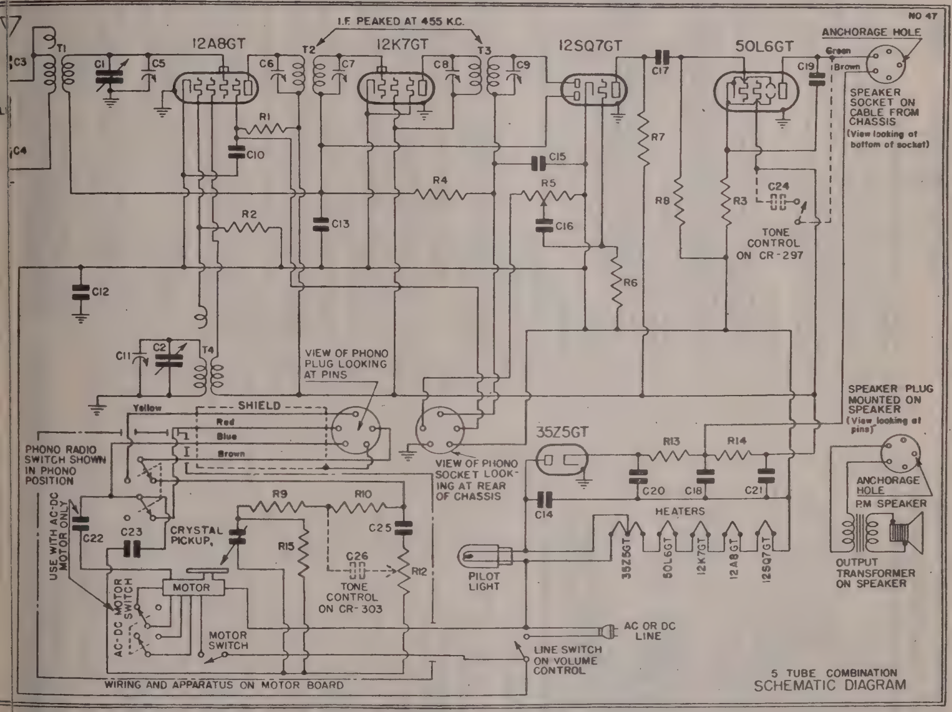
EMERSON RADIO & PHONOGRAPH CORP.

MODELS CR297,CR303,CR1-297
CR1-303 Chassis CR,CR1
Schematic,Voltage



MOUNTING FOOT IS GROUND CONNECTION FOR ALL COILS

VIEW LOOKING AT BOTTOM OF CHASSIS
SHOWING LEADS TO OSCILLATOR COILS



5 TUBE COMBINATION
SCHEMATIC DIAGRAM

VOLTAGE ANALYSIS

eadings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus h) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, ll readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. e lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8GT	65	40	0	65	12
12K7GT	65	65	0	—	12
12SQ7GT	40	—	0	—	12
50L6GT	100	65	5.7	—	50

oltage at 35Z5 cathode—110 volts.

oltage across pilot light—4.5 volts.

ge rating	105-125 volts
r consumption	30 watts for receiver 20 watts for a.c. motor 30 watts for a.c.-d.c. motor
ency range	540 to 1730 kc

The tube complement is as follows:

One 12A8GT—pentagrid oscillator modulator
One 12K7GT—first i-f amplifier
One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
One 50L6GT—beam power output
One 35Z5GT—half-wave rectifier

CHASSIS CR,CR1
Alignment,Changes,Parts
CHASSIS CW,CZ
Voltage,Alignment,Tuner
Trimmers

EMERSON RADIO & PHONOGRAPH CORP.

MODEL CR-297 (AC) MODEL CR1-297 (AC-DC)
MODEL CR-303 (AC Portable Automatic Record Changer)
MODEL CR1-303 (AC-DC Portable Automatic Record Changer)

List Price as Effective as of Sept. ■■, 19■■ (Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
T1, L1	4XT-432A	Antenna coil with 455 kc wave-trap	$ .90
T4	6RT-476	Oscillator coil (see production change no. 1)	.35
T2	6RT-479	Double-tuned 455 kc first i-f transformer	1.10
T3	4XT-435E	Double-tuned 455 kc second i-f transformer	.80
R1	2CR-193	30,000 ohm ½ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4	HR-42	2 megohm ¼ watt carbon resistor	.16
R5	6VR-364	Volume control .5 megohm with line switch	.85
R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7, R8, R9 R10, R15	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R13	4ZR-325	175 ohm 1 watt metallized resistor	.16
R14	4XR-334	2500 ohm 1 watt carbon resistor	.16
C1, C2	6RC-436	Two-gang variable condenser	2.30
C3	4XC-401	0.00055 mica condenser	.20
†C4		Trimmer, part of wave-trap assembly.	
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10, C13, C23	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	AC-6	0.1 mf, 200 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15	6RC-441	0.00045 mf mica condenser	.20
C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17	6JC-425	0.024 mf, 400 volt tubular condenser	.20
C19	LC-65	0.02 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426B	Dual 20 mf, 150 volt tubular dry electrolytic condenser	.90
C18	4XC-404	20 mf, 135 volt dry electrolytic condenser	.65
C22	3LC-297A	0.01 mf, 400 volt molded condenser (*used with a.c.-d.c. motors only*)	.20
C25	3HC-274	0.002 mf, 600 volt tubular condenser	.20
		ADDITIONAL PARTS USED ON CR-297 AND CR1-297	
R12	LLR-154	75,000 ohm ¼ watt carbon resistor	.16
C24	BC-12	0.05 mf, 200 volt tubular condenser	.20
	3LM-253	Phonograph needle cup	.20
	3LM-255	Needle cup cover	.15
	6JPM-46	117 volt a.c. phonograph motor (rim drive)	9.00
	or		
	4XPM-20B	117 volt a.c. phonograph motor	12.25
	or		
	3GPM-1	117 volt a.c.-d.c. phonograph motor	48.20
	4XC-418A	Crystal phono pick-up	8.10
	6YS-418	8″ permanent magnet dynamic speaker	7.80
	6VS-414	Phono-radio switch	.75
	4RS-301	Automatic stop switch	2.50
	3ES-256L	Tone control switch	.50
		ADDITIONAL PARTS USED ON CR-303 AND CR1-303	
R12	6RR-372	Potentiometer for tone control	.95
C26	IC-47A	0.0005 mf mica condenser	.20
	3GM-251	Phonograph needle cup	.75
	6RPM-52	A.C. phonograph motor	34.20
	or		
	6RPM-52A	A.C.-D.C. phonograph motor	51.00
	6JS-386	6½″ permanent magnet dynamic speaker	6.20
	6VS-414B	Phono-radio switch	.70
	6RC-453	Crystal pick-up	14.35

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted under the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The oscillator coil is located underneath the chassis, beneath the speaker and the antenna coil and wave-trap assembly is mounted at the left side of the chassis.

I-f and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12A8GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for minimum response. (See General Notes, paragraph No. 4.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

PRODUCTION CHANGES

1. CR chassis also uses oscillator coil 6JT-467A or 6RT-476. For correct lug connections to either of these coils see illustration on previous page.

MODEL CW-279 and MODEL CZ-282

CHASSIS MODEL CW

CHASSIS MODEL CZ

Location of Coils and Trimmer Adjustments

MODEL CW

The first i-f transformer is located between the variable cond·nser and the speaker. The trimmers are accessible through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The antenna coil is located to the left of the speaker and the oscillator coil underneath the chassis below the speaker.

Trimmers for the antenna and oscillator coils are located on the variable condenser, the trimmer on the section adjacent to the 50L6GT tube being for the oscillator.

The 455 kc wave trap is wound on the same form as the antenna coil and may be adjusted from the left side of the chassis.

MODEL CZ

The first i-f transformer is located to the left of the speaker and the second i-f transformer, to the right of the speaker. Trimmers for both coils are accessible through holes in the tops of the cans.

The oscillator coil is located directly beneath the speaker. The loop antenna acts as the antenna coil. Trimmers for both oscillator and antenna coil are located on the variable condenser, the trimmer on the section adjacent to the 50L6GT tube being for the oscillator.

i-f and Wave-Trap Alignment

MODEL CW

Rotate the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 12A8GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap trimmer for minimum response. (See General Notes, paragraph No. 4.)

MODEL CZ

Repeat the same procedure as for Model CW except for trap alignment. Model CZ does not use a wave trap.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on section of variable condenser near 50L6) then the antenna trimmer (on section of variable condenser near 12K7) for maximum response.

Preadjustment of Automatic Tuning Keys

Select four nearby stations desired for automatic tuning. Choose one of these stations and any key to be adjusted for it. Follow the procedure outlined below.

1. Remove all four keys. The two center keys should be taken out first. Grasp the key firmly on each side with the fingers and pull directly up. Remove the two end keys by prying them up with a screw-driver; the screw-driver should be inserted in the slot at the side of the key. See Fig. 1.
2. Seat the screw-driver in the slot of the locking screw to be adjusted. Press down the screw-driver firmly and loosen the screw about 1 to 1½ turns. See Fig. 2.
3. With the screw-driver seated in the locking-screw, press it down firmly with the left hand while tuning in the desired station with the right hand, using the station selector. See Fig. 3.
4. Release the station selector knob and tighten the locking screw as much as possible. See Fig. 4.
5. Replace the key on its shaft. The vertical piece of metal alongside the locking screw slides into the slot in the key which contains a flat spring. Remove the tab bearing the station call letters from one of the cards supplied in a seperate envelope with the receiver. Moisten the tab and place it in the depression provided for it in the key. See Fig. 4.
6. Check the adjustment by turning well past the station, using the selector knob, and then pushing down the key. The station should come back in again clearly and with maximum volume.

FIG 1

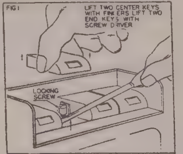

LIFT TWO CENTER KEYS WITH FINGERS LIFT TWO END KEYS WITH SCREW DRIVER
LOCKING SCREW

FIG. 2

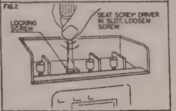


FIG. 3

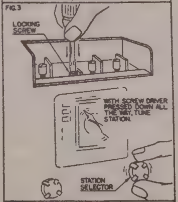
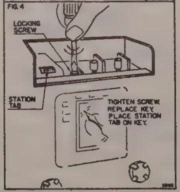


FIG. 4



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

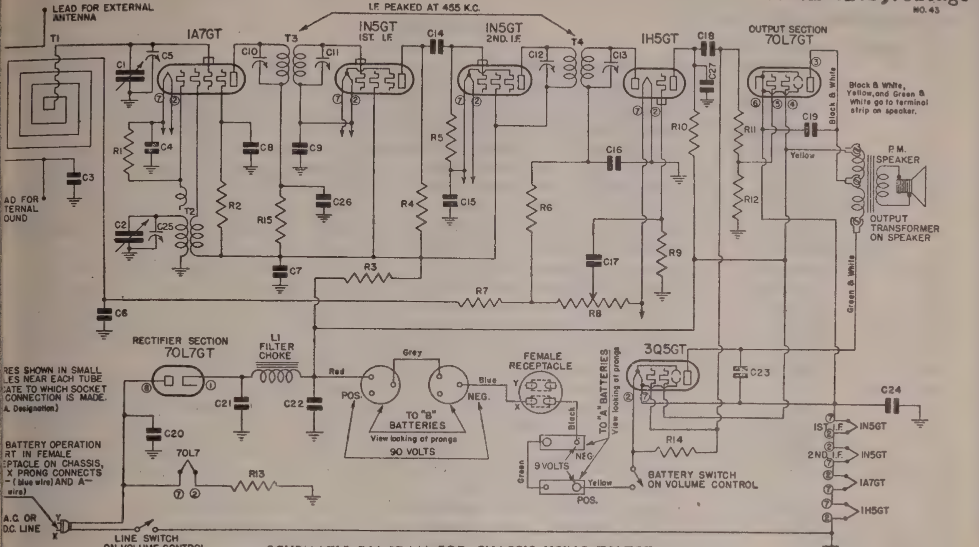
Tube		Plate	Screen	Cathode	Osc. Plate	Fil.
12A8GT	pentagrid oscillator modulator	88	50	0	88	12
12K7GT	first i-f amplifier	88	88	0	—	12
12SQ7GT	diode detector, a-f amplifier, a.v.c.	40	—	0	—	12
50L6GT	beam power output	82	88	5.7	—	50

Voltage at 35Z5 cathode—115 volts.

Voltage across speaker field—27 volts.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DF302,DF306
Chassis DF(2 Types)
Schematics,Voltage

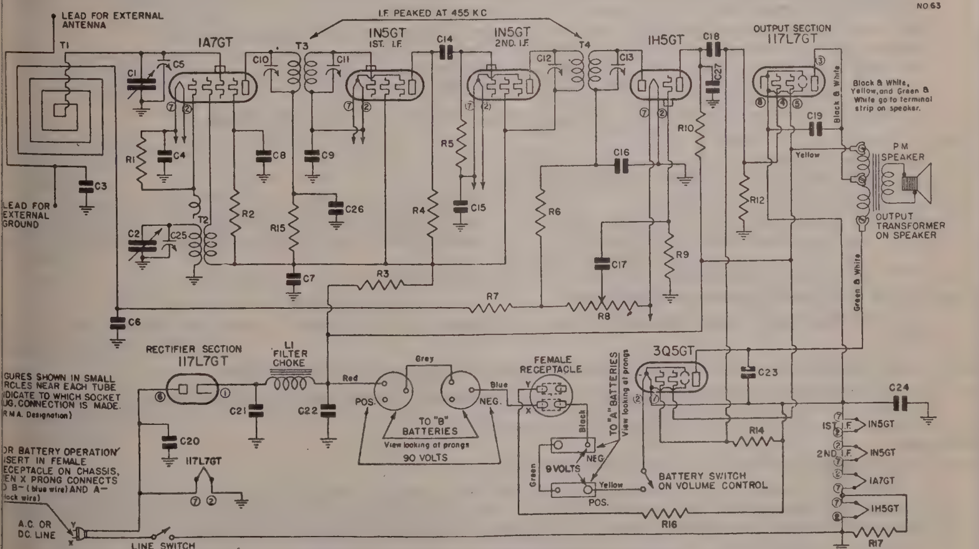


SCHEMATIC DIAGRAM FOR CHASSIS USING 70L7GT
MODEL DF

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control tued on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	88	50	82	1.5
1N5GT 1st i-f	50	88	—	1.5
1N5GT 2nd i-f	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT	85	88	—	3.0
70L7GT (line operation only)	86	95	—	70.0
70L7GT rectifier cathode (Pin no. 1) (line operation only)—125 volts.				
or 117L7GT (line operation only)	86	95	—	117
117L7GT rectifier cathode (Pin no. 1) (line operation only)—125 volts.				


NO 63
LEAD FOR EXTERNAL ANTENNA
T1
1A7GT
I.F. PEAKED AT 455 K.C.
1N5GT 1ST. I.F.
1N5GT 2ND. I.F.
T3
T4
1H5GT
OUTPUT SECTION 117L7GT
C1
C5
C10
C11
C14
C12
C13
C18
C27
R1
C4
C3
C8
C9
C26
R2
R15
R4
R5
C15
C16
R6
R10
R12
C19
Black & White
Black & White, Yellow, and Green & White go to terminal strip on speaker.
Yellow
P.M. SPEAKER
OUTPUT TRANSFORMER ON SPEAKER
LEAD FOR EXTERNAL GROUND
C2
C25
T2
C7
R3
C17
R9
R7
R8
C6
Green & White
RECTIFIER SECTION 117L7GT
L1 FILTER CHOKE
Red
Grey
Blue
POS.
NEG.
TO "B" BATTERIES
View looking at prongs
90 VOLTS
FEMALE RECEPTACLE
TO "A" BATTERIES View looking at prongs
Black
Green
9 VOLTS
Yellow
NEG.
POS.
3Q5GT
C23
C24
R14
R16
R17
BATTERY SWITCH ON VOLUME CONTROL
1ST I.F. 1N5GT
2ND I.F. 1N5GT
1A7GT
1H5GT
C21
C22
C20
117L7GT
GURES SHOWN IN SMALL RCLES NEAR EACH TUBE IDICATE TO WHICH SOCKET UG. CONNECTION IS MADE. RMA Designation)
OR BATTERY OPERATION ISERT IN FEMALE ECEPTACLE ON CHASSIS, EN X PRONG CONNECTS O B– (blue wire) AND A– lock wire)
A.C. OR D.C. LINE
LINE SWITCH ON VOLUME CONTROL

SCHEMATIC DIAGRAM FOR CHASSIS USING 117L7GT
MODEL DF

10-39.

EMERSON RADIO & PHONOGRAPH CORP.

Item	Part No.	DESCRIPTION	PRIC (Subject to change without ice)
†Not supplied separately.			
T1	6XW-174	Loop antenna assembly	$1.1
L1	7FT-512	Iron core filter choke	.5
T2	6RT-476	Oscillator Coil	.3
T3	7BT-488A	Double-tuned 455 kc first i-f transformer	1.0
T4	7FT-513	Double-tuned 455 kc diode i-f transformer	.9
R1, R6	KR-53	50,000 ohm ¼ watt carbon resistor	.1
R2	ZZR-196	30,000 ohm ¼ watt carbon resistor	.1
R3	KR-50	500 ohm ¼ watt carbon resistor	.1
R4	OR-73	25,000 ohm ¼ watt carbon resistor	.1
R5	KR-54	100,000 ohm ¼ watt carbon resistor	.1
R7, R14	NNR-220	3 megohm ¼ watt carbon resistor	.1
R8	3HR-240C	Volume control with line and battery switch	1.0
R9	3RR-274	5 megohm ¼ watt carbon resistor	.1
R10, R12	KR-56	500,000 ohm ¼ watt carbon resistor	.1
R11	LR-61	200,000 ohm ¼watt carbon resistor	.1
R13	7FR-370	315 ohm metal clad resistor (see Production Change No. 2)	.3
R15, R16	PR-79	1,000 ohm ¼ watt carbon resistor (see General Note No. 9 and Production Change No. 3)	.1
R17	7JR-376	330 ohm ¼ watt carbon resistor (see General Note No. 9 and Production Change No. 3)	.1
C1, C2	6RC-436B	Two gang variable condenser	2.3
C3	3HC-274	0.002 mf, 600 volt tubular condenser	.2
C4, C6, C9, C26	BC-12	0.05 mf, 200 volt tubular condenser	.2
†C5		Trimmer part of loop assembly	
C7	BC-13	0.25 mf, 200 volt tubular condenser	.2
C8, C18	LC-65	0.02 mf, 400 volt tubular condenser	.2
†C10, C11, C12, C13		Trimmers, part of i-f transformers	
C14, C27	4XC-394A	0.00022 mf, mica condenser	.2
C15	5AC-388	0.25 mf, 100 volt tubular condenser	.2
C16	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.2
C17	HC-34	0.006 mf, 600 volt tubular condenser	.2
C19	3VC-324	0.003 mf, 600 volt tubular condenser	.2
C20	LC-64	0.05 mf, 400 volt tubular condenser	.2
C21, C22	6JC-426E	Dual 20 mf, 150 volt dry electrolytic condenser	.8
C23	NNC-199	0.001 mf, 600 volt tubular condenser (see Production Change No. 1)	.2
C24	7FC-451	40 mf, 25 volt dry electrolytic condenser	.8
C25		Trimmer, part of variable condenser	

List Price
Effective of
Oct. 1st, 19

PRODUCTION CHANGES

1. Chassis using certain speakers use output condenser C23 part no. KC-58—.01 mf.—400 volt.
2. Chassis bearing serial numbers between 3000651 and 3001051 and between 3325600 and 3326599 use 117L7GT in place of 70L7G and do not use resistor R13.
3. The schematic diagram of chassis using 70L7GT does not show resistors R16 and R17. These resistors occupy the same position i this chassis as they are shown in the schematic of chassis using 117L7GT.

Some chassis do not contain resistors R16 and R17. These resistors should be added to increase tube life.

On chassis bearing serial numbers between 2,888,350 and 2,963,000 use only bakelite base tubes when replacing the IN5GT's.

To permit the use of *metal base* 1N5GT's in the above chassis, the following change must be made in the chassis:

1. Unsolder and remove the three leads from the #1 pin soldering lug of the IN5GT socket at the rear of the chassis. (Three leads are condenser C26, resistor R15, and one wire.)
2. Solder these three leads to the #8 pin soldering lug of the 1A7GT socket. (This lug is a blank.)

The tube complement is as follows:

1—1A7GT oscillator-modulator.
1—1N5GT 1st i-f amplifier.
1—1N5GT 2nd i-f amplifier.
1—1H5GT 2nd detector, a.v.c., a-f amplifier.
1—3Q5GT beam power output (battery operation only).
1—70L7GT beam power output and half wave rectifier (line operation only).
or
1—117L7GT beam power output and half wave rectifier (see Production Change No. 2)

See Note above.

Range	540—1600 kc.
Voltage Rating (Line Operation)	105-125 volts a.c. o
Power Consumption (Line Operation)	30 watts
Current Drain (Battery Operation)	"A" Battery 0.05 a "B" Battery 0.01 a

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable co denser.

The loop antenna acts as the antenna coil. The trimmer for the loop is on the loop frame.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is the one at the left end of the chassi The diode i-f transformer is located between the 1N5GT first i-f tube and the variable condenser. The trimming condensers f both transformers can be reached through holes in the tops of the cans.

Alignment

IF-Swing variable condenser to minimum capacity position.

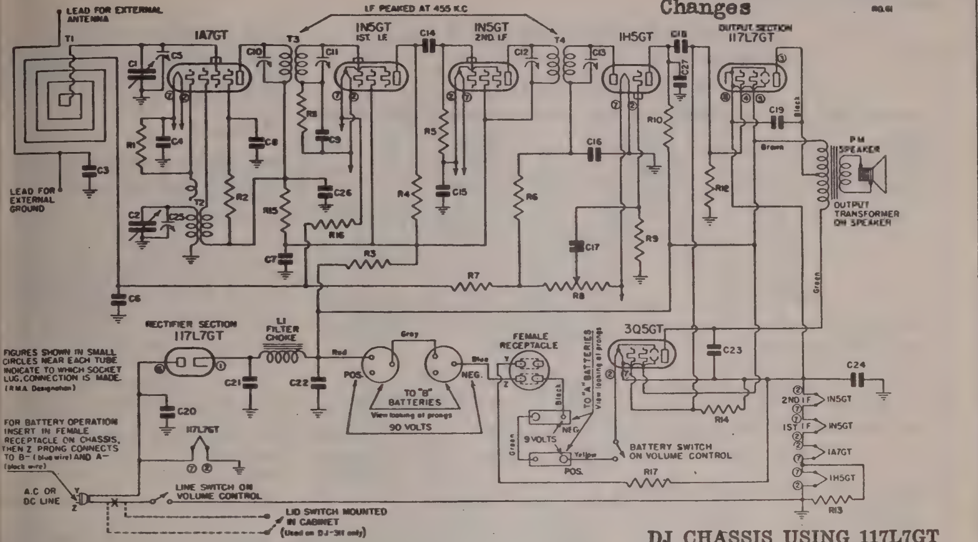
Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response

RF-Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillato trimmer (on rear section of variable condenser) then the antenna trimmer (on loop frame) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance Align at 140. Set the dial at 60 an feed 600 kc to the antenna lead. A portion of the outside turn of the loop may then be swung to either side of the center to giv maximum response. Realign at 140.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DJ310,DJ311,DJ312
Chassis DJ (2 Types)
Schematics,Voltage
Changes

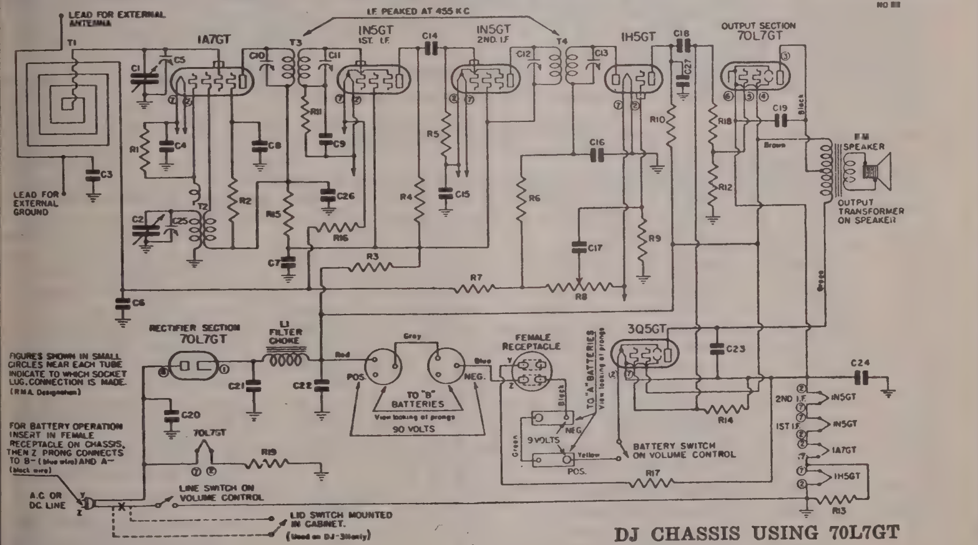

LEAD FOR EXTERNAL ANTENNA
IF PEAKED AT 455 KC
T1
1A7GT
T3
1N5GT 1ST I.F.
C14
1N5GT 2ND I.F.
T4
1H5GT
C18
OUTPUT SECTION 117L7GT
C1
C5
C10
C11
C12
C13
C27
R1
C4
C8
R8
C9
R5
R10
C19
Black
Brown
PM SPEAKER
C3
C16
LEAD FOR EXTERNAL GROUND
C26
R4
C15
R6
R12
OUTPUT TRANSFORMER ON SPEAKER
C2
C25
T2
R2
R15
R16
C17
R9
C7
R3
R7
R8
Green
C6
RECTIFIER SECTION 117L7GT
L1 FILTER CHOKE
Red
Gray
Blue
FEMALE RECEPTACLE
TO "A" BATTERIES View looking at prongs
3Q5GT
C23
C24
FIGURES SHOWN IN SMALL CIRCLES NEAR EACH TUBE INDICATE TO WHICH SOCKET LUG. CONNECTION IS MADE. (RMA Designation)
C21
C22
POS.
NEG.
TO "B" BATTERIES View looking at prongs 90 VOLTS
Black
NEG
9 VOLTS
Green
Yellow
POS.
R14
2ND I.F. 1N5GT
1ST I.F. 1N5GT
1A7GT
1H5GT
C20
117L7GT
FOR BATTERY OPERATION INSERT IN FEMALE RECEPTACLE ON CHASSIS, THEN Z PRONG CONNECTS TO B- (blue wire) AND A- (black wire)
BATTERY SWITCH ON VOLUME CONTROL
R17
A.C OR DC LINE
Y
Z
LINE SWITCH ON VOLUME CONTROL
R13
LID SWITCH MOUNTED IN CABINET (Used on DJ-311 only)

DJ CHASSIS USING 117L7GT

DUCTION CHANGES

I chassis bearing serial numbers below 3,017,129 use 70L7GT rectifier-output tube. See lower schematic.

I Model DJ-311 receivers after serial number 3,021,529, the door switch, part No. 7JS-444, has been omitted.


LEAD FOR EXTERNAL ANTENNA
IF PEAKED AT 455 KC
T1
1A7GT
T3
1N5GT 1ST I.F.
C14
1N5GT 2ND I.F.
T4
1H5GT
C18
OUTPUT SECTION 70L7GT
C1
C5
C10
C11
C12
C13
C27
R1
C4
C8
R11
C9
R5
R10
R18
C19
Black
Brown
PM SPEAKER
C3
C16
LEAD FOR EXTERNAL GROUND
C26
R4
C15
R6
R12
OUTPUT TRANSFORMER ON SPEAKER
C2
C25
T2
R2
R15
R16
C17
R9
C7
R3
R7
R8
Green
C6
RECTIFIER SECTION 70L7GT
L1 FILTER CHOKE
Red
Gray
Blue
FEMALE RECEPTACLE
TO "A" BATTERIES View looking at prongs
3Q5GT
C23
C24
FIGURES SHOWN IN SMALL CIRCLES NEAR EACH TUBE INDICATE TO WHICH SOCKET LUG. CONNECTION IS MADE. (RMA Designation)
C21
C22
POS.
NEG.
TO "B" BATTERIES View looking at prongs 90 VOLTS
Black
NEG
9 VOLTS
Green
Yellow
POS.
R14
2ND I.F. 1N5GT
1ST I.F. 1N5GT
1A7GT
1H5GT
C20
70L7GT
R19
FOR BATTERY OPERATION INSERT IN FEMALE RECEPTACLE ON CHASSIS, THEN Z PRONG CONNECTS TO B- (blue wire) AND A- (black wire)
BATTERY SWITCH ON VOLUME CONTROL
R17
A.C OR DC LINE
Y
Z
LINE SWITCH ON VOLUME CONTROL
R13
LID SWITCH MOUNTED IN CABINET. (Used on DJ-311 only)

DJ CHASSIS USING 70L7GT

TAGE ANALYSIS

n should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with nol turned on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

Tube	*Plate*	*Screen*	*Osc. Plate*	*Fil.*
1A7GT	88	50	82	1.5
1N5GT 1st i-f	50	88	—	1.5
1N5GT 2nd i-f	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT	85	88	—	3.0
117L7GT (line operation only)	86	95	—	117

117L7GT rectifier cathode (Pin no. 1) (line operation only)—125 volts. (See production change no. 1.)

MODELS DJ310,DJ311,DJ312
Chassis DJ
Alignment,Batt.Data,Parts
Trimmers

EMERSON RADIO & PHONOGRAPH CORP.

MODELS: DJ-310, DJ-311 and DJ-312

CHASSIS MODEL: DJ

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Type Battery	*No. Req.*	*Eveready Part No.*	*Rayovac Part No.*	*Burgess Part No.*
4½ volt "A"	2	746 (plug-in type)	P83A or EM-83 (plug-in type)	3G (plug-in type)
45 volt "B"	2	482 Minimax (plug-in type)	—	—

DESCRIPTION

Type: Universal (Battery, A.C.-D.C.) Superheterodyne.

Frequency Range: 540-1600 kc.

Power Supply: Battery, A.C. or D.C.

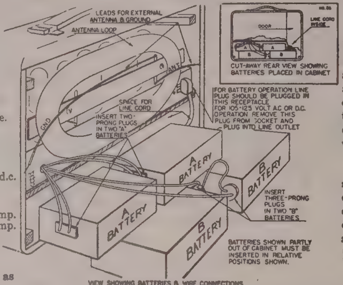
Voltage Rating: (Line operation) 105-125 volts, a.c.-d.c.

Power Consumption: (Line operation) 30 watts.

Current Drain: (Battery operation) "A" battery 0.05 amp.
"B" battery 0.01 amp.

GENERAL NOTES

1. The color coding of the i-f transformer leads is as follows:
   Grid—green Plate—blue
   Grid return—black B plus—red
2. The color coding of the battery cable is as follows:
   Red—B plus, 90 volts Yellow—A plus, 9 volts
   Blue—B minus Black—A minus
3. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
4. **A.C.-D.C. Operation:** Open the small door at the back of the cabinet. *It is important that this small door be left open while operating the receiver on either a.c. or d.c. power.* Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet. If the power supply is d.c. and the receiver does not operate at first, remove the plug from the wall outlet, turn it half way around and re-insert it in the outlet, thus obtaining the proper polarity.
5. **Battery Operation: Important:** Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet underneath the shelf.


LEADS FOR EXTERNAL ANTENNA & GROUND
ANTENNA LOOP
ANT
GND
SPACE FOR LINE CORD
INSERT TWO-PRONG PLUGS IN TWO "A" BATTERIES
A BATTERY
B BATTERY
A BATTERY
B BATTERY
FOR BATTERY OPERATION LINE PLUG SHOULD BE PLUGGED IN THIS RECEPTACLE FOR 105-125 VOLT AC OR DC OPERATION REMOVE THIS PLUG FROM SOCKET AND PLUG INTO LINE OUTLET
INSERT THREE-PRONG PLUGS IN TWO "B" BATTERIES
BATTERIES SHOWN PARTLY OUT OF CABINET MUST BE INSERTED IN RELATIVE POSITIONS SHOWN.
DOOR
LINE CORD
A
A
B
B
CUT-AWAY REAR VIEW SHOWING BATTERIES PLACED IN CABINET

CHASSIS MODEL DJ

VIEW SHOWING BATTERIES & WIRE CONNECTIONS
(WITH BACK REMOVED)

6. The receiver has a self-contained antenna and normally does not require additional antenna or ground connection. For permanent home installations of this model, however, in a location far removed from broadcasting stations, an additional outside antenna should be used. The outside antenna and ground connections should be made to the two leads at the rear of the cabinet. See the illustration
7. The self-contained loop antenna has directional properties. *It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.*

ADJUSTMENTS

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the front section of the variable condenser.

The loop antenna acts as the antenna coil. The trimmer for the loop is on the rear section of the variable condenser.

The i-f transformers are located in cans mounted top of the chassis. The first i-f transformer is at the rig of the variable condenser and the diode i-f transformer to the left of the variable condenser. The trimming co densers for both transformers can be reached throu holes in the tops of the cans.

I-f Alignment

Swing variable condenser to minimum capacity positi Feed 455 kc to the grid of the 1A7GT tube throu a 0.01 mf condenser. Adjust the four i-f trimmers maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from signal generator into a loop of wire about one foot diameter. Hold this radiating loop approximately one fo away from and parallel to the receiver loop antenna a advance the output of the signal generator until a suitab deflection is obtained on the output meter. Adjust fir the oscillator trimmer (on front section of variable co denser) then the antenna trimmer (on rear section variable condenser) for maximum response.

If the loop antenna has been replaced it may be nece sary to adjust the loop inductance. Align at 140. Set th dial at 60 and feed 600 kc to the radiating loop. A portio of the outside turn of the loop may then be swung either side of the center to give maximum response. R align at 140.

Battery Installation

To install and connect the batteries in this cabin observe the following procedure:

1. Remove the back panel of the cabinet by taking ou the screws.

2. Locate the battery cable coming from the receive and identify the plugs on the cable ends.

3. Insert the three-prong plug on the battery cabl into the two "B" batteries. Place the two batteries in th bottom of the cabinet with the plug-ends of the batterie facing each other. Push the batteries up against the fron of the cabinet. The wood blocks at the rear corners an rear center of the cabinet serve to hold the "B" batteries in place.

4. Insert the two-prong plug on the battery cable into the two "A" batteries. Place the "A" batteries, one at a time, above the "B" batteries in the cabinet. The plug-ends of the "A" batteries should be facing to the left, as indicated in the illustration. Push the "A" batteries to the left, when placing them in the cabinet, in order to clear the small wood block in the front right-hand corner of the cabinet.

5. Replace the back panel of the cabinet and fasten it in place with the screws.

*Item	Part No.	DESCRIPTION	PRICE
T1	7JW-206	Loop antenna assembly	$ .95
L1	7JT-524	Iron core filter choke	.85
T2	7CT-511	Oscillator coil	.40
T3	7BT-488E	Double-tuned 455 kc first i-f transformer	.95
T4	7JT-544A	Double-tuned 455 kc diode i-f transformer	.95
R1, R6	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R2	ZZR-196	30,000 ohm ¼ watt carbon resistor	.16
R3	KR-50	500 ohm ¼ watt carbon resistor	.16
R4	OR-73	25,000 ohm ¼ watt carbon resistor	.16
R5	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R7, R14	NNR-220	3 megohm ¼ watt carbon resistor	.16
R8	3HR-240E	Volume control with line and battery switch (500,000 ohms)	.95
R9, R11	3RR-274	5 megohm ¼ watt carbon resistor	.16
R10, R12	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R18	LR-61	200,000 ohm ¼ watt carbon resistor (see production change no. 1)	
R13	7JR-376	330 ohm ¼ watt carbon resistor (see production change no. 1)	.16
R15, R17	PR-79	1,000 ohm ¼ watt carbon resistor	.16
R16	4XR-327	15 megohm ¼ watt carbon resistor	.16
C1, C2	7BC-445	Two-gang variable condenser	2.30
C3	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C6, C7, C9, C26, C28	BC-12	0.05 mf, 200 volt tubular condenser	.20

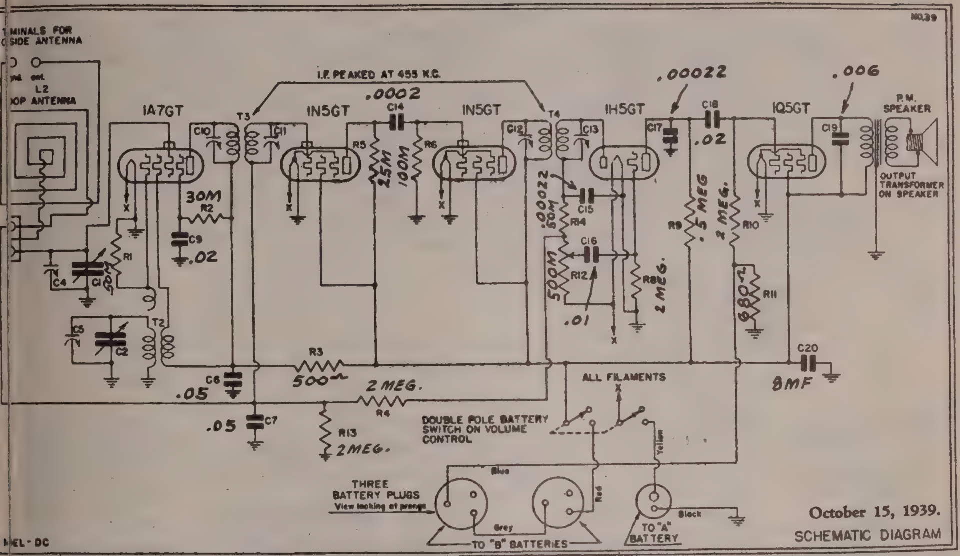
*Item	Part No.	DESCRIPTION	PRICE
C8, C18	LC-65	0.02 mf, 400 volt tubular condenser	.20
†C10, C11, C12, C13		Trimmers, part of i-f transformers.	
C14, C27	4XC-394A	0.00022 mf, mica condenser	.20
C15	5AC-388	0.25 mf, 100 volt tubular condenser	.20
C16	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C17	HC-34	0.006 mf, 600 volt tubular condenser	.20
C19	3VC-324	0.003 mf, 600 volt tubular condenser	.20
C20	LC-64	0.05 mf, 400 volt tubular condenser	.20
C21, C22	6JC-426E	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C23	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C24	7FC-451	40 mf, 25 volt dry electrolytic condenser	.80
†C25, C5		Trimmer, part of variable condenser.	
C29	AC-6	0.1 mf, 200 volt tubular condenser	.20
	7JS-444	Door switch (for DJ-311)	.50
	7JS-440	5½" permanent magnet dynamic speaker (for DJ-310 and DJ-326)	5.10
	7JS-443	6½" permanent magnet dynamic speaker (for DJ-311 and 312)	5.75
		DIAL PARTS	
	7JD-93	Dial face	.10
	4MZ-588A	Dial pointer	.20
	7BH-40B	Dial drive shaft	.10
	6RW-162	Drive cord spring	.02
	7JW-217	Battery cable (DJ)	.60
	7BZ-867A	Dial drive cord	.02
	7JE-30A	Dial crystal (for 310, 311)	.25
	7JE-30	Dial crystal (for 312)	.20

*Item number locates article on schematic diagram. †Not supplied separately.

Specify part numbers when ordering—List price each effective as of October 15, 1939. (Subject to change without notice.)

EMERSON RADIO & PHONOGRAPH CORP.

MODEL DC308
Chassis DC
Schematic,Voltage,Changes
Alignment,Trimmers



October 15, 1939.

SCHEMATIC DIAGRAM

The tube complement is as follows:

1—1A7GT oscillator-modulator
1—1N5GT 1st i-f amplifier
1—1N5GT 2nd i-f amplifier
1—1H5GT 2nd detector, a.v.c., a-f amplifier
1—1Q5GT pentode output

PRODUCTION CHANGES

1. **Chassis bearing serial numbers below 2,936,285 use .5 megohm at R10.**
2. **Chassis bearing serial numbers below 2,939,151 use diode i-f transformer**

Current drain .... "A" battery—0.3 amps.
"B" battery—0.010 amps. with no signal

Frequency range ....530 to 1600 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control d on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	*Plate*	*Screen*	*Osc. Plate*	*Fil.*
1A7GT	82	52	82	1.5
1N5GT 1st i-f	70	82	—	1.5
1N5GT 2nd i-f	82	82	—	1.5
1H5GT	25	—	—	1.5
1Q5GT	77	82	—	1.5

Bias for the 1Q5GT tube is obtained across the resistor R11. The voltage drop across this resistor should be 6.8 volts.

cation of Coils and Trimmer Adjustments

The first i f transformer is located to the right of the variable condenser and the diode i-f transformer to the left of the vari- condenser. Trimmers for both transformers are accessible through holes in the tops of the cans.

The oscillator coil is located under the chassis, beneath the variable condenser. Trimmer for the oscillator is located on the section of the variable condenser.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the rear section of the variable condenser.

Alignment

Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

Alignment

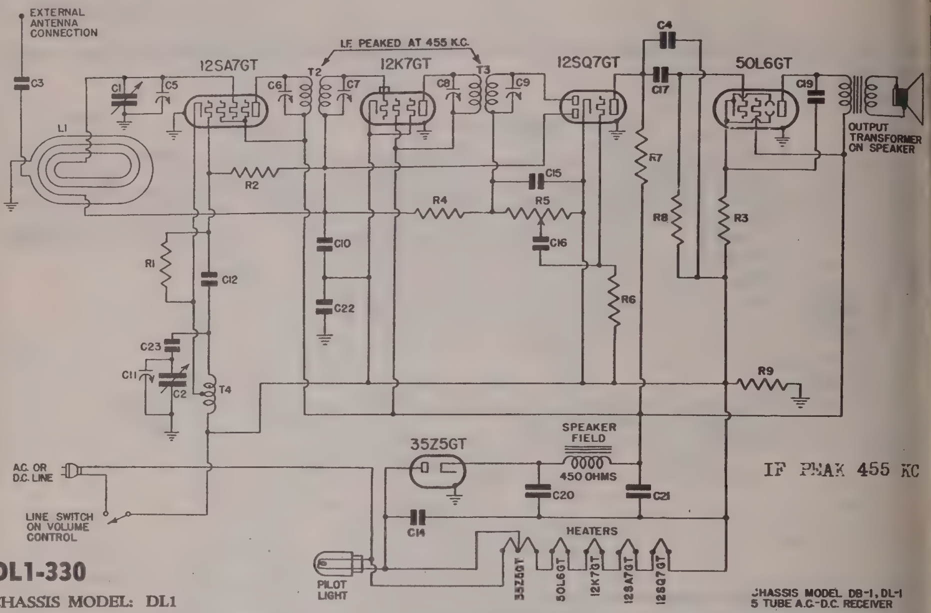
Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscil- trimmmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for max- response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance, align at 140. With the pointer set at 60 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum nse. Repeat the alignment at 140.

MODEL DL1-330
Chassis DL1
Schematic ,Parts

EMERSON RADIO & PHONOGRAPH CORP.

NO.73



IF PEAK 455 KC

DL1-330

CHASSIS MODEL: DL1

FOR ALIGNMENT,VOLTAGE, AND TRIMMERS SEE DL-330 CHASSIS DL.

When ordering, specify part numbers. List price each, effective as of Jan. 1, 1940. **Subject to change without notice.**

*Item	Part No.	DESCRIPTION	PRICE
L1	7BW-179	Loop antenna assembly	$ .90
T4	7BT-486	Oscillator coil (DL)	.40
T4	7BT-486A	Oscillator coil (DL1)	.40
T2	7BT-488	Double-tuned 455 kc first i-f transformer	1.00
T3	7BT-550B	Double-tuned 455 kc second i-f transformer	.95
R1	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ wattwire-wound resistor	.16
R4	NNR-220	3 megohm ¼ watt carbon resistor	.16
R5	7LR-378	Volume control 0.5 megohm with line switch	.85
R6, R2	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7, R8	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R9	LR-61	200,000 ohm ¼ watt carbon resistor (DL1)	.16
C1, C2	7BC-445A	Two-gang variable condenser	2.25
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10, C23	BC-12	0.05 mf, 200 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C12, C15, C4	4XC-394A	0.00022 mf mica condenser	.20
C16, C3	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17, C19	6JC-425	0.024 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426C	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C22	3CC-302	0.15 mf, 200 volt tubular condenser (DL1 only)	.20
	7BS-409	5" dynamic speaker (DL)	3.80
	7BS-435	5" dynamic speaker (DL1)	3.85
	6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda No. 47	.20
	7BB-77	Pilot light socket	.15
	7LD-96	Dial face	.25
	7BZ-867A	Drive cord	.02
	6RW-162	Drive cord spring	.02
	7BH-40C	Drive shaft and pulley	.10
	7QD-103	Dial pointer	.15
	5FZ-758	Dial crystal (DL)	.25
	5FZ-758A	Dial crystal (DL1)	.25

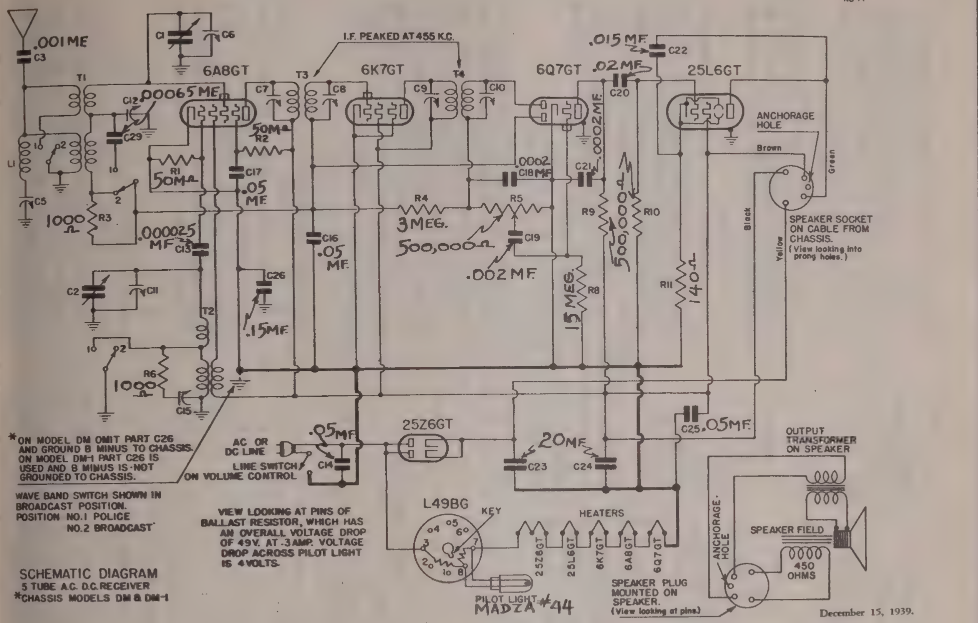
*Item number locates the article on the schematic diagram.

†Not supplied separately.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DM331,DM1-331
Chassis DM,DM1
Schematic,Voltage
Alignment,Trimmers

NO 71



*ON MODEL DM OMIT PART C26 AND GROUND B MINUS TO CHASSIS. ON MODEL DM-1 PART C26 IS USED AND B MINUS IS NOT GROUNDED TO CHASSIS.

WAVE BAND SWITCH SHOWN IN BROADCAST POSITION.
POSITION NO.1 POLICE
NO.2 BROADCAST

VIEW LOOKING AT PINS OF BALLAST RESISTOR, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT .3AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4VOLTS.

SPEAKER PLUG MOUNTED ON SPEAKER. (View looking at pins.)

SCHEMATIC DIAGRAM
5 TUBE A.C. D.C. RECEIVER
*CHASSIS MODELS DM & DM-1

December 15, 1939.

ODEL: DM-331 MODEL: DM1-331

ASSIS MODEL: DM CHASSIS MODEL: DM1

DESCRIPTION

ype: Two-band superheterodyne.

equency ranges: 540 -1700 kc
2300-6600 kc

umber of Tubes: Five.

ype of tubes:

- 1—6A8GT, pentagrid oscillator-modulator
- 1—6K7GT, first i-f amplifier
- 1—6SQ7GT, diode detector, a-f amplifier, a.v.c.
- 1—25L6GT, beam power output
- 1—25Z6GT, dual half-wave rectifier.

Octal-base tubes in this receiver may be replaced with either metal or bantam-type octal-base glass tubes. The letters "GT" at the end of the tube number indicates that the tube has a bantam glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

ower supply: A.C. or D.C.

oltage rating: 105-125 volts.

ower consumption: 45 watts.

GENERAL NOTES

If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.

The filament dropping resistor (L49BG on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.

3. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
4. The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
5. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

6. The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 455, 1500 and 6000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the short-wave antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the oscillator.

The trimmers for the broadcast oscillator and antenna coil are mounted on a dual assembly just below the variable condenser underneath the chassis.

The 455 kc wave-trap is part of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Note No. 6.)

Short-Wave Alignment

(Short-wave alignment should precede broadcast alignment.)

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a standard dummy antenna to the antenna lead. If an I.R.E. standard dummy antenna is not available, a 0.0002 mf mica condenser in series with 400 ohm non-inductive resistor may be used as a substitute.

Adjust first the oscillator trimmer (on front section of the variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 150 and feed 1500 kc through a standard dummy antenna to the antenna lead. A .0002 mf mica condenser may be used as a substitute. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of dual assembly) for maximum response.

VOLTAGE ANALYSIS

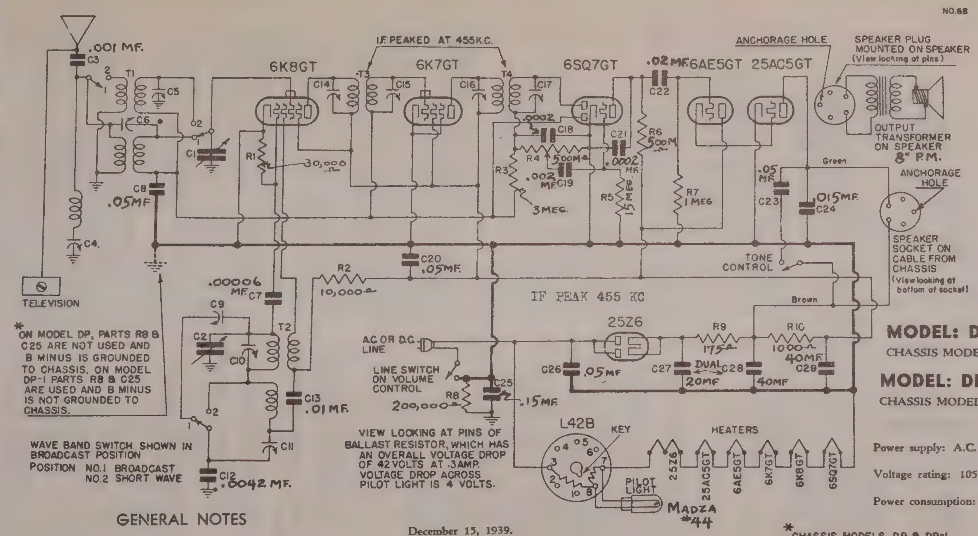
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings pt cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A8GT	95	45	0	95	6.3
6K7GT	95	95	0	—	6.3
†6SQ7GT	38	—	0	—	6.3
‡25L6GT	90	95	6.5	—	25.0

Voltage at 25Z6 cathode—125 volts. Voltage drop across ballast resistor (pins nos. 3, 7)—49 volts.
Voltage across speaker field—28 volts. Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

MODELS DP332,DP1-332
Chassis DP,DP1
Schematic,Voltage
Alignment,Trimmers

EMERSON RADIO & PHONOGRAPH CORP.



December 15, 1939.

*CHASSIS MODELS DP & DP-1
6 TUBE A.C. D.C. RECEIVER

MODEL: DP-332
CHASSIS MODEL: DP

MODEL: DP1-332
CHASSIS MODEL: DP1

Power supply: A.C. or D.C.

Voltage rating: 105-125 volts.

Power consumption: 43 watts.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. The filament dropping resistor (L42B on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.
3. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
4. The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
5. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

6. The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

DESCRIPTION

Type: Two-band superheterodyne.

Frequency ranges: 540-1730 kc
5.6-18 mc.

Number of tubes: Six.

Type of tubes:

1—6K8GT, pentagrid oscillator-modulator
1—6K7GT, first i-f amplifier
1—6SQ7GT, diode detector, a-f amplifier, a.v.c.
1—6AE5GT, audio amplifier
1—25AC5GT, dynamic coupled output
1—25Z6GT, dual half-wave rectifier.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6K8GT	90	90	0	70	6.3
6K7GT	90	90	0	—	6.3
6SQ7GT	30	—	0	—	6.3
6AE5GT	90	—	14	—	6.3
25AC5GT	110	—	0	—	25.0

Voltage at 25Z6—125 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

ADJUSTMENTS

An oscillator with frequencies of 455, 1600 and 16,000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the antenna coil are mounted on the antenna coil assembly behind and to the right of the variable condenser. The trimmer in the center is for the broadcast band and the trimmer at the bottom for the short-wave band.

The trimmers for the oscillator coil are mounted on the oscillator coil assembly, located on the rear wall underneath the chassis. The trimmer farthest from the end is for the broadcast band. The center trimmer is the broadcast series padding condenser, and the trimmer closest to the end is for the short-wave band.

The 455 kc wave-trap is part of the antenna coil assembly. The trimmer for the trap is the uppermost trimmer of the assembly.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Note No. 6.)

Short-Wave Alignment

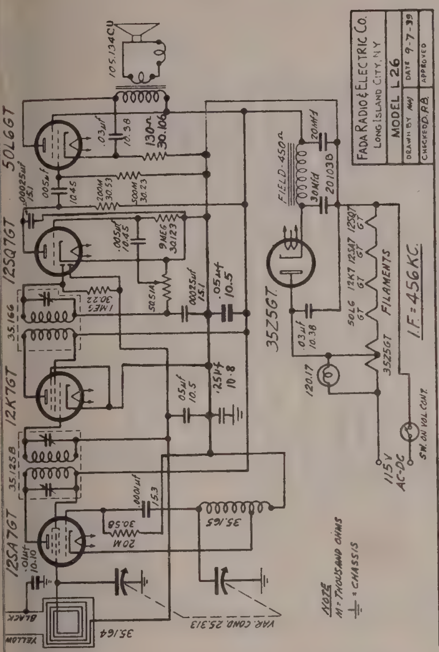
With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 16 mc. Feed 16,000 kc through a standard short-wave dummy antenna (a 400 ohm resistor may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer, then the antenna trimmer for maximum response.

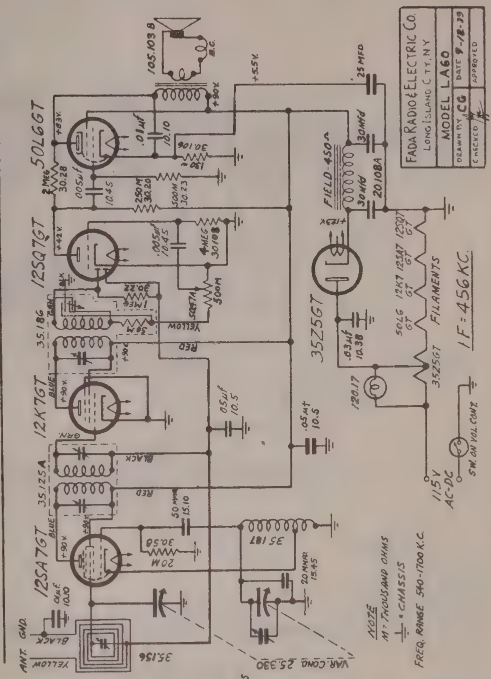
Broadcast Alignment

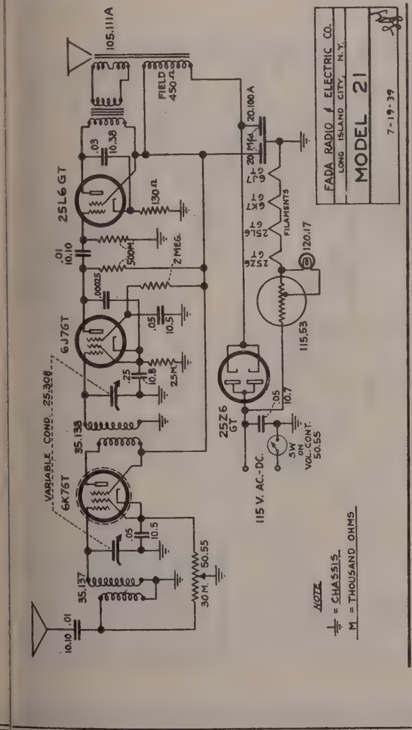
Rotate the wave-band switch clockwise and set the pointer at 160. Feed 1600 kc through a standard broadcast dummy antenna to the antenna lead (a .0002 mf condenser may be used as a substitute) and adjust first the broadcast oscillator trimmer and then the antenna trimmer for maximum response. Move pointer to 60, feed 600 kc and adjust series padder (while rocking the variable) for maximum response.

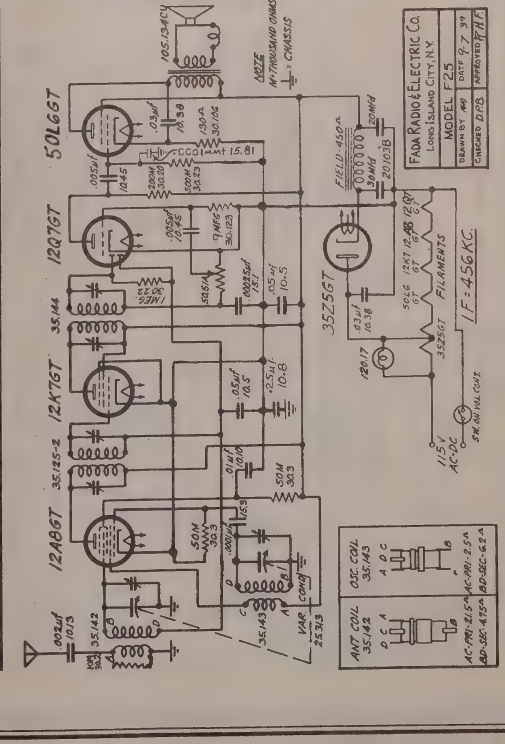
FADA RADIO & ELECTRIC CO

MODEL 21
MODEL F25
MODEL L26



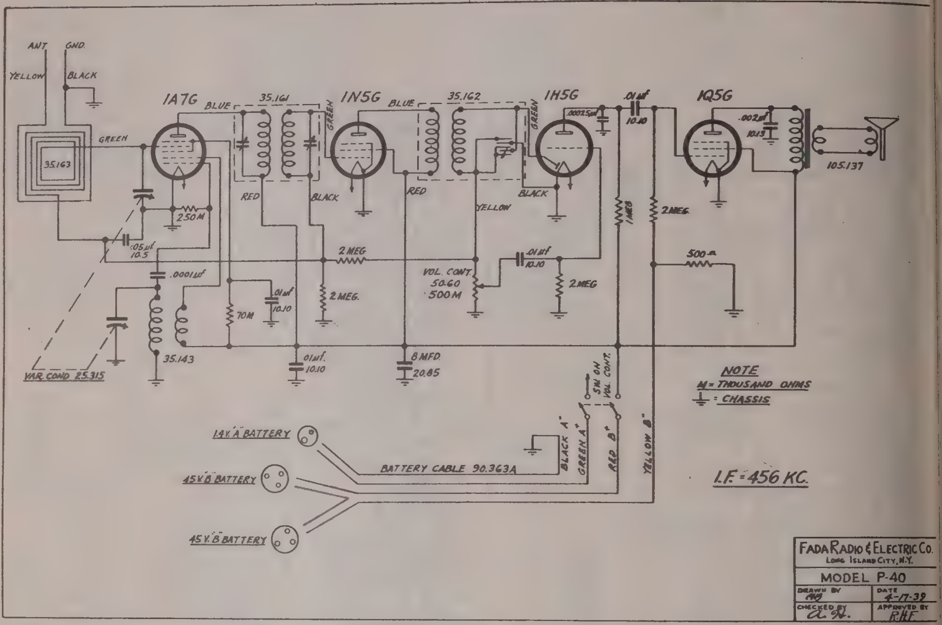


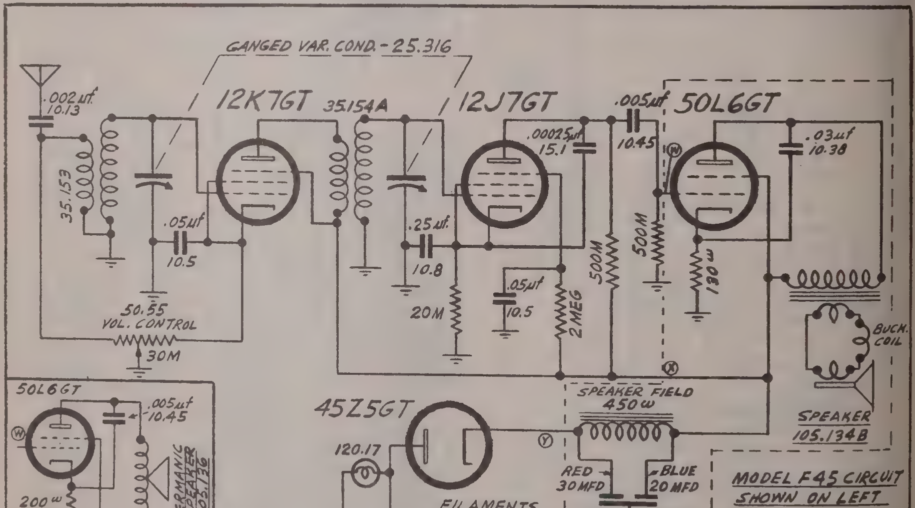




MODEL P40
MODELS F44,F45
Schematics

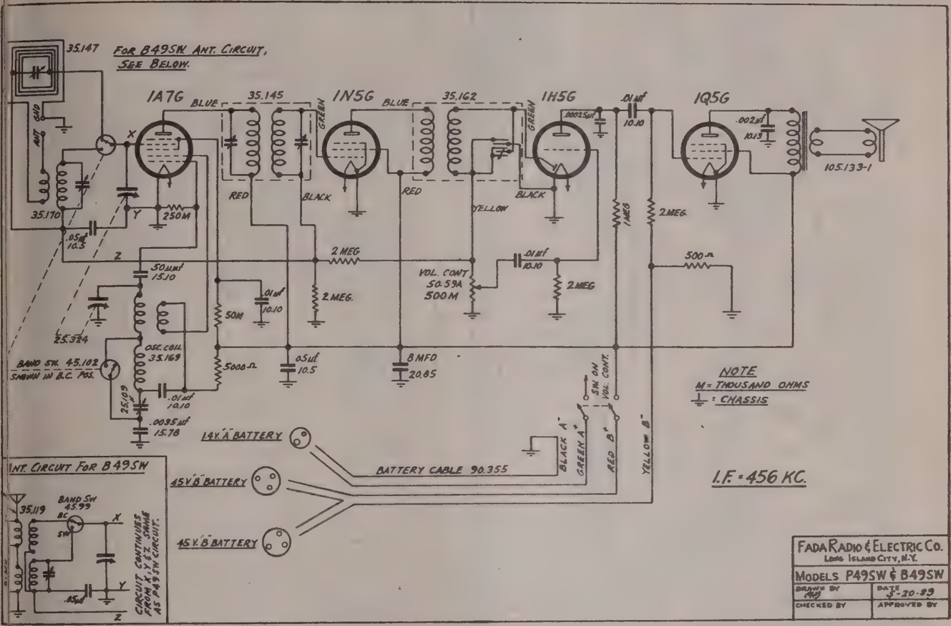
FADA RADIO & ELECTRIC CO

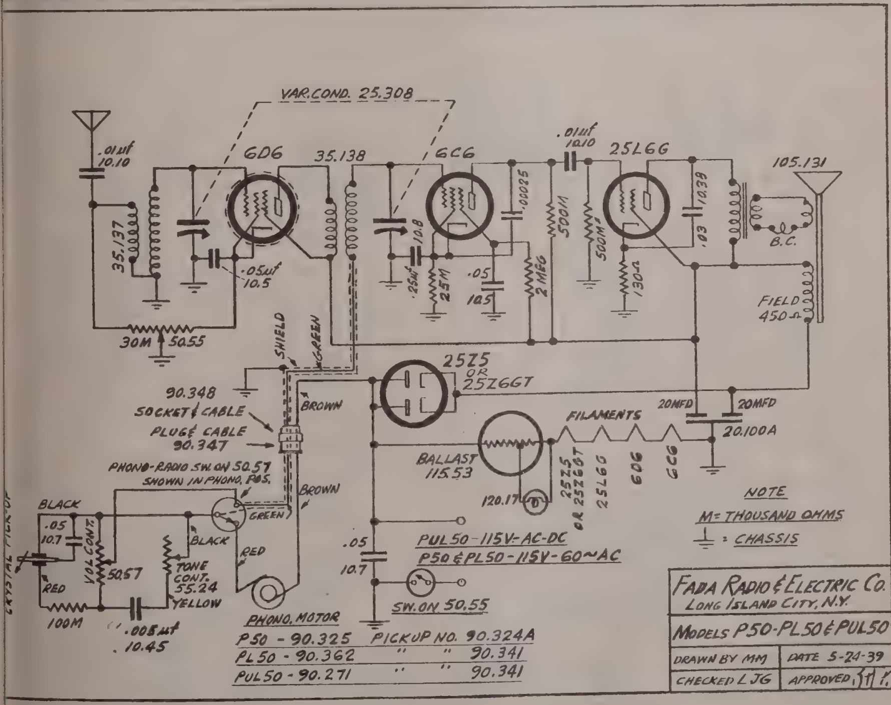




FADA RADIO & ELECTRIC CO

MODELS P49SW,B49SW
MODELS P50,PL50,PUL50
Schematics

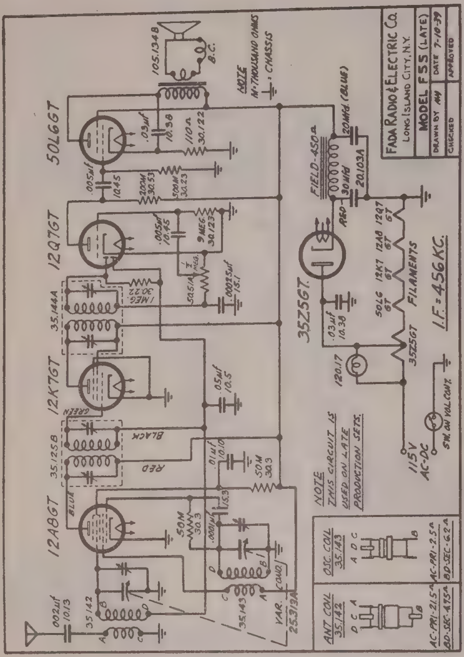


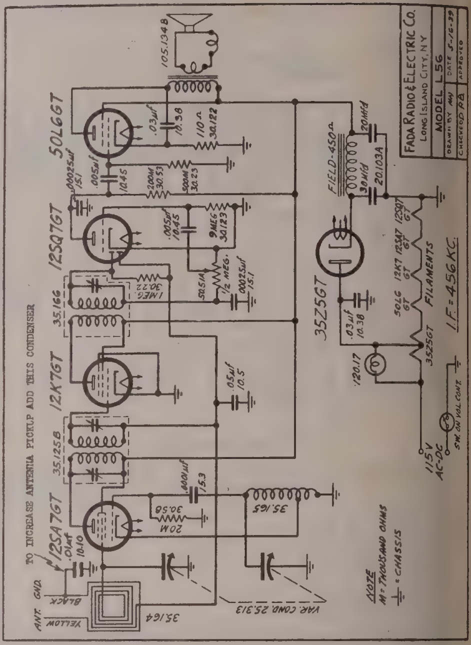


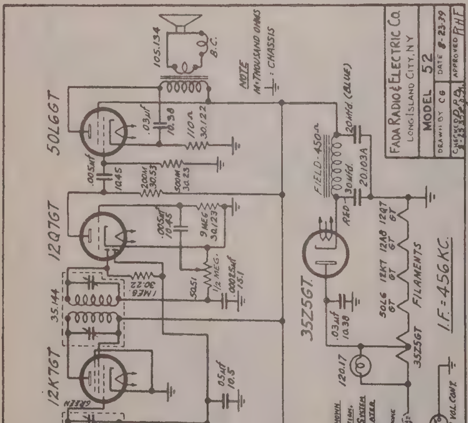
MODELS 52,F52
MODEL 53
MODEL F55 Late

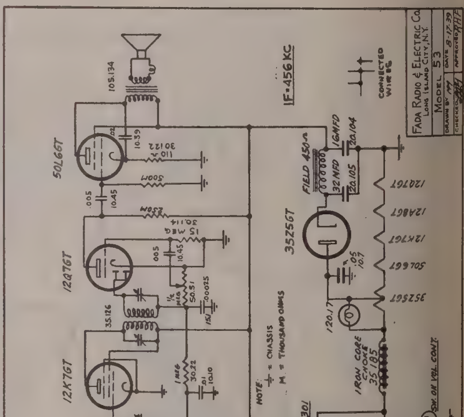
FADA RADIO & ELECTRIC CO

MODEL L5
Schemati



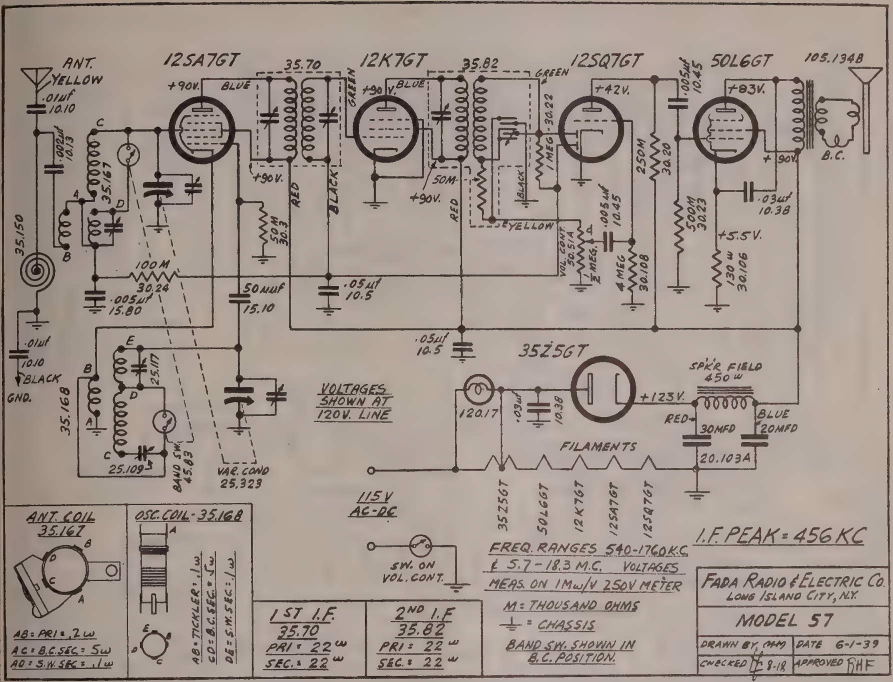


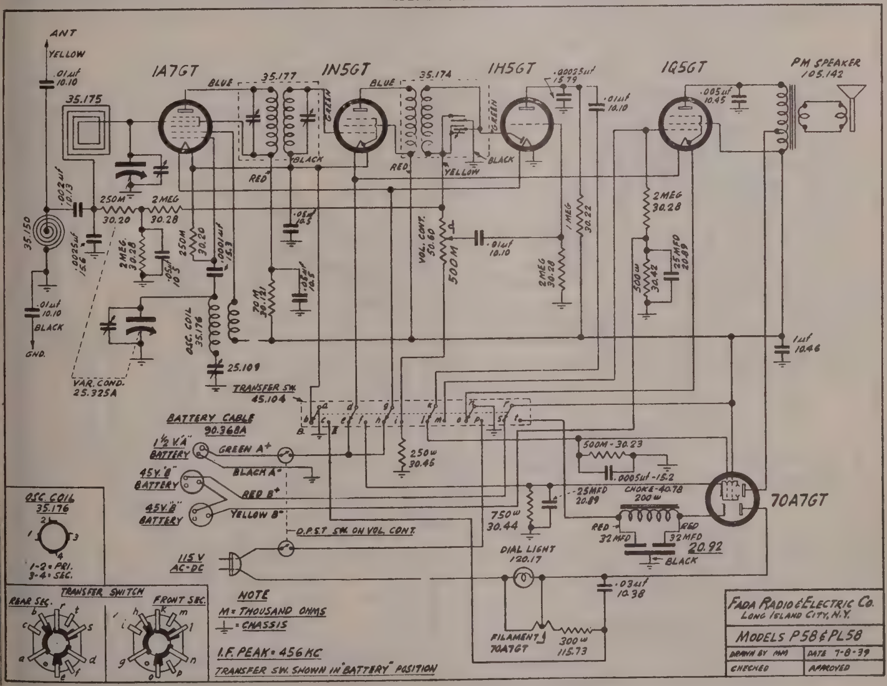




FADA RADIO & ELECTRIC CO

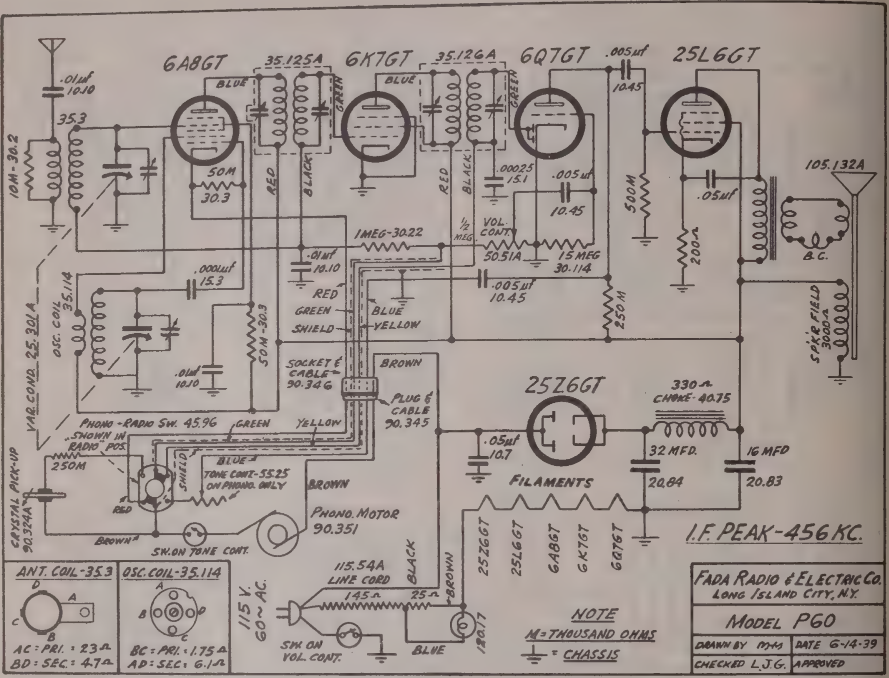
MODEL 57
MODELS P58,PL58
Schematics



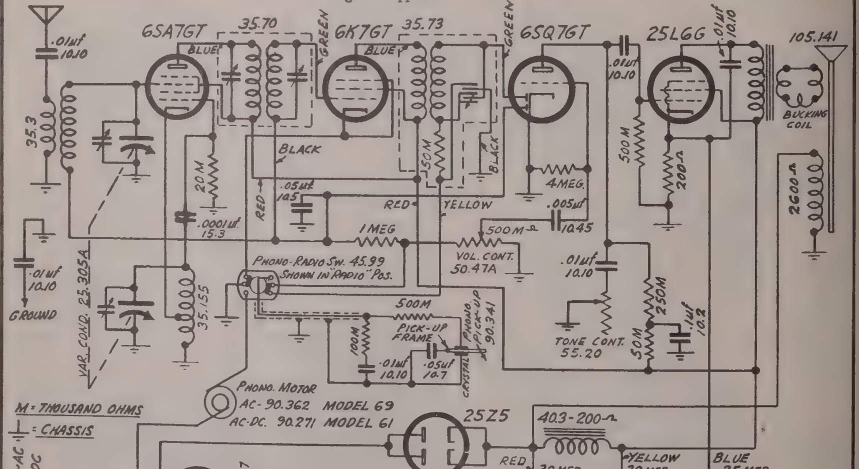


MODEL P60
MODELS 61,69
Schematics

FADA RADIO & ELECTRIC CO

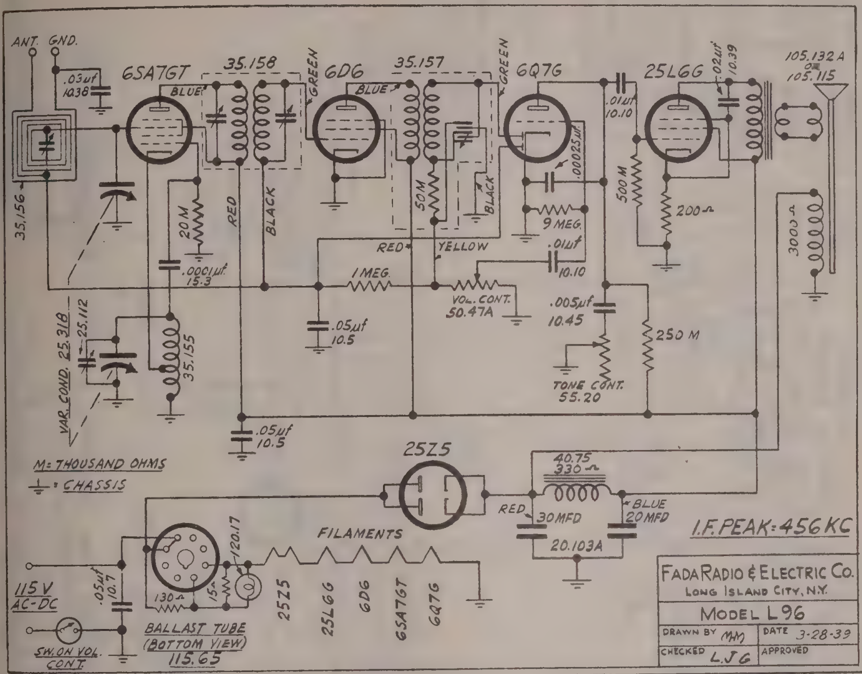


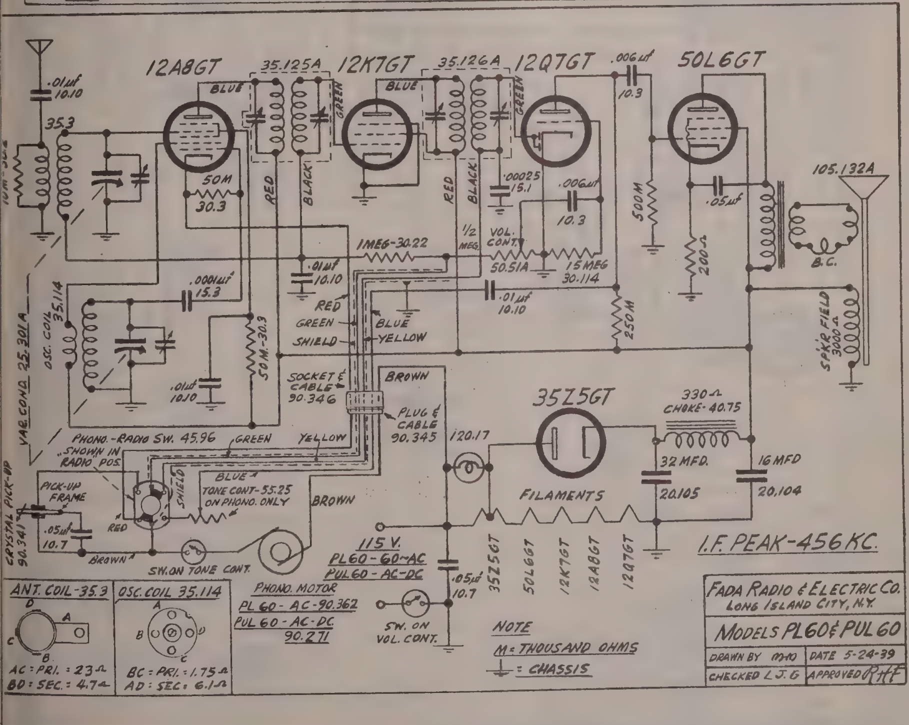
HUM - A.C. leads from ballast to rectifier (Blue and Brown) are too close to the grid of the 6SQ7GT in some sets. Lift and rearrange on opposite sides of chassis.



FADA RADIO & ELECTRIC CO

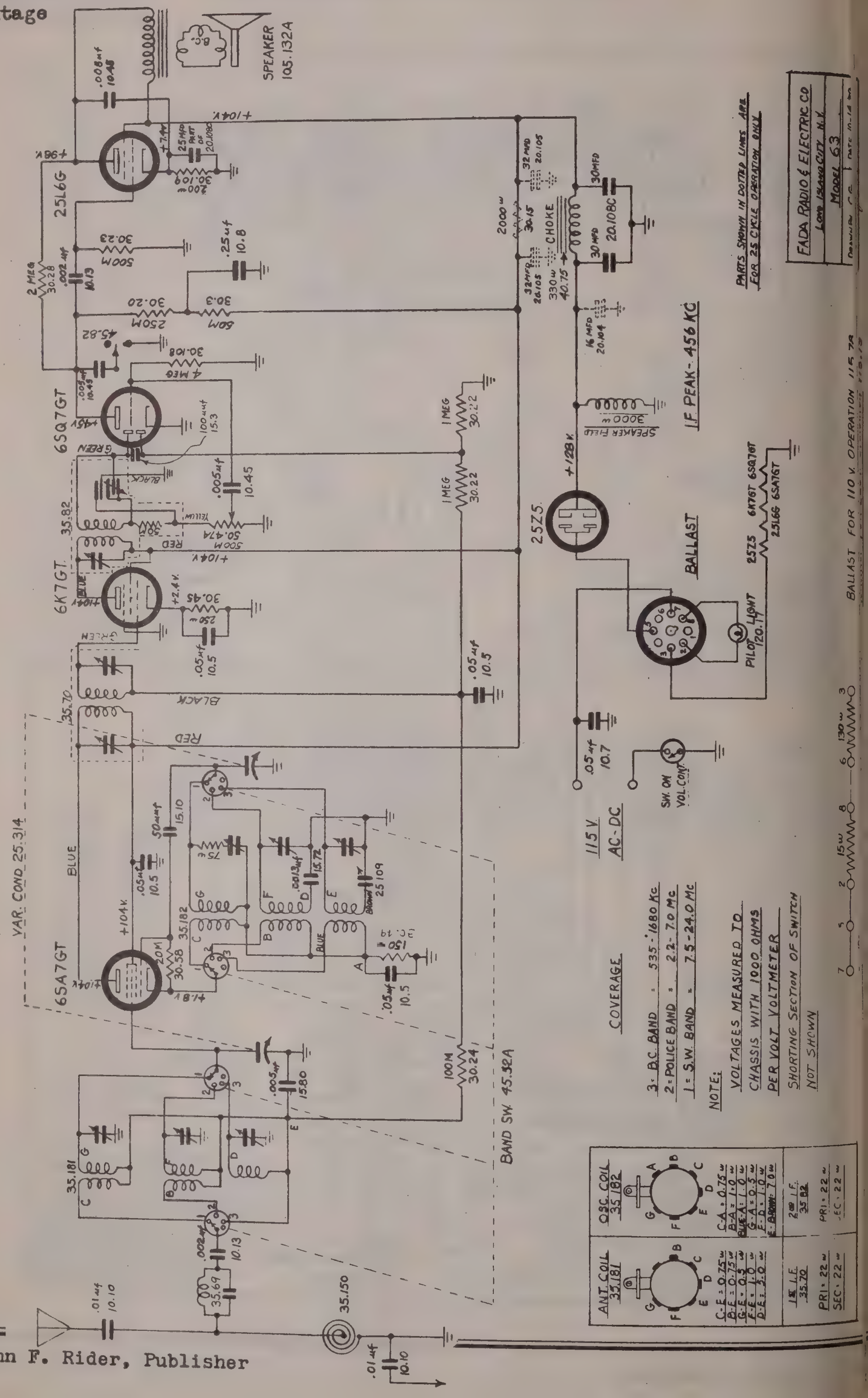
MODELS PL60,PUL60
MODEL L96
Schematics





MODEL 63
Schematic
Voltage

FADA RADIO & ELECTRIC CO



COVERAGE

3 = B.C. BAND = 535-1680 Kc
2 = POLICE BAND = 2.2-7.0 Mc
1 = S.W. BAND = 7.5-24.0 Mc

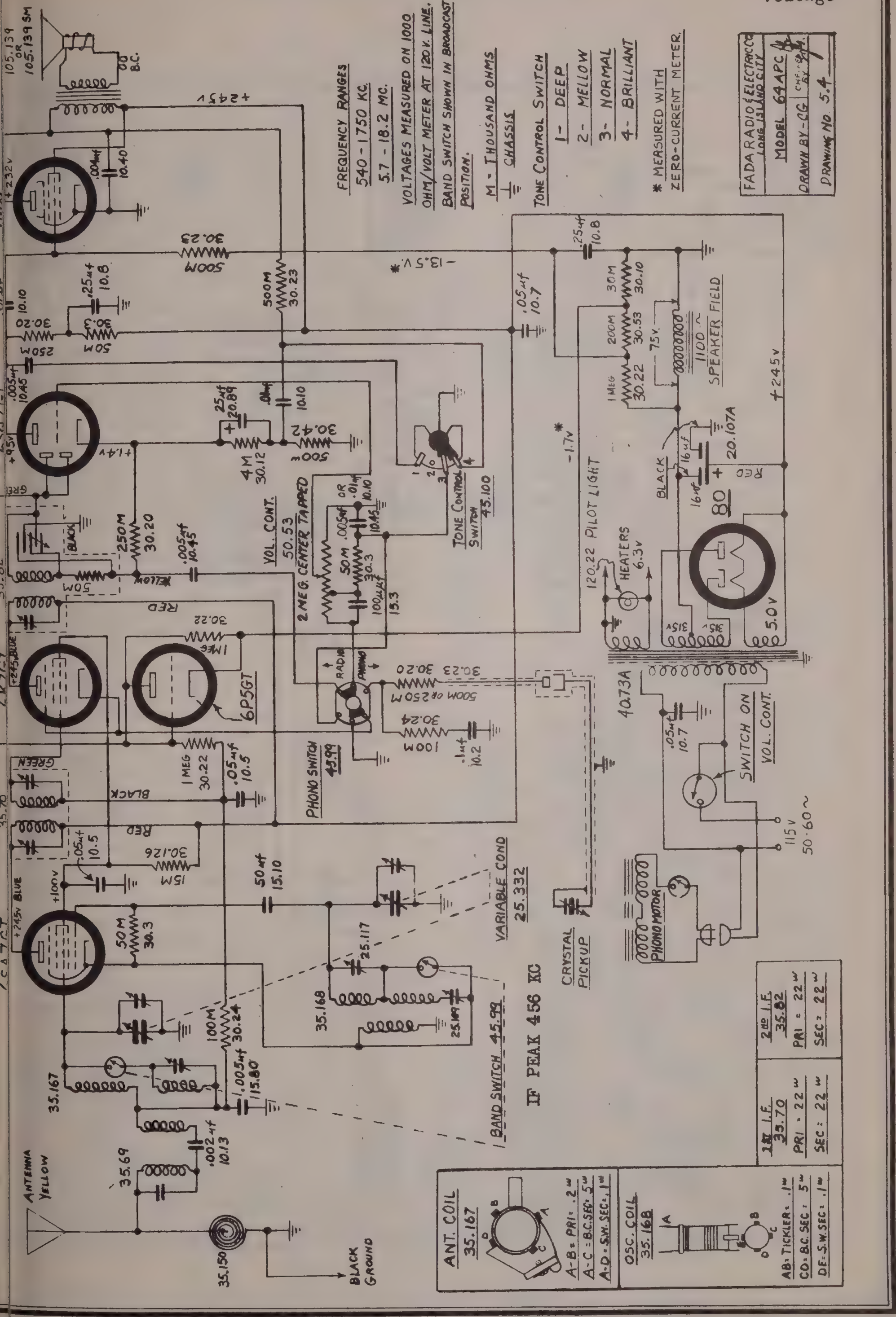
NOTE:
VOLTAGES MEASURED TO CHASSIS WITH 1000 OHMS PER VOLT VOLTMETER
SHORTING SECTION OF SWITCH NOT SHOWN

PARTS SHOWN IN DOTTED LINES ARE FOR 25 CYCLE OPERATION ONLY

ANT. COIL 35.181	OSC. COIL 35.182
C-E = 0.75 w B-E = 0.75 w G-E = 0.5 w F-E = 1.0 w D-E = 5.0 w	C-A = 0.75 w B-A = 1.0 w BLUE-A = 1.0 w G-A = 0.5 w E-D = 1.0 w E-BROWN = 7.0 w

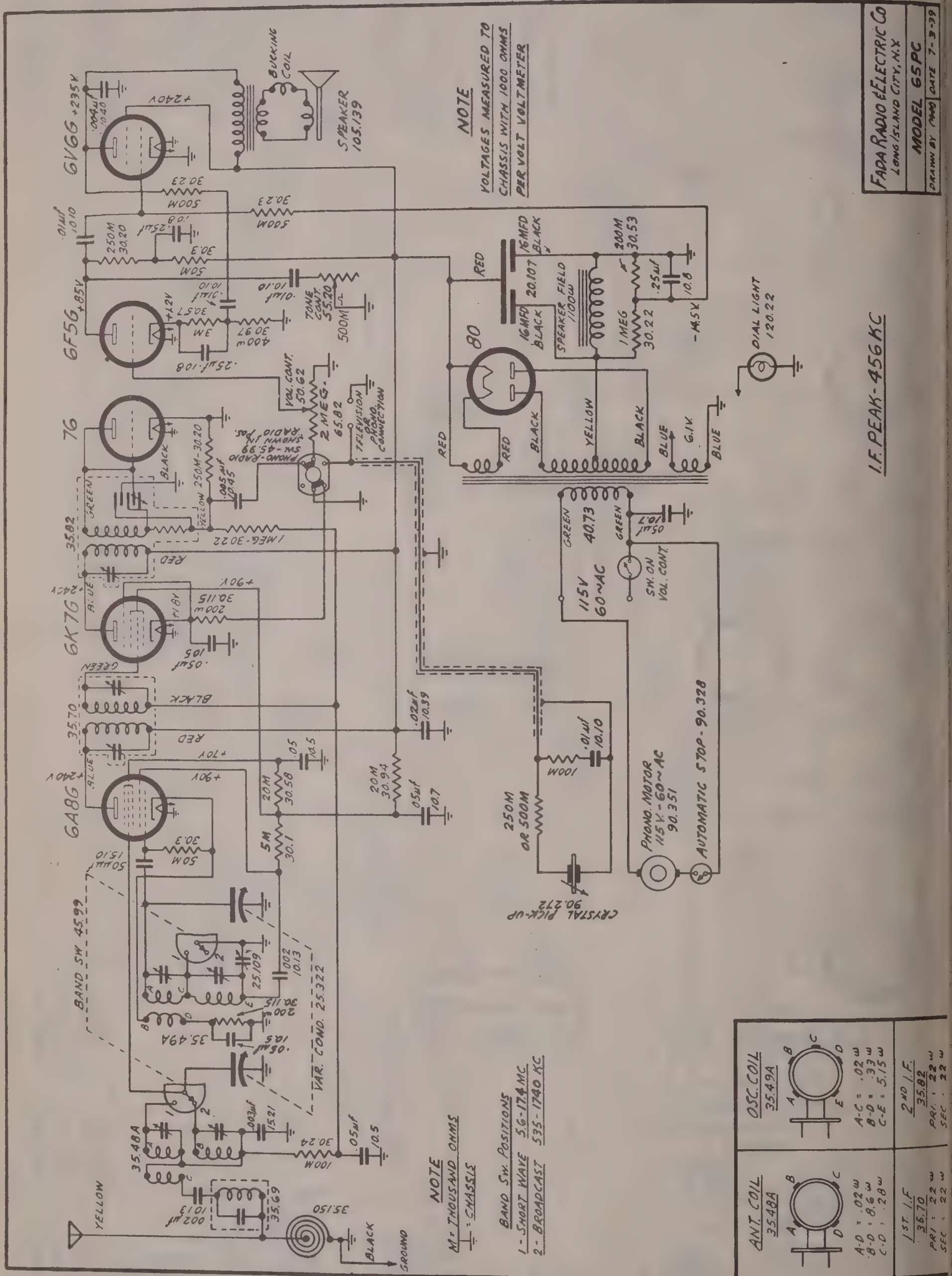
MODEL 64APC
Schematic
Voltage

FADA RADIO & ELECTRIC CO

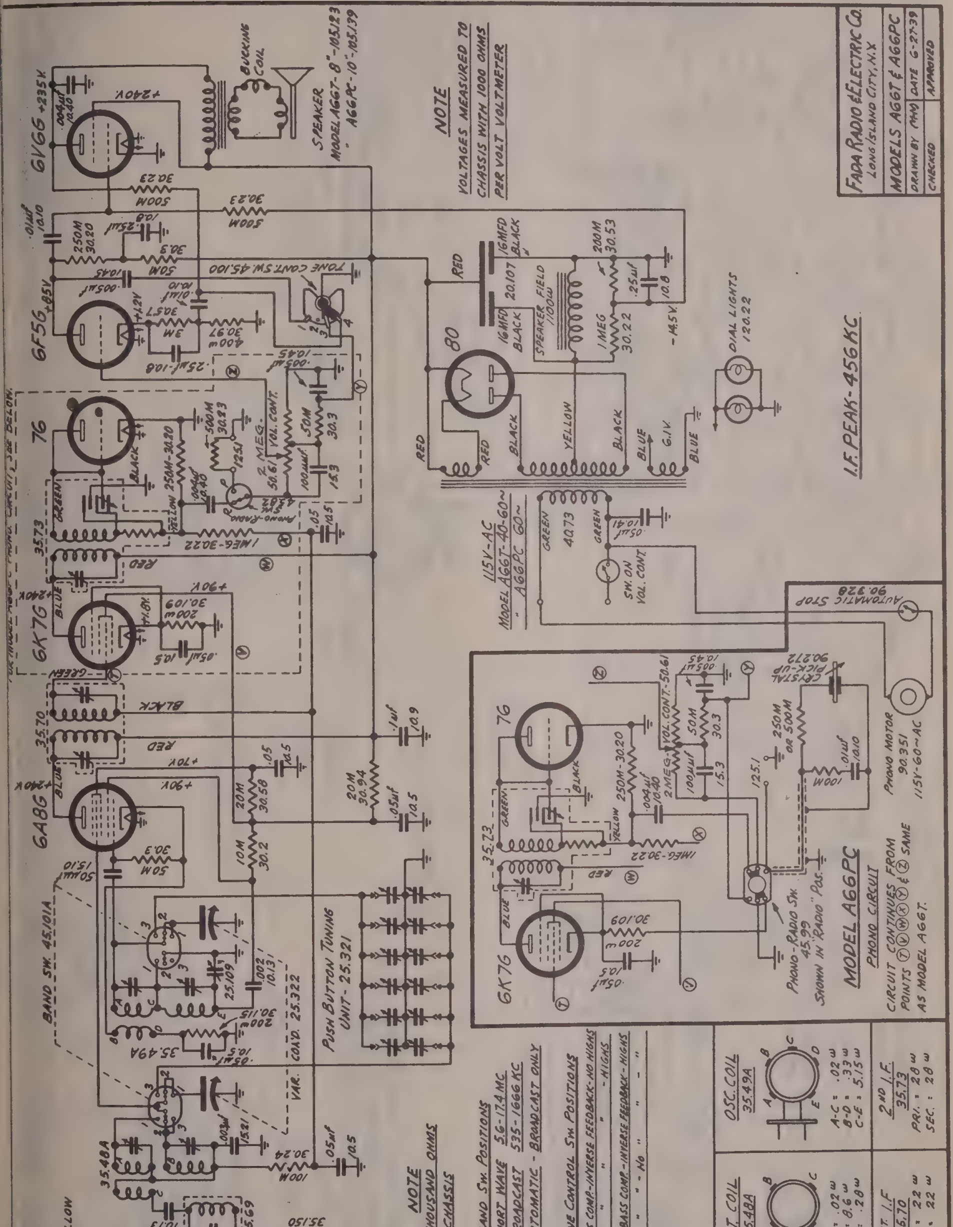


MODEL 65PC
Schematic
Voltage

FADA RADIO & ELECTRIC CO



FADA RADIO & ELECTRIC CO



NOTE
VOLTAGES MEASURED TO CHASSIS WITH 1000 OHMS PER VOLT VOLTMETER

NOTE
M = THOUSAND OHMS
⏚ = CHASSIS

BAND SW. POSITIONS
1 - SHORT WAVE 5.6-17.4 MC
2 - BROADCAST 535-1666 KC
3 - AUTOMATIC - BROADCAST ONLY

TONE CONTROL SW. POSITIONS
1 - BASS COMP - INVERSE FEEDBACK - NO HIGHS
2 - " " " - HIGHS
3 - NO BASS COMP - INVERSE FEEDBACK - HIGHS
4 - " " " - NO "

I.F. PEAK - 456 KC

MODEL A66PC
PHONO CIRCUIT
CIRCUIT CONTINUES FROM POINTS Ⓣ Ⓥ Ⓦ Ⓧ Ⓨ & Ⓩ SAME AS MODEL A66T.

ANT. COIL 35.48A
A-D: .02ω
B-D: 8.6ω
C-D: .20ω

OSC. COIL 35.49A
A-C: .02ω
B-D: .33ω
C-E: 5.15ω

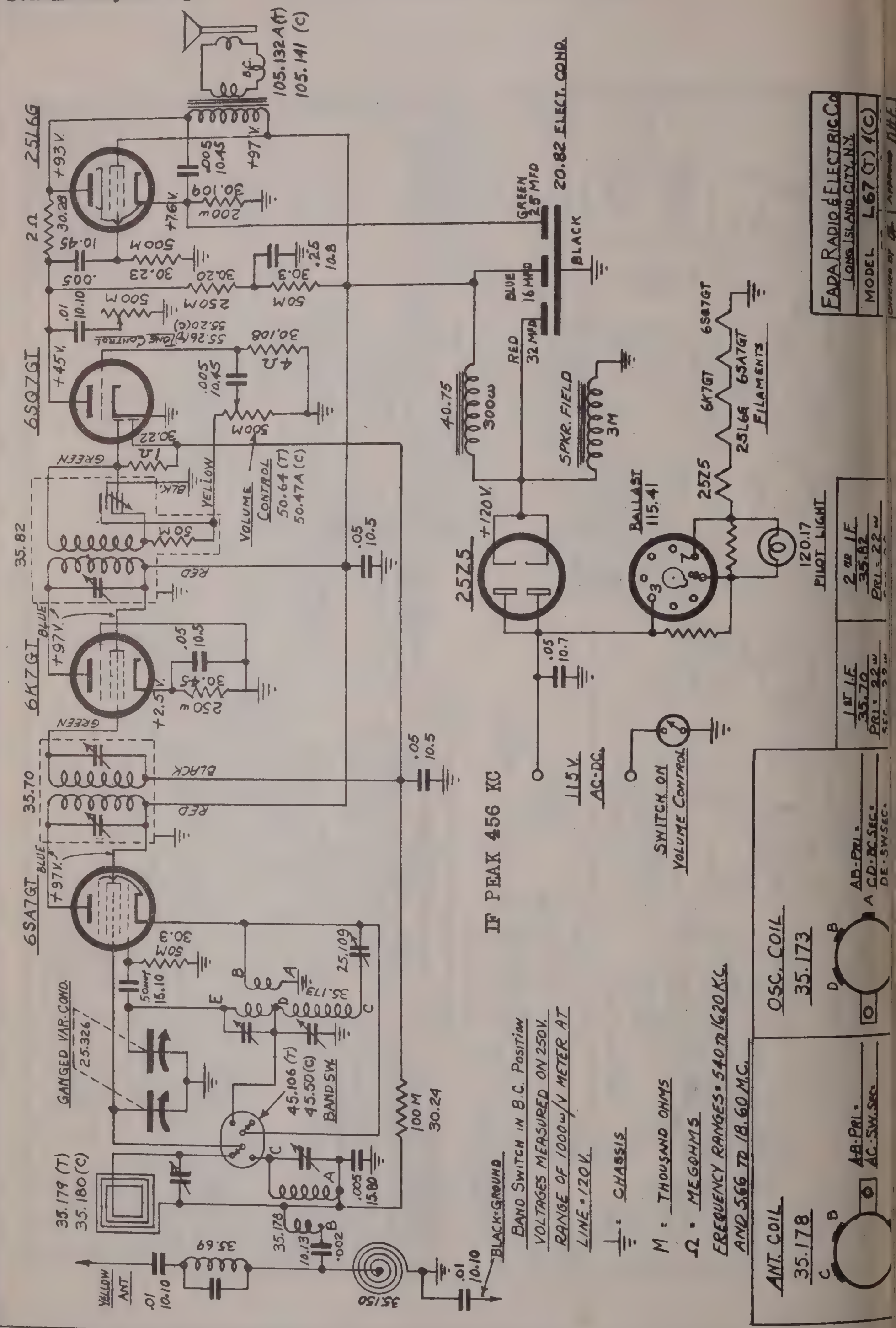
1ST. I.F 35.70
PRI.: 22ω
SEC.: 22ω

2ND I.F. 35.73
PRI.: 28ω
SEC.: 28ω

FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODELS A66T & A66PC
DRAWN BY (MH) DATE 6-27-39
CHECKED APPROVED

MODELS L67T,L67C
Schematic,Voltage

FADA RADIO & ELECTRIC CO



IF PEAK 456 KC

BAND SWITCH IN B.C. POSITION
VOLTAGES MEASURED ON 250V.
RANGE OF 1000Ω/V METER AT
LINE = 120V.

⏚ = CHASSIS

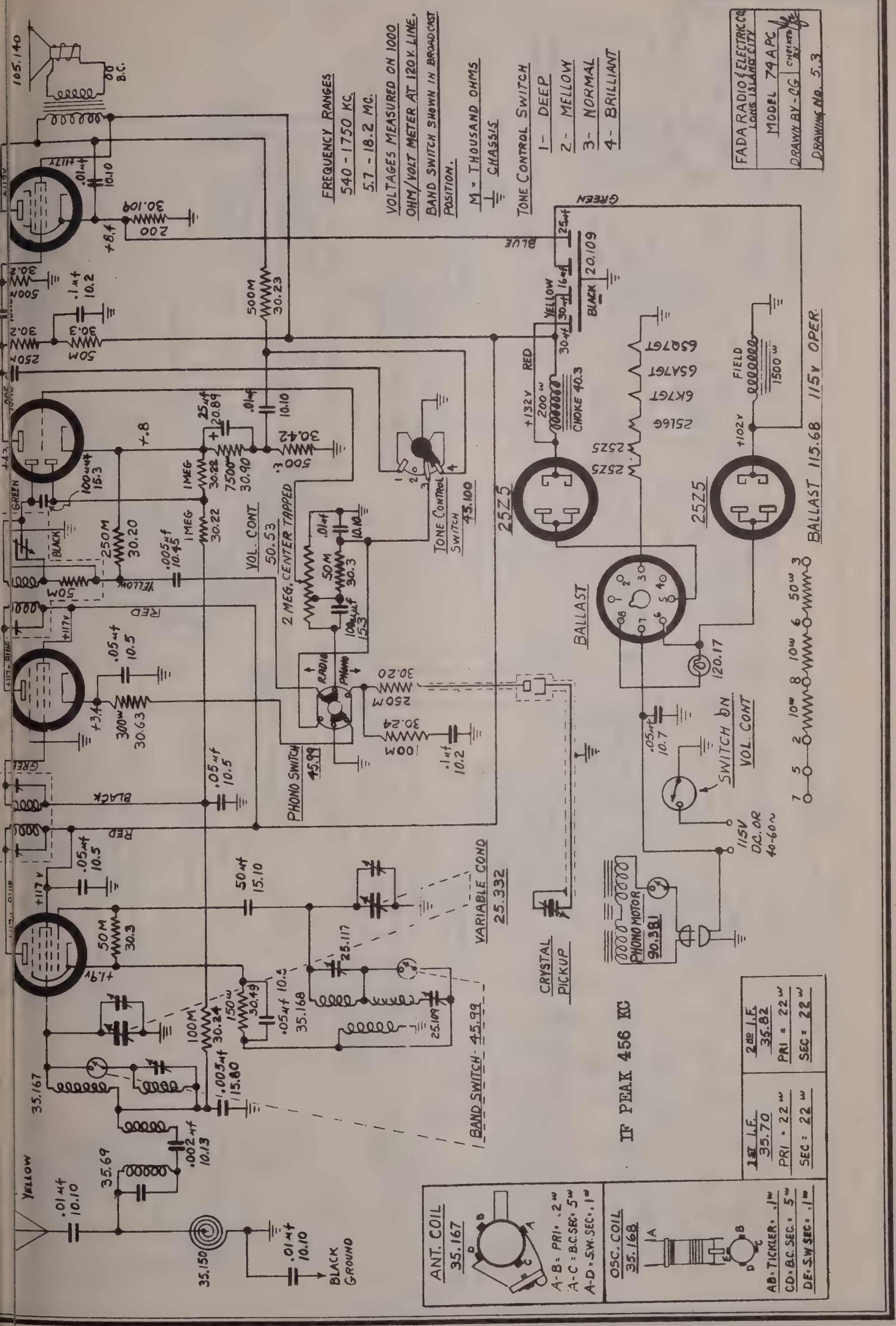
M = THOUSAND OHMS

Ω = MEGOHMS

FREQUENCY RANGES = 540 TO 1620 K.C.
AND 5.66 TO 18.60 M.C.

FADA RADIO & ELECTRIC CO

MODEL 74APC
Schematic, Voltage



IF PEAK 456 KC

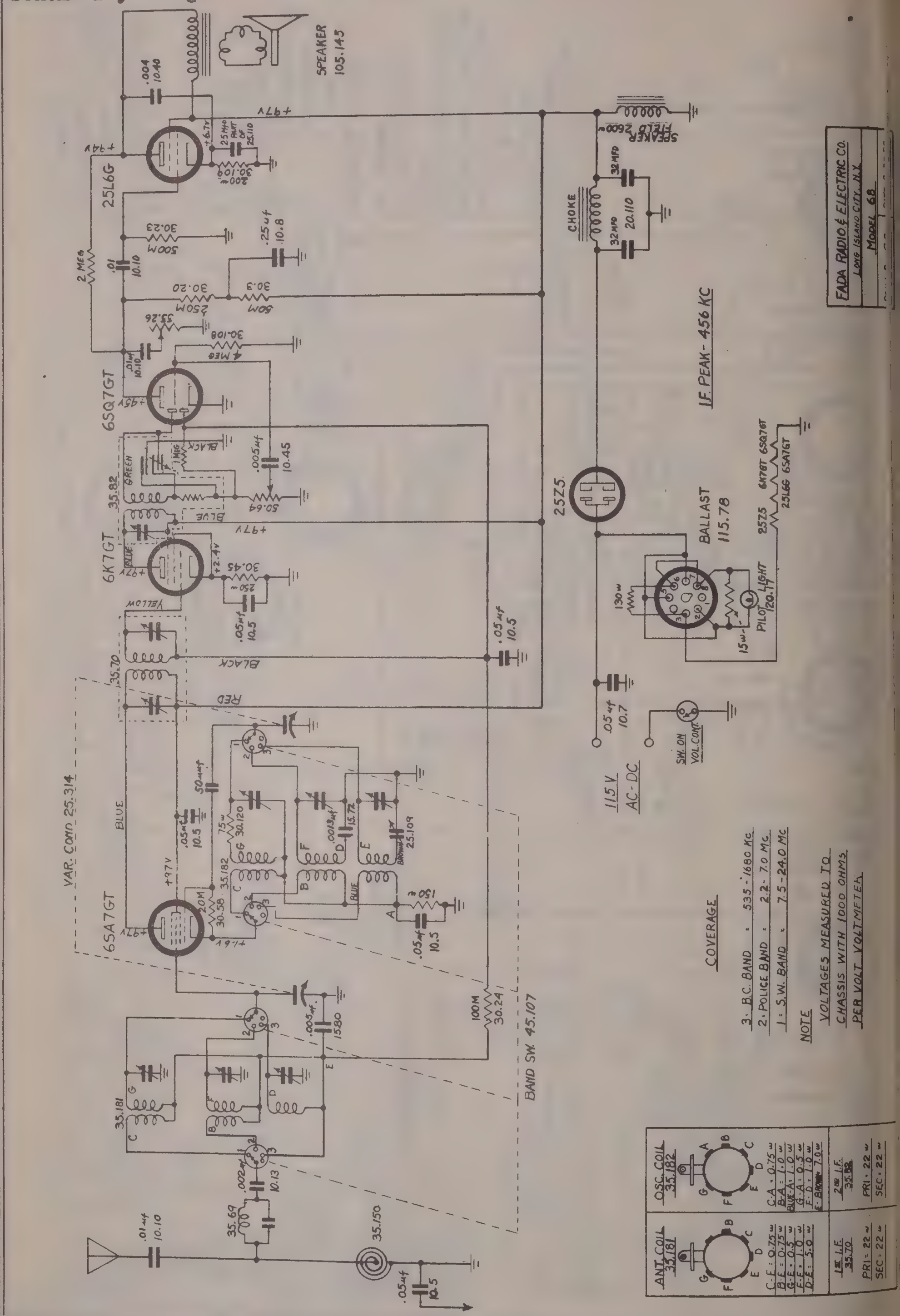
1st I.F. 35.70	2nd I.F. 35.82
PRI = 22Ω	PRI = 22Ω
SEC = 22Ω	SEC = 22Ω

ANT. COIL 35.167
A-B: PRI. .2Ω
A-C: B.C.SEC. 5Ω
A-D: S.W.SEC. .1Ω

OSC. COIL 35.168
AB: TICKLER .1Ω
CD: B.C.SEC. 5Ω
DE: S.W.SEC. .1Ω

MODEL 68
Schematic,Voltage

FADA RADIO & ELECTRIC CO



COVERAGE

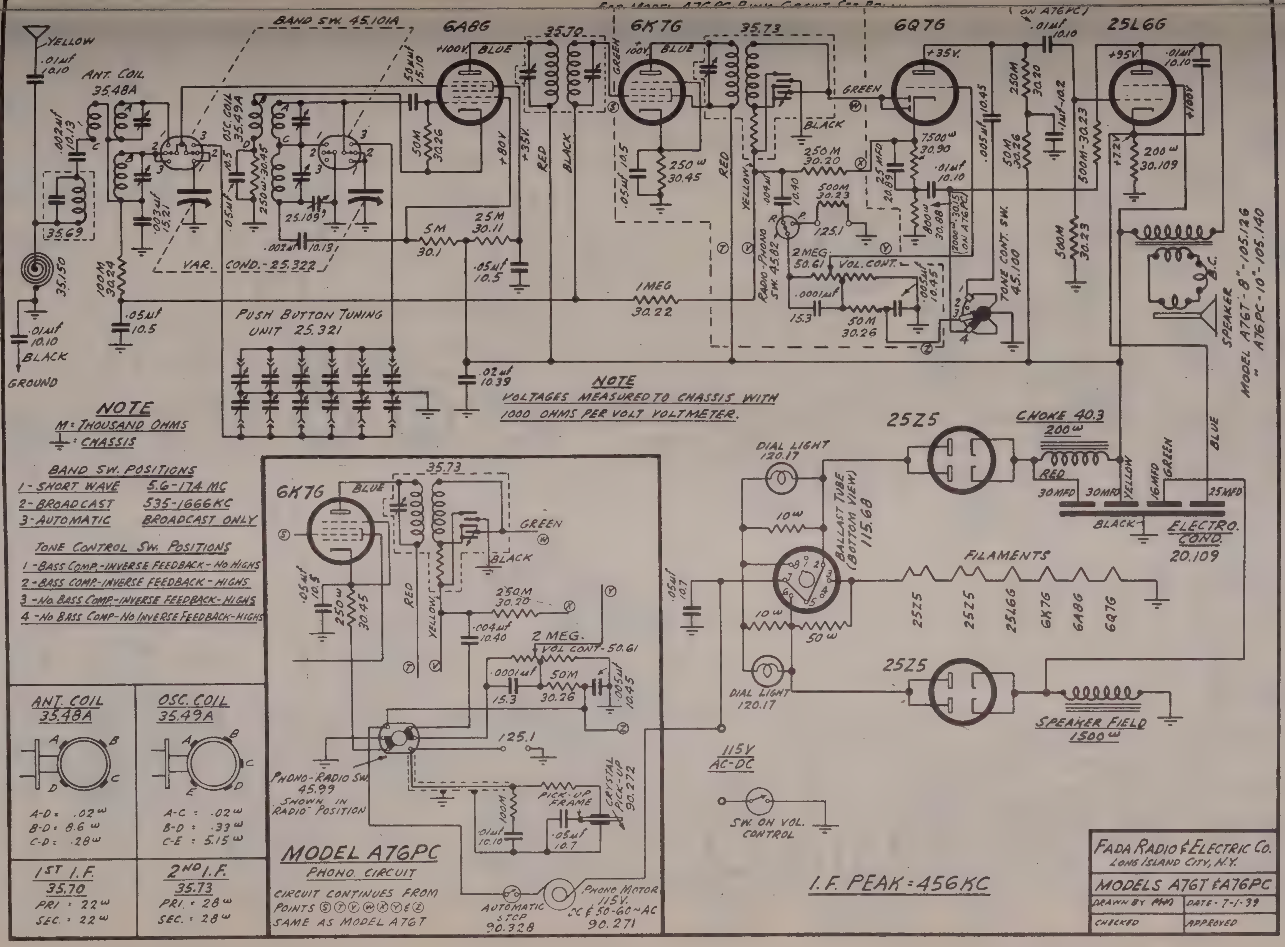
3 = B.C. BAND = 535 - 1680 KC
2 = POLICE BAND = 2.2 - 7.0 MC
1 = S.W. BAND = 7.5 - 24.0 MC

NOTE

VOLTAGES MEASURED TO CHASSIS WITH 1000 OHMS PER VOLT VOLTMETER

FADA RADIO & ELECTRIC CO

MODELS A76T,A76PC
Schematic,Voltage



NOTE
VOLTAGES MEASURED TO CHASSIS WITH 1000 OHMS PER VOLT VOLTMETER.

I.F. PEAK = 456KC

CIRCUIT CONTINUES FROM POINTS Ⓢ Ⓣ Ⓥ Ⓦ Ⓧ Ⓨ & Ⓩ SAME AS MODEL A76T

NOTE
M = THOUSAND OHMS
⏚ = CHASSIS

BAND SW. POSITIONS

1 - SHORT WAVE	5.6-17.4 MC
2 - BROADCAST	535-1666 KC
3 - AUTOMATIC	BROADCAST ONLY

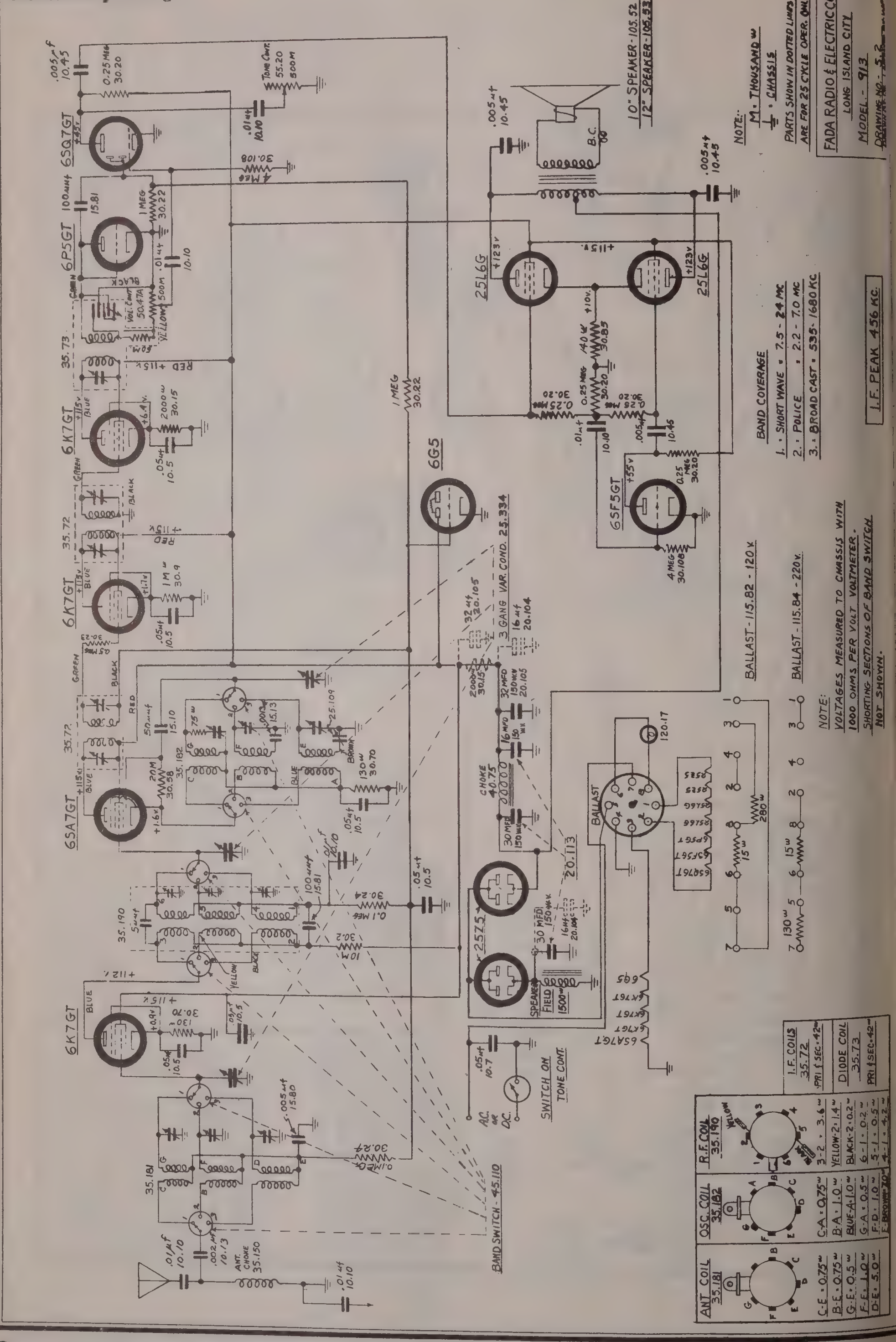
TONE CONTROL SW. POSITIONS
1 - BASS COMP. - INVERSE FEEDBACK - NO HIGHS
2 - BASS COMP. - INVERSE FEEDBACK - HIGHS
3 - NO BASS COMP. - INVERSE FEEDBACK - HIGHS
4 - NO BASS COMP. - NO INVERSE FEEDBACK - HIGHS

ANT. COIL 35.48A	OSC. COIL 35.49A
A-D = .02ω B-D = 8.6ω C-D = .28ω	A-C = .02ω B-D = .33ω C-E = 5.15ω
1ST I.F. 35.70	**2ND I.F. 35.73**
PRI. = 22ω SEC. = 22ω	PRI. = 28ω SEC. = 28ω

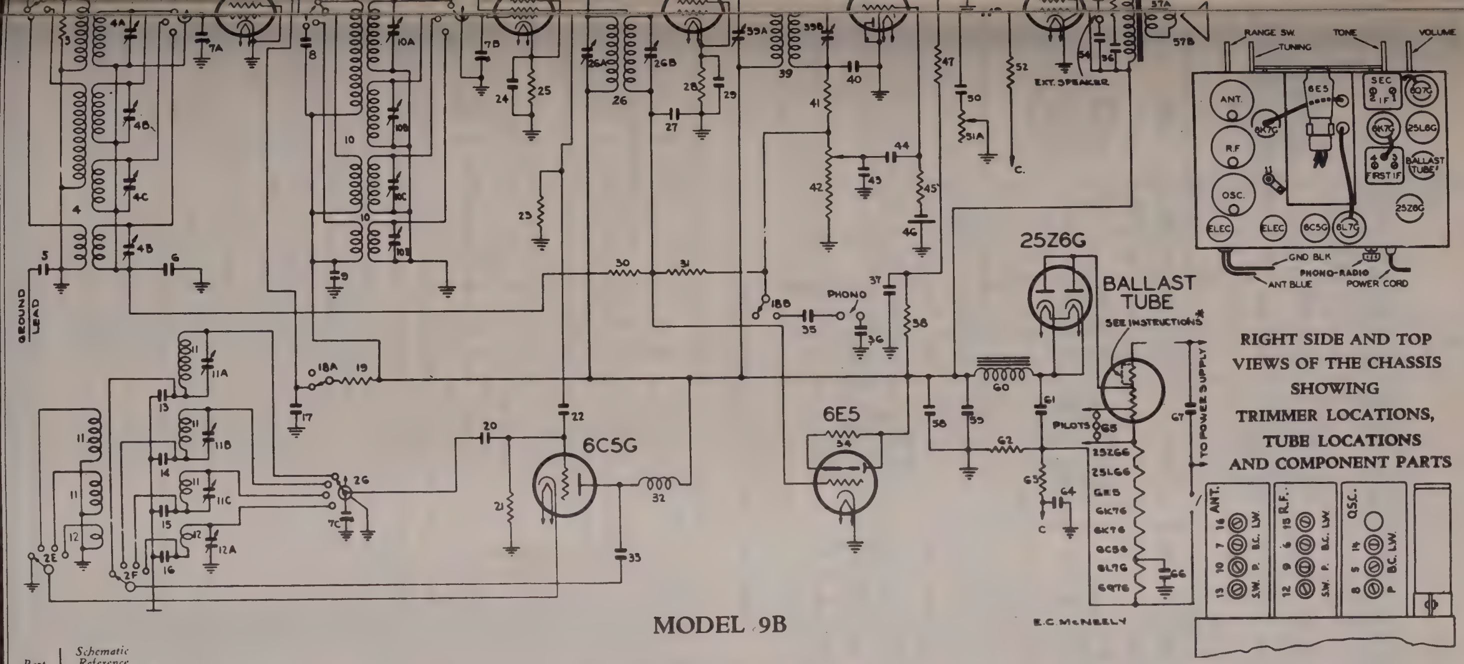
FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODELS A76T & A76PC
DRAWN BY [illegible] DATE - 7-1-39
CHECKED APPROVED

MODEL 913
Schematic, Voltage

FADA RADIO & ELECTRIC CO



FAIRBANKS, MORSE & CO.



RIGHT SIDE AND TOP VIEWS OF THE CHASSIS SHOWING TRIMMER LOCATIONS, TUBE LOCATIONS AND COMPONENT PARTS

MODEL 9B

IF PEAK 456 KC

Part Number	Schematic Reference Number	Description
503-8	12	Coil Assembly—HF Oscillator
280-1	12A	Condenser—Air Trimmer
420-3	60	Choke—Iron Core Filter, 200 oh:..
425-4	32	Choke—Oscillator Plate
211-4	61	Condenser—Electrolytic 30 mfd., 150 volt
210-3	59	Condenser—Electrolytic 20 mfd., 150 volt
261-25	16	Condenser—Mica 5700 mmfd., HF. Pad.
260-5	22	Condenser—Mica 50 mmfd.
260-7	20, 40, 43, 48	Condenser—Mica 100 mmfd.
260-13	8	Condenser—Mica 500 mmfd.
260-18	33	Condenser—Mica 1000 mmfd
285-3	15	Condenser—Semi Fixed Padder 1535 mmfd.
285-4	14	Condenser—Semi Fixed Padder 503 mmfd.
285-5	13	Condenser—Semi Fixed Padder 296 mmfd.
251-1	67	Condenser—Moulded Paper .01-600 volt
250-12	1	Condenser—Tubular Paper .01-400 volt
250-15	44, 49, 56, 64	Condenser—Tubular Paper .02-600 volt
250-16	50	Condenser—Tubular Paper .03-600 volt
250-39	6, 24, 27, 29, 66	Condenser—Tubular Paper .05-200 volt
250-21	5, 9, 17, 35, 36, 53, 54	Condenser—Tubular Paper .1-200 volt
250-27	37, 58	Condenser—Tubular Paper .25-200 volt
203-1	7—A, B, C	Condenser—Variable Tuning, 3-Gang
340-5	51—A, B	Control—Tone and Power Switch 500,000 ohm
340-9	42	Control—Volume 500,000 ohm
337-2	62	Resistor—Wire Wound 100 ohm, 1 watt
302-17	55	Resistor—Fixed Carbon 4700 ohm, 1 watt
301-9	28	Resistor—Fixed Carbon 220 ohm, ½ watt
301-10	25	Resistor—Fixed Carbon 330 ohm, ½ watt
301-15	19	Resistor—Fixed Carbon 2200 ohm, ½ watt
301-17	3	Resistor—Fixed Carbon 4700 ohm, ½ watt
301-23	21, 23, 30, 38, 41	Resistor—Fixed Carbon 47,000 ohm, ½ watt
301-26	47	Resistor—Fixed Carbon 150,000 ohm, ½ watt
301-27	63, 52	Resistor—Fixed Carbon 220,000 ohm, ½ watt
301-29	45	Resistor—Fixed Carbon 470,000 ohm, ½ watt
301-31	31	Resistor—Fixed Carbon 1 megohm, ½ watt
805-2	65	Dial Light .25 Amp., 6.3 volt
22-7	57—A, B	Speaker—PM, Dyn. (12")
22-6	57—A, B	Speaker—PM, Dyn. (8")
	* 808-1	Tube—Ballast (100-125 volt)
	802-2	Tube—Ballast (125-150 volt)
	808-4	Tube—Ballast 200-255 volt)

ELECTROLYTIC CONDENSER COLOR CODE

(All Other Color Codes Standard R. M. A.)

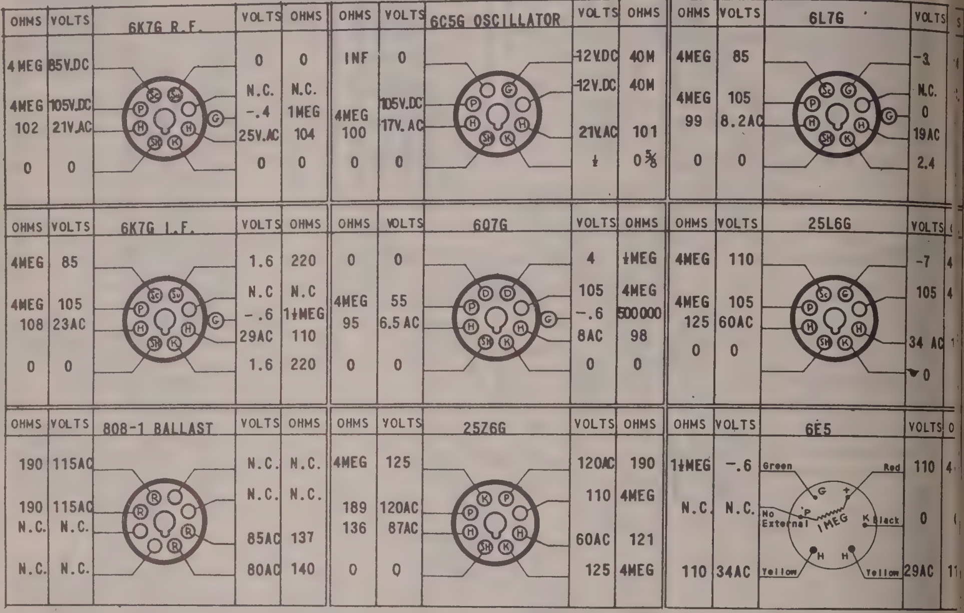
With the positive (+) or center solder lug toward you, read the colored markings as follows from left to right:

LEFT HAND OR CAPACITY COLOR		SECOND FROM LEFT OR MAXIMUM VOLTAGE COLOR	
Black	0 to 9 mfd.	Black	0 to 99 volts
Brown	9 to 19 mfd.	Brown	99 to 199 volts
Red	19 to 29 mfd.	Red	199 to 299 volts
Orange	29 to 39 mfd.	Orange	299 to 399 volts
Yellow	39 to 49 mfd.	Yellow	399 to 499 volts
		Green	499 to 599 volts

If a third (blue) stripe is shown, the condenser is a regulator and should be in the position farthest from the rectifier tube in the filter circuit.

MODEL 9B
Voltage,Alignment
Resistance

FAIRBANKS, MORSE & CO.



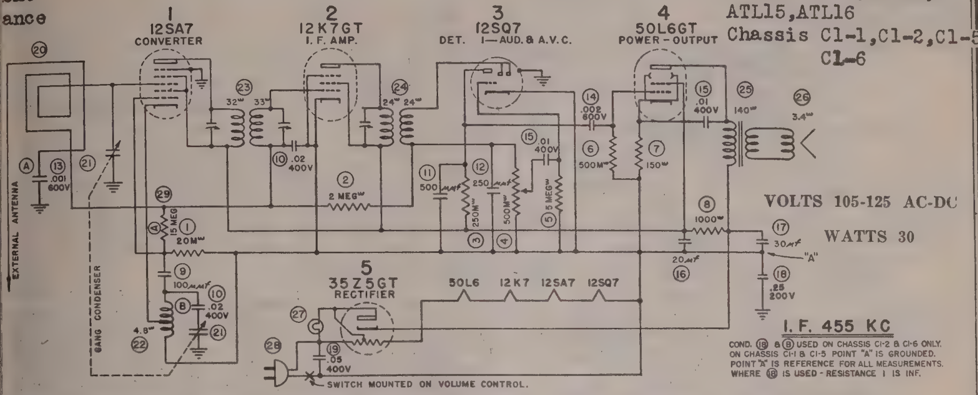
VOLTAGE AND RESISTANCE DATA

No.	Connect Generator To	Signal Generator Setting Freq.	Signal Generator Setting Meters	Dummy	Range Switch	Dial Setting Freq.	Dial Setting Meters	Stage	Trimmer No.	Peak For	Special Instructions
1	6L7G Grid	456 KC	658	.1 mfd. Condenser	Broadcast	550 KC	550	2nd IF	1	Max.	Note: On all bands—Do not connect low side of signal generator to chassis pan. Connect to black ground lead.
2	6L7G Grid	456 KC	658	.1 mfd. Condenser	Broadcast	550 KC	550	2nd IF	2	Max.	
3	6L7G Grid	456 KC	658	.1 mfd. Condenser	Broadcast	550 KC	550	1st IF	3	Max.	
4	6L7G Grid	456 KC	658	.1 mfd. Condenser	Broadcast	550 KC	550	1st IF	4	Max.	
5	Antenna Lead	350 KC	850	.1 mfd. Condenser	LW-A	350 KC	850	LW Osc.	14	Max. *	*On LW Band—Keep Antenna and speaker leads separated when aligning, to avoid regeneration.
6	Antenna Lead	350 KC	850	.1 mfd. Condenser	LW-A	350 KC	850	LW R.F.	15	Max. *	
7	Antenna Lead	350 KC	850	.1 mfd. Condenser	LW-A	350 KC	850	LW Ant.	16	Max. *	Check Calibration at 175 KC., 1700 Meters.
8	Antenna Lead	1500 KC	200	200 mmfd. Condenser	BC-B	1500 KC	200	BC Osc.	5	Max.	
9	Antenna Lead	1500 KC	200	200 mmfd. Condenser	BC-B	1500 KC	200	BC R.F.	6	Max.	
10	Antenna Lead	1500 KC	200	200 mmfd. Condenser	BC-B	1500 KC	200	BC Ant.	7	Max.	Check Calibration at 600 KC., 500 Meters.
11	Antenna Lead	6.0 MC	50	400 ohm Resistor	Pol.-C	6.0 MC.	50	Police Osc.	8	Max.	
12	Antenna Lead	6.0 Mc.	50	400 ohm Resistor	Pol.-C	6.0 MC.	50	Police R.F.	9	Max.	
13	Antenna Lead	6.0 MC	50	400 ohm Resistor	Pol.-C	6.0 MC.	50	Police Ant.	10	Max.	Check Calibration at 2.5 MC., 120 Meters.
14	Antenna Lead	18 MC	17	400 ohm Resistor	SW-D	18 MC.	17	SW Osc.	11	Max. **	**Check for image at 17.1 MC., or 17.5 meters approx. If not received, oscillator is not aligned on fundamental.
15	Antenna Lead	18 MC	17	400 ohm Resistor	SW-D	18 MC.	17	SW R.F.	12	Max.	
16	Antenna Lead	18 MC	17	400 ohm Resistor	SW-D	18 MC.	17	SW Ant.	13	Max.	Check Calibration at 7.5 MC., 40 meters.

ALIGNMENT PROCEDURE CHART

FARNESWORTH TELEV. & RADIO CORP.

MODELS AT10,AT11,AT12
AT14,AT15,AT16,ATL10,
ATL11,ATL12,ATL14,
ATL15,ATL16
Chassis C1-1,C1-2,C1-5
C1-6



VOLTS 105-125 AC-DC

WATTS 30

I. F. 455 KC

COND. ⑱ & Ⓑ USED ON CHASSIS C1-2 & C1-6 ONLY.
ON CHASSIS C1-1 & C1-5 POINT "A" IS GROUNDED.
POINT "A" IS REFERENCE FOR ALL MEASUREMENTS.
WHERE ⑱ IS USED - RESISTANCE 1 IS INF.

	1		2		3		4		5	
	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE
1	NONE	NONE	NONE	NONE	NONE	NONE	NONE	INF	NONE	120Ω
2	22 AC	24Ω	33 AC	36Ω	NONE	5 MEGΩ	33 AC	36Ω	115 AC	100Ω
3	80+	INF*	80+	INF*	NONE	NONE	120+	INF*	110 AC	100Ω
4	82+	INF*	82+	INF*	NONE	500MΩ	82+	INF*	NONE	NONE
5	6-	20MΩ	NONE	NONE	NONE	500MΩ	NONE	500MΩ	110 AC	100Ω
6	NONE	NONE	NONE	2.5 MEGΩ	55 +†	INF*	----	OPEN	82 +	INF*
7	11 AC	12Ω	22 AC	24Ω	11 AC	12Ω	78 AC	77Ω	78 AC	77Ω
8	NONE	2.5 MEGΩ	NONE	NONE	NONE	NONE	6+	150Ω	130+	INF*
CAP			NONE	2.5 MEGΩ						

BOTTOM VIEW OF SOCKETS

† THIS VALUE WILL VARY WITH VOLTMETER DUE TO SERIES RESISTOR.

* RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

VOLTMETER RESISTANCE 1000Ω PER VOLT.
LINE VOLTAGE 117 VOLTS.

With the low side (G) of the signal generator connected to the chassis through a .01 mfd. 200 Volt condenser, the following procedure should be used when aligning the receiver:

TABULATION FOR ALIGNMENT

EPS	Connect High Side of Generator to	Set Generator at	Set Gang at	Adjust the following	Located	To obtain
1.	SET VOLUME CONTROL AT MAXIMUM					MAXIMUM OUTPUT
2.	12K7GT I.F. Grid Cap in Series with .01 Mfd.*	455 Kc.	A Quiet Point	2nd I .F. Trimmer Only one	Top of Chassis	
3.	High Side of Loop in Series with .01 Mfd.			1st I. F. Trimmers 2 used	End of Chassis	
4.	Antenna in Series with 1000 mmf.	1730 Kc.	Minimum Capacity	Oscillator Trimmer	Side of Gang Condenser	
5.		1400 Kc.	1400 Kc.	Antenna Trimmer		
6.		600 Kc.	600 Kc.	End Plates of Gang		
7.	RECHECK ALL ABOVE ADJUSTMENTS					

not remove grid cap.

No.	Part No.	DESCRIPTION
1	773-16	20 M ohms—½ W.
2	773-25	2 Meg.—½ W.
3	773-21	250 M ohms—½ W.
4	782-1	500 M ohms Var. Vol. Cont.
5	773-27	5 Meg.—½ W.
6	773-23	500 M ohms—½ W.
7	773-35	150 ohms—½ W.-10%
8	775-9	1000 ohms—1 W.
9	253-1	100 mmf.—Mica
0	255-3	.02 mfd. 400 V.
1	253-3	500 mmf.—Mica
2	253-2	250 mmf.—Mica
3	255-1	.01 mfd. 400 V.
4	254-5	.002 mfd. 600 V.
5	255-1	.01 mfd. 400 V.
& 17	259-1	20 mfd. - 30 mfd.—150 V.
8	256-3	.25 mfd. 200 V.
9	255-2	.05 mfd. 400 V.
20	388-1	Loop & Shield Assembly
21	266-1	Gang Condenser
21	265-1	Gang Cond.—For Button Tuning
22	389-1	Osc. Coil
22	3811-1	Osc. Coil—Underwriters
23	387-1	1st I. F. Trans. Assembly
24	3810-1	2nd I. F. Trans. Assembly
26	814-1	Speaker Complete (C1-1, C1-5)
26	814-2	Speaker Complete—Underwriters
27	421	Pilot Light
28	2710-1	Line Cord
28	2713-1	Line Cord—Underwriters
	318-1	Dial Scale
	317-1	Dial Cover (Pyralyn)
	111-1	Dial Pointer
	595-1	Knob Walnut
	595-2	Knob Ivory
	596-1	Handle Walnut
	596-2	Handle Ivory
	601-1	Cardboard Back
	801-1	Tube Socket
	594-1	Push Button (Walnut)
	594-2	Push Button (Ivory)

MODEL AK-17
Chassis C1-3
Schematic,Voltage
Alignment,Parts
Resistance

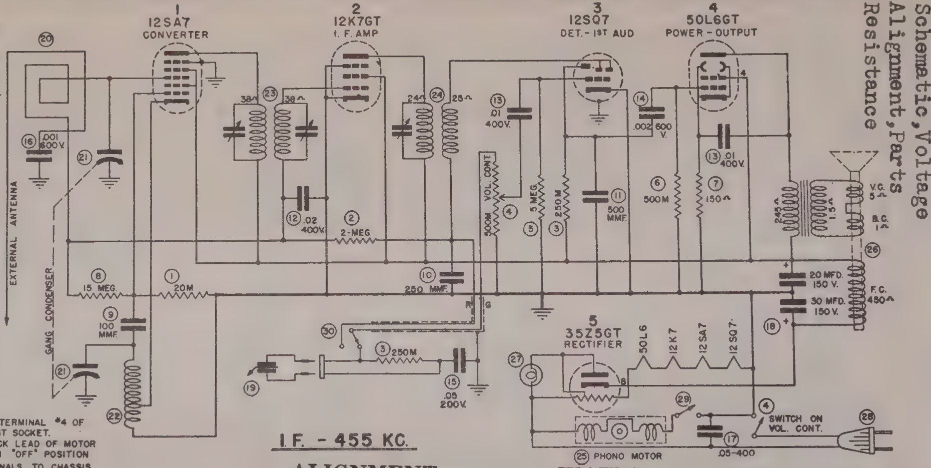
FARNESWORTH TELEV. & RADIO CORP.

	VOLTAGE 1	RESISTANCE 1	VOLTAGE 2	RESISTANCE 2	VOLTAGE 3	RESISTANCE 3	VOLTAGE 4	RESISTANCE 4	VOLTAGE 5	RESISTANCE 5
1	0	0	0	0	0	0	0	INF	120AC	125
2	26AC	37	38AC	58	0	5MEG	38AC	58	120AC	125
3	93	INF *	93	INF *	0	0	85	INF *	114AC	122
4	93	INF *	93	INF *	0	500M	93	INF *	OPEN	INF
5	0	20M	0	0	0	500M	0	500M	114AC	122
6	0	0	0	2.5MEG.	40	INF *	0	INF	0	2.5MEG
7	13AC	20	26AC	37	13AC	20	85AC	105	85AC	105
8	0	2.5MEG.	0	0	0	0	6	150	125DC	INF *
CAP.			0	2.5MEG						

ALL VOLTAGES MEASURED FROM SOCKET TERMINALS. TO CHASSIS.
*RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER
VOLTMETER RESISTANCE 1000 OHMS PER VOLT.
LINE VOLTAGE 117

BOTTOM VIEW OF SOCKETS

MEASURE RESISTANCE OF FIELD COIL FROM TERMINAL #4 OF 50L6GT SOCKET TO TERMINAL #8 OF 35Z5GT SOCKET.
PHONO MOTOR 200Ω MEASURED FROM BLACK LEAD OF MOTOR SWITCH TO GROUND WITH MOTOR SWITCH IN "OFF" POSITION
RESISTANCE MEASURED FROM SOCKET TERMINALS TO CHASSIS



I.F. - 455 KC.

WATTS 50 VOLTS 105-125 AC

Ref. No.	Part No.	DESCRIPTION
1	773-16	20 M ohm
2	773-25	2 meg.
3	773-21	250 M ohm
4	782-1	500 M ohm
5	773-27	5 meg.
6	773-23	500 M ohm
7	773-35	150 ohm
8	773-30	15 meg.
9	253-1	100 mmfd. mica
10	253-2	250 mmfd.
11	253-3	500 mmfd.
12	255-3	.02 mfd. 400 V.
13	255-1	.01 mfd. 400 V.
14	254-5	.002 mfd. 600 V.
15	256-1	.05 mfd. 200 V.
16	254-9	.001 mfd. 600 V.
17	255-2	.05 mfd. 400 V.
18	259-1	20 mfd.—30 mfd. 150 V.
19	712-1	Replacement Cartridge
20	388-1	Loop & Shield assy.
21	266-1	Gang Condenser
22	389-1	Oscillator Coil
23	387-1	1st I. F. Transformer
24	3810-1	2nd I. F. Transformer
25	442-1	Phono Motor
26	8113-1	Speaker Complete
27	421-1	Pilot Lamp
28	2710-1	Line Cord
29	134-2	Automatic Stop Assembly
30	909-1	Phono-radio Switch
	6024-1	Cardboard back
	713-1	Tone Arm
	135-1	Tone Arm Rest
	318-1	Dial Scale
	317-1	Dial Cover
	111-1	Dial Pointer
	595-1	Knob Walnut
	3658-1	Idler Retaining Spring
	1318-1	Phono Idler Pulley
	3657-1	Snap Buttons (for back)

ALIGNMENT

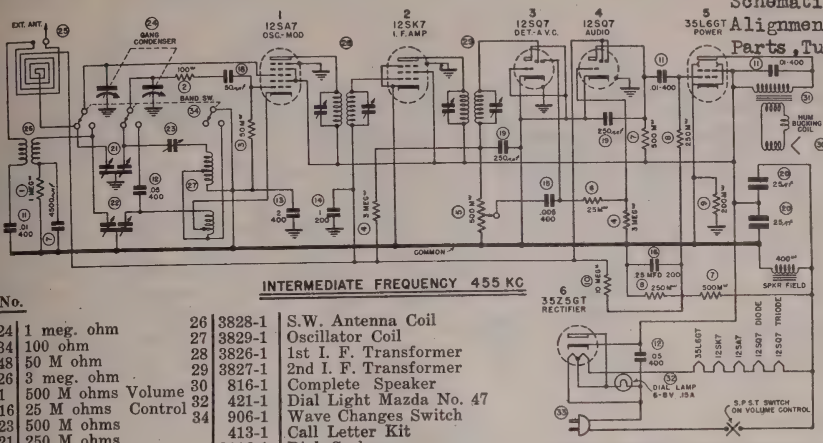
With the low side of the signal generator connected to the chassis through a .01 mfd. 200 volt condenser, the following procedure should be used when aligning the receiver:

STEPS	Use in Series With Generator	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	SET VOLUME CONTROL AT MAXIMUM					
2.	.01 mfd. to grid cap of 12K7GT I. F.*	455 Kc.	Minimum	2nd I. F. trimmer (1)	Top of Chassis	MAXIMUM OUTPUT
3.	.01 to high side of loop			1st I. F. trimmers (2)	End of Chassis	
4.	1000 mmf. to antenna	1730 Kc.		Oscillator Trimmer	Side of Gang Condenser	
5.		1400 Kc.	1400 Kc.	Antenna Trimmer		
6.		600 Kc.	600 Kc.	End Plates of Gang		
7.	RECHECK ALL ABOVE ADJUSTMENTS					

*Do not remove grid cap

MODELS AT-20 to AT23
Chassis C5-1
Schematic,Voltage
Alignment,Resistance
Parts,Tuner

FARNESWORTH TELEV. & RADIO CORP.



INTERMEDIATE FREQUENCY 455 KC

VOLTS
105-125
AC-DC

WATTS 30

ef o.	Part No.	
	771-24	1 meg. ohm
	771-34	100 ohm
	771-48	50 M ohm
	771-26	3 meg. ohm
	785-1	500 M ohms Volume
	771-16	25 M ohms Control
	771-23	500 M ohms
	771-21	250 M ohms
	771-21	200 M ohms
	771-29	10 meg ohms
	255-1	.01 mfd. 400 V.
	255-2	.05 mfd. 400 V.
	255-6	.2 mfd. 400 V.
	256-2	.1 mfd. 200 V.
	255-5	.005 mfd. 400 V.
	256-3	.25 mfd. 200 V.
	2513-4	4500 mmfd. ± 3%
	253-3	50 mmfd.
	253-2	250 mmfd.
	2515-1	25 mfd. 200 V.
	2613-1	Dual Antenna Trimmer
	2612-1	Dual Oscillator Trimmer.
	2614-1	600 Kc. Pac 200—600 mmfd.
	2611-1	Gang Condenser
	3830-1	Loop Antenna

26	3828-1	S.W. Antenna Coil
27	3829-1	Oscillator Coil
28	3826-1	1st I. F. Transformer
29	3827-1	2nd I. F. Transformer
30	816-1	Complete Speaker
32	421-1	Dial Light Mazda No. 47
34	906-1	Wave Changes Switch
	413-1	Call Letter Kit
	3116-1	Dial Scale
	921-2	Dial Cord
	1311-1	Dial Pointer
	3117-1	Dial Crystal
	0710-1	Dial Escutcheon
	5647-1	Button Escutcheon
	5914-3	Tuning Knob Beetle W-23
	5914-1	Tuning Knob Red
	5914-2	Tuning Knob for Wood Cabinet
	5915-1	Tuning Button Beetle W-23
	5915-2	Tuning Button Red
	5916-1	Tuning Button for Wood Cabinet
	5646-1	Dial Shaft

Pin	Socket 1 Voltage	Socket 1 Resistance	Socket 2 Voltage	Socket 2 Resistance	Socket 3 Voltage	Socket 3 Resistance
1	0	200MΩ	0	200MΩ	0	200MΩ
2	38AC	450Ω	38AC	450Ω	0	0
3	100	INF *	0	0	0	0
4	103	INF *	0	2.5MEGΩ	0	500MΩ
5	-.2	50MΩ	0	0	0	3MEGΩ
6	0	0	103	INF *	0	0
7	25AC	435Ω	53AC	470Ω	25AC	435Ω
8	0	2.5MEGΩ	100	INF *	12AC	420Ω

Pin	Socket 4 Voltage	Socket 4 Resistance	Socket 5 Voltage	Socket 5 Resistance	Socket 6 Voltage	Socket 6 Resistance
1	0	200MΩ	0	200MΩ	0	INF
2	0	3MEGΩ	53AC	470Ω	115AC	520Ω
3	0	0	99	INF *	109AC	520Ω
4	0	2.5MEGΩ	103	INF *	OPEN	INF
5	0	2.5MEGΩ	0	500MΩ	109AC	520Ω
6	35	INF *	REF AC	400Ω †	0	400Ω
7	12AC	420Ω	85AC	500Ω	85AC	500Ω
8	0AC	400Ω	0	0	103	INF *

* - RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.
† - RESISTANCE OF SPEAKER FIELD

RES.&D.C. REFERENCE PIN 3, SOCKET 4.
A.C. REFERENCE: PIN 6, SOCKET 5.

BOTTOM VIEW OF SOCKETS

SPEAKER FIELD
VOLTAGE DROP 25V D.C., RESISTANCE 400Ω

PRIMARY OF OUTPUT	125Ω	PRIMARY OF 1ST I. F.	14Ω
SECONDARY " "	1Ω	SECONDARY " " "	14Ω
VOICE COIL	4Ω	PRIMARY " 2ND "	14Ω
HUM BUCKING COIL	LESS THAN 1Ω	SECONDARY " " "	14Ω

PUSH BUTTON SET UP

At the right hand end of the top of the cabinet four btons project. These buttons are set for stations by—

1. Loosen button to be set by unscrewing it about one fu turn.
2. Depress button which is to be set up.
3. While holding button down, carefully tune in the station to be set up.
4. Tighten button—detune set and check button by depressing it.

The other three buttons are set up in the same manner.

ALIGNMENT PROCEDURE

To properly align this set an output meter and a sig- n generator are required. The generator must be cali- bted at the following points: 455 Kc., 600 Kc., 1400 Kc., 10 Kc., 6 Mc., 10 Mc., 15 Mc., and 18.3 Mc.

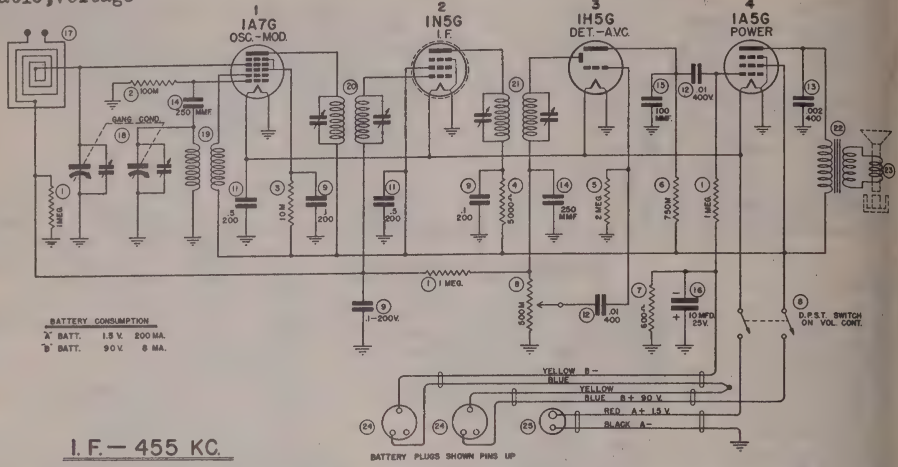
Always run the output of the signal generator as low as possible and still have accurate readings of the output meter. Connect high side of generator to antenna lead and low side to chassis through .01 condenser.

TEPS	In Series With Antenna	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	SET VOLUME CONTROL AT MAXIMUM					MAXIMUM OUTPUT
2.	250 mmfd.	455 Kc.	Minimum	2nd I. F. Trimmers	Front Top of Chassis	
3.				1st I. F. Trimmers	Rear Top of Chassis	
4.		1600 Kc.		B. C. Osc. Trimmer	Rear Side	
5.		1400 Kc.	Strongest Sig. & Rock Gang While Adjust. Is Made	B.C. R.F. Trimmer	Osc. is Right hand. R.F. Left Hand Screw	
6.		600 Kc.		B.C. Pad	Top of Chassis	
7.	Recheck	1400 Kc.				
8.	400 ohms No Condenser	18.3 Mc.	Minimum	S.W. Osc. Trimmer	Bottom of Osc. Coil. Osc. Trimmer Is Nearest Rear of Chassis	
9.		15.0 Mc.	Strongest Sig. & Rock Gang	S.W. R.F. Trimmer		
10.	CHECK SIGNAL AT 6 Mc. and 10 Mc.					

MODEL AT-30
Chassis C6-1
Schematic,Voltage

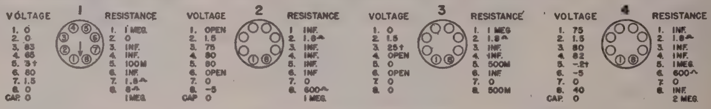
FARNESWORTH TELEV. & RADIO CORP.

Alignment,
Resistance



I. F. — 455 KC.

Any combination of one 1½ volt "A" battery and two 45 volt "B" batteries that will fit in the r ceiver case will be satisfactory. Battery drain is .2 amp., at 1½ volts and 9 ma., at 90 volts.



Pin	1 Voltage	1 Resistance	2 Voltage	2 Resistance	3 Voltage	3 Resistance	4 Voltage	4 Resistance
1.	0	1 MEG.	OPEN	INF.	0	1 MEG	75	INF.
2.	0	0	1.5	1.8^	1.5	1.8^	1.5	1.8^
3.	83	INF.	75	INF.	25†	INF.	80	INF.
4.	65	INF.	80	INF.	OPEN	INF.	82	INF.
5.	3†	100M	80	INF.	0	500M	-.2†	1 MEG.
6.	80	INF.	OPEN	INF	OPEN	INF	-5	600^
7.	1.5	1.8^	0	0	0	0	0	0
8.	0	8^	-5	600^	0	500M	40	INF.
CAP.	0	1 MEG.	0	1 MEG.			0	2 MEG.

BOTTOM VIEW OF SOCKETS

†DEPENDS ON SENSITIVITY OF METER.
RESISTANCE MEASUREMENTS MADE WITH BATTERIES DISCONNECTED.
VOLTAGE & RESISTANCE MEASURED TO GROUND WITH A 1000^ PER VOLT VOLTMETER.

Ref. No.	Part No.	
		Resistors
1	771-24	1 meg.
2	771-19	100 M
3	771-44	10 M
4	771-13	5 M
5	771-25	2 meg.
6	771-91	750 M
7	771-38	600 ohms
8	788-1	500 M Volume Control
		Tubular Condensers & Switch
9	256-2	.1 mfd. 200 V.
11	256-5	.5 mfd. 200 V.
12	255-1	.01 mfd. 400 V.
13	255-4	.002 mfd. 400 V.
		Mica Condensers
14	253-2	250 mmfd.
15	253-1	100 mmfd.
		Electrolytic Condensers
16	2518-1	10 mfd. 25 V.
		Miscellaneous
17	3839-1	Loop Antenna
18	2617-1	Gang Condensers
19	3840-1	Oscillator Coil
20	3841-1	1st I. F. Transformer
21	3842-1	2nd I. F. Transformer
22	9412-1	Output Transformer
23	817-1	Speaker
24	8016-1	3 Prong Battery Plug
25	8019-1	2 Prong Battery Plug
	3130-1	Dial Crystal
	3129-1	Dial Scale
	5657-1	Dial Pointer
	9210-1	Dial Drive Cable
	5917-2	Knob Marked "Tuning"
	5920-1	Knob Marked "Off-Volume
	644-1	Dial Cord Spring

ALIGNMENT

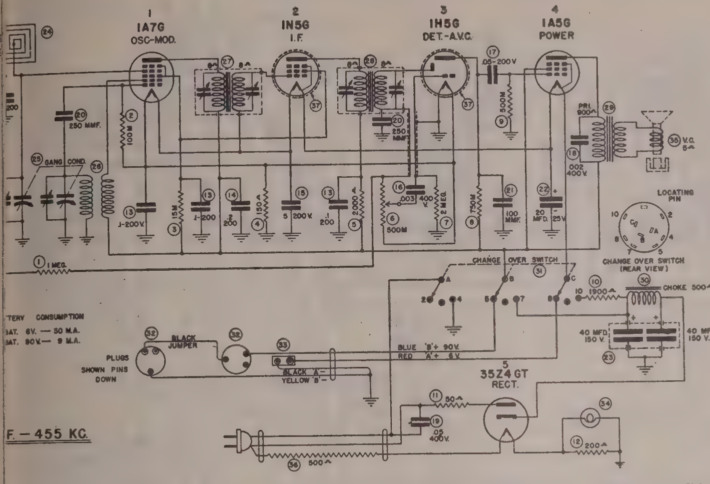
To properly align this receiver, a signal generator calibrated at 455 Kc., 1400 Kc., and 1730 Kc., is required. After aligning the I. F. stages, replace receiver in cabinet and FASTEN LOOP IN NORMAL POSITION before aligning the R. F. end through the openings in the end of the cabinet. These openings are closed by snap fasteners. The oscillator trimmer is nearest the front panel and the loop trimmer is directly behind it.

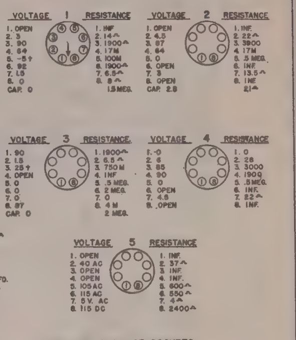
STEPS	Use in Series With Generator	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	.02 mfd. to Chassis Connect high side of Generator to grid cap of 1A7G tube.	455 Kc.	Quiet Point	2nd I. F. Trimmers	Top of I. F. Trans.	MAXIMUM OUTPUT
				1st I. F. Trimmers		
2.	Loop**	1730 Kc.	1730 Kc.	Oscillator Trimmer*	See Note Below	
3.	Loop**	1400 Kc.	1400 Kc. and Rock Gang	Loop Trimmer*		

*See preceding paragraph for location of trimmers.
**Loop to consist of five to ten turns of insulated wire wound on a three to four inch form to be closely coupled to the loop antenna in the receiver.

FARNESWORTH TELEV. & RADIO CORP.

MODEL AT-31
Chassis C7-1
Schematic,Voltage
Alignment,Parts
Resistance





VOLTAGE 1	RESISTANCE 1	VOLTAGE 2	RESISTANCE 2
1. OPEN	1. INF	1. OPEN	1. INF.
2. 3	2. 14Ω	2. 4.5	2. 22Ω
3. 90	3. 1900Ω	3. 87	3. 3900
4. 64	4. 17M	4. 64	4. 17M
5. -5†	5. 100M	5. 0	5. .5 MEG.
6. 92	6. 1900Ω	6. OPEN	6. INF.
7. 1.5	7. 6.5Ω	7. 3	7. 13.5Ω
8. 0	8. 8Ω	8. OPEN	8. INF.
CAP. 0	1.5 MEG.	CAP. 2.8	21Ω

VOLTAGE 3	RESISTANCE 3	VOLTAGE 4	RESISTANCE 4
1. 90	1. 1900Ω	1. -0	1. 0
2. 1.5	2. 6.5Ω	2. 6	2. 28
3. 25†	3. 750M	3. 85	3. 3000
4. OPEN	4. INF	4. 90	4. 1909
5. 0	5. .5 MEG.	5. 0	5. .5 MEG.
6. 0	6. 2 MEG.	6. OPEN	6. INF.
7. 0	7. 0	7. 4.8	7. 22Ω
8. 87	8. 4 M	8. OPEN	8. INF.
CAP. 0	2 MEG.		

VOLTAGE 5	RESISTANCE 5
1. OPEN	1. INF.
2. 40 AC	2. 37Ω
3. OPEN	3. INF.
4. OPEN	4. INF.
5. 105 AC	5. 600Ω
6. 115 AC	6. 550Ω
7. 5 V. AC	7. 4Ω
8. 115 DC	8. 2400Ω

BOTTOM VIEW OF SOCKETS

† DEPENDS ON SENSITIVITY OF METER
ALL READINGS WERE TAKEN ON 115 V. AC SUPPLY.
ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND, WITH A 1000 OHM/VOLT VOLTMETER.
ALL RESISTANCES MEASURED FROM SOCKET TERMINALS TO GROUND.

WATTS 30 VOLTS 105-125 AC-DC

ef. No.	Part No.	
1	771-24	1 meg.
2	773-19	100 M ohm
3	771-45	15 M ohm
4	771-50	150 ohm
5	771-41	2 M ohm
6	786-1	500 M ohm volume control
7	771-25	2 meg.
8	771-91	750 M ohm
9	771-23	500 M ohm
10	779-1	1900 ohm candohm
11	771-32	50 ohm
12	778-1	200 ohm flexible
13	256-2	.1 200 V.
14	256-4	.2 200 V.
15	256-5	.5 200 V.
16	254-3	.003 400
17	256-1	.05 200
18	255-4	.002 400
19	255-2	.05 400
20	253-2	250 mmfd. Mica
21	253-1	100 mmfd. Mica
22	2517-1	20 mfd. 25 V.
23	2516-1	40 mfd. 150 V.—40 mfd. 150 V. dual.
24	3833-1	Loop Assembly
25	2615-1	Gang Condenser
26	3834-1	Osc. Coil
27	3831-1	1st I. F. Transformer
28	3832-1	2nd I. F. Transformer
29	9410-1	Output Transformer
30	9411-1	Filter choke
31	908-1	Change Over Switch
32	8016-1	Battery plug (3 prong)
33	8017-1	Battery plug (2 prong)
34	422-1	Dial bulb
35	818-1	Speaker less transformer
36	222-1	Line Cord
	3118-1	Dial Scale
	5651-1	Dial Pointer
	0712-1	Dial escutcheon and crystal
	5917-1	Knob marked Volume
	5917-2	Knob marked Tuning
	5918-1	Knob for AC battery switch
	926-1	Dial Cord
	5652-1	Dial shaft

WHEN INSTALLING BATTERIES

1. Remove corner brackets. These lift out readily.
2. Put "B" battery against left wall of cabinet. Push against front panel, then slide as far to right as possible against wooden block. Insert other "B" battery in space just vacated.
3. If batteries stick, opening bottom door will facilitate installation.

ALIGNMENT

A signal generator calibrated at 455 Kc., 1400 Kc., and 1730 Kc., is necessary to properly align this receiver. After aligning the I. F. stages, replace receiver in cabinet and fasten loop in normal position before aligning the R. F. end through the openings in the end of the cabinet. These openings are closed by snap fasteners. The oscillator trimmer is nearest the front panel and the loop trimmer is directly behind it.

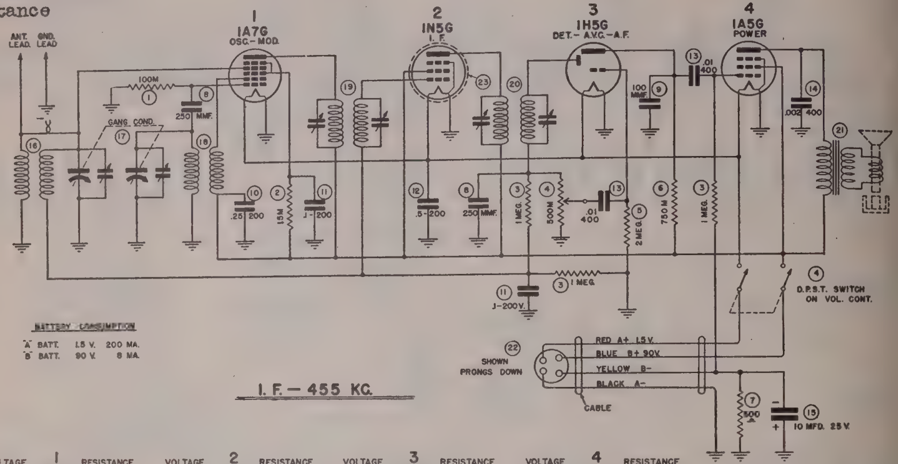
STEPS	Use in Series with Generator	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	.02MFD in each lead Connect high side of generator to grid cap of 1A7G tube	455 Kc.	Quiet Point	2nd I. F. Trimmers	Top of I. F. Trans.	MAXIMUM OUTPUT
				1st I. F. Trimmers		
2.	Loop**	1730 Kc.	Minimum	Oscillator Trimmer*	See Note Below	
3.	Loop**	1400 Kc.	1400 Kc. & Rock Gang	Loop Trimmer*		

*See preceeding paragraph for location of trimmers.

**Loop to consist of five to ten turns of insulated wire wound on a three to four inch form to be closely coupled to the loop antenna in the receiver.

MODEL AT-40
Chassis C8-1
Schematic,Voltage
Alignment,Parts
Resistance

FARNESWORTH TELEV. & RADIO CORP.

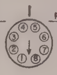


BATTERY CONSUMPTION

"A" BATT.	1.5 V.	200 MA.
"B" BATT.	90 V.	8 MA.

1

VOLTAGE	RESISTANCE
1. OPEN	1. INF.
2. 0	2. 0
3. 85	3. INF.
4. 57	4. INF.
5. -5†	5. 100M
6. 85	6. 1 MEG.
7. 1.5	7. 2.4Ω
8. 85	8. INF.



2

VOLTAGE	RESISTANCE
1. OPEN	1 INF.
2 0	2. 0*
3. 85	3. INF.
4. 85	4. INF
5. 85	5. INF.
6. OPEN	6. INF.
7. 1.5	7. 2.4Ω
8. OPEN	8. INF.

3

VOLTAGE	RESISTANCE
1. OPEN	1. INF.
2. 1.5	2. 2.4Ω
3. 25†	3. INF.
4. 0	4. INF.
5. 0	5. INF.
6. 0	6. INF.
7. 0	7. 0
8. 0	8. INF.

4

VOLTAGE	RESISTANCE
1. OPEN	1. INF.
2. 1.5	2. 2.4Ω
3. 83	3. INF.
4. 85	4. INF.
5. -0.2†	5. INF.
6. -5	6. 600Ω
7. 0	7. 0
8. OPEN	8. INF.

BOTTOM VIEW OF SOCKETS

† DEPENDS ON SENSITIVITY OF METER.
ALL VOLTAGES AND RESISTANCE MEASURED TO GROUND.
MEASURE RESISTANCE WITH BATTERY DISCONNECTED.

Ref. No.	Part No.	
		Resistors
1	771-19	100 M ohm
2	771-45	15 M ohm
3	771-24	1 meg.
4	787-1	500 M ohm Volume Control & Switch
5	771-25	2 meg.
6	771-91	750 M ohm
7	771-8	600 ohm
		Mica Condensers
8	253-2	250 mmfd. Mica
9	253-1	100 mmfd. Mica
		Tubular Condensers
10	256-3	.25 mfd. 200 V.
11	256-2	.1 mfd. 200 V.
12	256-5	.5 mfd. 200 V.
13	255-1	.01 mfd. 400 V.
14	255-4	.002 mfd. 400 V.
		Electrolytic Condensers
15	2518-1	10 mfd. 25 V.
		Miscellaneous
16	3837-1	Antenna Coil
17	2616-1	Gang Condenser
18	3838-1	Oscillator Coil
19	3835-1	1st I. F. Transformer
20	3836-1	2nd I. F. Transformer
21	819-1	Speaker Complete
22	8018-1	Battery Plug 4 Prong
23		Tube Shield
	5655-1	Dial Pointer
	5656-1	Dial Escutcheon
	3120-1	Dial Scale
	5919-1	Knobs
	926-2	Dial Cord
	5653-1	Dial Shaft
	5654-1	Dial Indicator
	3121-1	Dial Crystal

This set is designed to be used with an outdoor antenna which should be placed as high as possible and as far as possible from sources of interference. A good ground connection should be used.

ALIGNMENT

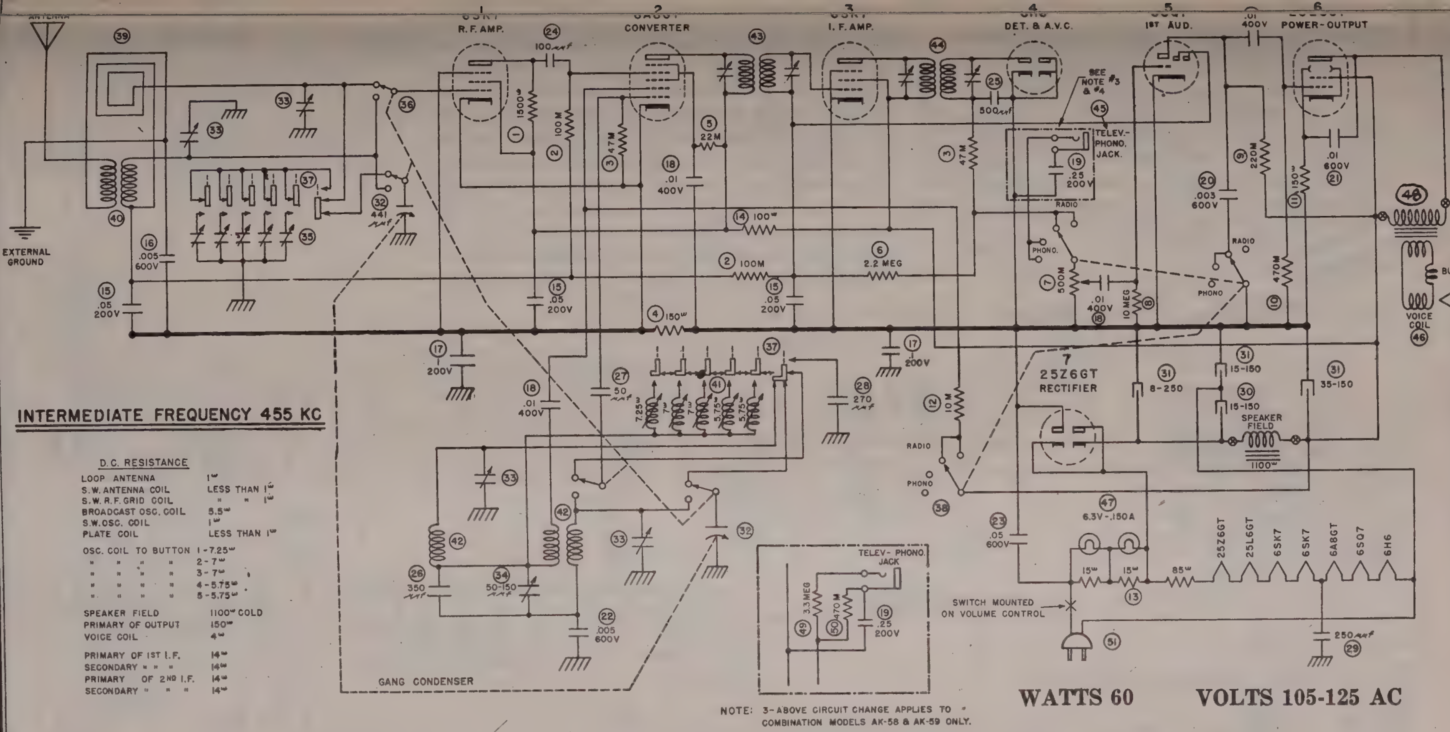
To properly align this receiver, an output meter and a signal generator are required. The generator must be calibrated at the following frequencies: 455 Kc., 600 Kc., 1400 Kc., and 1700 Kc. The volume control must bet set at maximum and the signal generator at the lowest value that will give an accurate reading on the output meter. The high side of the generator is connected to the blue antenna lead and the low side is connected to the black lead.

STEPS	In Series With Antenna	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	SET VOLUME CONTROL AT MAXIMUM.					
2.	250 mmf.	455 Kc.	Minimum	2nd I. F. Trimmers	Top of I. F.	MAXIMUM OUTPUT
3.				1st I. F. Trimmers		
4.		1700 Kc.	1700 Kc.	Oscillating Trimmer	Top Front of Gang	
5.		1400 Kc.	Strongest Signal and Rock Gang While Adjustment is Made	Antenna Trimmer	Top Rear of Gang	

hmatic,Voltage
sstance

FARNESWORTH TELEV.
& RADIO CORP

MODELS ATL50,-52
Chassis C2-1
ATL51,Chassis C2-2
ATL55,-56,Ch.C2-3
ATL58,-59,Ch.C2-4



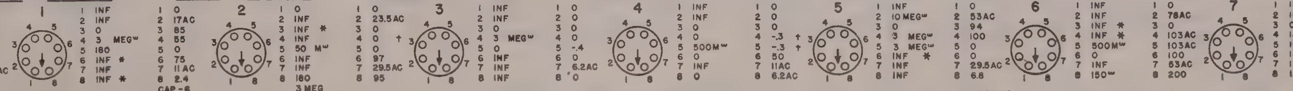
INTERMEDIATE FREQUENCY 455 KC

D.C. RESISTANCE	
LOOP ANTENNA	1ω
S.W. ANTENNA COIL	LESS THAN 1ω
S.W. R.F. GRID COIL	" " 1ω
BROADCAST OSC. COIL	5.5ω
S.W. OSC. COIL	1ω
PLATE COIL	LESS THAN 1ω
OSC. COIL TO BUTTON	1-7.25ω
" " " "	2-7ω
" " " "	3-7ω
" " " "	4-5.75ω
" " " "	5-5.75ω
SPEAKER FIELD	1100ω COLD
PRIMARY OF OUTPUT	150ω
VOICE COIL	4ω
PRIMARY OF 1ST I.F.	14ω
SECONDARY " " "	14ω
PRIMARY OF 2ND I.F.	14ω
SECONDARY " " "	14ω

NOTE: 3-ABOVE CIRCUIT CHANGE APPLIES TO COMBINATION MODELS AK-58 & AK-59 ONLY.

WATTS 60

VOLTS 105-125 AC



	1 VOLTAGE	1 RESISTANCE	2 VOLTAGE	2 RESISTANCE	3 VOLTAGE	3 RESISTANCE	4 VOLTAGE	4 RESISTANCE	5 VOLTAGE	5 RESISTANCE	6 VOLTAGE	6 RESISTANCE	7 VOLTAGE	7 RESISTANCE
1	0	INF	0	0	0	INF	0	INF	0	INF	0	INF	0	INF
2	17AC	INF	17AC	INF	23.5AC	INF	0	INF	0	10 MEGω	53AC	INF	78AC	INF
3	0	0	85	INF *	0	0	0	0	0	0	94	INF *	0	0
4	0 †	3 MEGω	55	INF	0 †	3 MEGω	0	0	-.3 †	3 MEGω	100	INF *	103AC	INF *
5	2.4	180	0	50 Mω	0	0	-.4	500Mω	-.3 †	3 MEGω	0	500Mω	103AC	INF *
6	95	INF *	75	INF	97	INF	0	0	50	INF *	0	0	100	INF *
7	23.5AC	INF	11AC	INF	29.5AC	INF	6.2AC	INF	11AC	INF	29.5AC	INF	53AC	INF
8	85	INF *	2.4	180	95	INF	0	0	6.2AC	INF	6.8	150ω	200	INF *
			CAP - 6	3 MEG										

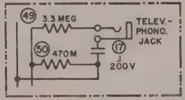
BOTTOM VIEW OF SOCKETS

† VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.

* RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

FOR ALIGNMENT
SEE INDEX

Ⓐ



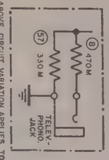
NOTE 4: ABOVE CIRCUIT CHANGE APPLIES TO COMBINATION MODELS AK-58 & AK-59 WHEN STAMPED ②.

NOTE:-#1-CONNECTION #1 ON ALL SOCKETS CONNECTED TO CHASSIS.
#2-CONNECTION #2 ON SOCKET 4 IS REFERENC POINT FOR A. C. FILAMENT VOLTAGES.

Chassis C4-1,C4-2
Tuner Data

FARNESWORTH TELEV. & RADIO CORP.

MODELS AC70,AC7
Chassis C3-1
AK76,Chassis C3
Schematic,Volta
Tuner,Resistanc

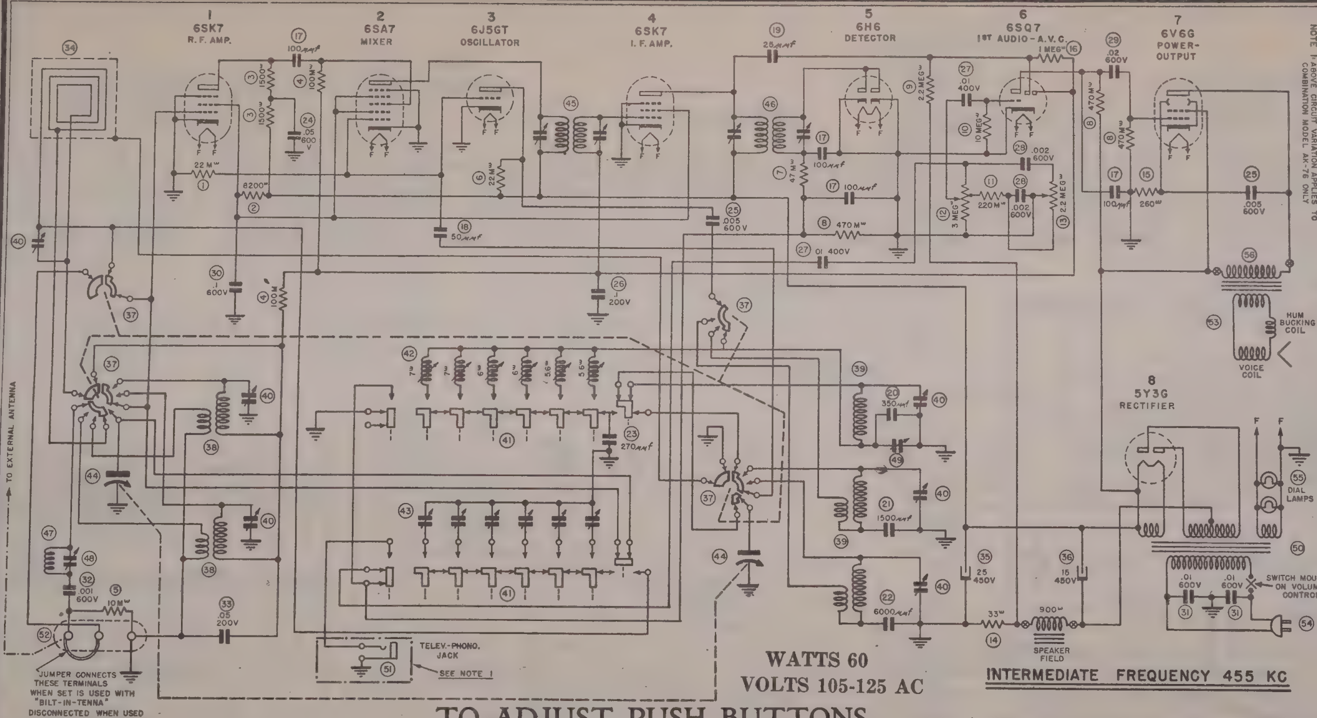


NOTE 1: ABOVE CIRCUIT VARIATION APPLIES TO COMBINATION MODEL AK-76 ONLY

D.C. RESISTANCES

LOOP ANTENNA	1Ω	S.W. OSC. COIL	1Ω
SPEC.SERV.ANT COIL	LESS THAN 1Ω	S.W PLATE COIL	LESS THAN 1Ω
S.S.R.F GRID COIL	1.2Ω	BROADCAST OSC. COIL	5.5Ω
" " OSC.	1.2Ω	SPEAKER FIELD	900Ω COLD
" " PLATE	LESS THAN 1Ω	OUTPUT PRI.	550Ω, SEC. 1Ω
S.W. ANTENNA "	" " "	1ST I F PRI.	14Ω, SEC. 14Ω
S.W.R.F GRID "	" " "	2ND I.F. "	" , " "

POWER TRANS. O.T.H.V. SEC. TO PLATE 4=185Ω; PLATE 6=175Ω.



WATTS 60
VOLTS 105-125 AC

INTERMEDIATE FREQUENCY 455 KC

TO ADJUST PUSH BUTTONS

Remove dial escutcheon—above the push button are the six R. F. trimmers, below are the six iron core oscillator coil adjustments shown in Fig. 1 below. Press the manual tuning button and carefully tune in one of the stations to be set up on the buttons. Adjust the signal generator to zero beat with the wanted station, select a button whose coil covers the frequency of the desired station then adjust first the oscillator coil, then the R. F. coil to give maximum signal, check the setting by pressing the return to manual button without the signal generator. The same procedure

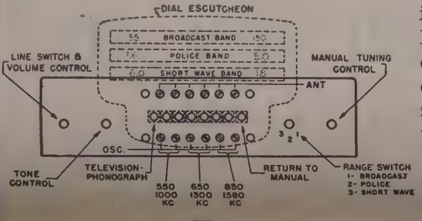
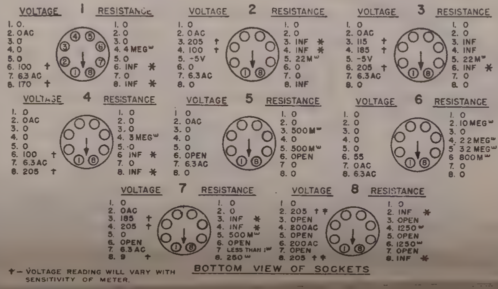


Fig. 1



VOLTAGE	1	RESISTANCE
1. 0.		1. 0
2. 0AC		2. 0
3. 0		3. 0
4. 0		4. 4 MEGΩ
5. 0		5. 0
6. 100 †		6. INF *
7. 6.3 AC		7. 0
8. 170 †		8. INF *

VOLTAGE	2	RESISTANCE
1. 0		1. 0
2. 0AC		2. 0
3. 205 †		3. INF *
4. 100 †		4. INF *
5. -5V		5. 22MΩ
6. 0		6. 0
7. 6.3AC		7. 0
8. 0		8. INF

VOLTAGE	3	RESISTANCE
1. 0		1. 0
2. 0AC		2. 0
3. 115 †		3. INF
4. 185 †		4. INF
5. -5V		5. 22MΩ
6. 205 †		6. INF *
7. 6.3AC		7. 0
8. 0		8. 0

VOLTAGE	4	RESISTANCE
1. 0		1. 0
2. 0AC		2. 0
3. 0		3. 0
4. 0		4. 3MEGΩ
5. 0		5. 0
6. 100 †		6 INF *
7. 6.3AC		7. 0
8. 205 †		8. INF *

VOLTAGE	5	RESISTANCE
1 0		1. 0
2. 0AC		2. 0
3. 0		3. 500MΩ
4. 0		4. 0
5. 0		5. 500MΩ
6. OPEN		6. OPEN
7. 6.3AC		7 0
8. 0		8. 0

VOLTAGE	6	RESISTANCE
1. 0		1. 0
2. 0		2. 10MEGΩ
3. 0		3. 0
4. 0		4. 2.2MEGΩ
5. 0		5 3.2MEGΩ
6. 55		6 800MΩ
7. 0AC		7. 0
8. 6.3AC		8. 0

VOLTAGE	7	RESISTANCE
1. 0		1. 0
2. 0AC		2. 0
3. 185 †		3. INF *
4. 205 †		4. INF *
5. 0		5. 500MΩ
6. OPEN		6. OPEN
7. 6.3AC		7 LESS THAN 1Ω
8. 9 †		8. 250Ω

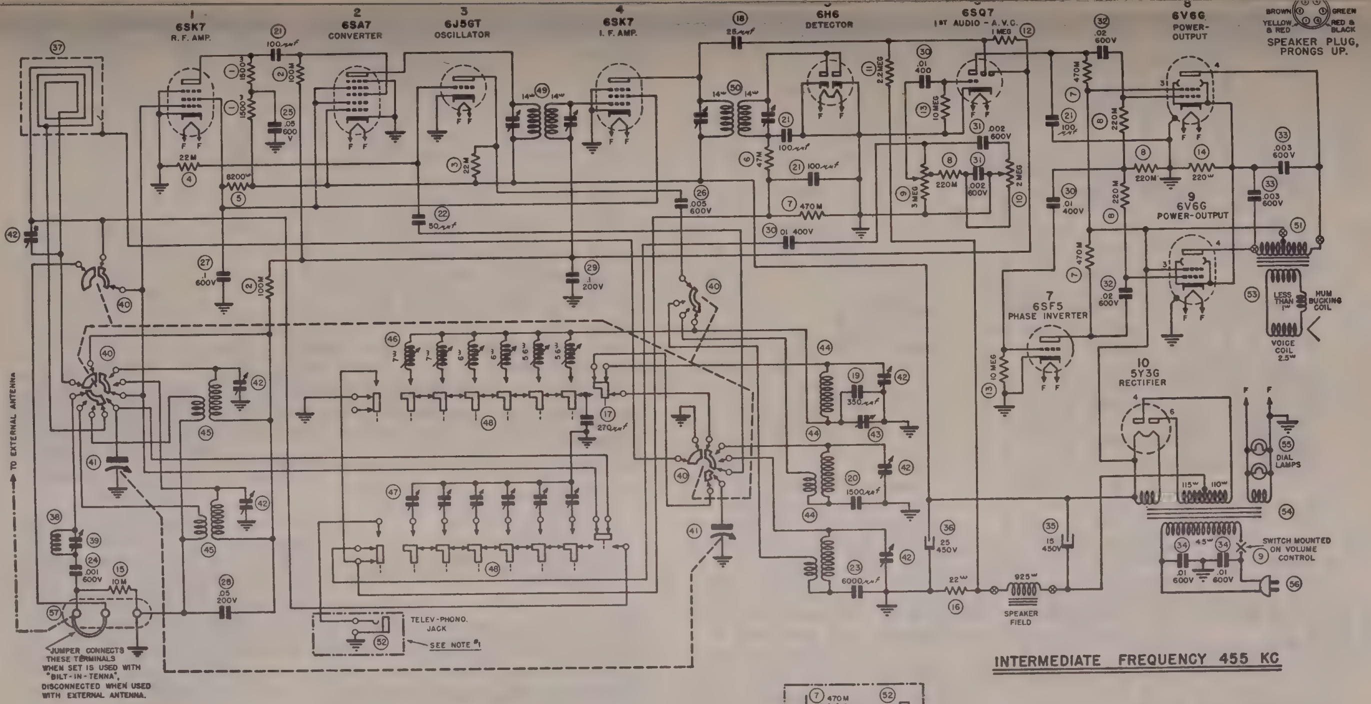
VOLTAGE	8	RESISTANCE
1 0		1. 0
2. 205 †*		2. INF *
3. OPEN		3. OPEN
4. 200AC		4. 1250Ω
5. OPEN		5. OPEN
6. 200AC		6. 1250Ω
7. OPEN		7. OPEN
8. 205 †*		8. INF *

† — VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.

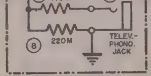
BOTTOM VIEW OF SOCKETS

FARNESWORTH TELEV. & RADIO CORP.

MODELS AC90,AC91
Chassis C4-1
AK95,AK96,Ch.C4-2
Schematic,Voltage
Resistance



INTERMEDIATE FREQUENCY 455 KC



NOTE #1: ABOVE CIRCUIT VARIATION APPLIES TO COMBINATION MODELS ONLY.

D.C. RESISTANCES

LOOP ANTENNA	1Ω	S.W. OSC. COIL	1Ω
SPEC. SERV. ANT. COIL	LESS THAN 1Ω	S.W. PLATE COIL	LESS THAN 1Ω
S.S. R.F. GRID COIL	1.2Ω	B'DCAST OSC. "	5.5Ω
" " OSC. "	1.2Ω	OUTPUT SEC.	LESS THAN 1Ω
" " PLATE "	LESS THAN 1Ω	" PRI.	330Ω, 310Ω. MEASURED FROM PIN #3 TO #4 OF EACH OUTPUT TUBE.
S.W. ANTENNA "	" " "		
S.W. R.F. GRID "	" " "		

POWER TRANS. C.T. H.V. SEC. TO PLATE 4 = 185Ω; PLATE 6 = 175Ω.

Schematic C4-1 and C4-2.

WATTS 70 VOLTS 105-125 AC

Pin	Voltage 1	Resistance 1	Voltage 2	Resistance 2	Voltage 3	Resistance 3	Voltage 4	Resistance 4	Voltage 5	Resistance 5	Voltage 6	Resistance 6	Voltage 7	Resistance 7	Voltage 8 & 9	Resistance 8 & 9	Voltage 10	Resistance 10
1.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	OPEN
2.	0	0	0	0	0	0	0	0	0	0	0	10 MEG	0	0	0	0	240	INF *
3.	0	0	225	INF *	115	INF *	0	0	-.5	1 MEG	0	0	0	10 MEG	225	INF *	0	OPEN
4.	0	1.2 MEG	105	INF *	200	INF *	0	INF *	0	0	0	INF	0	0	230	INF *	230 AC	1100Ω
5.	0	0	-6 †	26M	-6 †	26M	0	0	-.5	1 MEG	0	INF	55	INF *	0	400M	0	OPEN
6.	105	INF *	0	0	225	INF *	105	INF *	0	OPEN	55	INF	0	OPEN	0	300M	230 AC	1100Ω
7.	6.3 AC	0	6.3 AC	0	6.3 AC	0	6.3 AC	0	6.3 AC	0	6.3 AC	0	6.3 AC	0	6.3 AC	0	0	OPEN
8.	170	INF. *	0	INF *	0	0	220	INF *	0	0	0	0	0	0	12	220Ω	240	INF *

BOTTOM VIEW OF SOCKETS

† - VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.

✱ - RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

LINE VOLTAGE = 110.
RECTIFIER FILAMENT VOLTAGE 5 V.A.C. MEASURED FROM PIN 2 TO PIN 8 OF SOCKET #10.

CHASSIS C2-1,C2-2,
C2-3,C2-4
CHASSIS C3-1,C3-2
CHASSIS C4-1,C4-2
Alignment,Tuner

FARNESWORTH TELEV. & RADIO CORP.

MODELS ATL-50,ATL-52 (Ch.C2-1),ATL-51 (Ch.C2-2),ATL-55,ATL-56 (Ch.C2-3),ATL-58, ATL-59 (Ch.C2-4).

CHASSIS REMOVAL

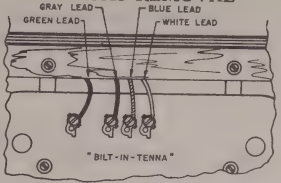


Fig. 2

When removing the chassis from the cabinet for service, first remove the loop antenna in table models. Second—disconnect the pointer from the drive cable by bending tongue toward the rear of the chassis to release drive cord, before loosening chassis hold down bolts. In consoles the loop is mounted below the chassis shelf, so it is not necessary to remove the loop assembly. However, the four leads from the chassis to the four screw type terminals on the loop shield should be removed by loosening the screws. See Fig. 2 for color code, when replacing chassis.

ALIGNMENT

Before re-aligning the set be sure all adjusting screws for the iron core oscillator coils are flush with or inside the chassis base.

Connect the low side of the signal generator to the black (ground) lead of the set and the high side of the generator to the green (antenna) lead.

PUSH BUTTON SET UP

At the rear of the chassis between the television jack and the antenna and ground leads are five pairs of holes. The lower hole is for the adjustment of the iron cores for the oscillator coils. The upper hole is for the R.F. stage adjustment. It is suggested that a signal generator be used for alignment. Tune in by means of the tuning knob, one of the stations that is to be set up. Select the button in the range covering the station selected, as shown by the label on the back of the chassis and Fig. 1 below. Before pushing the button adjust the signal generator to zero beat with the desired station, then push button. Adjust the oscillator (lower screw) first, then the R.F. stage (upper screw) turn off the signal generator, check against manual tuning by the manual tuning button. When the screws are turned to the right (clockwise) the frequency of the associated circuit is lowered.

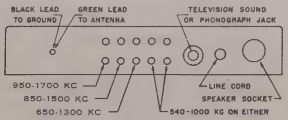


Fig. 1

CAUTION—Often two peaks are found at 18Mc. Use the one found at the minimum setting of the oscillator trimmer.

STEPS	Use in series with antenna	Set Generator at	Set Gang at	Adjust	Located	To obtain
1.	SET VOLUME CONTROL AT MAXIMUM					MAXIMUM OUTPUT
2.	250 mmfd.	455 Kc.	Minimum	2nd I. F. Trimmers	Top 2nd I. F. Tran.	
3.				1st I. F. Trimmers	Top 1st I. F. Tran.	
4.		1600 Kc.		B.C. Osc. Trimmer	Top of Chassis	
5.		1500 Kc.	Strongest Signal and Rock Gang	B.C.R.F. Trimmer		
6.		600 Kc.		B.C. Pad		
7.	Recheck 1600 Kc.					
8.	400 Ohms	18.1 Mc.	Minimum	S.W. Osc. Trimmer		
9.		16 Mc.	Strongest Signal and Rock Gang	S.W.R.F. Trimmer		
10.	Check Signal at 6 Mc. and 10 Mc.					

MODELS AC-70,AC-71 (Ch.C3-1),AK-76 (Ch.C3-2) AC-90,AC-91 (Ch.C4-1),and AK-95, AK-96 (Ch.C4-2).

TO REMOVE CHASSIS

Before removing the chassis it is necessary to remove the loop antenna, this is done as follows: First remove the 3 prong plug from top of loop frame. Loosen the bolt which goes through the wooden member at the bottom of the speaker enclosure. This will allow the bottom pivot (wood) to drop—allowing the top pivot of the loop to be removed from its bearing. Caution should be used so that the heavy rubber washer is not lost, also when the loop is removed from the top bearing, a lead which plugs into the top of the loop axis, must be disconnected, if the loop is dropped this lead may break. After the loop is free the set should be manually tuned to 900 K. C. and the pointer disconnected from the drive cord by bending the center tab toward the back of the cabinet and releasing the cord.

The chassis bolts may be removed and the chassis lifted out taking care that the two sets of leads to the loop do not catch on the chassis shelf.

When replacing the loop after the chassis, chassis pointer and the single lead to the center of the loop have been reinstated, before replacing the loop make sure the lower bearing support has the dowel pointing away from the loud speaker so that an angle of approximately 10° or 15° is made with a line parallel with the front panel. When the loop is installed be sure the label faces the back of the cabinet and that the loop is raised by the lower support so the rubber washer is slightly compressed so the loop will not rotate by itself. Then plug in the three prong plug making certain the leads are dressed so no strain is on them when the loop is rotated.

When replacing chassis adjust signal generator to 900 Kc—then manually tune in the signal, set the pointer so its center line coincides with the center line of the 900 Kc marker, then clamp pointer to drive cord. If set is correctly aligned the calibration will check at 600 Kc and 1500 Kc within the pointer's width.

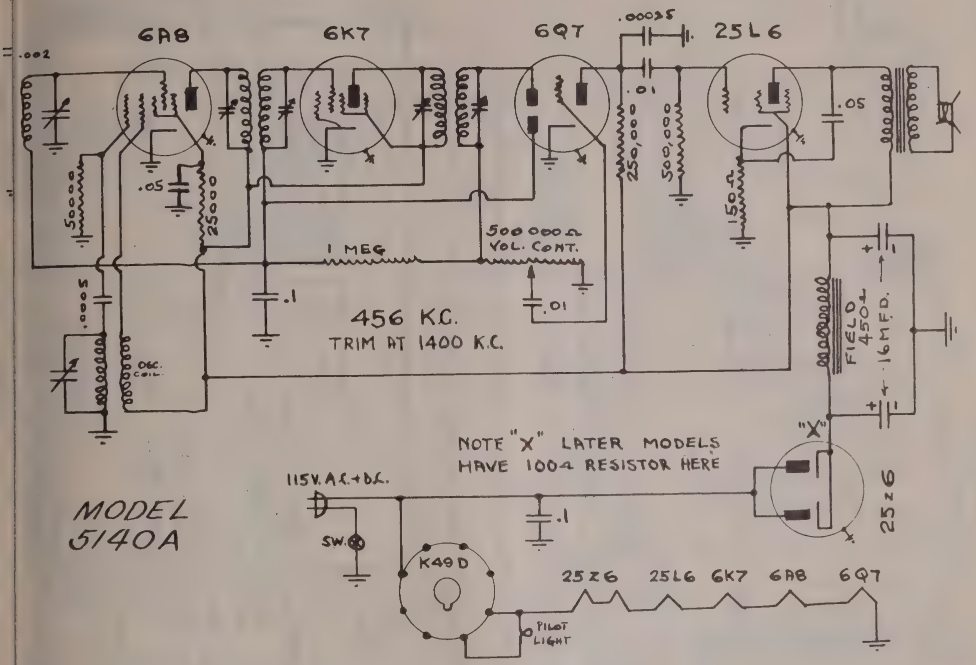
ALIGNMENT Connect the high side of the generator to the antenna terminal and the low side of it to the ground terminal making certain jumper on terminal strip is disconnected. Before aligning tighten wave trap-trimmer screw.

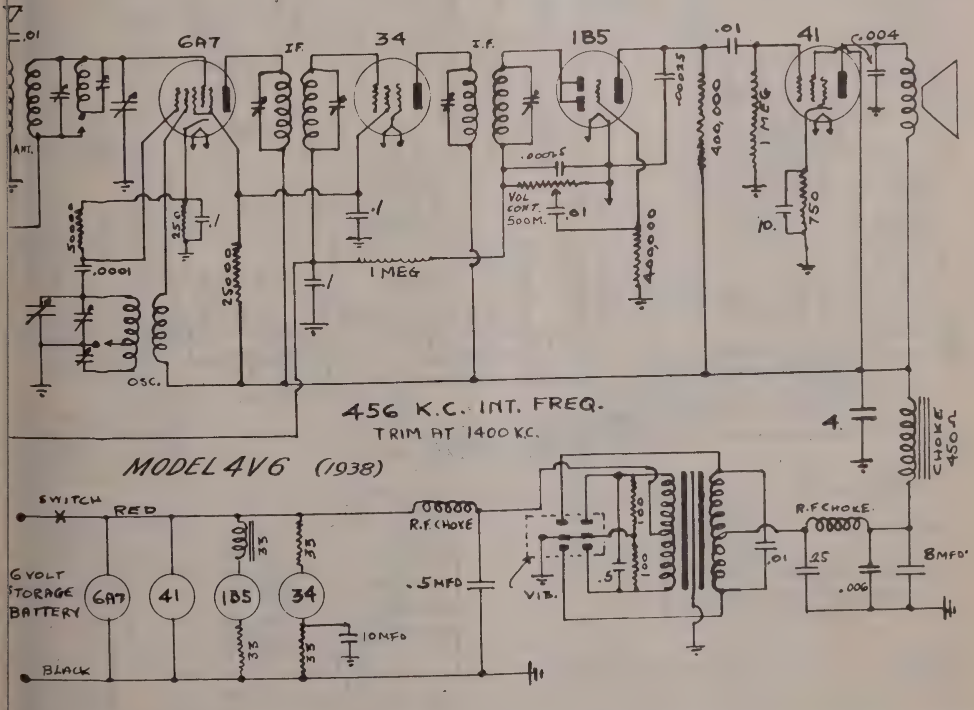
STEPS	In Series With Antenna	Set Generator at	Set Gang at	Adjust	Located	To Obtain
1	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2	250 mmfd.	455 Kc.	Minimum	2nd I. F. Trimmers	Top of I. F. Trans.	Maximum Output
3				1st I. F. Trimmers		
4				Wave Trap Trimmer	Rear of Chassis	Minimum Output
5		1600 Kc.		Osc. B. C. Trimmer	Top of Chassis	Maximum Output
6		1500 Kc.	Strongest Signal and Rock Gang	R. F. B. C. Trimmer		
7		600 Kc.		600 Kc. Pad		
8	Recheck 1500 Kc.					
9	400 Ohms.	5.6	Minimum	Osc. Police Trimmer*		
10		5 Mc.	Strongest Sig. & Rock Gang	R. F. Police Trimmer**		
11	Check 1.8 Mc.					
12	400 Ohms.	18.1 Mc.	Minimum	Osc. S. W. Trimmer*		
13		16 Mc.	Strongest Sig. & Rock Gang	R. F. S. W. Trimmer**		
14	Check 6 and 10 Mc.					

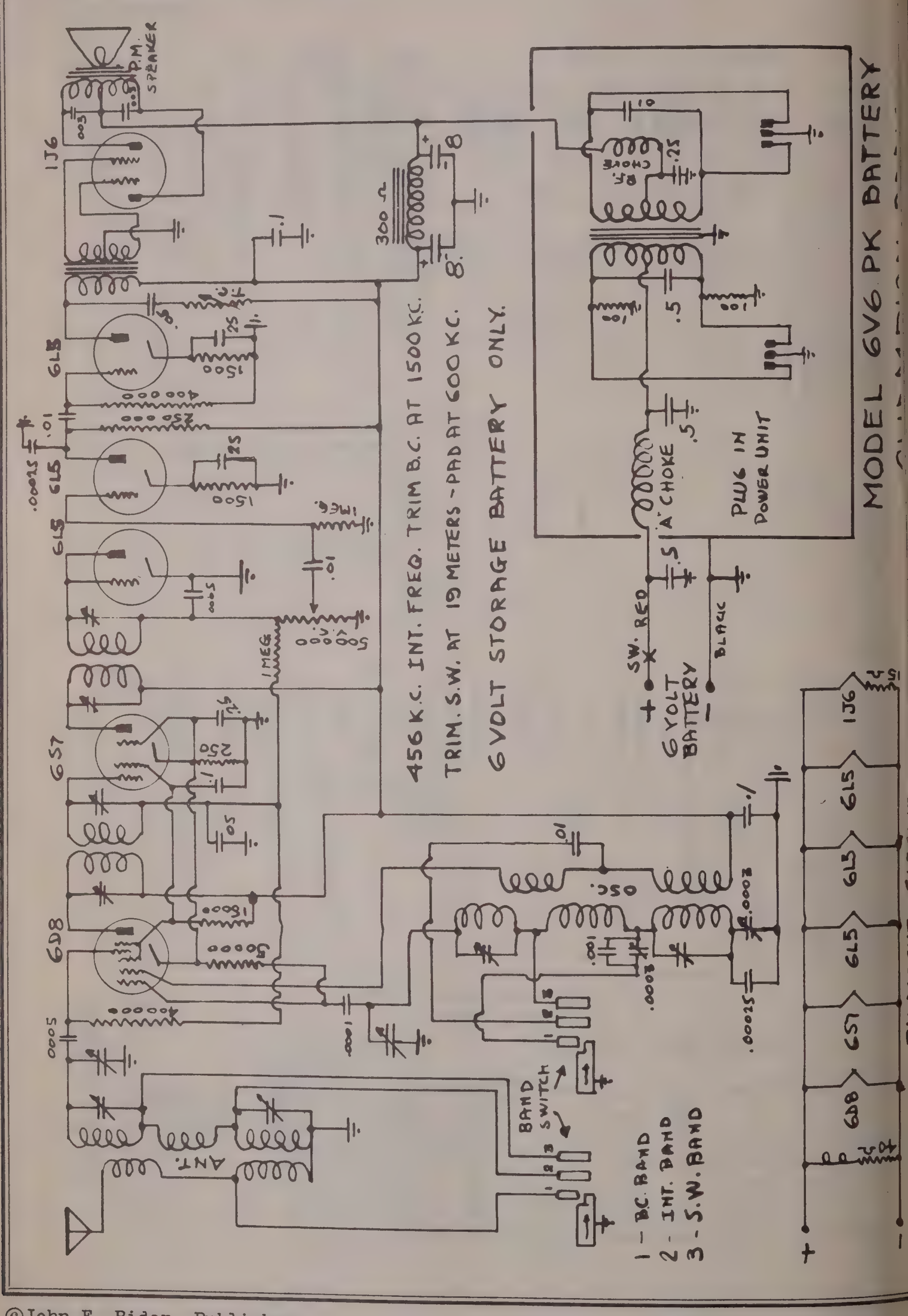
*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.
**Tighten R. F. trimmer screw for maximum capacity, then unscrew until first peak is secured.

FERGUSON RADIO, INC.

MODEL 4V6(1938)
MODEL 5140A
Schematics







456 K.C. INT. FREQ. TRIM B.C. AT 1500 K.C.

TRIM. S.W. AT 19 METERS - PAD AT 600 K.C.

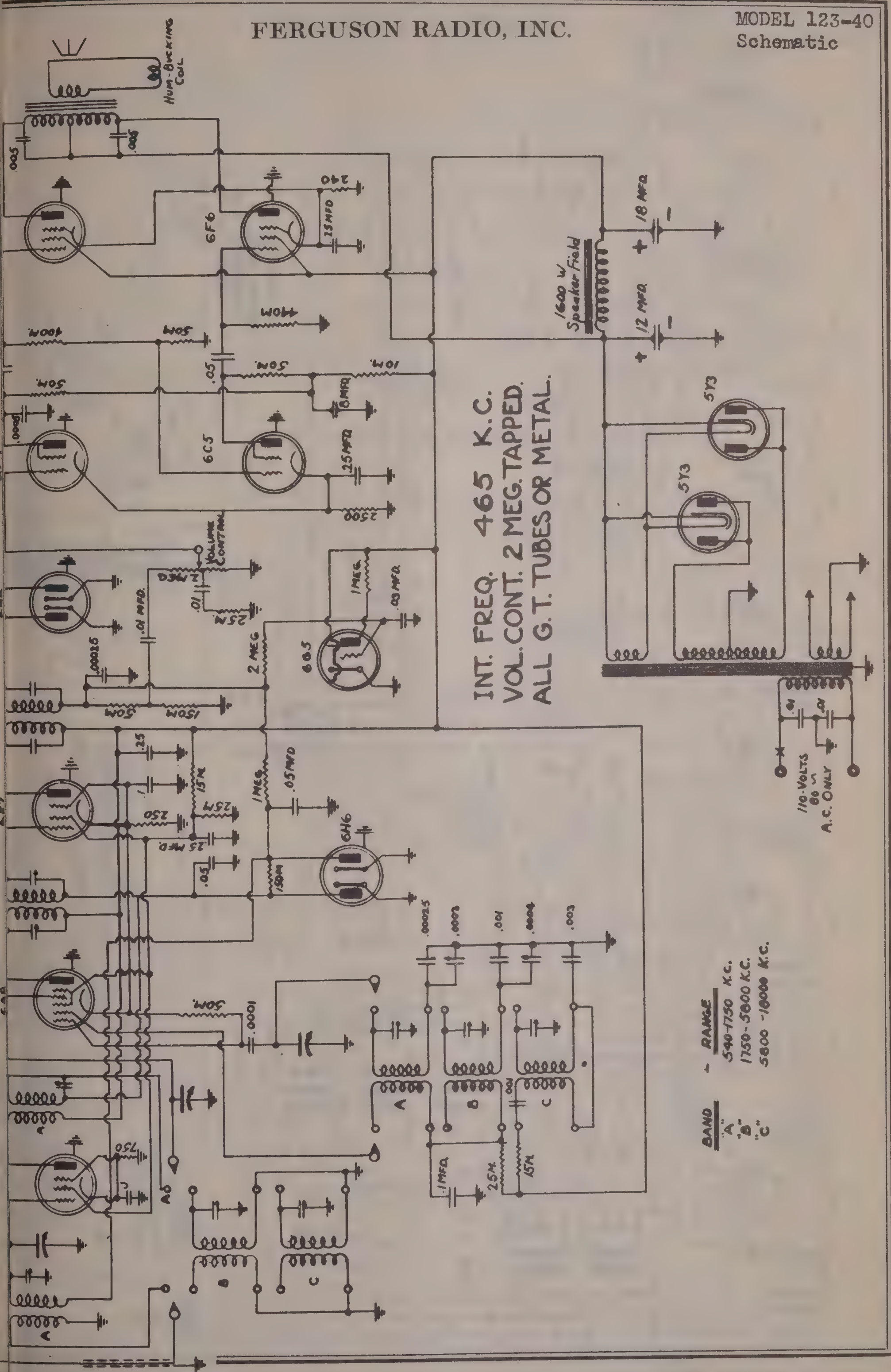
6 VOLT STORAGE BATTERY ONLY.

1 - B.C. BAND
2 - INT. BAND
3 - S.W. BAND

MODEL 6V6 PK BATTERY

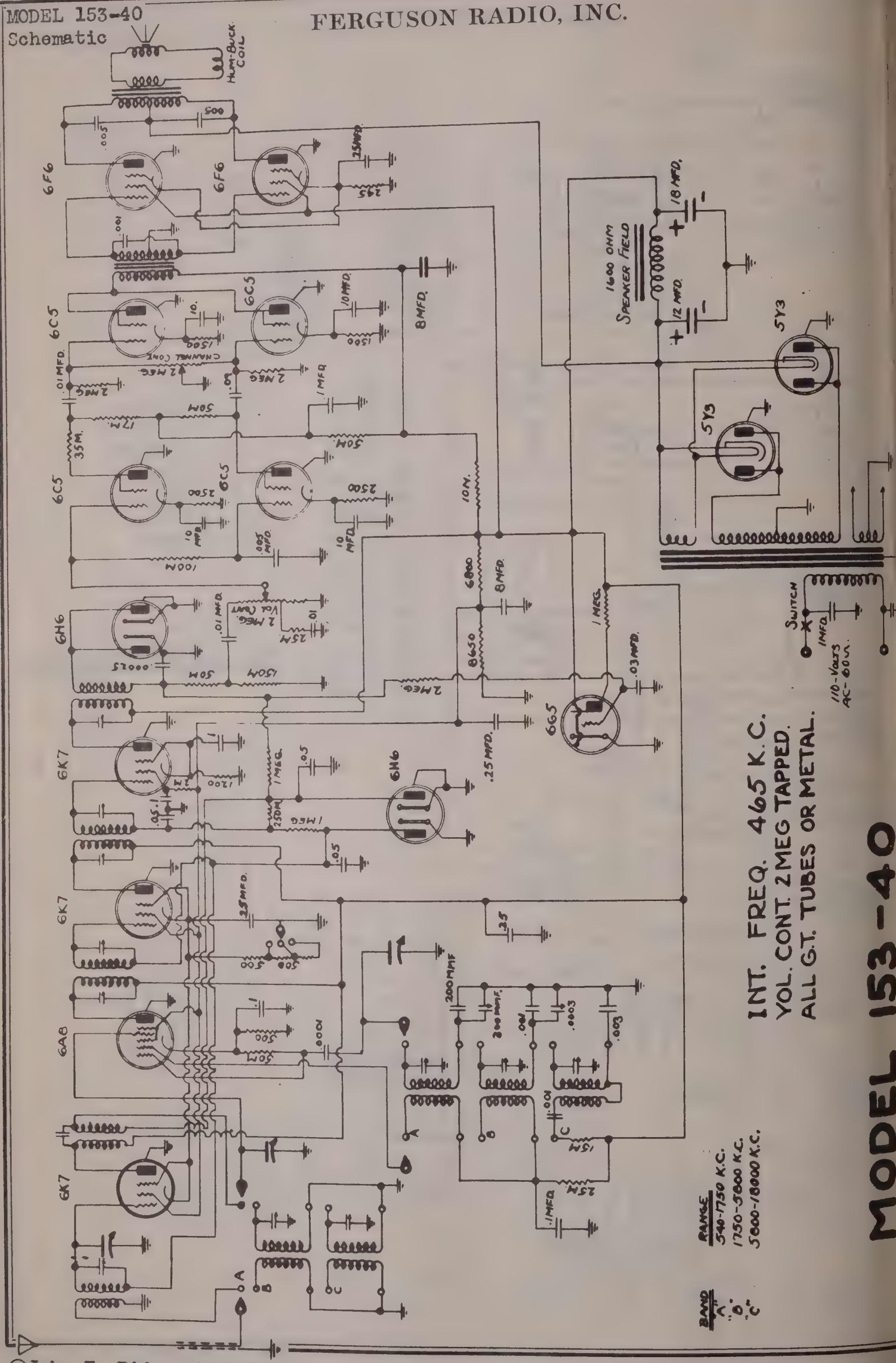
FERGUSON RADIO, INC.

MODEL 123-40
Schematic



MODEL 153-40
Schematic

FERGUSON RADIO, INC.



INT. FREQ. 465 K.C.
VOL. CONT. 2 MEG TAPPED.
ALL G.T. TUBES OR METAL.

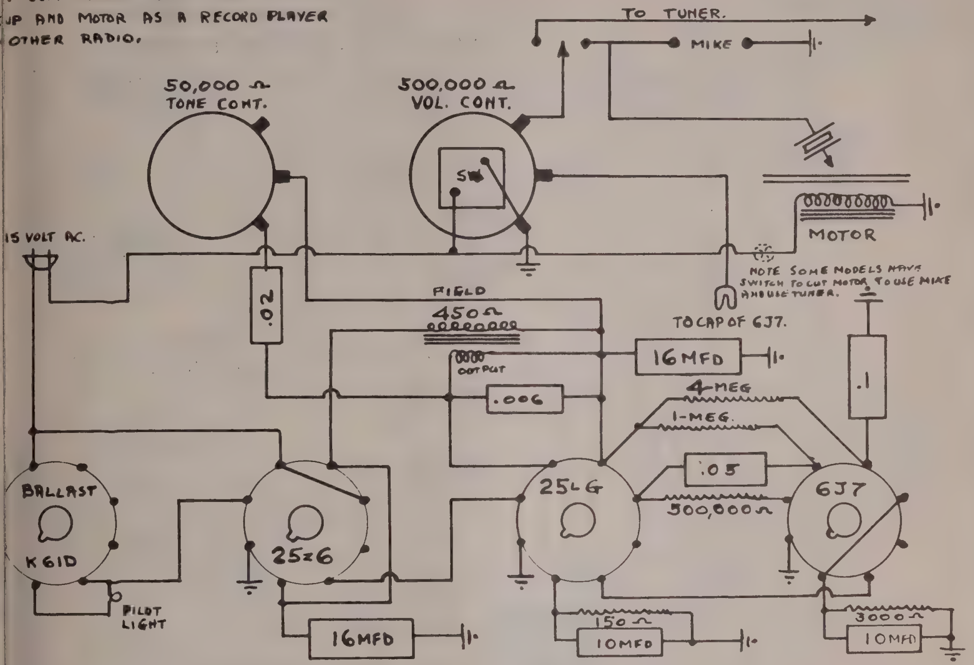
MODEL 153-40

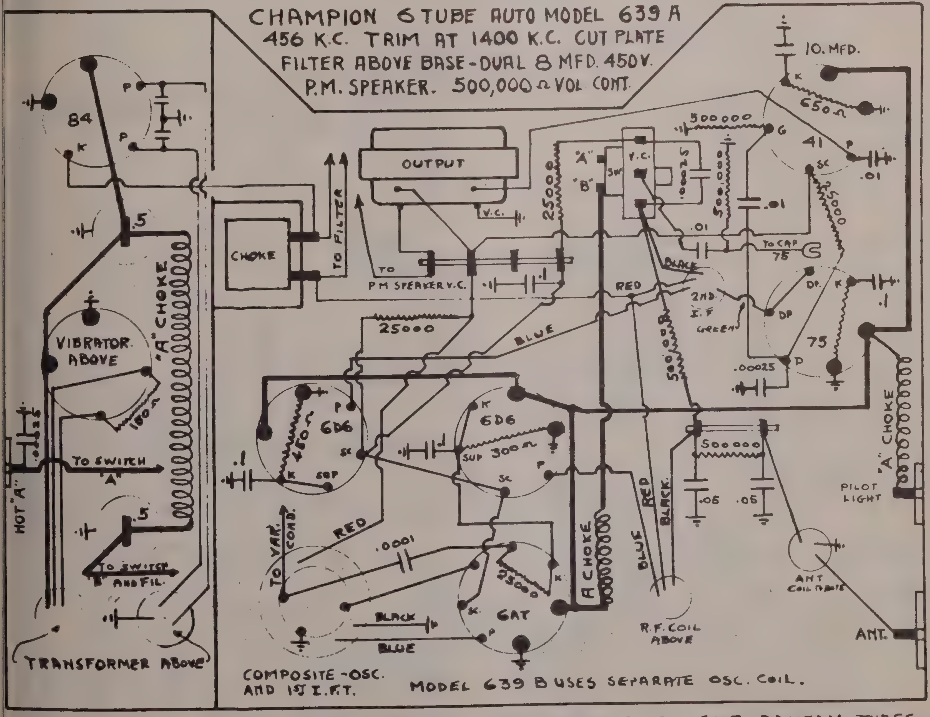
MODEL 3-Tube Phono.
MODELS 639A,639B
Schematics

FERGUSON RADIO, INC.

3 TUBE ELECTRIC PHONOGRAPH

O: SOME MODELS HAVE JACK TO USE
UP AND MOTOR AS A RECORD PLAYER
N OTHER RADIO.





CHAMPION 6 TUBE AUTO MODEL 639 A
456 K.C. TRIM AT 1400 K.C. CUT PLATE
FILTER ABOVE BASE - DUAL 8 MFD. 450V.
P.M. SPEAKER. 500,000 Ω VOL. CONT.

MODEL 639 B USES SEPARATE OSC. COIL.

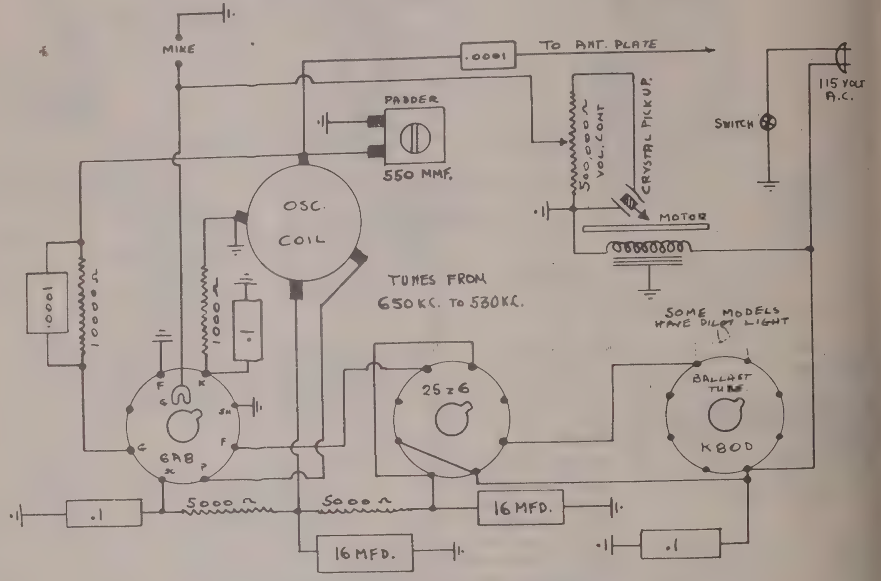
NOTE: MODEL 639-B USES: 6K7 - 6A8 - 6K7 - 6Q7 - 6K6 - 6X5 BANTAM TUBES

MODEL Wireless Record
Player
MODEL 6140AK
Serial 9293 up
Schematics

FERGUSON RADIO, INC.

CHAMPION RADIO – WIRELESS RECORD PLAYER

NOTE MIKE CONNECTION AND VOL CONTROL ON DE LUXE MODEL ONLY
NOT ON JUNIOR MODEL – RADIATOR EITHER IN LINE CORD OR BOTTOM

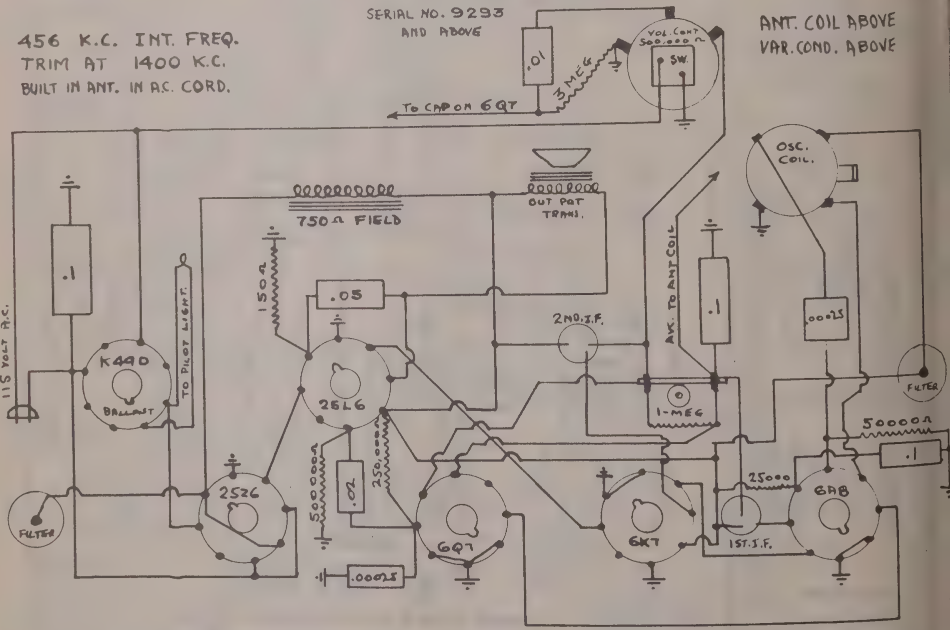


MODEL 6140 AK.

SERIAL NO. 9293
AND ABOVE

456 K.C. INT. FREQ.
TRIM AT 1400 K.C.
BUILT IN ANT. IN A.C. CORD.

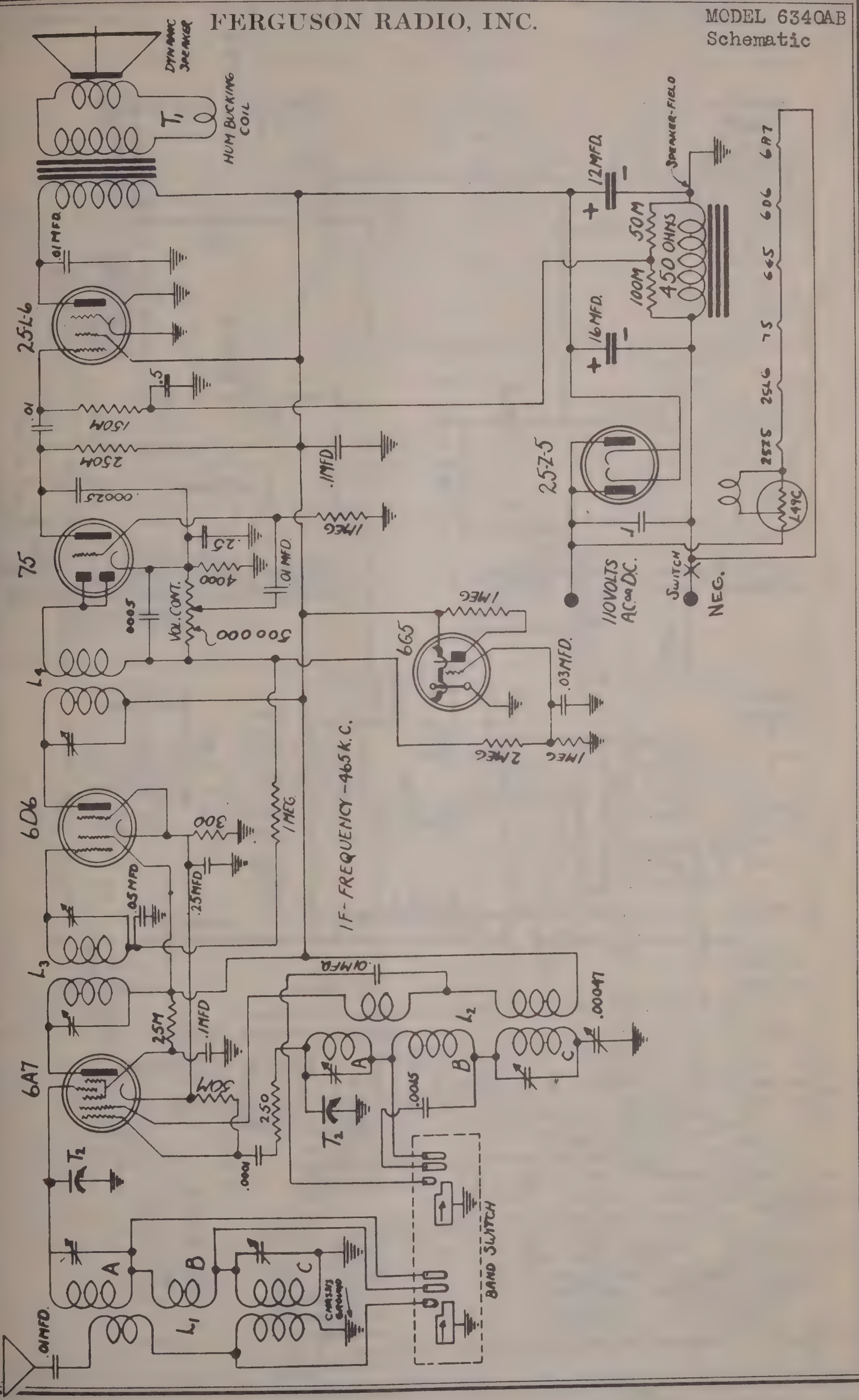
ANT. COIL ABOVE
VAR. COND. ABOVE



MODEL 6340 AB

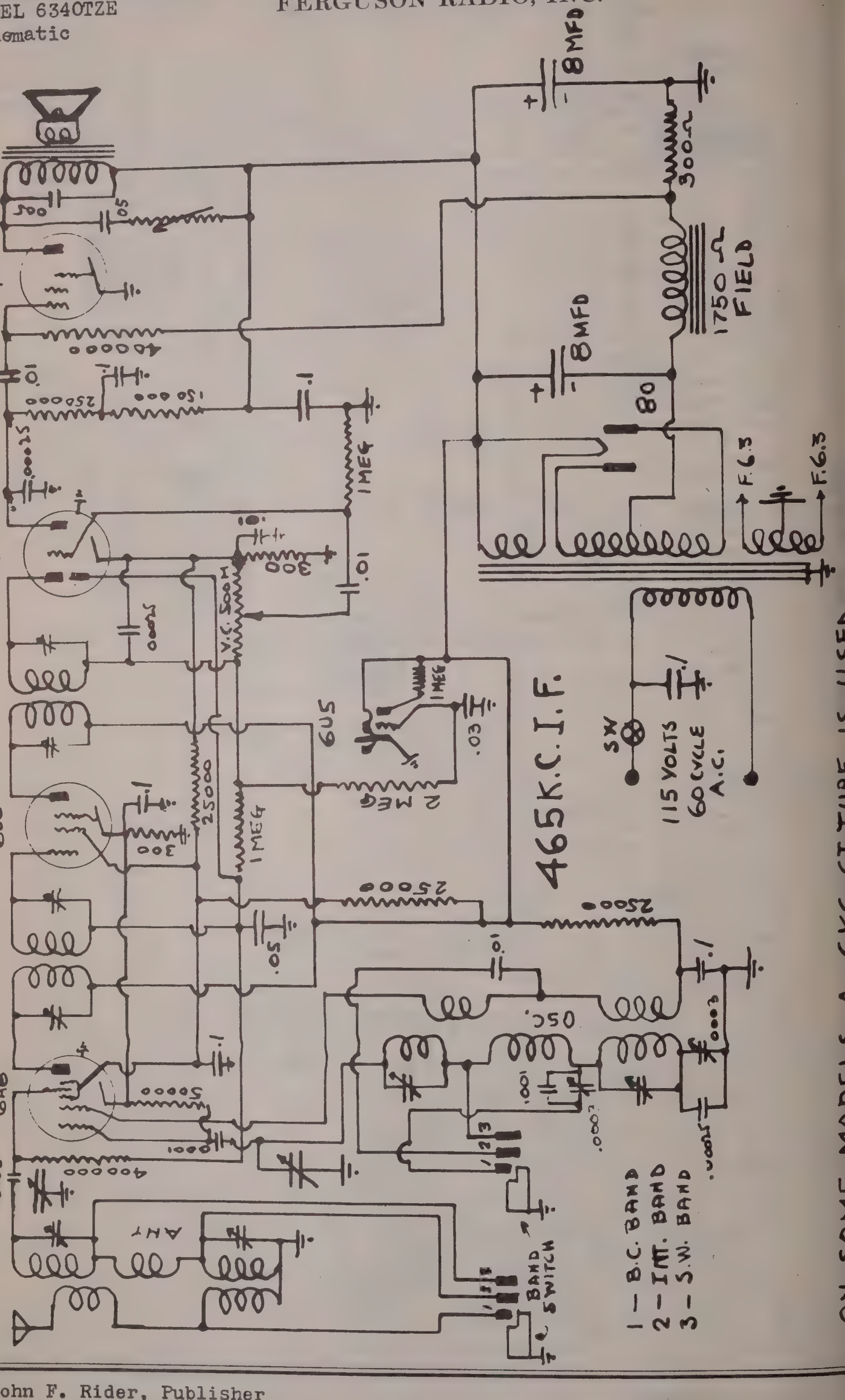
FERGUSON RADIO, INC.

MODEL 6340AB
Schematic



FERGUSON RADIO, INC.

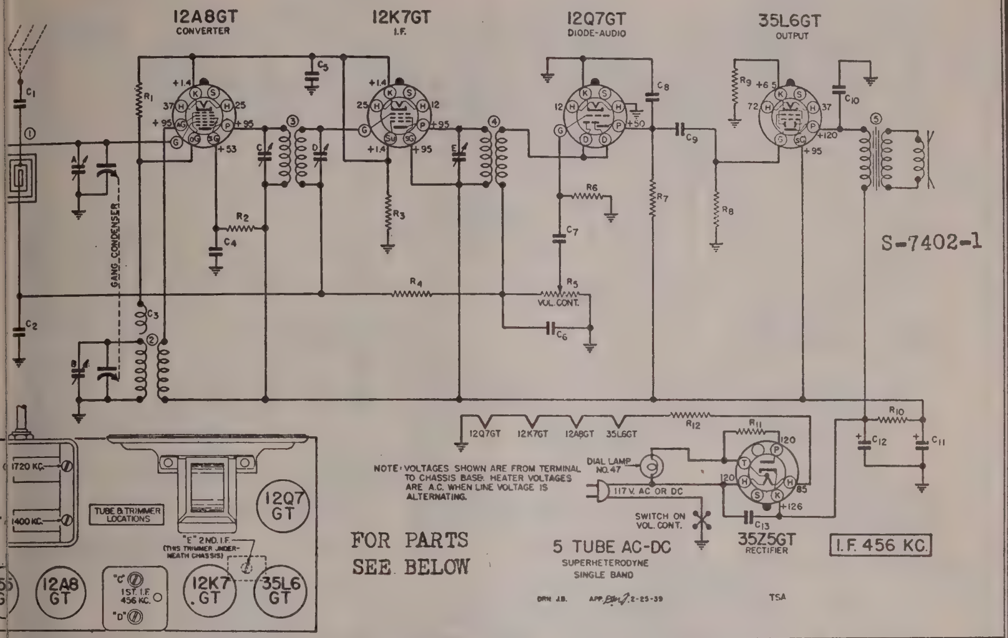
MODEL 6340TZE
Schematic



ON SOME MODELS A 6K6 G.T. TUBE IS USED

MODEL S7402-1
MODELS S7402-2,S7422-5
Schematics,Voltage
ket,Trimmers,Parts
gnment

FIRESTONE TIRE & RUBBER CO.



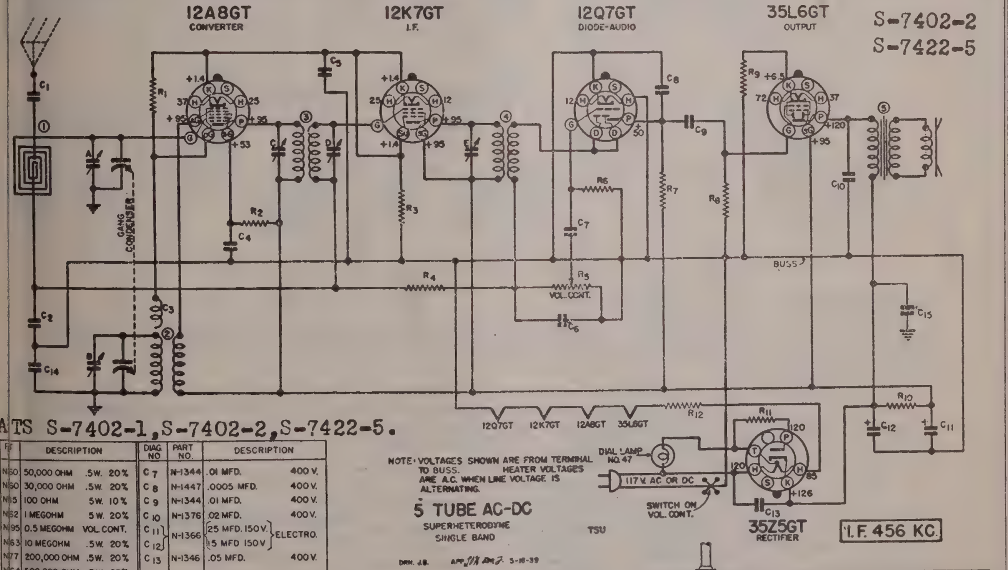
NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

FOR PARTS SEE BELOW

5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

DRN. J.B. APP. 2-25-39

TSA



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

TSU

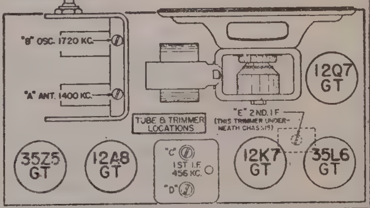
DRN. J.B. APP. 5-18-39

TS S-7402-1,S-7402-2,S-7422-5.

G O	P	DESCRIPTION	DIAG NO	PART NO.	DESCRIPTION
	N60	50,000 OHM .5W. 20%	C 7	N-1344	.01 MFD. 400 V.
2	N60	30,000 OHM .5W. 20%	C 8	N-1447	.0005 MFD. 400 V.
3	N15	100 OHM 5W. 10%	C 9	N-1344	.01 MFD. 400 V.
4	N62	1 MEGOHM 5 W. 20%	C 10	N-1376	.02 MFD. 400 V.
5	N95	0.5 MEGOHM VOL. CONT.	C 11 C 12	N-1366	25 MFD. 150 V. 15 MFD 150 V ELECTRO.
6	N63	10 MEGOHM .5W. 20%			
7	N77	200,000 OHM .5W. 20%	C 13	N-1346	.05 MFD. 400 V.
8	N64	500,000 OHM .5W. 20%			
9	N16	250 OHM .5W. 10%			
10	N17	2500 OHM .5W. 20%	1	N-1594	ANTENNA COIL LOOP
11	N14	50 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
12	N18	80 OHM 2W. 10%	3	N-1598	1ST. I.F TRANSFORMER
			4	N-1596	2ND. I.F. TRANSFORMER
			5	N-1585	4" P.M. SPEAKER & TRANS.
1	N44	.01 MFD. 400V	E	N-1597	2ND I.F. TRIMMING COND.
2	N45	.05 MFD. 200V.			
3		CAPACITY INCLUDED IN OSCILLATOR COIL		N-1431	GANG CONDENSER
4	N45	.05 MFD. 200V.			
5	N51	.1 MFD. 200V.			
6	N74	100 MMFD.			

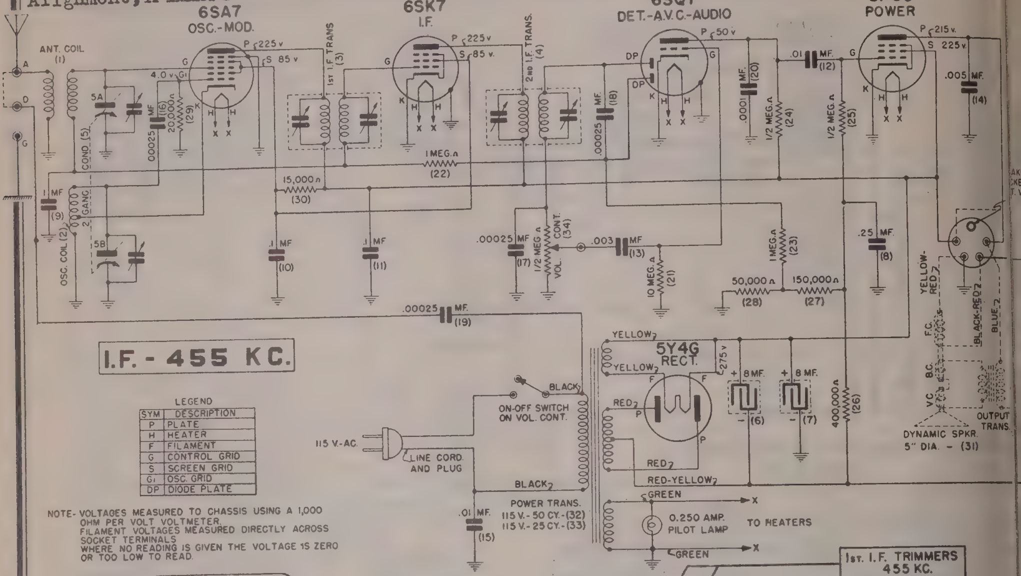
*PARTS S-7402-2
S-7422-5 ONLY.

DIAG. NO	PART NO.	DESCRIPTION
R 5	N-1955	0.5 MEGOHM VOL. CONT.
C 2	N-1351	.1 MFD. 200V.
C 14	N-1479	.25 MFD. 200V.
C 15	N-1351	.1 MFD. 200V.
3	N-1954	1ST. I.F. TRANSFORMER
	N-1953	GANG CONDENSER



MODEL S7403-3
Schematic, Voltage, Socket
Alignment, Trimmers

FIRESTONE TIRE & RUBBER CO.

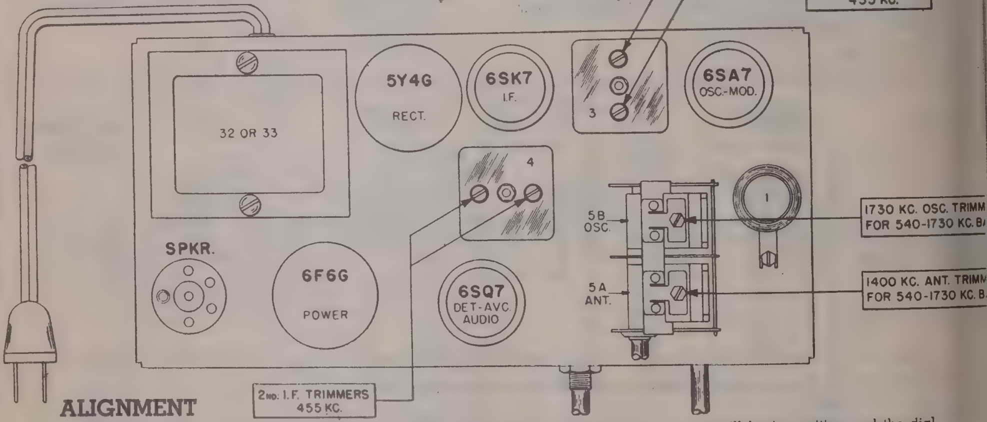


I.F. - 455 KC.

LEGEND

SYM	DESCRIPTION
P	PLATE
H	HEATER
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
DP	DIODE PLATE

NOTE- VOLTAGES MEASURED TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER. FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.



ALIGNMENT

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to the last line move to correct position.

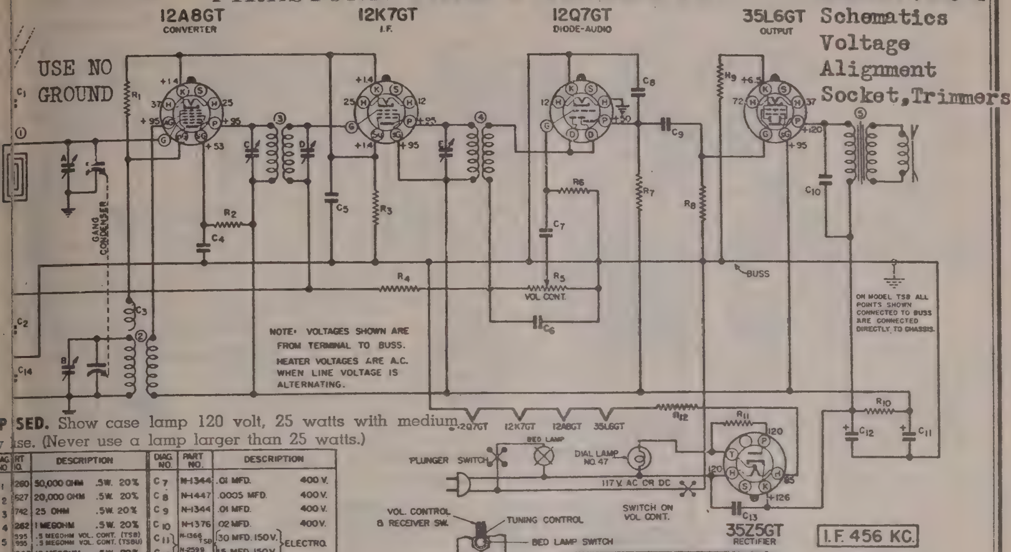
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 6SA7 tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver "A" antenna post.	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD condenser	Receiver "A" antenna post.	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

MODEL S7402-3
MODEL S7403-4
Schematics
Voltage
Alignment
Socket,Trimmers

FIRESTONE TIRE & RUBBER CO.

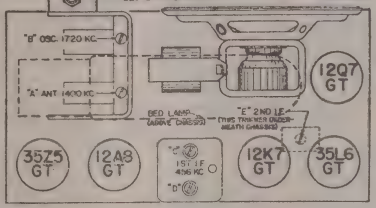


NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

ON MODEL TSB ALL POINTS SHOWN CONNECTED TO BUSS ARE CONNECTED DIRECTLY TO CHASSIS.

P SED. Show case lamp 120 volt, 25 watts with medium
se. (Never use a lamp larger than 25 watts.)

AG NO	RT NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
1	260	50,000 OHM .5W. 20%	C 7	N-1344	.01 MFD. 400 V.
2	627	20,000 OHM .5W. 20%	C 8	N-1447	.0005 MFD. 400V.
3	742	25 OHM .5W. 20%	C 9	N-1344	.01 MFD. 400 V.
4	262	1 MEGOHM .5W. 20%	C 10	N-1376	.02 MFD. 400V.
5	595 955	.5 MEGOHM VOL. CONT. (TSB) .5 MEGOHM VOL. CONT. (TSBU)	C 11	N-1366 TSB	30 MFD. 150V. ELECTRO.
6	263	10 MEGOHM .5W. 20%	C 12	N-2599 TSBU	15 MFD. 150V
7	377	200,000 OHM .5W. 20%	C 13	N-1346	.05 MFD. 400V.
8	264	500,000 OHM .5W. 20%	C 14	N-1479	.25 MFD. 400 V.
9	616	250 OHM .5W. 10%	1	N-2146	ANTENNA COIL LOOP
10	617	2500 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
11	614	50 OHM .5W. 20%	3	N-1598 N-1954	1ST. I.F. TRANS. (TSB) 1ST I.F. TRANS. (TSBU)
12	616	80 OHM 2W. 10%	4	N-1596	2ND I.F. TRANSFORMER
			5	N-2074 N 2428	4" P.M. SPKR & TRANS. (TSB) 4" P.M. SPKR & TRANS (TSBU)
1	344	.01 MFD. 400V.	E	N-1597	2ND. I.F. TRIMMING COND.
2	345 351	.05 MFD. 200 V. (TSB) .1 MFD. 200 V. (TSBU)			
3		CAPACITY INCLUDED IN OSCILLATOR COIL		N-2088	GANG CONDENSER
4	345	.05 MFD. 200V.		N-2595	BED LAMP
5	351	.1 MFD. 200V.		N-2094	BED LAMP SWITCH
6	370	100 MMFD.			



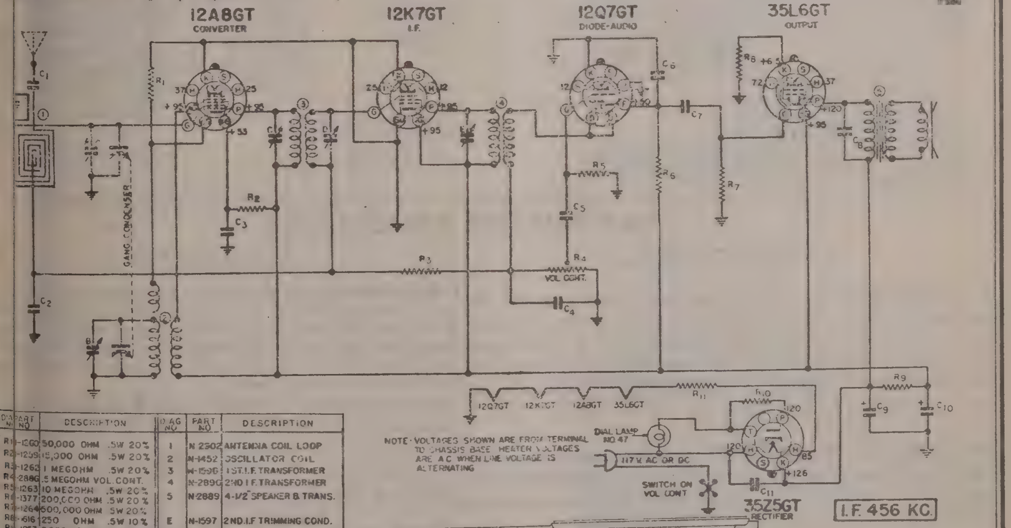
I.F. 456 KC.

TUNING RANGE
535 to 1720 KC

5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND
DRN. H B APP. 10/2/39

MODEL S-7402-3

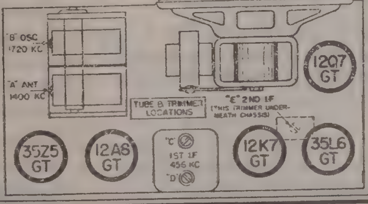
TSB
[redacted]



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING

DIA N	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R1	-1260	50,000 OHM .5W 20%	1	N 2302	ANTENNA COIL LOOP
R2	-1259	15,000 OHM .5W 20%	2	N-1452	OSCILLATOR COIL
R3	-1262	1 MEGOHM .5W 20%	3	N-1596	1ST.I.F. TRANSFORMER
R4	-2886	.5 MEGOHM VOL. CONT.	4	N-2890	2ND I.F. TRANSFORMER
R5	-1263	10 MEGOHM .5W 20%	5	N-2889	4-1/2" SPEAKER & TRANS.
R6	-1377	200,000 OHM .5W 20%			
R7	-1264	500,000 OHM .5W 20%			
R8	-616	250 OHM .5W 10%	E	N-1597	2ND.I.F TRIMMING COND.
R9	-1257	2,000 OHM .5W 20%			
R1	-1742	25 OHM .5W 20%			
R1	-1618	80 OHM 2 W 10%			
				N-2901	2 GANG CONDENSER
C1	-1344	.01 MFD. 400 V.			
C2	-1345	.05 MFD 200V			
C3	-1345	.05 MFD 200V.			
C4	1374	100 MMFD.			
C5	-1344	.01 MFD. 400V.			
C6	-1447	.0005 MFD. 400V.			
C7	-1344	.01 MFD. 400V.			
C8	-1376	.02 MFD. 400V.			
C9 C1	-1365	30 MFD. 150V 15 MFD. 150V ELECTRO.			
C1	1346	.05 MFD. 400V.			

I.F. 456 KC.

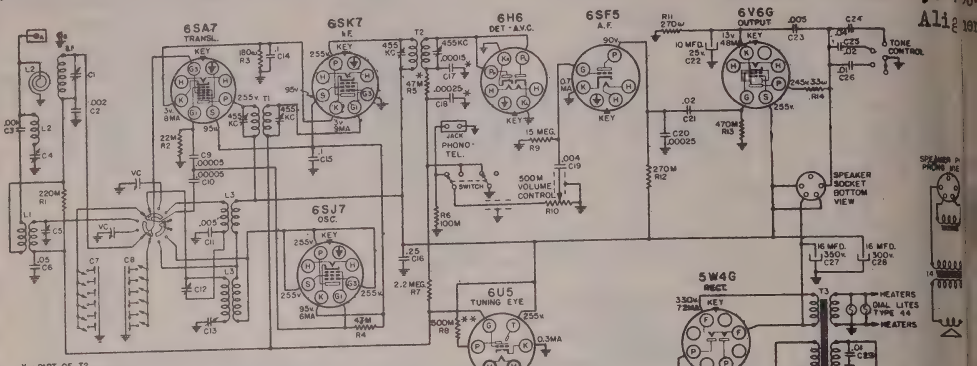


MODEL S-7403-4

5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND
DRN. L.T.C. APP'D

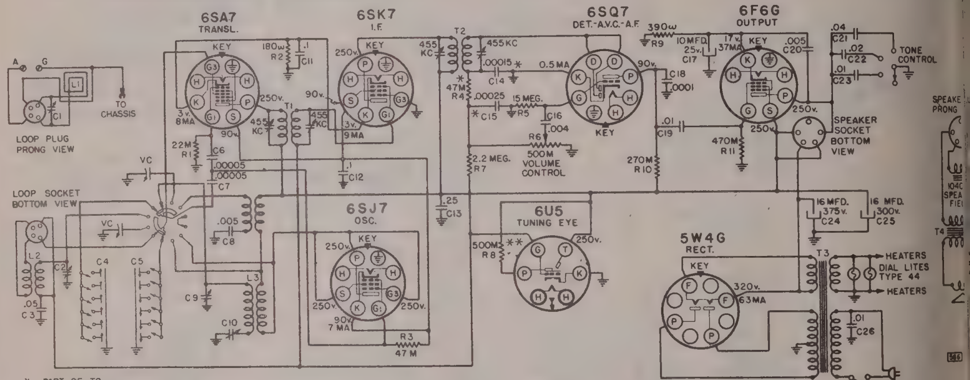
KM

MODEL S7404-2
(Serials Prefixed with C)



*- PART OF T2
**- IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MODEL
S-7404-2 (With serial numbers prefixed with "C".



*- PART OF T2
**- IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MODEL
S-7427-8

ALIGNMENT PROCEDURE

MODEL S-7402-3

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis from cabinet and set it up on the bench. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

MODEL S-7403-4

I. F. ALIGNMENT. With the gang condenser set at minimu
just the test oscillator to 456 KC and connect the output to th
of the first detector tube (12A8GT) through a .05 or .1 mf
denser. The ground on the test oscillator should be conne
the chassis ground. Align all three I.F. trimmers to peak or ma
reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, shield, a
antenna from cabinet and set them up on the bench so th
occupy exactly the same respective positions on the bench
did in the cabinet. Care should be taken to have no iron
metal near the loop. Do not make this set up on a metal

Connect the test oscillator to the antenna of the set thr
200 mmfd. (.0002) condenser. With the gang condenser
minimum capacity, set the test oscillator at 1720 KC, and
the oscillator (or 1720 KC trimmer) on gang condenser. Ne
the test oscillator at 1400 KC, and tune in the signal on th
condenser. Adjust the antenna trimmer (or 1400 KC trim
maximum signal. Next set the test oscillator at 600 KC, a
in signal on condenser to check alignment of coils.

FIRESTONE TIRE & RUBBER CO.

MODEL S7403-8
Schematic ,Voltage

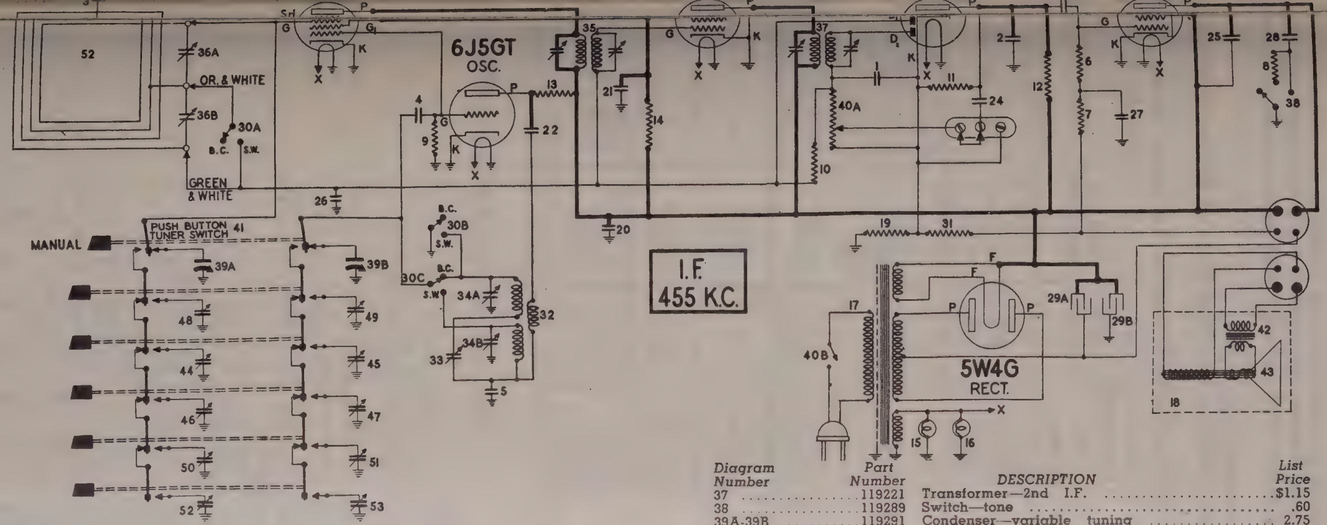


Diagram Number	Part Number	DESCRIPTION	List Price
1-2	83539	Condenser—Mica, 260 mmfd.	$0.20
3	83783	Condenser—Mica, 110 mmfd.	.20
4	85061	Condenser—Mica, 51 mmfd.	.15
5	89275	Condenser—Mica, .002 mfd.	.40
6	110559	Resistor—Carbon 470,000 ohms, ¼ watt	.12
8	110557	Resistor—carbon, 4,700 ohms, ¼ watt	.12
9	110578	Resistor—carbon, 68,000 ohms, ¼ watt	.12
10-11	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
12	110591	Resistor—680,000 ohms, ¼ watt	.12
13-14	110592	Resistor—carbon 22,000 ohms, 1 watt	.12
15-16	110629	Lamp—6.3 volt, .25 amps.	.15
17	114530	Power transformer, 117 volt—60 cycle	3.50
	119890	Power transformer, 117 volt—25 cycle	
18	U-115097	Speaker—dynamic 6″	5.20
19	116275	Resistor—Carbon 470,000 ohms, ¼ watt	.12
20-21	116625	Condenser—.1 mfd. 600 volt	.25
22-23	116640	Condenser—.01 mfd. 600 volt	.15
24-25	116647	Condenser—.004 mfd. 600 volt	.15
26	116819	Condenser—.05 mfd. 600 volt	.20
27	110377	Condenser—Electrolytic 10 mfd., 35 volt	.80
28	116984	Condenser—.04 mfd. 600 volts	.20
29A-29B	117034	Condenser—multiple electrolytic 15 mfd.—450 volt 10 mfd.—450 volt	1.45
30A-30B-30C	117532	Range switch	.76
31	118812	Resistor—180 ohms—1 W. WW.	.12
32	118916	Coil—oscillator	.52
33	118919	Condenser—padding	.40
34A-34B	118920	Trimmer condensers (2 section)	.30
35	119042	Transformer—1st I.F.	1.10
36A-36B	119126	Trimmer Condensers (2 section)	.35

Diagram Number	Part Number	DESCRIPTION	List Price
37	119221	Transformer—2nd I.F.	$1.15
38	119289	Switch—tone	.60
39A-39B	119291	Condenser—variable tuning	2.75
40A-40B	119602	Volume control—1 meg. (with switch)	1.25
41	119603	P. B. Switch	2.30
42	U-119646	Transformer—output for U-115097 speaker	1.65
43	U-119647	Cone & Voice coil for U-115097 speaker	1.65
44 to 47	119663	Condenser—P.B. trimmer (750-1375 KC.)	.24
48-49	119664	Condenser—P.B. trimmer (980-1600 KC.)	.24
50 to 53	119753	Condenser—P.B. trimmer (540-1000KC.)	.24
	119732	Loop Antenna and Cabinet back assembly	2.00

(Prices subject to change without notice)

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SA7	1st DET.	6.0 A.C.	O	Note A	—8	90		240		
6J5GT	OSC.	6.0 A.C.	O	—8				145		
6SK7	I.F. AMP.	6.0 A.C.	O	Note A		90	O	240		
6SQ7	2nd. DET.-A.V.C.-A.F.	6:0 A.C.	—3	Note A				50	Note A	Note A
6F6G	Output	6.0 A.C.	O	Note B		240		220		
5W4G	Rectifier	5.0 A.C.						Plates—340 A.C. to C.T.		

NOTE A: The voltage at these elements is —3 volts measured across resistor 19.
NOTE B: The voltage at this grid is —14 volts measured across resistors 19 and 31.

Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S7403-8
Alignment,Socket
Trimmers

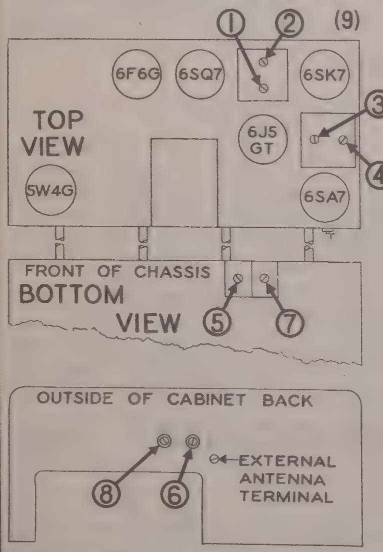
FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

ALIGNMENT: An output meter and an accurately calibrated signal generator are required.
Connect the output meter across the voice coil or between the plate of the 6F6G output tube and in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type sh connected across the voice coil.)
Connect the ground lead of the signal generator to the chassis.
Turn the volume control to the maximum volume position and keep it in this position throughout tire alignment procedure.
Be sure the loop is properly connected and in the same relative position it occupies when in the

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adju
.1 MFD. Condenser	Rear Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximu Then repeat adjustm
					3-4	1st I. F.	
400 OHM Carbon Resistor	External Antenna Terminal	6 MC	Foreign	6 MC	5	Foreign Oscillator (Shunt)	Adjust for maximum ou to see if proper peak was tuning in image at appr If image does not appea 6 MC. with trimmer s out. Recheck image.
400 OHM Carbon Resistor	External Antenna Terminal	6 MC	Foreign	Tune to 6 MC. Generator Signal.	6*	Foreign Antenna	Adjust for maximu Try to increase outp tuning trimmer and receiver dial until output is obtained.
200 MMFD. Mica Condenser	External Antenna Terminal	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum
200 MMFD. Mica Condenser	External Antenna Terminal	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for maximum
200 MMFD. Mica Condenser	External Antenna Terminal	600 KC	Broadcast	Tune To 600 KC Generator Signal	9	Broadcast Oscillator (Series Pad)	Adjust for maximum Try to increase outpu tuning trimmer and receiver dial until output is obtained.

*NOTE: Trimmers must be aligned in order shown. After set is in cabinet realign No. 6 at 6MC. Then No. 8 at 1500 KC. signals. Signal generator should be disconnected.



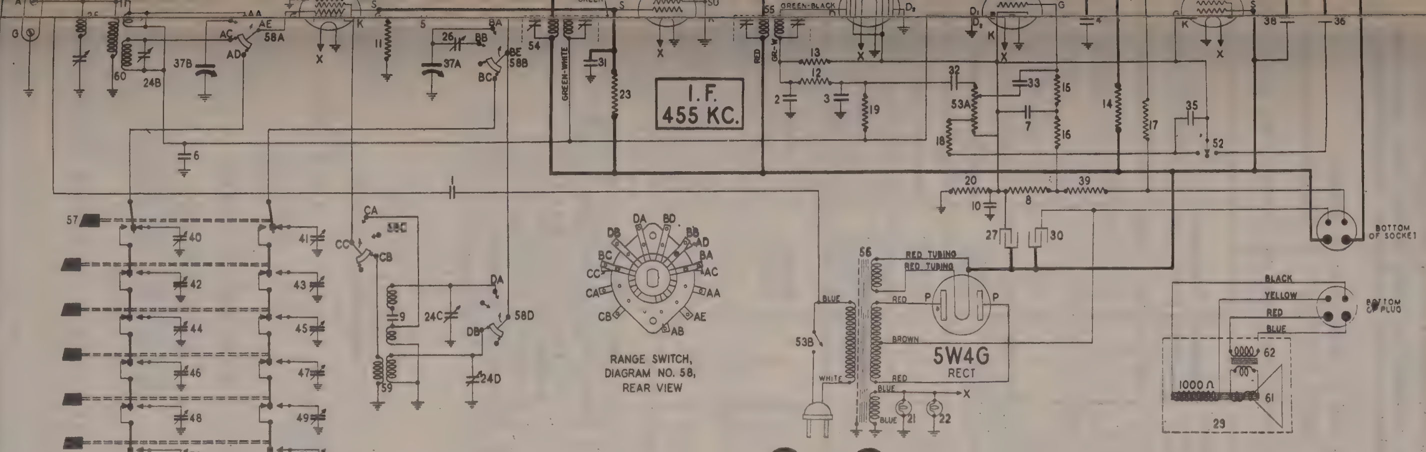
DIAL AND MISCELLANEOUS PARTS

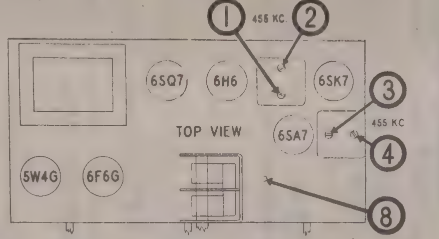
Part Number	*Description*	
114955	Clamp for dial cord	
119559	Clamp—dial scale retaining	
112745	Clip—coil mounting	
117057	Cord—drive (supplied in 2 foot lengths)	
119655	Dial escutcheon	
119694	Dial background	
119777	Dial scale	
117029	Drive drum and bushing	
88348	Eyelet for dial cord	Per do
119644	Knob	
119577	Pointer	
119654	Push button	
81145	Retaining ring—for drive shaft	Per
83624	Screw—self tapping 8x¼	
119218	Screw—Escutcheon mounting	
85040	Screw—No. 6 Hex. Hd.	Per
112874	Screw—No. 10x1⅛ Chassis mtg.	
85827	Set Screw—8-32 Square Head	
113191	Screw—No. 8-32x1⅛	
110501	Socket—4 prong (for speaker)	
116690	Socket—small octal base	
117078	Socket—octal with special grounding lug	
111090	Spacer—steel mtg.	
113177	Spring—dial cord tension	
119739	Station call letter tabs	
119824	Terminal strip—phono	
118606	Tuning shaft	
110829	Washer—chassis mounting	
111456	Washer—spring washer	Per
116530	Washer—for back of knobs	

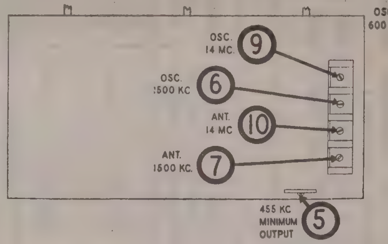
(Prices Subject to Change without Notice)

FIRESTONE TIRE & RUBBER CO.

MODEL S7404-1
Schematic, Voltage
Socket, Trimmers
Parts







SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SA7	1st Det. & Osc.	6.0 A.C.	0	—2.8	—8	85		255		
6SK7	I.F.	6.0 A.C.	0	—2.8		85	0	255		
6H6	2nd Det. & A.V.C.	6.0 A.C.	—3.5*						—2.8	0
6SQ7	1st A.F.	6.0 A.C.	—3.5*	—4.0*				130	—2.8	0
6F6G	Output	6.0 A.C.	—3.5*	—20*		255		235		
5W4G	Rectifier	5.0 A.C.						Plates 250 V. A.C.		

*Measured at Bias Resistor

Use a high resistance voltmeter of at least 1000 ohms per volt.

Diagram Number	Part Number	Description	List Price
1-2-3-4	83539	Condenser—mica, 260 mmfd.	$0.20
5	85061	Condenser—mica, 51 mmfd.	.15
6-7	88189	Condenser—paper, .05 mfd., 200 volt	.25
8	88465	Resistor—wire wound, 25 ohms, ½ watt	.15
9	88587	Condenser—mica, .0042 mfd.	.35
10	110377	Condenser—electrolytic, 10 mfd., 35 volt	.80
11-12	110552	Resistor—carbon, 47,000 ohms, ¼ watt	.12
13-14	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
15-16	110554	Resistor—carbon, 1 megohm, ¼ watt	.12
17	110559	Resistor—carbon, 470,000 ohms, ¼ watt	.12
18	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
19	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
20	110590	Resistor—180 ohm, ¼ watt	.12
21-22	110629	Lamp—6.3 volt — .25 amps.	.15
23	112398	Resistor—carbon, 20,000 ohms, 1 watt	.26
24A-24B-24C-24D	112792	Condenser—trimmer (4 section)	.60
25	112796	Coil—wave trap (with trimmer)	.50
26	112799	Condenser—padder (530 to 630 mmfd.)	.36
27	114258	Condenser—electrolytic, 8 mfd., 450 volts	.98
28	114969	Condenser—mica, 15 mmfd.	.12
29	M-115064	Speaker—dynamic, 8 inch	7.00
30	116262	Condenser—electrolytic, 16 mfd., 450 volts	.78
31	116625	Condenser—.1 mfd. 600 volt	.25
32-33-34-35-36	116893	Condenser—.02 mfd., 600 volt	.15
37A-37B	116996	Condenser—variable gang	3.30
38	117022	Condenser—.002 mfd., 600 volt	.15
39	117032	Resistor—300 ohms, 1 watt	.15
40-41-42-43-44-45-46-47-48-49-50-51	117081	Push button trimmer gang condenser assembly	$5.20
52	117209	Switch—tone control	.65
53A-53B	117212	Volume control, 1 meg. with switch	1.30
54	117215	Transformer—1st I.F.	1.50
55	117216	Transformer—2nd I.F.	1.50
56	117217	Transformer—power	5.00
57	117225	Switch—push button	3.00
58A-58B-58C-58D	117265	Range switch	1.35
59	117446	Coil—oscillator	1.00
60	117448	Coil—antenna	1.20
61	M-117671	Tone and voice coil for M-115064 speaker	1.80
62	M-117672	Transformer—output for M-115064 speaker	2.50

MODEL S7404-1
Alignment,Tuner
MODEL S7404-2
MODEL S7404-3

FIRESTONE TIRE & RUBBER CO.

MODEL S7426-8
MODEL S7427-1
Tuner Data

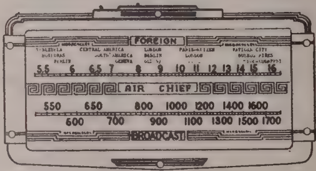
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube a ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive ty should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout t entire alignment procedure.
4. Remove the connector from between the "A" and "X" terminals. Check the pointer to see that it is c rectly set.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Front Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum outpı Then repeat adjustment.
					3-4	1st I. F.	
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	5	Wave Trap	Adjust for minimum outp using a strong generator signa
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for maximum output
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for maximum output
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune To 600 KC Generator Signal	8	Broadcast Oscillator (Series Pad)	Adjust for maximum output Try to increase output by de tuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC	9	Foreign Oscillator (Shunt)	Adjust for maximum output Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. I image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC	10	Foreign Antenna	Adjust for maximum output. Try to increase output by de-tuning trimmer and retuning receiver dial until maximum output is obtained.

TO SET UP THE BUTTONS FOR AUTOMATIC TUNING:

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.
2. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results. Also be sure to select stations that fall within the frequency range of the buttons.
3. Be sure the antenna is connected before proceeding further.
   It will be impossible to set up buttons properly without an antenna.
4. With the range switch in the Broadcast (Manual) position (position B) tune in the station to be set up. Then turn the range switch to Automatic Position (Position A) and push in the button to be set up, being sure to select a button with the proper frequency range (see Fig. 1). ALWAYS TRY TO SELECT THE BUTTON WHICH CAN BE SET UP TO A STATION WHOSE FREQUENCY IS WELL WITHIN THE BUTTON'S OPERATING RANGE.
5. At the back of the chassis will be found 6 holes numbered to correspond to the numbers of the buttons. See Fig. 1. Adjust the large screw with the number corresponding to the number of the button you have pushed in, until the same station is again heard. Tune accurately, adjusting for deepest tone.



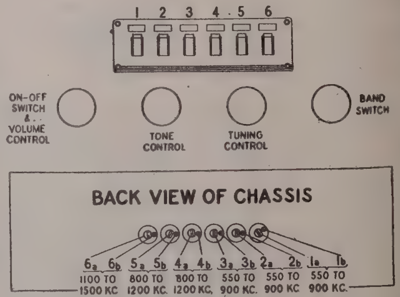


Fig. 1

6. Now adjust the small screw (located adjacent to the large screw just adjusted) until maximum output is obtained. Make a final adjustment on the large screw, always tuning for deepest tone.
7. The set-up is now complete for this button. The remaining buttons may be set up in the same way.
8. Call letter tabs which may be used to label the buttons are supplied with this radio.

FIRESTONE TIRE & RUBBER CO

MODEL S7404-2
(Serials Prefixed with A)
Schematic, Voltage, Parts

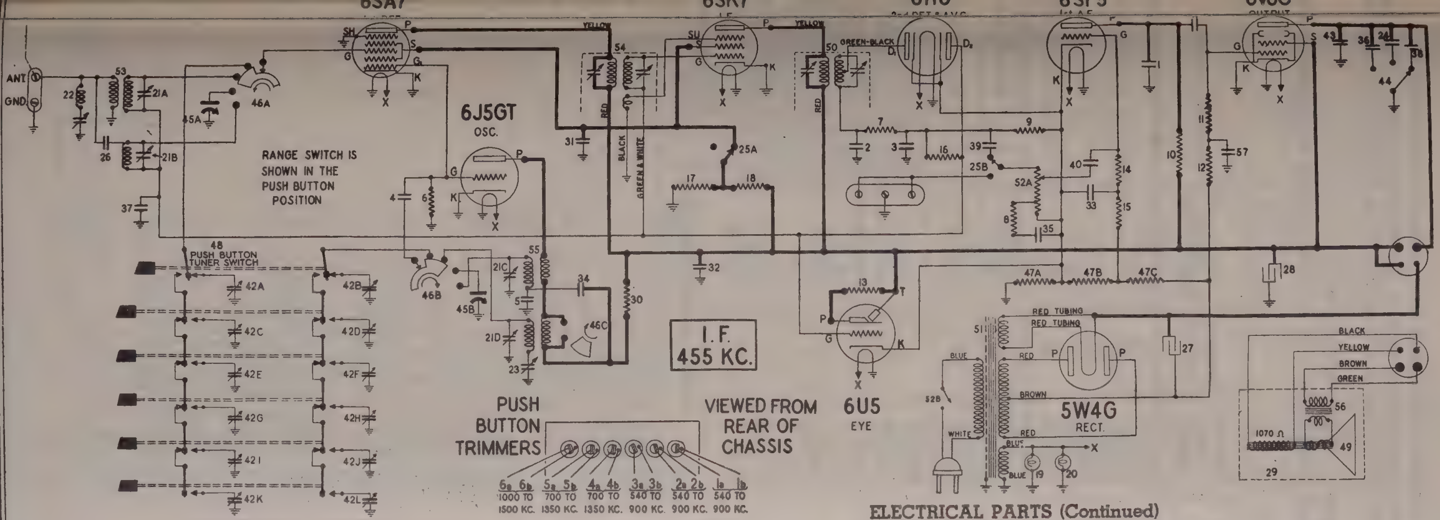


Fig. 1

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2-3	83783	Condenser—mica, 110 mmfd.	.20
4	85061	Condenser—mica, 51 mmfd.	.15
5	88587	Condenser—mica, .0042 mfd.	.35
6-7-8	110552	Resistor—carbon, 47,000 ohms, ¼ watt	.12
9-10-11-12	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
13-14-15	110554	Resistor—carbon, 1 megohm, ¼ watt	.12
16	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
17	110581	Resistor—carbon, 18,000 ohms, 2 watts	.30
18	110595	Resistor—carbon, 12,000 ohms, 3 watts	.20
19-20	110629	Lamp—6.3 volts — .25 amps.	.15
21A to 21D	112792	Condenser—trimmer (4 section)	.60
22	112796	Coil—wave trap (with trimmer)	.50
23	113346	Condenser—padding	.38
24	114108	Condenser—.03 mfd., 750 volt	.25
25A-25B	114141	Switch—D.P.D.T.	.44
26	114969	Condenser—mica, 15 mmfd.	.12
27-28	114972	Condenser—electrolytic, 16 mfd., 450 volt	.78
29	U-115078	Speaker—dynamic, 10"	9.00
30	116055	Resistor—carbon, 22,000 ohms, ½ watt	.12
31-32-33	116625	Condenser—.1 mfd., 600 volt	.25
34-35-36	116640	Condenser—.01 mfd., 600 volt	.15
37-38	116819	Condenser—.05 mfd., 600 volt	.20
39-40-41	116893	Condenser—.02 mfd., 600 volt	.15
42A to 42L	117081	Push button trimmer gang condenser assembly	5.20
43	118194	Condenser—.006 mfd., 600 volts	.15
44	118616	Switch—tone	.80
45A-45B	118619	Condenser—variable tuning	3.00
46A-46B-46C	118622	Range switch	1.20
47A-47B-47C	118628	Resistor—bias (candohm type)	.35
48	118631	Push button switch	2.65

FOR PUSH BUTTON DATA ,SEE INDEX

ELECTRICAL PARTS (Continued)

Diagram Number	Part Number	Description	List Price
49	U-118659	Cone & Voice coil for U-115078 speaker	$2.35
50	118664	Transformer—2nd I.F.	1.30
51	118665	Transformer—power	6.00
52A-52B	118669	Volume control (1 Meg.) with switch	1.40
53	118671	Coil—antenna	.80
54	118672	Transformer—1st I.F.	1.30
55	118675	Coil—oscillator	1.00
56	U-118678	Transformer—output for U-115078 speaker	1.80
57	116893	Condenser—.02 mfd., 600 volt	.15

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G1	S	SU	P	D1	D2
6SA7	1st Det.	6.0 A.C.	0	—3*	—10	90		255		
6J5GT	Osc.	6.0 A.C.	0	—10				145		
6SK7	I.F. Amp.	6.0 A.C.	0	—3*		90	0	255		
6H6	2nd Det. & A.V.C.	6.0 A.C.	—3						—3*	—3*
6SF5	1st A.F.	6.0 A.C.	—3	—4.5*				155		
6V6G	Output	6.0 A.C.	0	—14.5*		255		230		
6U5	Tuning Eye	6.0 A.C.	—3	—3*				T=255 Volts		
5W4G	Rectifier	5.0 A.C.						Plates=300 V.A.C.		

*Measured at Bias Resistor.

Use a high resistance voltmeter of at least 1000 ohms per volt.

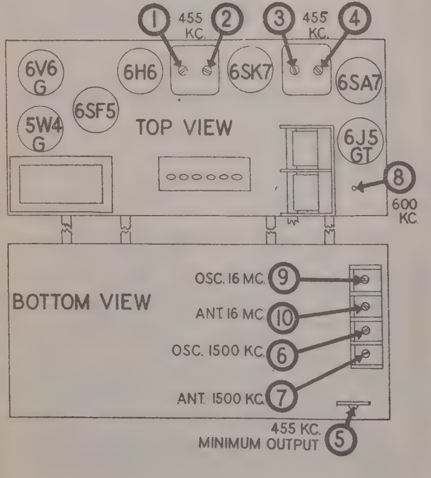
MODEL S7404-2
(Serials Prefixed with A)
Alignment,Socket,Trimmers

FIRESTONE TIRE & RUBBER CO.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6V6G output tube and grou in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "GND" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the ent alignment procedure.
4. Check the pointer to see that it is correctly set.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Front Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum outp Then repeat adjustment.
					3-4	1st I. F.	
200 MMFD. Mica Condenser	"Ant." Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	5	Wave Trap	Adjust for minimum outp using a strong generator sign
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for maximum outp
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for maximum outp
200 MMFD. Mica Condenser	"Ant." Terminal	600 KC	Broadcast	Tune To 600 KC Generator Signal	8	Broadcast Oscillator (Series Pad)	Adjust for maximum outpu Try to increase output by d tuning trimmer and retunii receiver dial until maximu output is obtained.
400 OHM Carbon Resistor	"Ant." Terminal	16 MC	Foreign	16 MC	9	Foreign Oscillator (Shunt)	Adjust for maximum outpu Check to see if proper pe was obtained by tuning image at approx. 15.1 MC. image does not appear realiç at 16 MC. with trimmer scre farther out. Recheck image.
400 OHM Carbon Resistor	"Ant." Terminal	16 MC	Foreign	16 MC	10	Foreign Antenna	Adjust for maximum outpu Try to increase output by d tuning trimmer and retunir receiver dial until maximu output is obtained.



DIAL AND MISCELLANEOUS PARTS

Part Number	Description	Li Pri
118749	Back—cabinet complete with antenna and terminal	$1.
118648	Band indicator	
118601	Band indicator lever	
113442	Bracket—for tuning eye	
114001	Clamp for dial scale retaining	
114955	Clamp—for dial cord	
110808	Clip—for tuning eye support	
112745	Clip—coil mounting	
112798	Clip—for mtg. wave trap coil	
113178	Cord—dial—for tone indicator (supplied in 4 ft. lengths)	
116948	Cord—dial drive (supplied in 6 ft. lengths)	
117057	Cord—drive (supplied in 2 ft. lengths)	
118663	Dial Gasket	1.
118547	Dial mounting plate & brackets	1.
118700	Dial Scale	
113402	Drum—dial cord drive	2.
114052	Escutcheon—dial	
113890	Escutcheon—eye	
118626	Escutcheon for push buttons	
117087	Knob—for tuning or volume	
118605	Pointer	
118625	Push button	
81145	Retaining ring—for drive shaft	Per C
83624	Screw—self tapping 8 x ¼	
85040	Screw—No. 6 Hex. Hd.	Per C
113191	Screw—special No. 8-32 x 1⅛	
114914	Screw—special head for mtg. escutcheon	Per Dz.
85827	Set Screw—8-32 Square Head	
111085	Sleeve—felt for tuning eye	
85427	Socket—octal base (standard)	
110501	Socket—4 prong (for speaker)	
113025	Socket—octal base (with special ground)	
114117	Socket—dial lamp	
111090	Spacer—steel, mechanism mtg. to chassis	
113177	Spring—dial cord tension	
114046	Spring—for band indicator drive	
117315	Tabs—station call letters	
85785	Terminal strip—antenna—ground	1
117703	Tuning eye cable and socket	
118606	Tuning shaft	
67590	Washer—steel; chassis mtg.	Per C
111456	Washer—spring washer	
111972	Washer—extension and tap (for mtg.)	
116530	Washer—(paper) for back of knobs	

PHONOGRAPH CONNECTIONS: Connect the wires from a phonograph record player to the left hand and middle terminals on the terminal strip nearest the middle of the chassis on the back of the chassis. Push the black sliding button on the back of the chassis to the right for phonograph or television reception. This switch must be pushed to the left for radio reception. Turn the volume knob on the record player to the maximum volume position and control volume by means of the volume control on the radio.

TELEVISION CONNECTIONS: Connect the wires from a television picture receiver to the right hand and middle terminals on the terminal strip. Operation will now be the same as for phonograph operation.

FIRESTONE TIRE & RUBBER CO.

MODEL S7404-2
(Serials Prefixed with C)
MODEL S7427-8
Alignment, Trimmers
Socket

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . Across loud speaker voice coil
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully on
Position of Tone Control . . . . Brilliant
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
Manual B.C.	Closed	455 kc	.1 mfd.	G3 of 6SA7	T2, T1	IF
Manual B.C.	600 kc	600 kc	.0003 mfd.	Ant. Term.	C4*	Wave Trap
Manual B.C.	Fully open	1720 kc	.0002 mfd.	Ant. Term.	C12**	Oscillator
Manual B.C.	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1	Translator
Manual B.C.	600 kc	600 kc	.0002 mfd.	Ant. Term.	C13	Padder
Manual S.W.	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Translator

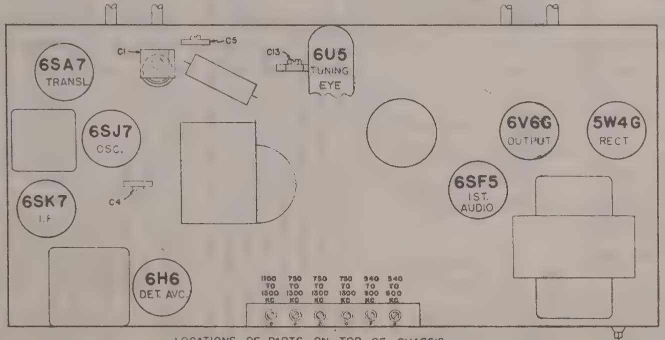
IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** Mounted under the chassis.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS ON TOP OF CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . Across loud speaker voice coil
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully on
Position of Tone Control . . . . Brilliant
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
Manual B.C.	Closed	455 kc	.1 mfd.	G3 of 6SA7	T2, T1	IF
Manual B.C.	Fully open	1620 kc	.0002 mfd.	Ant. Term.	C9	Oscillator
Manual B.C.	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1*	Translator
Manual B.C.	600 kc	600 kc	.0002 mfd.	Ant. Term.	C10	Padder
Manual S.W.	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C3	Translator

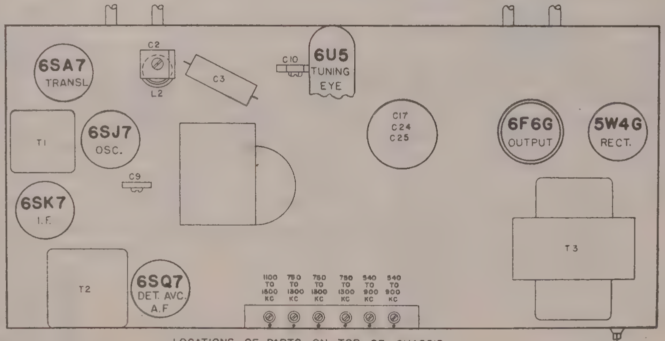
IMPORTANT ALIGNMENT NOTES

* Mounted on loop.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

With the signal generator disconnected, tune in a weak broadcast station at about 1400 kc and readjust C1 for the final adjustment.

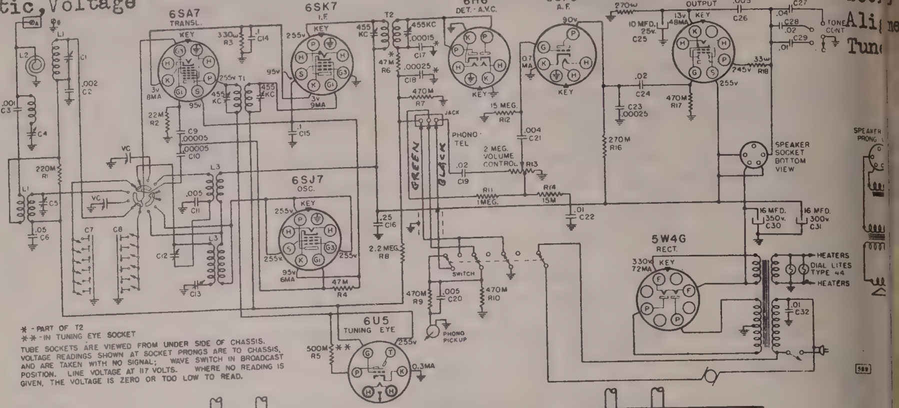


LOCATIONS OF PARTS ON TOP OF CHASSIS

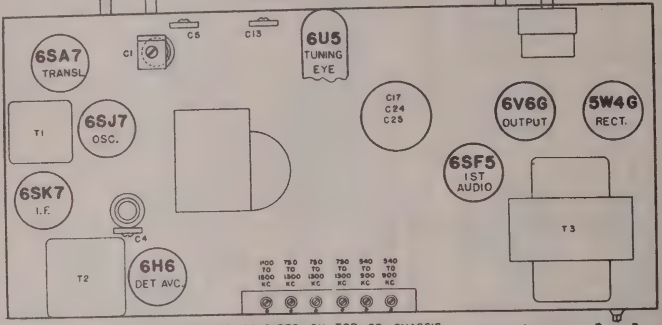
MODEL S7404-4
Schematic, Voltage

FIRESTONE TIRE & RUBBER CO.

Tri
Soc
Ali
Tun



* - PART OF T2
** - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF PARTS ON TOP OF CHASSIS

PRELIMINARY:

Output meter connections . . . . Across loud speaker voice
Generator ground lead connection . . . . .Receiver ch
Dummy antenna value to be in series with generator output . . . . .See chart
Connection of output lead . . . . .See chart
Generator modulation . . . . 30%, 400 c
Position of Volume Control . . . . .Ful
Position of Tone Control . . . . Bril
Position of Dial Pointer with variable fully closed . . . . On mark to le
550 kc calibration

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTED (IN ORDER SHOWN)	TRI FUNC
Manual B.C.	Closed	455 kc	.1 mfd.	G3 of 6SA7	T2,T1	I
Manual B.C.	600 kc	600 kc	.0002 mfd.	Ant. Term.	C4*	Wave
Manual B.C.	Fully open	1720 kc	.0002 mfd.	Ant. Term.	C12**	Oscil
Manual B.C.	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1	Transl
Manual B.C.	600 kc	600 kc	.0002 mfd.	Ant. Term.	C13	Padd
Manual S.W.	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Transl

* The generator should be adjusted for high output. The trimmer should be adjusted minimum output meter reading instead of the usual maximum reading. If the frequency o interfering station around 455 kc is known, the generator should be adjusted to the frequ of that station instead of to 455 kc.

** Mounted under the chassis.

Where indicated by the word, "Rock", the variable should be rocked back and for degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, greatest accuracy. Always keep the output from the test oscillator at its lowest pos value to make the AVC action of the receiver ineffective.

PUSH BUTTON TUNING

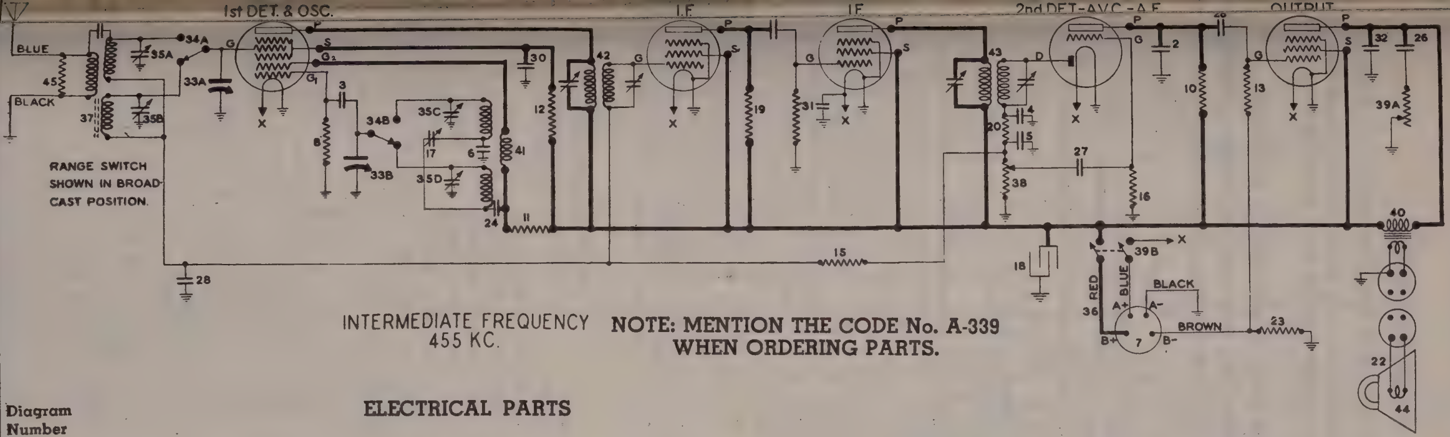
Each of the buttons will be set up in the following manner:

1. Turn the BAND knob to the MANUAL BROADCAST position and tune in the desired stat
2. Turn the BAND knob to PUSH BUTTON. Push in the button that is to be set to the sired station.
3. Turn the large screw of the corresponding adjustment until the station is tuned then the small screw for finer tuning. Repeat with the large screw for final adjustment. the Tuning Eye to secure exact tuning. The BAND knob can be turned back to MANUAL BROAD in order to check if the station is the desired one.
4. Fasten the proper call letters in the escutcheon.

Proceed in the same manner for the remaining buttons.

MODEL S7405-5
Schematic, Voltage

FIRESTONE TIRE & RUBBER CO.



INTERMEDIATE FREQUENCY
455 KC.

NOTE: MENTION THE CODE No. A-339
WHEN ORDERING PARTS.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmf.	.20
3-4-5	85061	Condenser—mica, 51 mmfd.	.15
6	88587	Condenser—mica, .0042 mfd.	.35
7	88631	Plug—4 prong, male	.06
8	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
9	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
10	110554	Resistor—carbon 1 megohm, ¼ watt	.12
11	110557	Resistor—carbon, 4,700 ohms, ¼ watt	.12
12	110566	Resistor—carbon, 33,000 ohms, ¼ watt	.12
13	110570	Resistor—carbon, 2.2 meg., ¼ watt	.15
15-16	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
17	112799	Condenser—padder	.36
18	112898	Condenser—electrolytic 16 mfd., 150 volt	.50
19	118816	Resistor—carbon, 6,700 ohms, ¼ watt	.12
20	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
21	114969	Condenser—mica, 15 mmfd.	.12
22	M-115093	Speaker—P.M. (8")	7.50
23	116078	Resistor—560 ohms, ¼ watt	$0.12
24-25-26	116640	Condenser—.01 mfd., 600 volt	.15
27	116647	Condenser—.004 mfd., 600 volt	.15
28 to 31	116819	Condenser—.05 mfd., 600 volt	.20
32	117022	Condenser—.002 mfd., 600 volt	.15
33A-33B	119533	Condenser—tuning (with drum)	3.30
34A-34B	119534	Range switch	.80
35A-35D	119536	Condenser—trimmer (4 sections)	.60
36	119537	Battery cable	.40
37	119541	Coil—antenna	1.25
38	119551	Volume control—1 meg.	.95
39A-39B	119552	Tone control—100,000 ohms, with switch	.95
40	119651	Transformer—output	1.50
41	119669	Coil—oscillator	.75
42	119720	Transformer—1st I.F.	1.25
43	119673	Transformer—2nd I.F.	1.25
44	M-119750	Cone & voice coil for M-115093 speaker	1.60
45	118805	Resistor—carbon, 10,000 ohms, 1 watt	.12

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

ANTENNA GROUNDED DIAL TUNED TO 540 KC.

Tube	Function	G	G_1	G_2	P	D	S	F(x)
1A7G	1st Det. & Osc.	0	—1	74	85	—	49	1.4
1N5G	I. F.	0	—	—	60	—	85	1.4
1N5G	I. F.	0	—	—	85	—	85	1.4
1H5G	2nd Det. A.V.C.—A.F	0	—	—	Note A	0	—	1.4
1A5G	Output	Note B	—	—	83	—	85	1.4

Note A: Only a small voltage will be measured at the plate of the 1H5G when using a voltmeter having a resistance of 1000 ohms per volt.

Note B: The bias on the 1A5G grid is —5 volts measured across resistor No. 23.

MODEL S7405-5
Alignment,Trimmers
Socket

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

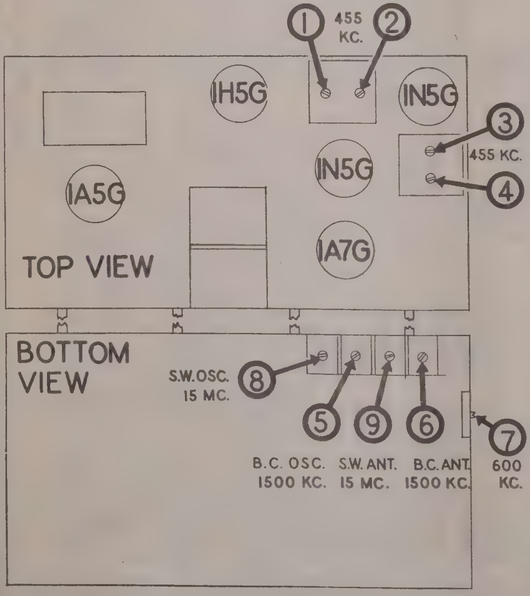
Connect the output meter across the voice coil or between the plate of the 1A5G output tube anc through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should nected across the voice coil.)

Connect the ground lead of the signal generator to the black ground wire or the chassis.

Turn the volume control to the maximum volume position and keep it in this position while aligni

With the gang condenser in full mesh, set the dial pointer to the low frequency edge of the dial sc

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adju
.1 MFD. Condenser	Control Grid of 1A7G	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximu Then repeat adjustm
					3-4	1st I. F.	
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adust for maximun
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximun
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	600 KC	Broadcast	Tune To 600 KC Generator Signal	7	Broadcast Oscillator (Series Pad)	Adjust for maximun Try to increase outpu tuning trimmer and receiver dial until output is obtained.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	15 MC	8	Foreign Oscillator (Shunt)	Adjust for maximum Check to see if pro was obtained by t image at approx. 14.1 image does not appea at 15 MC, with trimm farther out. Recheck i
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	15 MC	9	Foreign Antenna	Adjust for maximum Try to increase outpu tuning trimmer and receiver dial until output is obtained.

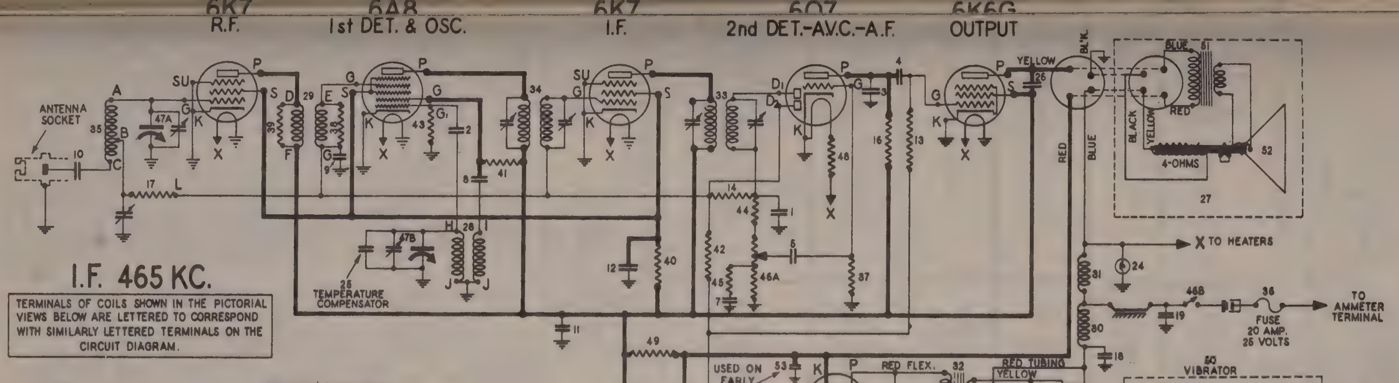


MISCELLANEOUS PARTS

Part Number	Description	
119538	Cabinet Back	
114955	Clamp—for dial cord	
112745	Clip- coil mounting	
117057	Cord—drive (supplied in 2 ft. lengths)	
119523	Dial Scale	
112265	Escutcheon- with celluloid window	
116411	Indicator lever assembly	
119644	Knob—push on	
119588	Pointer	
81145	Retaining ring for drive shaft	Per
83624	Screw—self tapping 8 x ¼	
113191	Screw—special No. 8-32 x 1⅛	
119587	Screw—No. 2 x ⅜ Phillips Round Head	
85827	Set Screw- -8-32 Square Head	
119549	Shaft extension for volume control	
116392	Shield base- tube	
116395	Shield—tube	
85427	Socket—octal base (standard)	
110501	Socket—4 prong (for speaker)	
111090	Spacer—steel mounting	
113169	Spring—for indicator lever	
114968	Spring -dial cord tension	
111972	Washer extension and top (for mounting)	
111456	Washer spring washer	Per

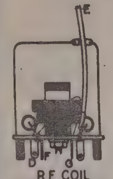
FIRESTONE TIRE & RUBBER CO.

MODEL S7407-6
Schematic,Voltage
Socket,Coils,Parts

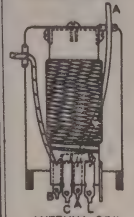


I.F. 465 KC.

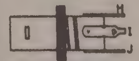
TERMINALS OF COILS SHOWN IN THE PICTORIAL VIEWS BELOW ARE LETTERED TO CORRESPOND WITH SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.



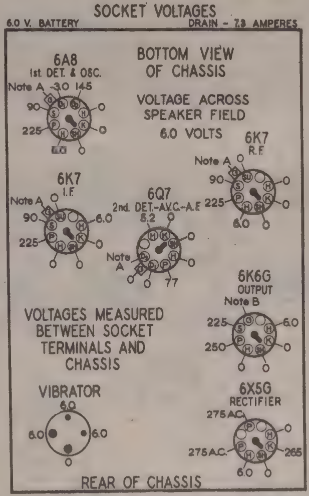
R.F COIL
PART NO. 116026
DIAGRAM NO. 29



ANTENNA COIL
PART NO. 116045
DIAGRAM NO. 35



OSCILLATOR COIL
PART NO. 116025
DIAGRAM NO. 28



USE A HIGH RESISTANCE VOLTMETER OR A 1000 OHMS PER VOLT.
NOTE A:- THE ACTUAL BIAS ON THESE GRIDS AND DIODE PLATE (D_2) IS -3 VOLTS. DUE TO THE HIGH RESISTANCE IN THIS BIAS SUPPLY CIRCUIT IT IS NOT POSSIBLE TO MEASURE THE ACTUAL VOLTAGE UNLESS A VACUUM TUBE VOLTMETER IS AVAILABLE.
NOTE B:- THE BIAS ON THIS GRID IS -18 VOLTS MEASURED ACROSS RESISTOR NO. 23.

PARTS LIST

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2	83783	Condenser - mica 110 mmf.(10%)	.20
3	83784	Condenser - mica .0011 mfd.	.25
4	86026	Condenser-paper .02 mfd. 400 V.	.25
5-6	88029	Condenser-paper .004 mfd.400 V.	.25
7-8-53	88030	Condenser-paper .01 mfd. 400 V.	.25
9	88189	Condenser-paper .05 mfd. 200 V.	.25
10	88205	Condenser - mica 2100 mmfd.	.35
11	88682	Condenser - paper .1 mfd.400 V.	.25
12	89421	Condenser - paper .1 mfd.200 V.	.25
13	112971	Resistor - insulated 470,000 ohms 1/4 watt	.15
14	112973	Resistor - insulated 1.5 meg. 1/4 watt	.15
15	112976	Resistor - wire wound 220 ohms 1/2 watt (10%)	.15
16	112987	Resistor - insulated 220,000 ohms 1/4 watt	.15
17	112993	Resistor - carbon 470,000 ohms 1/10 watt	.12
18-19	113561	Condenser-paper .5 mf. 150 volt	.38
20-21	114258	Condenser-elect. 8 mfd.450 volt	.98
22	114277	Condenser-oil filled .01 mfd. 2000 volts	.24
23	114334	Resistor - wire wound 360 ohms 2 watts (10%)	.20
24	114401	Dial Lamp - 6 volt	.18
25	114499	Condenser-temp. comp. for osc.	.48
26	114528	Condenser-paper .005 mfd. 600V.	.15
27	U-115046	Speaker - dynamic 6"	5.95
28	116025	Oscillator coil	.40
29	116026	R.F. Coil & Shield Assembly	1.40
30	116032	Choke coil in "A" supply (long)	.35
31	116035	Choke coil in"A" supply (short)	.25
32	116038	Transformer - power (6 volt)	3.50
33	116040	Transformer - 2nd I.F.	1.00
34	116043	Transformer - 1st I.F.	1.25
35	116045	Ant. Coil - with shield & brkt.	1.25
36	116049	Fuse - 20 amp. 25 volt	.05
37	116050	Resistor-insul. 10 meg. 1/4 W.	.12
38	116052	Resistor-carb. 33,000 ohm 1/10W	.12
39	116053	Resistor-carb. 68,000 ohm 1/10W	.12
40	116054	Resistor-carb. 27,000 ohm 1 W.	.12
41	116055	Resistor-carb. 22,000 ohm ½ W.	.12
42	116057	Resistor-carb. 10 meg. ¼ W.(10%)	.12
43-44-45	116058	Resistor-carb. 47,000 ohm ¼ W.	.12
46A - 46B	116125	Volume control - 500,000 ohms with off-on switch	1.00
47A - 47B	116127	Condenser - variable gang	2.75
48	116166	Resistor-W.W. 3 ohms 1 watt	.15
49	116167	Resistor-W.W. 1,500 ohms 1 watt	.15
50	116202	Vibrator	3.00
51	U-116207	Output transformer for U-115046 speaker	1.70
52	U-116208	Cone & Voice coil assembly for U-115046 speaker	1.50
53	88030	Condenser-paper .01 mfd. 400 V.	.25

MODEL S7407-6
Alignment,Trimmers
Parts

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

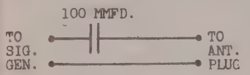
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 1 are required.

1- Connect the output meter across the speaker voice coil or between the plate of the 6K6G output tube and through a .1 mfd. condenser. The more sensitive type meter should be connected across the voice coil.

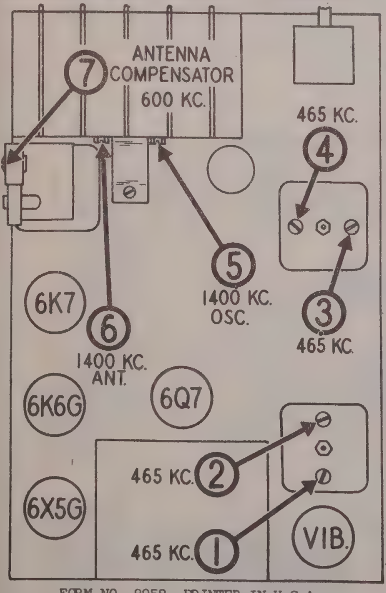
2- Connect the ground lead of the signal generator to the receiver chassis and leave it connected in this throughout the entire alignment procedure.

3- Turn the volume control to the maximum volume position.

4- With the gang condenser in full mesh, set the pointer to the last division on the low frequency end of the dial This can be done by releasing the clip holding the pointer to the dial cord and slide the pointer to the position. Then retighten the pointer clip on the dial cord.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GEN. OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3-4	1ST I. F.	
WHEN ALIGNING TRIMMERS NO. 5, 6 AND 7 CONNECT THE SIGNAL GENERATOR OUTPUT TO THE ANTENNA LEAD-IN PLUG ON THE LEFT SIDE OF THE RECEIVER CASE WITH A 100 MMFD. (APPROX.) MICA CONDENSER IN SERIES WITH GENERATOR OUTPUT.  100 MMFD. TO SIG. GEN. TO ANT. PLUG IMPORTANT:- IF THIS CONDENSER IS OMITTED THE ALIGNMENT WILL BE INCORRECT.		1400 KC.	TUNE TO 1400 KC GENERATOR SIGNAL	5	OSCILLATOR (Shunt) CONDENSER	ADJUST FOR MAXIMUM OUTPUT
				6	ANTENNA (Shunt) CONDENSER	ADJUST FOR MAXIMUM OUTPUT.
		600 KC	TUNE TO 600 KC GENERATOR SIGNAL	7	ANTENNA COMPENSATOR (Series Condenser)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED

AFTER THE SET IS INSTALLED IN THE CAR. TUNE IN A FAIRLY WEAK STATION I 600 KC. AND ADJUST TRIMMER 7 FOR MAXIMUM OUTPUT.



FORM NO. 8958 PRINTED IN U.S.A.

PARTS LIST

PART NUMBER	DESCRIPTION	LIST PRICE
INSTALLATION PARTS		
116155	"A" Cable with fuse hous.	.30
116158	"A" Cable (chassis end)-	.28
83319	Fuse insulator tube-----	.02
77650	Nut for mtg. back of rec.	.02
61086	Lockwasher-for mtg. front bracket---Per C	.25
79056	Lockwasher-1/4" for mtg. back of receiver- doz.	.08
116269	Lockwasher - double edge for rear brkt. mtg.--	.01
116225	Mtg. Bracket - for rear-	.35
116285	Mtg. Brkt.R.H.for front-	.10
116286	Mtg. Brkt.L.H. for front	.10
116264	Mtg. Bolt (1/4-20 X 1½)-	.02
45569	Nut-#10-32 for front brkt	.01
77854	Screw-10-32 for frt.brkt.	.08 dz
NOISE SUPPRESSION PARTS		
110236	Anti Rattle Clips-------	.05
110402	Braided Ground Bond (10")	.22
110403	Braided Ground Bond (6")	.18
110410	Cond.-.5 mfd. 100 volt--	.35
88429	Distributor suppressors-	.35
88430	Dome light filter-------	1.00
88422	Ford distributor cond.--	.75
88350	Gen.cond.-.5 mfd. 150 V.	.75
CASE SECTIONS AND ASSOCIATED PARTS		
116121	Bottom cover-(spkr.case)	1.50
116214	Escutcheon - for nose---	.65
116169	Grill - for speaker-----	.30
116213	Nose for receiver case--	.60
110430	Nose Mounting screws----	.01
116120	Receiver case - less bottom cover---------	2.00

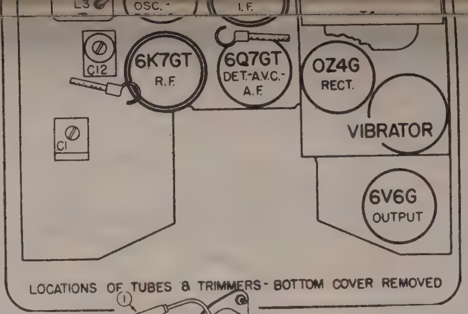
PART NUMBER	DESCRIPTION
116217	Screw for mtg. nose esc.
116218	Speed Nut - for nose esc.
114339	Trunk clamp-upper sect.-
114341	Trunk clamp-lower sect.-
DIAL AND MISCELLANEOUS PAR	
113170	Adjusting lug-for shafts-
110087	Antenna lead receptacle--
116171	Cable & Plug for spkr.---
114253	Clamp - for vibrator-----
112745	Clip - coil mounting-----
113178	Cord - dial-------(4 ft.)
116148	Dial Drive Drum & Pinion-
116153	Dial Frame & Pulley------
116150	Dial Scale - glass-------
116200	Knob-for tun. or vol.----
116346	Mechanical Tuner Assem.--
12349	Nut for spkr. mtg.--Per C
116109	Pointer - for dial-------
116201	Push button--------------
116117	Retainer-for dial (large)
116118	Retainer-for dial (small)
81145	Retaining ring------Per C
114327	Spring-push button key---
111403	Set Screw - fluted head--
116243	Shaft - for push buttons-
116124	Socket -for dial lamp----
116168	Speaker plug - male end--
113177	Spring - for dial cord---
114356	Tab - cellulod-----Per Dz
116266	Tabs - call letters---Set
110237	Tube shield cap----------
114611	Tube socket - octal type-
114612	Tube socket (spec. grd.)-
116154	Tuning shaft-------------
88262	Vibrator socket(4 prong)-

FIRESTONE TIRE & RUBBER CO.

MODEL S7407-5, Late
Schematic, Voltage
Socket, Trimmers
Alignment, Assembly

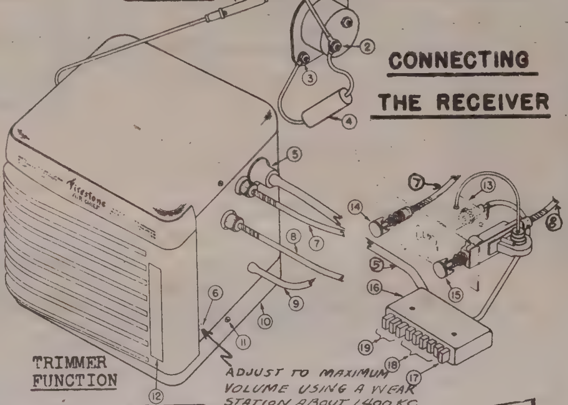
2. Connection to Ammeter.
3. Grounding of Ammeter Condenser.
4. Ammeter Condenser.
5. Push Button and Tone Control cable.
6. Hole for Antenna Matching Adjustment.
7. Volume Control Cable.
8. Station Selector Cable.
9. Antenna Leadin Cable.
10. Bottom Cover, Removable for Tube Replacement.

12. Cover Over Monomatic Tuning Adjustments (SEE INDEX FOR SETTING TUNER)
13. Manual Tuning Control.
14. On-Off Switch and Volume Control Knob.
15. Station Selector Knob.
16. Push Button Tuning Control
17. MONOMATIC TUNING Button.
18. Station Call Letter Indicators.
19. TRIMATIC Tone Control Buttons.

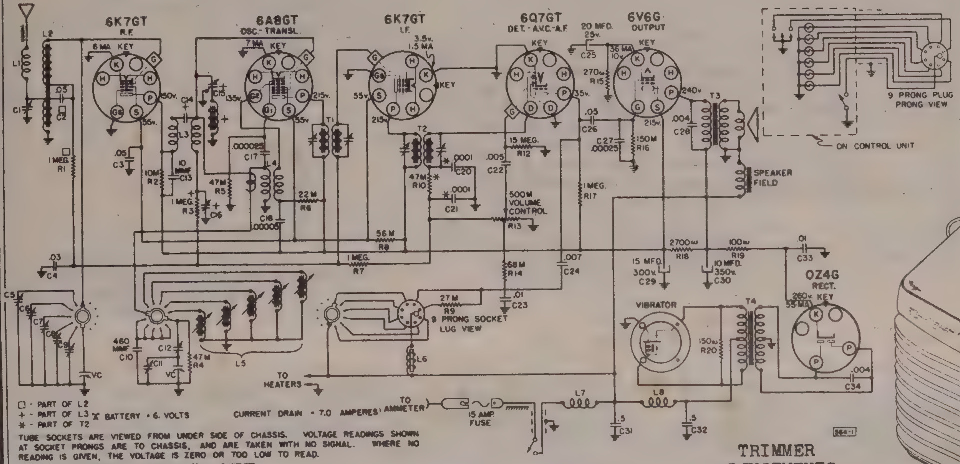


LOCATIONS OF TUBES & TRIMMERS - BOTTOM COVER REMOVED

CONNECTING THE RECEIVER



ADJUST TO MAXIMUM VOLUME USING A WEAK STATION ABOUT 1400 KC.

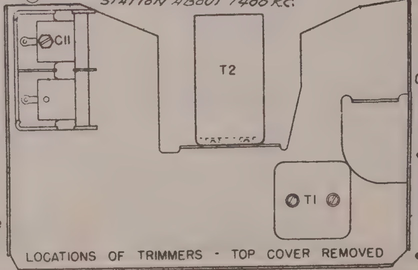


□ - PART OF L2
+ - PART OF L3
* - PART OF T2

X BATTERY - 6. VOLTS

CURRENT DRAIN - 7.0 AMPERES.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF TRIMMERS - TOP COVER REMOVED

FOR TUNER SEE
PAGE 10-2, VOL. X

ALIGNMENT PROCEDURE

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN) S-7407-5	S-7407-8	TRIMMER FUNCTION
Closed	455 kc	.1 mfd.	RF Grid	T2, T1	T2 T1	IF
Closed	455 kc	.1 mfd.	RF Grid	C16*	C8*	IF Wave Trap
Open	1530 kc	.00008 mfd.	Ant. Conn.	C11	C7	Oscillator
Open	3430 kc	.00008 mfd.	Ant. Conn.	C15*	C6*	Image Rejector
Closed	540 kc	.00008 mfd.	Ant. Conn.	C12	C9	Padder
Open	1520 kc	.00008 mfd.	Ant. Conn.	C11	C7	Oscillator
1400 kc	1400 kc	.00008 mfd.	Ant. Conn.	C1	C1	Antenna
600 kc(rock)	600 kc	.00008 mfd.	Ant. Conn.	C12	C9	Padder

The receiver must be in its case during alignment.

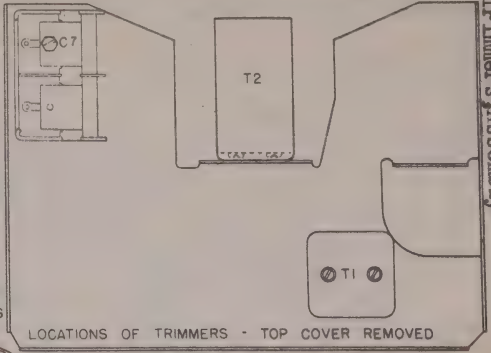
* The signal generator should be adjusted for high output and the trimmer should be adjusted for minimum response.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

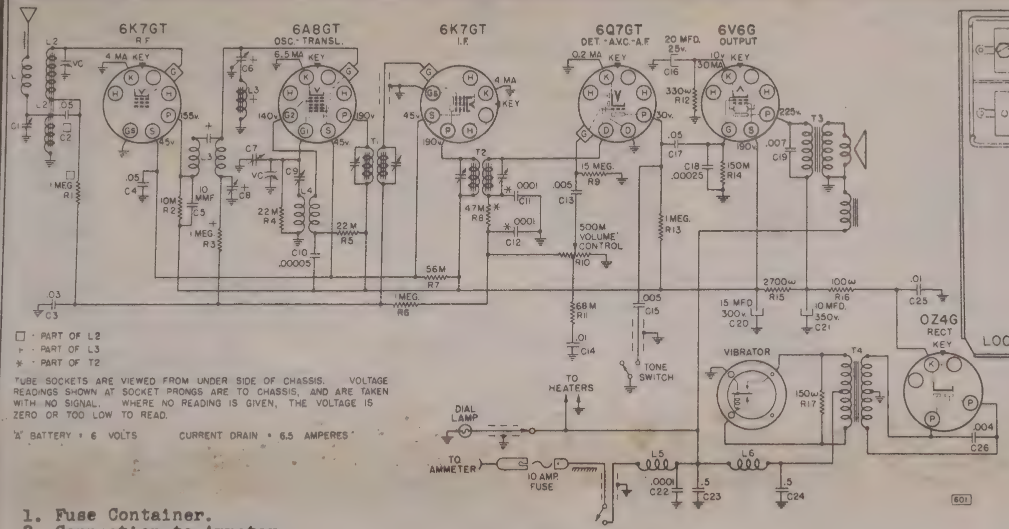
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment, except as noted by (*) above.

MODEL S7407-8
Schematic, Socket, Voltage
Trimmers, Assembly

FIRESTONE TIRE & RUBBER CO.



LOCATIONS OF TRIMMERS - TOP COVER REMOVED



□ · PART OF L2
+ · PART OF L3
* · PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

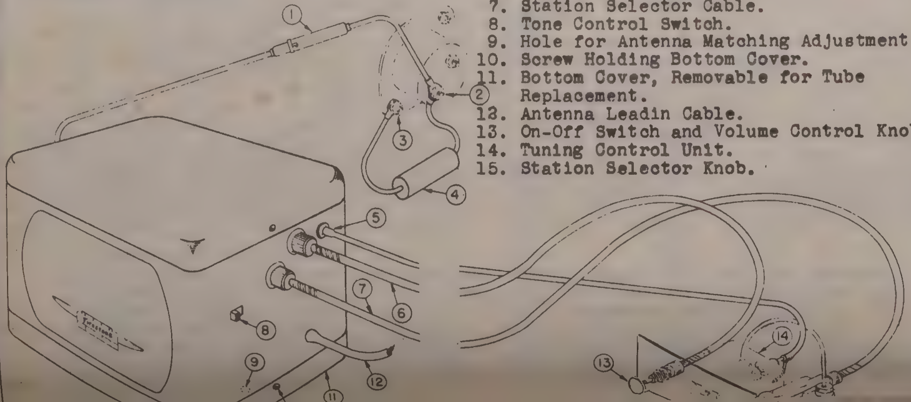
"A" BATTERY · 6 VOLTS CURRENT DRAIN · 6.5 AMPERES

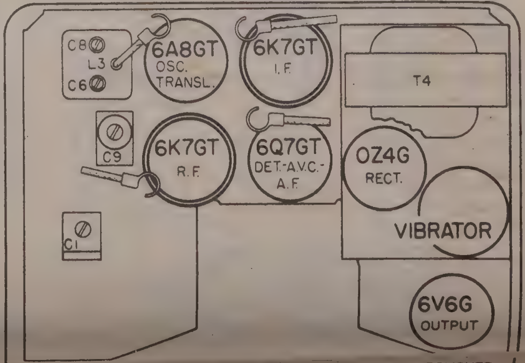
FOR ALIGNMENT, SEE INDEX

IF PEAK 455 KC

1. Fuse Container.
3. Connection to Ammeter.
3. Grounding of Ammeter Condenser.
4. Ammeter Condenser.

5. Dial Light Connection.
6. Volume Control Cable.
7. Station Selector Cable.
8. Tone Control Switch.
9. Hole for Antenna Matching Adjustment.
10. Screw Holding Bottom Cover.
11. Bottom Cover, Removable for Tube Replacement.
13. Antenna Leadin Cable.
13. On-Off Switch and Volume Control Knob
14. Tuning Control Unit.
15. Station Selector Knob.





LOCATIONS OF TUBES & TRIMMERS - BOTTOM COVER REMOVED

CROSLEY SERVICE SUPPLEMENT

February, 1938

MODEL A-158 AND A-258 (Roamio)

No. 185

SPECIFICATIONS

This model Crosley Roamio is a single unit five-tube superheterodyne receiver. It incorporates an unusual push button tuning system of rugged mechanical design that is positive, accurate, and easy to adjust and operate. A highly efficient superheterodyne circuit employs five tubes to the utmost advantage as follows: one 6A8G as an oscillator and mixer or modulator, one 6U7G as an intermediate frequency amplifier, one 6Q7G as detector, A. V. C. and 1st A. F. amplifier, one 6K6G as power output amplifier and a 6X5G as a rectifier. A full wave vibrator is used. Bias for the 6A8G and 6U7G tubes is obtained across item 27 (60 ohm resistor), for the 6Q7G tube across item 28 (40 ohm resistor) and for the 6K6G across the "B" Filter choke, item 7, and items 27 and 28.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and the receiver chassis. Voltage readings taken with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range D-C voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Ga	Go
6A8-G	Oscillator-Modulator	6.0	190	100	—	0	102	0
6U7-G	I-F Amplifier	6.0	190	100	0	0	—	—
6Q7-G	Diode Detector & A-F Amp.	6.0	85	—	—	-2.3	—	—
6K6-G	Output	6.0	185	200	—	0	—	—
6X5-G	Rectifier	6.0	—	—	—	200	—	—

Power Output approximately 4 Watts.
Battery Drain approximately 5.7 Amperes at 6 Volts.

SOCKET VOLTAGE LAYOUT

The socket layout in the illustration Fig. 5, shows the voltage readings taken between the tube prongs and receiver chassis. It will be noted that certain unused terminals are used as junction blocks while others are not used at all. All readings are taken with the receiver in operating condition and no signal input.

SETTING PUSH BUTTONS

Should it become necessary to realign the circuits of the receiver, it may also be necessary to reset the push buttons. The push buttons may be quickly and accurately set, either with the receiver in the case or with the case removed.

Insert a small screw driver in the hole through each push button and loosen (do not remove) the set screw in the bottom of the hole. By means of the conventional tuning knob, tune-in AS ACCURATELY AS POSSIBLE the favorite station having the highest frequency—that is, the station nearest the left-hand end of the dial. Completely depress and hold the No. 1 push button on the left and tighten the set screw SECURELY.

The push button tuning system is now correctly set for the 1st station. Follow through with this same procedure, setting the other four stations in the order of their frequency (kilocycles).

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 6U7G I. F. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely disengaged and turn Vol. Cont. to maximum position (RIGHT).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I. F. trimmer condensers for maximum output. Fig. 3.

(e) Transfer generator lead to top of 6A8G Osc.-Mod. tube, leaving the tube's grid clip in place.

(f) Adjust both trimmers located on the 1st I-F transformer for maximum output.

(g) Repeat operations (d) and (f) for more accurate adjustments.

IN ORDER TO PREVENT A. V. C. ACTION ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

To obtain the greatest gain from the R. F. amplifier,

the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna havinig a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READJUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser, located between the control knobs on the front of the chassis, for maxiumum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "Ant" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

REPLACING DIAL DRIVE CORDS

Two dial drive cords are used and should the innermost cord break, it will be necessary to remove the outer cord and large pulley before the inner cord can be replaced.

To replace the inner cord:

(1) After removing the broken cord, place the chassis on end with the push buttons "up" and the speaker toward you.

(2) Thread an 18" length of drive cord through the hook on one end of the tension spring which was removed from the pulley on the end of the push button rocker plate.

(3) Insert both ends of this cord through the eyelet in the rocker plate pulley from the inside. Pull the cord through until the tension spring is pulled into the pulley, then hook the free end of the spring over the catch in the pulley in the side opposite the eyelet.

(4) Open the condenser gang all the way.

(5) Pull all but approximately 4½" of the cord through the eyelet. Loop the 4½" end of the cord around the lower half of the pulley.

(6) Loop the long end of the cord over the top of the pulley and back over the brass idler pulley to the drive shaft. Continue the cord around the drive shaft, threading from the inside and over the top. Wrap four complete turns of the cord around the drive shaft and continue the cord over the top of the rocker plate pulley.

(7) Pull on the short end of the cord until the tension spring in the pulley is stretched to within ⅛" of the eyelet. Maintain this tension and tie a knot in the two ends of the cord over the catch which holds the spring. Loop the cord over the spring catch so that the knot is turned in. (A drop of bees' wax on the knot would be an added protection against coming untied.)

To replace the outer cord:

(1) Place the chassis in a horizontal position with the push buttons to the left and the speaker toward you.

(2) Close the condenser gang and mount the large drive pulley on the shaft. Place the pulley on the condenser shaft so that the shaft is flush with the outside of the pulley bushing and the eyelet in the pulley is horizontal with the shaft and toward the dial.

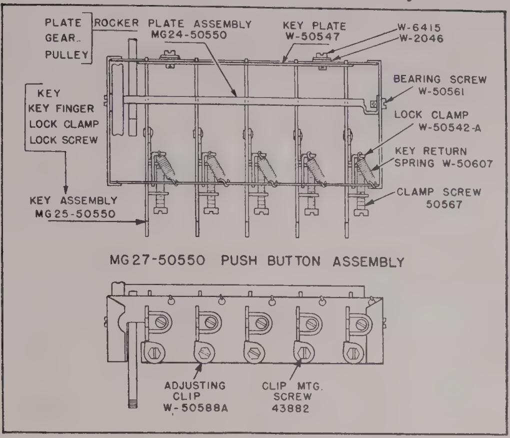
(3) Cut a 22" length of drive cord and tie a knot ½" from the two ends.

(4) Hook one end of the tension spring over the catch provided in the pulley and hook the other end over the drive cord at the knot.

5) Thread the cord through the eyelet in the pulley and extend one side up and over the vertical brass pulley. Loop this lead around the horizontal idler pulley at the left-hand side of the dial and then around the idler pulley at the right-hand side of the dial and then over the top of the large drive pulley. The tension on the spring should be sufficient to stretch it to within approximately ½" of the eyelet.

(6) With the gang closed, move the pointer to the extreme right-hand end of the dial. Press the cord into the slots in the back of the pointer and check to see that the pointer travels from one end of the dial to the other as the gang is opened and closed. It may be advisable to place some Aratex or other liquid adhesive on the cord where it fits into the pointer.

Fig. 4 Push Button Assembly



PARTS LIST—MODEL A-258

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G167—32000	Ant. Coil
2	G167—32002	Osc. Coil
3	G185—32004	1st I-F Assy., 455 Kc.
4	G186—32004	2nd I-F Assy., 455 Kc.
5	G19 —32977	Motor Noise Check
6	G27 —28067	"A" Filter Choke
7	G16 —29535	"B" Filter Choke
8	G50 —33001	2 Section Gang Cond.
9	—50054B	Ant. Compensating Cond.
	C —50623	Glass Dial Face
	W —50545	L. H. Dial Mtg. Clip
	W —50560	R. H. Dial Mtg. Clip
	W —50517B	Dial Mask (Maroon)
	W —50518	Pointer
	B —78	Screw—Dial Clip Mtg.
	MG23—50550	Dial Mtg. Bracket Assy. (Riveted to Chassis)
	MG28—50550	Manual Drive Shaft-Brkt. Assy.
	G8 —43564	Pulley and Hub Assy.
	W —23877	Set Screw—Hub
	—41582	Drive Cord—40 Inches
	W —50590	Spring—Cord Tension—Large Pulley
	W —43561	Spring—Cord Tension—Small Pulley
	W —50524B	Manual Drive Shaft
10	G3 —50369	Temp. Compensating Cond.
11A	W —32380	Condenser, .05 Mf. 200 V.
11B	W —32380	Condenser, .05 Mf. 200 V.
11C	W —32380	Condenser, .05 Mf. 200 V.
11D	W —32380	Condenser, .05 Mf. 200 V.
12	W —37226	Condenser, .02 Mf. 160 V.
13	W —23191A	Condenser, .01 Mf. 400 V.
14	W —50203	Condenser, .0065 Mf. 1,000 V.
15A	W —50161	Condenser, .5 Mf. 120 V.
15B	W —50161	Condenser, .5 Mf. 120 V.
16A	W —50105	Condenser, .1 Mf. 160 V.
16B	W —50105	Condenser, .1 Mf. 160 V.
17Z	W —50528	Condenser, 4. Mf. 350 V.
17Y		Condenser, 4. Mf. 350 V.
	W —50224	Cond. Clamp
18	G1 —34002	Condenser, .00025 Mf. Molded
19	G3 —34002	Condenser, .0005 Mf. Molded
20	—35600	Resistor, 100,000 Ohm ¼W.
21A	—35601	Resistor, 300,000 Ohm ¼W.
21B	—35601	Resistor, 300,000 Ohm ¼W.
22A	—36322	Resistor, 500,000 Ohm ¼W.
22B	—36322	Resistor, 500,000 Ohm ¼W.
23	—23616	Resistor, 15,000 Ohm 1W.
24	—35602	Resistor, 1. Megohm ¼W.
25	—35927	Resistor, 2. Megohm ¼W.
26	—50641	Resistor, 750 Ohm ½W.
27	—50643	Resistor, 60 Ohm ½W.
28	—50642	Resistor, 40 Ohm ½W.
29Z	—50526	Volume Control, 1. Meg.
29Y		On-Off Switch
30	G178—36400	8 Prong Socket
	W —50176	Tube Shield Half (2 Req.)
	W —31210	Tube Shield Ring
31	G105—28807	Vib. Socket
	W —50123A	Vib. Gnd. Clip
32	278-BL-7"U"	Speaker, Mfg. Spec. 5B-122
	—45889	Output Trans.
33	B —50644	Power Trans.
	W —50130	Power Trans. Can
34	G1 —50631	Dial Light Bulb—6-8 V.
35Z	G29 —32750	"A" Lead—Set to Fuse
35Y	G27 —32750	"A" Lead—Fuse to Ammeter
36A	—38915	Resistor, 100 Ohm ½W. W. W.
36B	—38915	Resistor, 100 Ohm ½W. W. W.
37	G2 —34002	Condenser, .0001 Mf. Molded
38	G10 —38000	Vibrator, Interchangeable
	G13 —38000	Vibrator
	W —32757	Fuse (12 Amp.)
	W —32776	Fuse Insulator
		Miscellaneous Mechanical Parts
	MG27—50550	Push Button Unit Assy.
	MG25—50550	Key Assy.
	W —50542A	Key Clip (Lock Clamp)
	—50567	⅞″—6x32 Screw (Clamp)
	W —50607	Spring—(Key Return)
	W —50588A	Adjusting Clip (Heart Shaped)
	—43882	¼″ No. 8 P. K. Screw (Clip Mtg.)
	W —50547	Key Plate (Rear Guide)
	MG24—50550	Rocker Plate Assy.
	W —50561	⅛″—6x40—Fil. H. Screw (Rocker Plate Bearing)
	W —45553B	Push Button
	W —50551A	Celluloid Cover
	—50549	Call Letter Sheet
	D —50503B	Case (Rear Half) FS49
	C —50554A	Case (Front Half) FS49
	W —50589	Felt (Dial Window)
	—50505	Knob (2 Req.)
		Mounting Parts
	W —38038D	Distributor Suppressor
	W —29754C	Generator Condenser
	—25846	¾″ No. 10 P. K. Screw (Set Mtg.)
	—6213	¼″—20 Hex. Nut (Brkt. Mtg.)
	—35065	¼″—20 Screw (Brkt. Mtg.)
	W —38205	¼″ Lock Washer (Brkt. Mtg.)
	—32783	Ant. Cable (Accessory)
	W —50167	Mtg. Bracket (Set)
	W —50395	Ammeter Cond. (Accessory)
	W —38935	Case Ground Clip

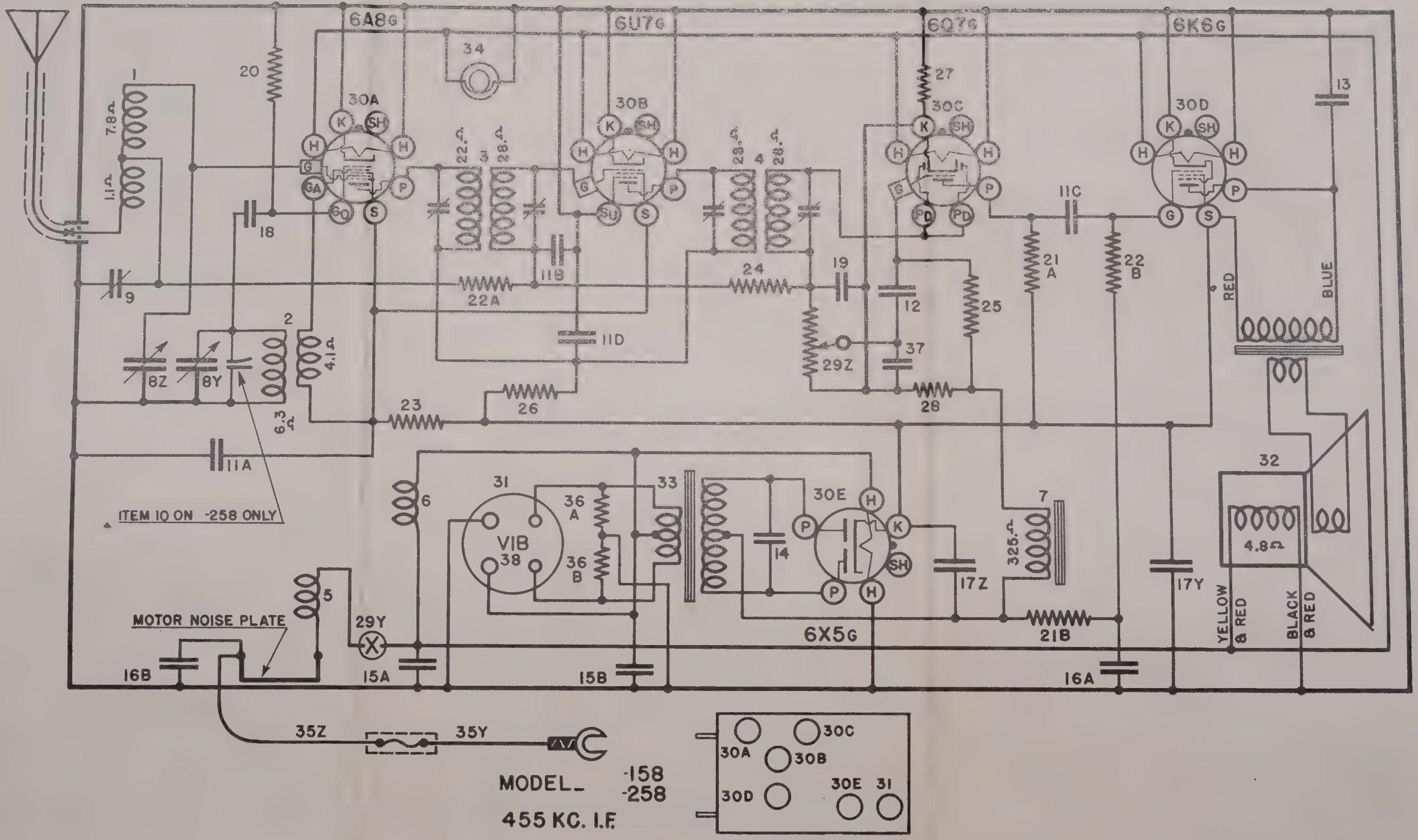


FIG. 1—WIRING DIAGRAM—MODEL A-258

MODEL A-158

The model A-158 and the model A-258 are the same electrically with the exception of a few minor parts. Mechanically they differ in that the A-258 has Push Button Tuning and the A-158 is manually tuned. When referring to the A-258 Parts List for replacement parts for the A-158 disregard all parts listed between Items 7 and 11 and all parts listed under the heading Miscellaneous Mechanical Parts.

The following are parts to fill the above deletions to complete Parts List for the A-158:

PARTS LIST — MODEL A-158

Item No.	*Part No.*	*Description*
8	G49—33001	2 Section Gang Condenser
	C —50455B	Glass Dial Face
	MG23—50500	Dial Support Bracket (Riveted to chassis)
	W —43549	Retaining Washer (Drive Shaft)
	W —50512	Drive Shaft
	G9 —43564	Pulley & Hub assembly
	—41582	Drive Cord (30 in.)
9	W —50054B	Ant. Comp. Condensor
16B	W —50105	Condensor 0.1 Mf. 160 V.
	W —50589	Felt (Dial window)
	D —50503B	Case (Rear section)
	C —50504B	Case (Front section)
	—50505	Knob (2 Required)

REPLACING THE A-158 DRIVE CORD

1.—Remove the broken cord and the cord tension spring.

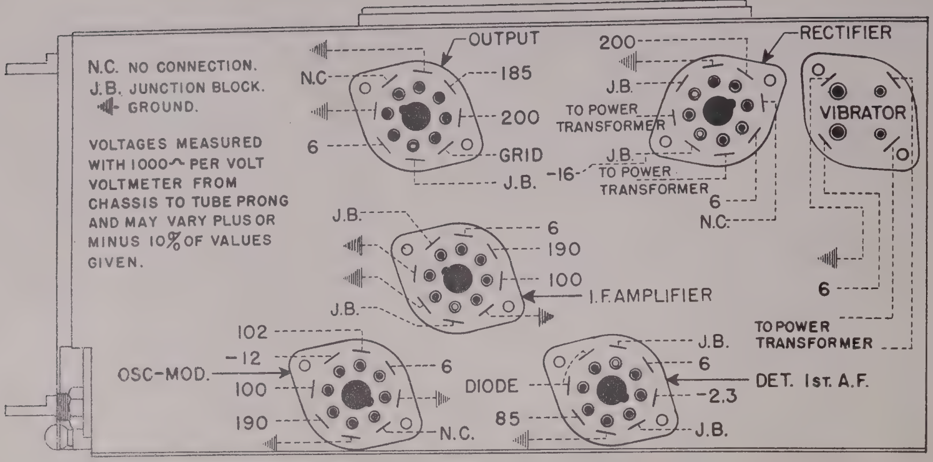
2.—Cut a 30 inch length of drive cord and tie the tension spring approximately 4 inches from one end. Thread both ends through the eyelet in the large pulley from the inside. Hook the other end of the spring to the catch in the pulley and bend catch to secure spring.

3.—Close the condenser gang and see that the eyelet in pulley is on top and that the end of the condenser shaft is flush with the inside of the pulley.

4.—Take the long end of cord and place on small brass idler pulley on the right side of the dial bracket. Loop around pulley in a clockwise direction and then around idler pulley on the left side of the dial bracket, continue on over the top of the large pulley and down to the drive shaft. From the under side of drive shaft wrap 2 turns around shaft in a counter-clockwise direction, bringing cord up on the left side of large pulley. Be sure the cord is on all the pulleys then tie a knot, pulling with sufficient force to stretch the tension spring to within ½ inch of the edge of pulley.

5.—Close gang and place the pointer on the cord at the extreme left end of the dial. Check to see that pointer travels full lenghth of the dial. It may be advisable to place some "ARATEX" or other liquid adhesive on cord where it fits into the pointer.

THE ALIGNMENT PROCEDURE IS THE SAME AS THAT OF MODEL A-258.


N.C. NO CONNECTION.
J.B. JUNCTION BLOCK.
GROUND.

VOLTAGES MEASURED WITH 1000~ PER VOLT VOLTMETER FROM CHASSIS TO TUBE PRONG AND MAY VARY PLUS OR MINUS 10% OF VALUES GIVEN.

Fig. 5 Socket Voltage Layout

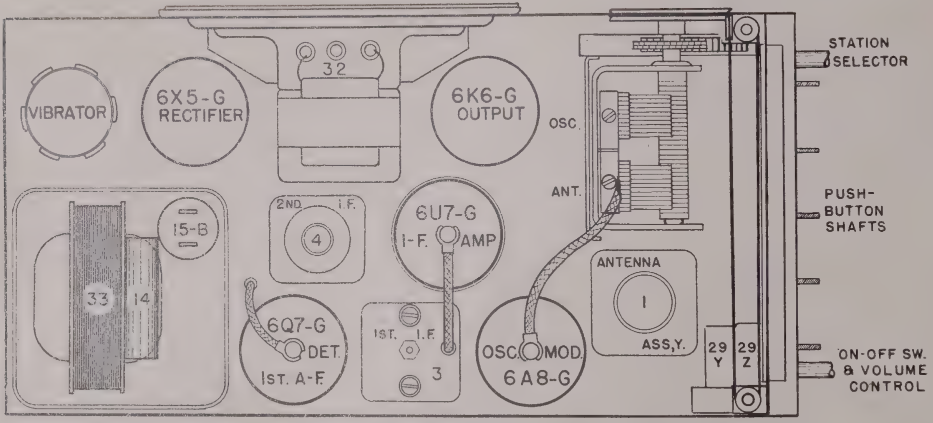


Fig. 2. Top View A-258

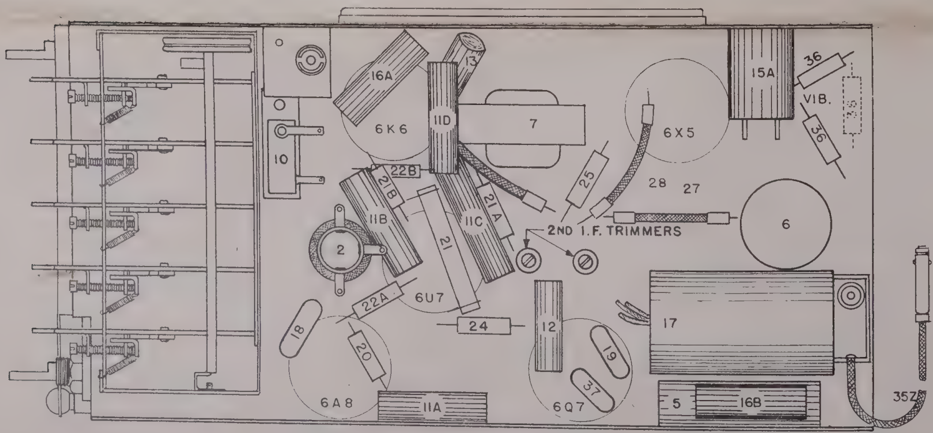


Fig. 3 Bottom View A-258

FIRESTONE TIRE & RUBBER CO.

MODEL S7425-3
Schematic, Voltage
Chassis, Socket
Trimmers

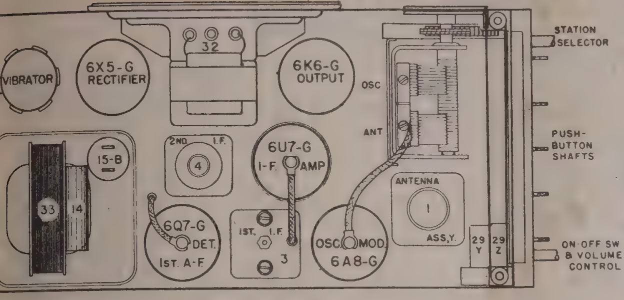


Fig. 2. Top View

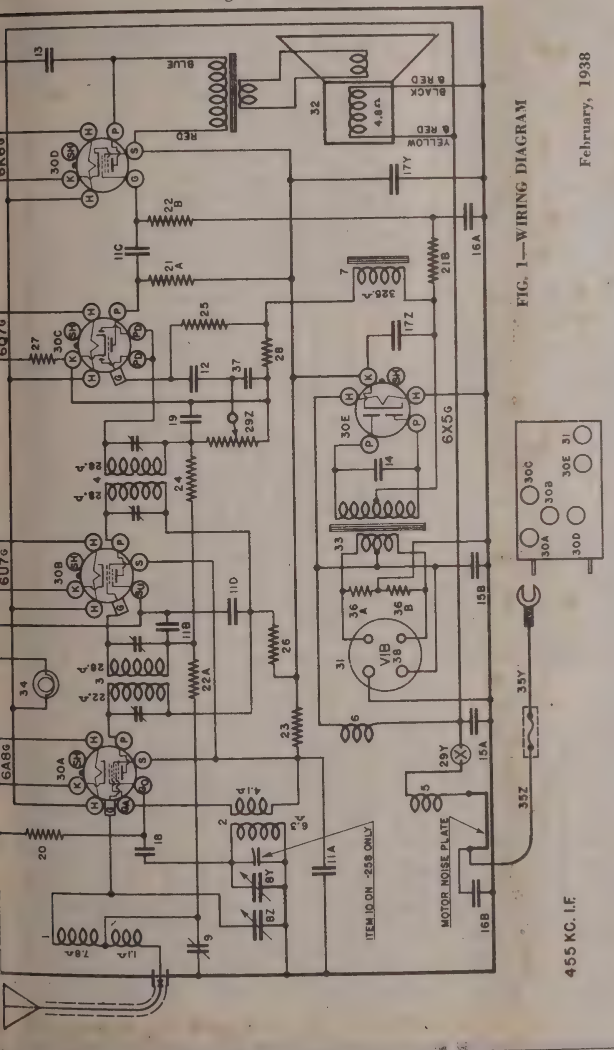


FIG. 1—WIRING DIAGRAM

February, 1938

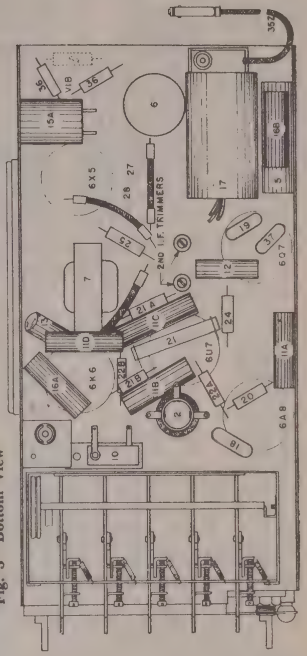
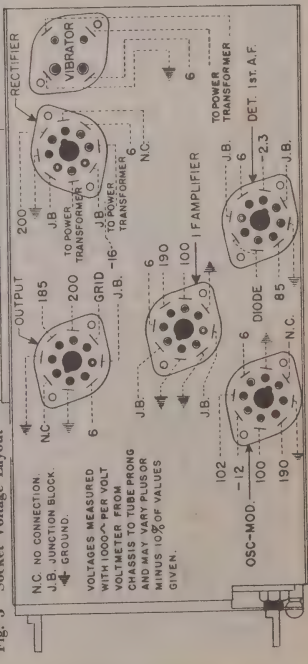


Fig. 3 Bottom View



N.C. NO CONNECTION.
J.B. JUNCTION BLOCK.
⏚ GROUND.

VOLTAGES MEASURED WITH 1000Ω PER VOLT VOLTMETER FROM CHASSIS TO TUBE PRONG AND MAY VARY PLUS OR MINUS 10% OF VALUES GIVEN.

Fig. 5 Socket Voltage Layout

MODEL S7425-3
Alignment, Tuner
Dial Data, Parts

FIRESTONE TIRE & RUBBER CO.

SPECIFICATIONS

This model is a single unit five-tube superheterodyne receiver. It incorporates an unusual push button tuning system of rugged mechanical design that is positive, accurate, and easy to adjust and operate. A highly efficient superheterodyne circuit employs five tubes to the utmost advantage as follows: one 6A8G as an oscillator and mixer or modulator, one 6U7G as an intermediate frequency amplifier, one 6Q7G as detector, A. V. C. and 1st A. F. amplifier, one 6K6G as power output amplifier and a 6X5G as a rectifier. A full wave vibrator is used. Bias for the 6A8G and 6U7G tubes is obtained across item 27 (60 ohm resistor), for the 6Q7G tube across item 28 (40 ohm resistor) and for the 6K6G across the "B" Filter choke, item 7, and items 27 and 28.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and the receiver chassis. Voltage readings taken with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range D-C voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

SOCKET VOLTAGE LAYOUT

The socket layout in the illustration Fig. 5, shows the voltage readings taken between the tube prongs and receiver chassis. It will be noted that certain unused terminals are used as junction blocks while others are not used at all. All readings are taken with the receiver in operating condition and no signal input.

SETTING PUSH BUTTONS

Should it become necessary to realign the circuits of the receiver, it may also be necessary to reset the push buttons. The push buttons may be quickly and accurately set, either with the receiver in the case or with the case removed.

Insert a small screw driver in the hole through each push button and loosen (do not remove) the set screw in the bottom of the hole. By means of the conventional tuning knob, tune-in AS ACCURATELY AS POSSIBLE the favorite station having the highest frequency—that is, the station nearest the left-hand end of the dial. Completely depress and hold the No. 1 push button on the left and tighten the set screw SECURELY.

The push button tuning system is now correctly set for the 1st station. Follow through with this same procedure, setting the other four stations in the order of their frequency (kilocycles).

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap

in place. Connect the ground lead from the signal generator to the receiver chassis frame. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely disengaged and turn Vol. Cont. to maximum position (RIGHT).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I. F. trimmer condensers for maximum output. Fig. 3.

(e) Transfer generator lead to top of 6A8G Osc.-Mod. tube, leaving the tube's grid clip in place.

(f) Adjust both trimmers located on the 1st I-F transformer for maximum output.

(g) Repeat operations (d) and (f) for more accurate adjustments.

IN ORDER TO PREVENT A. V. C. ACTION ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

To obtain the greatest gain from the R. F. amplifier, the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna havinig a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READJUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser, located between the control knobs on the front of the chassis, for maxiumum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "Ant" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.

maximum volume in the speaker.

REPLACING DIAL DRIVE CORDS

Two dial drive cords are used and should the innermost cord break, it will be necessary to remove the outer cord and large pulley before the inner cord can be replaced.

To replace the inner cord:

(1) After removing the broken cord, place the chassis on end with the push buttons "up" and the speaker toward you,

(2) Thread an 18" length of drive cord through the hook on one end of the tension spring which was removed from the pulley on the end of the push button rocker plate.

(3) Insert both ends of this cord through the eyelet in the rocker plate pulley from the inside. Pull the cord through until the tension spring is pulled into the pulley, then hook the free end of the spring over the catch in the pulley in the side opposite the eyelet.

(4) Open the condenser gang all the way.

(5) Pull all but approximately 4½" of the cord through the eyelet. Loop the 4½" end of the cord around the lower half of the pulley.

(6) Loop the long end of the cord over the top of the pulley and back over the brass idler pulley to the drive shaft. Continue the cord around the drive shaft, threading from the inside and over the top. Wrap four complete turns of the cord around the drive shaft and continue the cord over the top of the rocker plate pulley.

(7) Pull on the short end of the cord until the tension spring in the pulley is stretched to within ⅛" of the eyelet. Maintain this tension and tie a knot in the two ends of the cord over the catch which holds the spring. Loop the cord over the spring catch so that the knot is turned in. (A drop of bees' wax on the knot would be an added protection against coming untied.)

To replace the outer cord:

(1) Place the chassis in a horizontal position with the push buttons to the left and the speaker toward you.

(2) Close the condenser gang and mount the large drive pulley on the shaft. Place the pulley on the condenser shaft so that the shaft is flush with the outside of the pulley bushing and the eyelet in the pulley is horizontal with the shaft and toward the dial.

(3) Cut a 22" length of drive cord and tie a knot ½" from the two ends.

(4) Hook one end of the tension spring over the catch provided in the pulley and hook the other end over the drive cord at the knot.

5) Thread the cord through the eyelet in the pulley and extend one side up and over the vertical brass pulley. Loop this lead around the horizontal idler pulley at the left-hand side of the dial and then around the idler pulley at the right-hand side of the dial and then over the top of the large drive pulley. The tension on the spring should be sufficient to stretch it to within approximately ½" of the eyelet.

(6) With the gang closed, move the pointer to the extreme right-hand end of the dial. Press the cord into the slots in the back of the pointer and check to see that the pointer travels from one end of the dial to the other as the gang is opened and closed. It may be advisable to place some Aratex or other liquid adhesive on the cord where it fits into the pointer.

REPLACING THE DRIVE CORD

1.—Remove the broken cord and the cord tension spring.

2.—Cut a 30 inch length of drive cord and tie the tension spring approximately 4 inches from one end. Thread both ends through the eyelet in the large pulley from the inside. Hook the other end of the spring to the catch in the pulley and bend catch to secure spring.

3.—Close the condenser gang and see that the eyelet in pulley is on top and that the end of the condenser shaft is flush with the inside of the pulley.

4.—Take the long end of cord and place on small brass idler pulley on the right side of the dial bracket. Loop around pulley in a clockwise direction and then around idler pulley on the left side of the dial bracket, continue on over the top of the large pulley and down to the drive shaft. From the under side of drive shaft wrap 2 turns around shaft in a counter-clockwise direction, bringing cord up on the left side of large pulley. Be sure the cord is on all the pulleys then tie a knot, pulling with sufficient force to stretch the tension spring to within ½ inch of the edge of pulley.

5.—Close gang and place the pointer on the cord at the extreme left end of the dial. Check to see that pointer travels full lenghth of the dial. It may be advisable to place some "ARATEX" or other liquid adhesive on cord where it fits into the pointer.

When referring to manually tuned model disregard all parts listed between Items 7 and 11 and all parts listed under the heading Miscellaneous Mechanical Parts.

PARTS — The following are parts to fill the deletions to complete Parts List

Item No.	Part No.	Description
8	G49—33001	2 Section Gang Condenser
	C —50455B	Glass Dial Face
	MG23—50500	Dial Support Bracket (Riveted to chassis)
	W —43549	Retaining Washer (Drive Shaft)
	W —50512	Drive Shaft
	G9 —43564	Pulley & Hub assembly
	—41582	Drive Cord (30 in.)
9	W —50054B	Ant. Comp. Condensor
16B	W —50105	Condensor 0.1 Mf. 160 V.
	W —50589	Felt (Dial window)
	D —50503B	Case (Rear section)
	C —50504B	Case (Front section)
	—50505	Knob (2 Required)

FIRESTONE TIRE & RUBBER CO.

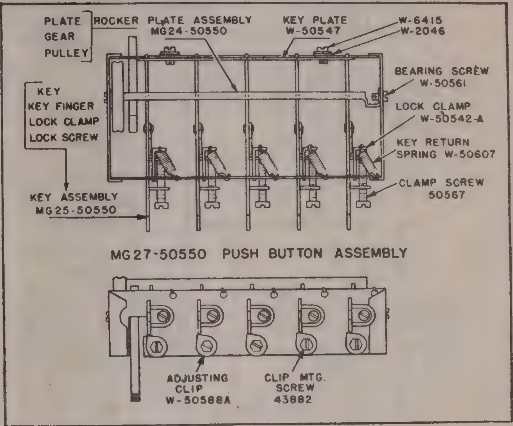
MODEL S7425-3
Voltage,Parts
Tuner Assembly

PARTS LIST

gures in first column refer to parts in Diagrams.

Part No.	Description
G167—32000	Ant. Coil
G167—32002	Osc. Coil
G185—32004	1st I-F Assy., 455 Kc.
G186—32004	2nd I-F Assy., 455 Kc.
G19 —32977	Motor Noise Check
G27 —28067	"A" Filter Choke
G16 —29535	"B" Filter Choke
G50 —33001	2 Section Gang Cond.
—50054B	Ant. Compensating Cond.
C —50623	Glass Dial Face
W —50545	L. H. Dial Mtg. Clip
W —50560	R. H. Dial Mtg. Clip
W —50517B	Dial Mask (Maroon)
W —50518	Pointer
B —78	Screw—Dial Clip Mtg.
MG23—50550	Dial Mtg. Bracket Assy. (Riveted to Chassis)
MG28—50550	Manual Drive Shaft Brkt. Assy.
G8 —43564	Pulley and Hub Assy.
W —23877	Set Screw—Hub
—41582	Drive Cord—40 Inches
W —50590	Spring—Cord Tension—Large Pulley
W —43561	Spring—Cord Tension—Small Pulley
W —50524B	Manual Drive Shaft
G3 —50369	Temp. Compensating Cond.
W —32380	Condenser, .05 Mf. 200 V.
W —32380	Condenser, .05 Mf. 200 V.
W —32380	Condenser, .05 Mf. 200 V.
W —32380	Condenser, .05 Mf. 200 V.
W —37226	Condenser, .02 Mf. 160 V.
W —23191A	Condenser, .01 Mf. 400 V.
W —50203	Condenser, .0065 Mf. 1,000 V.
W —50161	Condenser, .5 Mf. 120 V.
W —50161	Condenser, .5 Mf. 120 V.
W —50105	Condenser, .1 Mf. 160 V.
W —50105	Condenser, .1 Mf. 160 V.
W —50528	Condenser, 4. Mf. 350 V. Condenser, 4. Mf. 350 V.
W —50224	Cond. Clamp
G1 —34002	Condenser, .00025 Mf. Molded
G3 —34002	Condenser, .0005 Mf. Molded
—35600	Resistor, 100,000 Ohm ¼W.
—35601	Resistor, 300,000 Ohm ¼W.
—35601	Resistor, 300,000 Ohm ¼W.
—36322	Resistor, 500,000 Ohm ¼W.
—36322	Resistor, 500,000 Ohm ¼W.
—23616	Resistor, 15,000 Ohm 1W.
—35602	Resistor, 1. Megohm ¼W.
—35927	Resistor, 2. Megohm ¼W.
—50641	Resistor, 750 Ohm ½W.
—50643	Resistor, 60 Ohm ½W.
—50642	Resistor, 40 Ohm ½W.
	Mounting Parts
W —38038D	Distributor Suppressor
W —29754C	Generator Condenser
—25846	¾" No. 10 P. K. Screw (Set Mtg.)
—6213	¼"—20 Hex. Nut (Brkt. Mtg.)
—35065	¼"—20 Screw (Brkt. Mtg.)
W —38205	¼" Lock Washer (Brkt. Mtg.)
—32783	Ant. Cable (Accessory)
W —50167	Mtg. Bracket (Set)
W —50395	Ammeter Cond. (Accessory)
W —38935	Case Ground Clip

Fig. 4 Push Button Assembly



29Z 29Y	—50526	Volume Control, 1. Meg. On-Off Switch
30	G178—36400	8 Prong Socket
	W —50176	Tube Shield Half (2 Req.)
	W —31210	Tube Shield Ring
31	G105—28807	Vib. Socket
	W —50123A	Vib. Gnd. Clip
32	278-BL-7"U"	Speaker, Mfg. Spec. 5B-122
	—45889	Output Trans.
33	B —50641	Power Trans.
	W —50130	Power Trans. Can
34	G1 —50631	Dial Light Bulb—6-8 V.
35Z	G29 —32750	"A" Lead—Set to Fuse
35Y	G27 —32750	"A" Lead—Fuse to Ammeter
36A	—38915	Resistor, 100 Ohm ½W. W. W.
36B	—38915	Resistor, 100 Ohm ½W. W. W.
37	G2 —34002	Condenser, .0001 Mf. Molded
38	G10 —38000	Vibrator, Interchangeable
	G13 —38000	Vibrator
	W —32757	Fuse (12 Amp.)
	W —32776	Fuse Insulator
		Miscellaneous Mechanical Parts
	MG27—50550	Push Button Unit Assy.
	MG25—50550	Key Assy.
	W —50542A	Key Clip (Lock Clamp)
	—50567	⅞"—6x32 Screw (Clamp)
	W —50607	Spring—(Key Return)
	W —50588A	Adjusting Clip (Heart Shaped)
	—43882	¼" No. 8 P. K. Screw (Clip Mtg.)
	W —50547	Key Plate (Rear Guide)
	MG24—50550	Rocker Plate Assy.
	W —50561	⅛"—6x40—Fil. H. Screw (Rocker Plate Bearing)
	W —45553B	Push Button
	W —50551A	Celluloid Cover
	—50549	Call Letter Sheet
	D —50503B	Case (Rear Half) FS49
	C —50554A	Case (Front Half) FS49
	W —50589	Felt (Dial Window)
	—50505	Knob (2 Req.)

TUBE SOCKET VOLTAGE READINGS

ub	Function	H	P	S	Su	K	Ga	Go
A8-	Oscillator-Modulator	6.0	190	100	—	0	102	0
U7-	I-F Amplifier	6.0	190	100	0	0	—	—
Q7-	Diode Detector & A-F Amp.	6.0	85	—	—	-2.3	—	—
K6-	Output	6.0	185	200	—	0	—	—
X5-	Rectifier	6.0	—	—	—	200	—	—

wer utput approximately 4 Watts.
tery Drain approximately 5.7 Amperes at 6 Volts.

MODEL S7425-6
Chassis R-320
Schematic,Voltage
Socket,Coils

FIRESTONE TIRE & RUBBER CO.

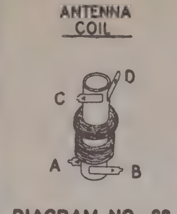


DIAGRAM NO. 23
PART NO. 113449

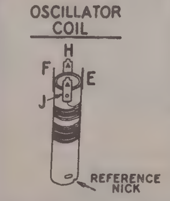
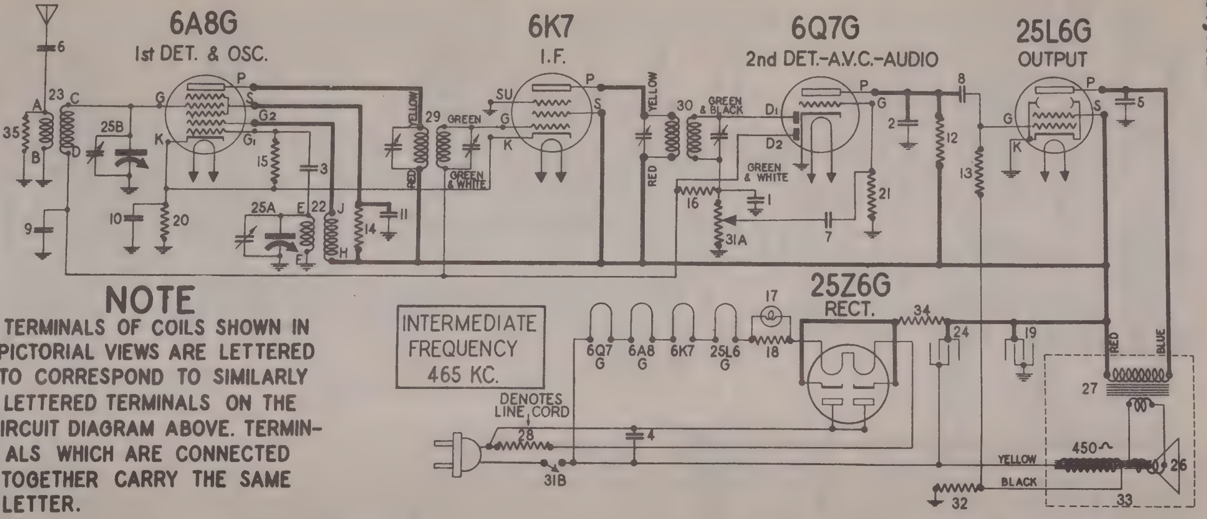


DIAGRAM NO. 22
PART NO. 113042



NOTE

TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM ABOVE. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.

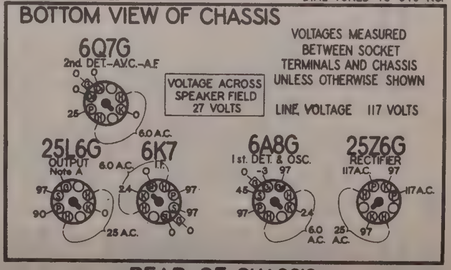
PARTS LIST

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	83539	Condenser - mica 260 mmfd.	.20
3	83783	Condenser - mica, 110 mmf.	.20
4-5	88026	Condenser - paper .02 mfd. 400 V.	.25
6	88029	Condenser - paper .004 mfd. 400 V.	.25
7-8	88030	Condenser - paper .01 mfd. 400 V.	.25
9-10	88189	Condenser - paper .05 mfd. 200 V.	.25
11	89421	Condenser - paper .1 mfd. 200 V.	.25
12	110553	Resistor - carb. 220000 ohms ¼ W.	.12
13	110559	Resistor - carb. 470000 ohms ¼ W.	.12
14	110566	Resistor - carb. 33000 ohms ¼ W.	.12
15	110578	Resistor - carb. 68000 ohms ¼ W.	.12
16	110580	Resistor - carb. 3.3 meg. 1/4 watt	.12
17	110629	Lamp - 6.3 volt - .25 amps.	.15
18	110975	Resistor - W.W. 33 ohms ½ W.(10%)	.12
19	112898	Condenser - elect. 16 mfd. 150 V.	.50
20	112974	Resistor - carb. 220 ohm ¼ W.(10%)	.15
21	112975	Resistor - carbon 10 meg. 1/4 watt	.12
22	113042	Coil - oscillator	.45
23	113449	Coil - antenna	.78
24	113472	Condenser - elect. 40 mfd. 150 V.	.56
25A - 25B	113478	Condenser - variable gang	3.20
26	R-114061	Cone - voice coil assembly (for R-115039 speaker)	1.50
27	R-114062	Transformer - output	1.20
28	114951	Power cord - (dropping resistance 143 ohms 10%)	.98
29	114802	Transformer - 1st I.F.	1.10
30	114804	Transformer - 2nd I.F.	.85
31A - 31B	114814	Volume control 1 megohm with off-on switch	.96
32	114815	Resistor - W.W. 110 ohms ½ W.(10%)	.14
33	R-115039	Speaker - dynamic 5 inch	3.95
34	116013	Resistor - W.W. 50 ohms 1 watt	.18
35	110569	Resistor - carb. 10,000 ohms ¼ W.	.12

SOCKET VOLTAGES

ANTENNA GROUNDED
DIAL TUNED TO 540 KC.



REAR OF CHASSIS

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A:- The bias for the control grid of the 25L6-G tube is -6.7 volts, measured across resistor number 32.

FIRESTONE TIRE & RUBBER CO.

MODEL S7425-6
Chassis R-320
Alignment, Tuner
Socket, Trimmers
MODEL S7425-1, Late
MODEL S7426-1
Tuner Data

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

① — Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.

② — Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally.

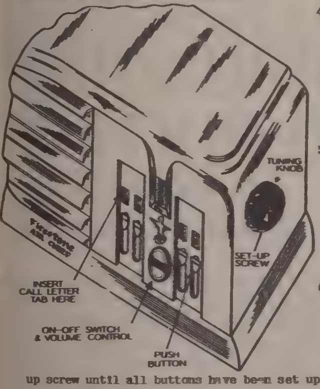
③ — Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

④ — **TO CALIBRATE THE DIAL:-** Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). Release the set screw in the collar which connects the gang condenser shaft with the tuning unit. Holding the gang in full mesh turn the dial until the last dial division (just below 55) on the low frequency end is exactly 4 3/8 inch above the table surface. Now retighten the set screw in the coupler collar. The 4 3/8 inch division on the ruler (when measured vertically from table surface) is to be used as the dial indicator for all calibrations and alignment.

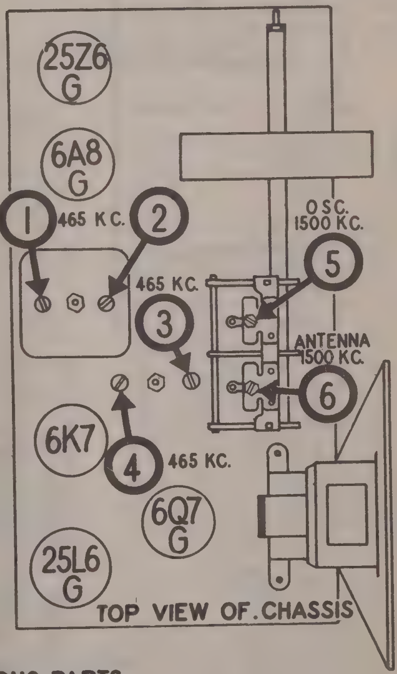
DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. MICA CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	1ST I. F.	ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT
				3-4	2ND I. F.	
200 MMFD. MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	1500 KC	5	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	6	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.

HOW TO SET UP THE PUSH BUTTONS.

1. Be sure that the antenna wire furnished with the set is extended to its full length and placed under the carpet or around the floor molding. In most instances the 20 feet of brown insulated wire included with the radio will make a satisfactory antenna. However in localities remote from powerful broadcast stations, it may be found necessary to use an outside antenna.
2. Turn the set on and allow it to operate at least one quarter hour before setting up the push buttons.
3. Select the four nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals generally give poor results.



4. The large tuning knob at the side of your set has a set screw located in the center. Grasp this tuning knob firmly and then using a screw driver or a coin, turn the screw counter-clockwise not more than two whole turns.
5. Push down any one of the four buttons and holding it down tune in the desired station using the tuning knob. The push button must be held down firmly while the station is being tuned in otherwise the setting will be incorrect.
6. Release the button that you have just set up. WARNING:- Do not attempt to use any button until you have completed the set-up of all four buttons. Do not retighten the set-up screw until all buttons have been set up.
7. Proceed to set up the next button by pushing down on the button firmly and tuning in the desired station, using the tuning knob. The rest of the buttons should be set-up in a similar manner.
8. After all of the buttons have been set-up YOU MUST RE-TIGHTEN THE SCREW IN THE TUNING KNOB: OTHERWISE ALL SETTINGS OF THE BUTTONS WILL BE DESTROYED. GRASP THE KNOB FIRMLY AND USE A SMALL SCREW DRIVER OR A COIN TO TIGHTEN THE SCREW SECURELY.



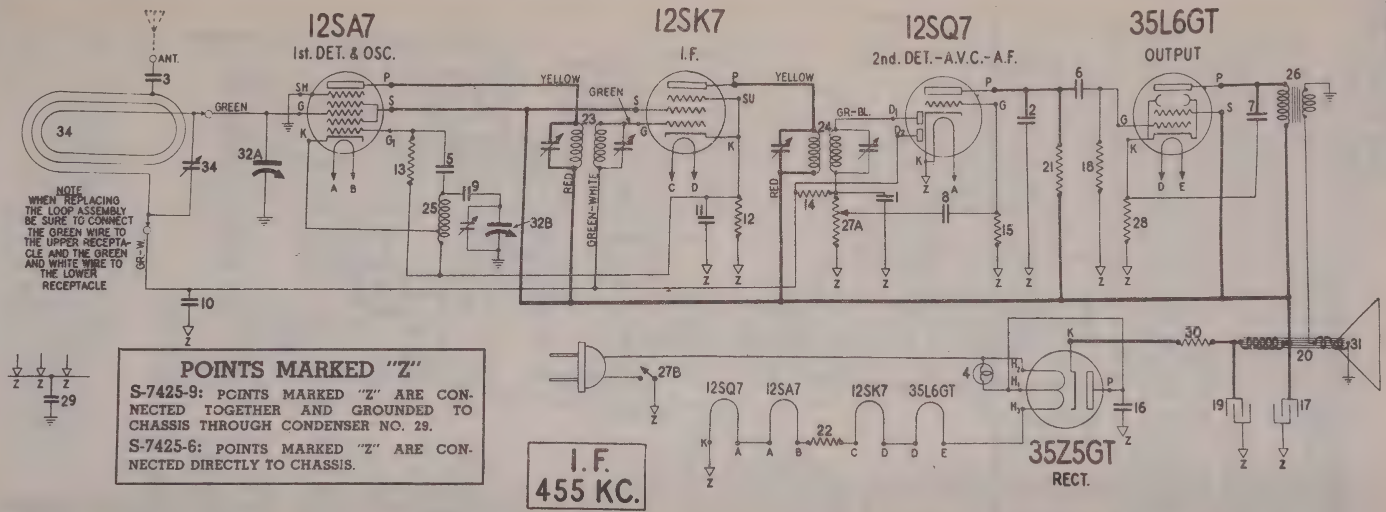
TOP VIEW OF CHASSIS

DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
112745	Clip - coil mounting (osc. & ant.)	.01
113558	Clutch Spring - for tuner (on cam shaft)	.04
113504	Collar - Coupling (between tuner unit and gang condenser shaft)	.08
113560	Dial Scale - celluloid strip	.22
113753	Dial Window - celluloid	.16
113557	Key - for push button tuner (left hand)	.24
113572	Key - for push button tuner (right hand)	.24
113531	Knob - tuning (ivory)	.30
113574	Knob - volume (ivory)	.18
113500	Mechanical Tuner Unit - less tenite tips for push buttons	3.90
113699	Screw - #8 X 1" for chassis mtg.	.01
113538	Screw - for tuning knob (chrome head)	.14
85427	Socket - octal base (standard)	.15
113543	Socket - dial lamp	.18
113559	Spring - for key return	.02
113550	Tabs - station call letters	.28
113529	Tip - for push button (ivory)	.05

MODELS S7425-6, Late
S7425-9, Loop
Schematic, Voltage
Socket

FIRESTONE TIRE & RUBBER CO.



POINTS MARKED "Z"

S-7425-9: POINTS MARKED "Z" ARE CONNECTED TOGETHER AND GROUNDED TO CHASSIS THROUGH CONDENSER NO. 29.

S-7425-6: POINTS MARKED "Z" ARE CONNECTED DIRECTLY TO CHASSIS.

I.F.
455 KC.

ELECTRICAL PARTS

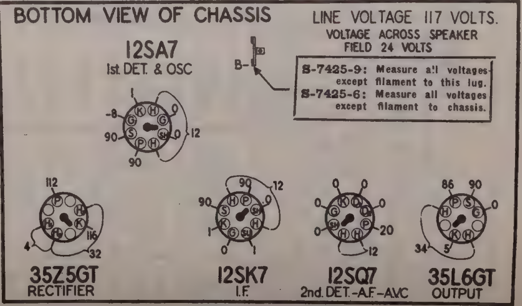
Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica, 260 mmfd.	$0.20
3	83783	Condenser—mica, 110 mmfd.	.20
4	85296	Lamp—dial, 6 to 8 volt (mazda #51)	.16
5	85394	Condenser—mica, 510 mmfd.	.25
6-7	88026	Condenser—paper, .02 mfd., 400 volt	.25
8	88030	Condenser—paper, .01 mfd., 400 v.	.25
9	88030	Condenser—paper, .01 mfd., 400 volt (S-7425-9 only)	.25
10	88189	Condenser—paper, .05 mfd., 200 volt	.25
11	88193	Condenser—paper, .25 mfd., 150 volt	.35
12	110560	Resistor—carbon, 100 ohms, ¼ watt	.12
13	110565	Resistor—22,000 ohms, ¼ watt	.12
14-15	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
16	111252	Condenser—paper, .05 mfd., 400 volt	.13
17	112898	Condenser—electrolytic, 16 mfd., 150 volt	.50
18	112971	Resistor—insulated 470,000 ohms, ¼ watt	.15
19	113472	Condenser — electrolytic 40 mfd., 150 volt	.56
20	U-115055	Speaker—electro dynamic	3.60
21	116067	680,000 ohm, ¼ watt—20% insulated	.12
22	116527	Resistor—100 ohms—10% 3 watt W.W.	.26
23	116667	Transformer—1st I.F.	1.00
24	116672	Transformer—2nd I.F.	1.00
25	116674	Coil—oscillator	.35
26	U-116676	Transformer—output for U-115055 speaker	1.00
27A-27B	116691	Volume control with switch	1.00
28	116702	Resistor—140 ohms—10% ½ watt W.W.	.12
29	116706	Condenser — 0.2 mfd., 600 volt (S-7425-9 only)	.35
30	116752	Resistor—33 ohms, 1 watt W.W.	.15
31	U-116727	Cone & Voice Coil Assem. for U-115055 speaker	1.20
32A-32B	116755	Condenser—2 gang	3.50
33	116775	Loop antenna	1.00
34	116781	Condenser—trimmer for loop ant. assembly	.22

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

ANTENNA GROUNDED

DIAL TUNED TO 540 KC.



LINE VOLTAGE 117 VOLTS.
VOLTAGE ACROSS SPEAKER FIELD 24 VOLTS

S-7425-9: Measure all voltages except filament to this lug.
S-7425-6: Measure all voltages except filament to chassis.

Use a high resistance voltmeter of at least 1000 ohms per volt.

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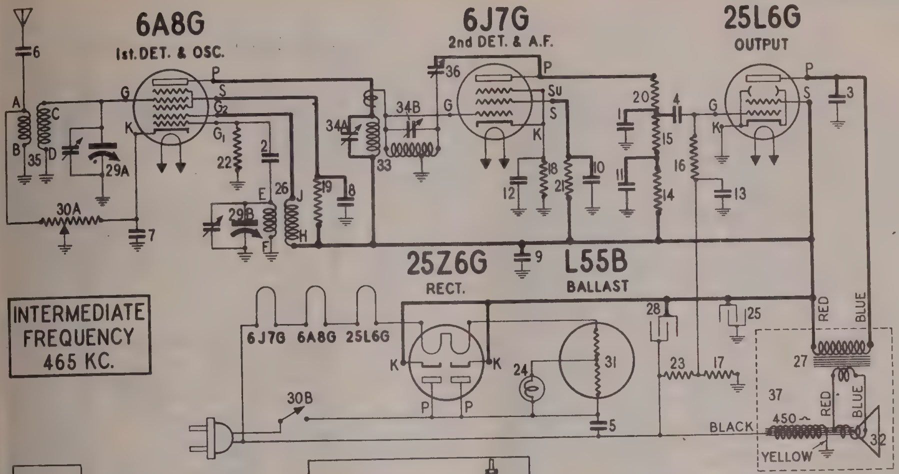
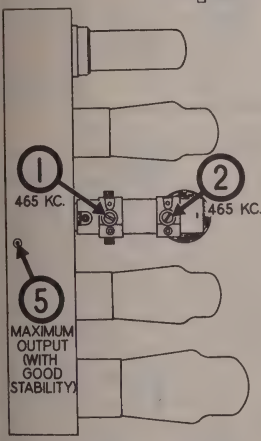
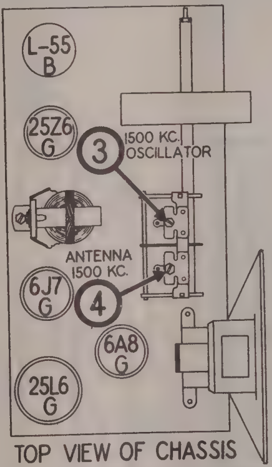
FIRESTONE TIRE & RUBBER CO.

MODELS S7425-8UA,
S7425-9,Ch.R317
MODEL S7426-1
Chassis R311





REAR VIEW OF CHASSIS



TOP VIEW OF CHASSIS

TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS BELOW ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM ABOVE. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.

ANTENNA COIL

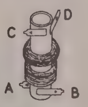


DIAGRAM NO. 35
PART NO. 113744

OSCILLATOR COIL

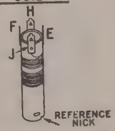
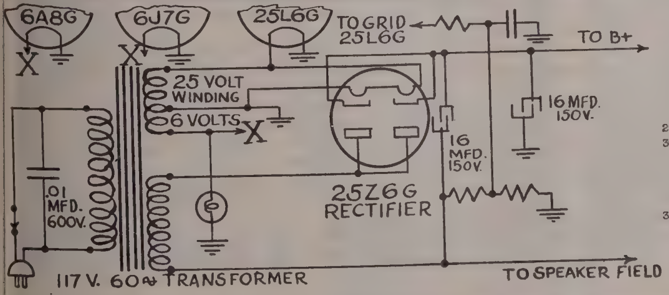


DIAGRAM NO. 27
PART NO. 113042

The Firestone Air Chief Stock No. 7425-8UA and 7425-9 (317 chassis) are identical in operation, performance and circuit wiring to the Firestone Air Chief Stock No. 7426-1 (311 chassis) except for the following differences:

The 317 chassis is designed for operation from a 117 volt 60 cycle power supply while the 311 chassis will operate on either 117 volt A.C. or D.C. power system. The only difference between the two models is that a one-to-one power transformer which also has a 25 volt and a 6 volt filament winding, has been substituted for the ballast resistor tube. A partial schematic diagram for the 317 chassis, showing only the power supply wiring, tube filament wiring and associated parts list is shown below. ALL OTHER CIRCUIT WIRING IS IDENTICAL TO THE 311 CHASSIS.



ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2	83783	Condenser - mica 110 mmf.	.20
3-4-5	88026	Condenser - paper .02 mfd. 400 volt	.25
6	88029	Condenser - paper .004 mfd. 400 volt	.25
7-8-9 10-11	89421	Condenser - paper .1 mfd. 200 volt	.25
12-13	89532	Condenser - paper .25 mfd. 200 volt	.32
14	110553	Resistor - carbon 220,000 ohm 1/4 watt	.12
15-16	110559	Resistor - carbon 470,000 ohm 1/4 watt	.12
17	110564	Resistor - carbon 100,000 ohm 1/4 watt	.12
18	110565	Resistor - carbon 22,000 ohm 1/4 watt	.12
19	110566	Resistor - carbon 33,000 ohm 1/4 watt	.12
20	110569	Resistor - carbon 10,000 ohm 1/4 watt	.12
21	110570	Resistor - carbon 2.2 meg. 1/4 watt	.15
22	110578	Resistor - carbon 68,000 ohm 1/4 watt	.12
23	110584	Resistor - carbon 330,000 ohm 1/4 watt	.12
24	110629	Lamp - 6.3 volt - .25 amps.	.15
25	112898	Condenser - electrolytic 16 mfd. 150 volt	.50
26	113042	Coil - oscillator	.45
27	R-113343	Transformer - output for R-115013 spkr.	1.00
28	113472	Condenser - electrolytic 40 mfd. 150 volt	.56
29A-29B	113478	Condenser - variable gang-	3.20
30A-30B	113501	Volume Control-20,000 ohms with on-off switch	.92
31	113506	Ballast Resistor - L55B	.65
32	R-113737	Cone - voice coil Assem. for R-115025 spkr.	1.90
33	113738	Transformer - I.F. (with trimmer)	1.26
34A-34B	113743	Condenser - trimmer (2 section for I.F.)	.30
35	113744	Coil - antenna	.72
36	113745	Condenser - trimmer (regen control)	.28
37	R-115025	Speaker - dynamic - 5" (sub. R-115013)	4.80

MODELS S7425-8UA
S7425-9,Ch.R317
MODEL S7426-1
Chassis R311

FIRESTONE TIRE & RUBBER CO.

Alignment,Volta
Circuit Data

Chassis Model	Voltage
R-311..	..........117 volts A.C. or D.C.

This chassis is a 5 tube single band push-button tuning superheterodyne receiver. It is designed for operation on either alternating or direct current, and incorporates an L-55-B ballast resistor tube. The tuning range of the receiver is 540 to 1720 KC.

IMPORTANT: In cases where it is found that the push-button tuner does not tune in stations correctly due to extreme sharpness in tuning it is only necessary to back off (turn clockwise) the regeneration control trimmer (#5) slightly. This will make tuning broader and will result in more accurate tuning when using the push button tuner.

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

① Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

② Connect the ground lead of the signal generator to the chassis of the receiver through a .1 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator.

③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

④ With the gang condenser in full mesh, set the indicator to the last mark on the top end of the dial scale. If the pointer is only slightly off calibration, it may be possible to slip the dial drum just enough to correct for this slight mis-calibration. If the dial is several divisions off calibration, loosen the set screw on the condenser shaft. Then grasp the end of the tuning shaft and turn the dial until the last division of the scale is directly under the indicator, when the gang is in full mesh. Then retighten the set-screw.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. IF OSCILLATION OCCURS "BACK-OFF" (ONE QUARTER TURN CLOCKWISE) THE REGENERATION CONTROL TRIMMER # 5.
200 MMFD. CONDENSER	ANTENNA LEAD (BLUE WIRE)	1500 KC	1500 KC	3	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. CONDENSER	ANTENNA LEAD (BLUE WIRE)	1500 KC	TUNE TO 1500 KC GEN. SIG.	4	BROADCAST ANTENNA (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
CONNECT RECEIVER TO CUSTOMERS ANTENNA OR TO A 50 MMFD. MICA CONDENSER IN SERIES WITH THE SIGNAL GENERATOR.		TUNE IN A WEAK SIGNAL ON THE LOW FREQUENCY END OF THE DIAL. A WEAK SIGNAL IS REQUIRED SO THAT VOLUME CONTROL MAY BE SET TO MAXIMUM VOLUME POSITION.		5	REGENERATION CONTROL	ADJUST TRIMMER TO GIVE MAXIMUM OUTPUT, CONSISTENT WITH GOOD STABILITY AND TONE QUALITY.
✱ .1 MFD. CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.

✱ THIS ADJUSTMENT MUST AGAIN BE MADE AFTER THE REGENERATION CONTROL TRIMMER HAS BEEN SET.

DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
83624---	Screw - Self Tapping 8 X 1/4 for mounting I.F. transformer------	$ .01
85427----	Socket - tube, 8 prong---------------	.15
85827----	Set Screw - 8/32 square head---------	.02
88161----	Shield Tube - (short section)--------	.08
88162----	Shield Tube - (long section)---------	.08
88164----	Shield Cap - tube, grid type---------	.06
89911----	Shield - Tube, base------------------	.04
89912----	Clip - grounding, for tube base------	.02
112745---	Clip - coil mounting (osc. & ant.)---	.01
113500---	Mechanical Tuner Unit - less tenite tips for push buttons------------	3.90
113504--	Collar - Coupling (between tuner unit and gang cond. shaft)--------	.08
113510---	Tip - for push button (walnut)-------	.05
113530---	Knob - tuning (walnut)---------------	.25
113537---	Screw for tuning knob & set-up-------	.18
113543---	Socket - dial lamp-------------------	.18
113548---	Felt Pad - behind push buttons-------	.01
113550---	Tabs - station call letters----------	.28
113557---	Key - for push button tuner(left hand)	.24
113558--	Clutch spring - for tuner (on cam shaft)------------------------------	.04
113559---	Spring - for key return--------------	.02
113560---	Dial Scale - Celluloid Strip---------	.22
113572---	Key - for push button (right hand)---	.24
113573---	Knob - Volume (walnut)---------------	.18
113636---	Screw - #8 X 3/4" For chassis mtg.---	.01
113638---	Screw - Back cover retaining---------	.01
113699---	Screw - #8 X 1" For chassis mtg.-----	.01
113753---	Dial Window - celluloid--------------	.16

I.F. TRANSFORMER & REGENERATION CONTROL.

This R-311 chassis employs only one intermediate frequency transformer, the windings of which are capacitively coupled. The two trimmers used to tune the primary and secondary of this transformer are mounted on the transformer assembly, and are accessible from the rear of the chassis. Also associated with this intermediate frequency transformer is an additional trimmer condenser, which is accessible through a hole in the rear of the chassis. This condenser is used to feed back a portion of the intermediate frequency signal appearing in the plate circuit of the 6J7-G tube. This signal is introduced into the 6J7-G grid circuit through a coupling coil, which is a part of the secondary coil. The regeneration obtained increases the amplification and selectivity obtainable from the intermediate frequency transformer, and makes the performance of this set comparable to that which is obtained from a set employing an intermediate frequency stage.

When aligning the intermediate frequency transformer the output of the signal generator is set at 465 KC and is coupled to the grid of the 6A8-G tube in the customary manner. The primary and secondary windings are tuned by adjusting Trimmer Screws No. 1 and No. 2 until a maximum deflection is obtained on the output meter. If the set has a tendency to oscillate when adjusting these trimmer screws, turn Trimmer Screw No. 5 to the right (clockwise) until the oscillation ceases. The signal generator is next coupled to the antenna lead, and Trimmers No. 3 and No. 4 are aligned for maximum output, using a generator frequency of 1500 KC. Now connect the set to the CUSTOMER'S antenna and tune in a station on the low frequency end of the dial. The regeneration control, Trimmer No. 5 is now adjusted to give maximum output of the set, consistent with good stability and tone quality. After changing the setting of Trimmer No. 5 it is necessary to re-adjust Trimmers No. 1 and No. 2, as their setting will be found to have changed slightly. The output of the signal generator is set at 465 KC and is coupled to the grid of the 6A8-G tube through a .1 mfd. condenser and Trimmers No. 1 and No. 2 adjusted, as was done previously.

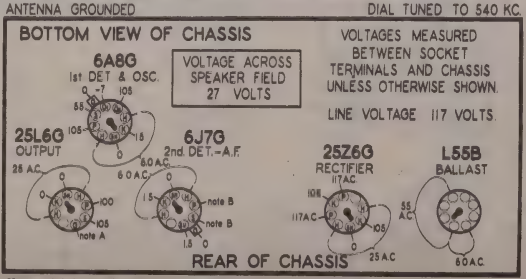
A-C OPERATION

When the set is used on alternating current, all D-C potentials are supplied by a 25Z6G rectifier tube and its associated filter circuit. The tube is connected for half-wave rectification of the A-C supply.

If any hum is noticed when the set is used on A-C, reversing the power plug in the receptacle will sometimes reduce the hum level. When the set has not been used for some time, or the filter condensers have been replaced, a slight hum may be audible when the set is first turned on. This hum may not clear up immediately upon reversal of the power plug. However, it will probably be eliminated after approximately five minutes operation by which time the anode plates of the electrolytic capacitors in the filter system will have reformed.

D-C OPERATION

If the set fails to operate after allowing time for the tubes to reach their normal operating temperatures, reverse the power plug in the receptacle. When the set is used on direct current, the 25Z6G rectifier tube and the filter system remains in the circuit and serve two purposes. If the power cord should be plugged in with incorrect polarity, the 25Z6G tube protects the filter condensers from damage. On correct D-C polarity the 25Z6G tube passes the D-C and the filter circuit aids in smoothing the supply voltage, thus minimizing line noises.



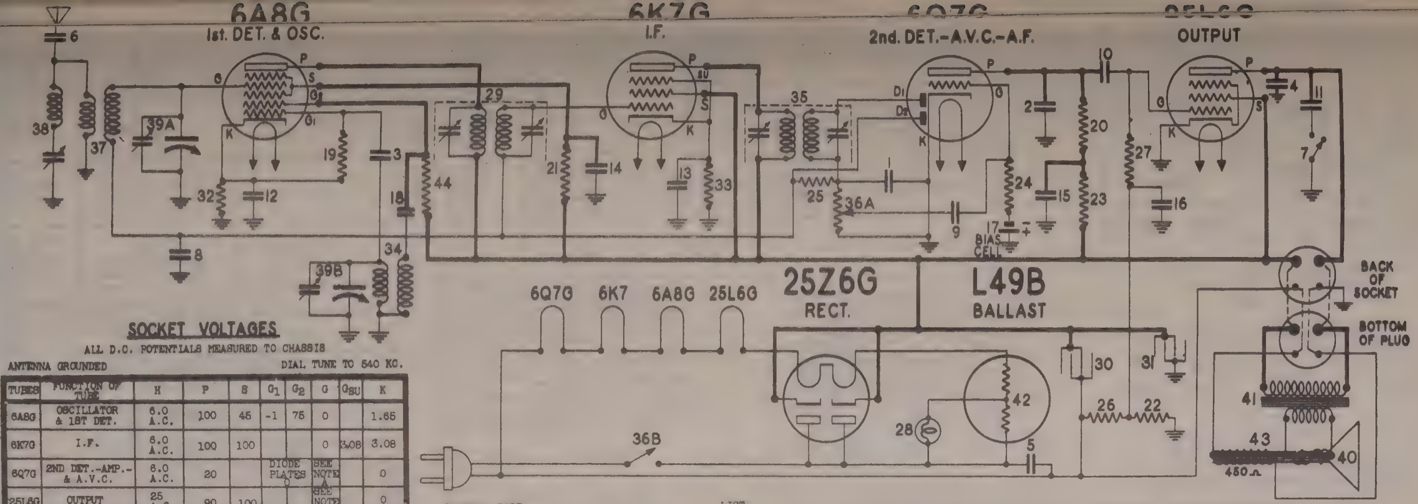
Use a high resistance voltmeter of a least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 25L6G output tube is -6.0 volts. Due to the high resistance in this grid circuit the voltage measured will be extremely small.

NOTE B: Due to the high resistance in the plate and screen grid circuits, the voltages measured at these terminals will be very small.

MODEL S7426-2
Schematic, Voltage
Socket, Trimmers
Alignment

FIRESTONE TIRE & RUBBER CO.



SOCKET VOLTAGES

ALL D.C. POTENTIALS MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNE TO 540 KC.

TUBES	FUNCTION OF TUBE	H	P	S	G_1	G_2	G	G_{SU}	K
6A8G	OSCILLATOR & 1ST DET.	6.0 A.C.	100	45	-1	75	0		1.65
6K7G	I.F.	6.0 A.C.	100	100			0	3.08	3.08
6Q7G	2ND DET.-AMP.-& A.V.C.	6.0 A.C.	20		DIODE PLATES 0		SEE NOTE A		0
25L6G	OUTPUT	25 A.C.	90	100			SEE NOTE B		0
25Z6G	RECTIFIER	25 A.C.	110 A.C 110 A.C						130

DROP ACROSS SPEAKER FIELD 26 VOLTS.

Use a high resistance voltmeter of at least 1000 ohms per volt.

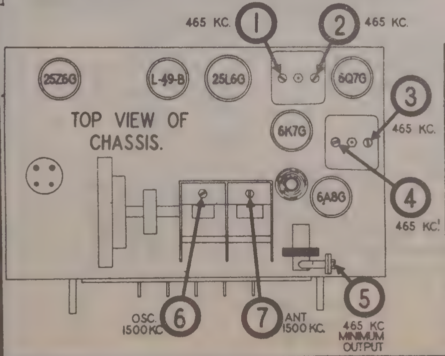
NOTE B:- The bias for the control grid of the 25L6G output tube is -8.7 volts measured across resistor 22.

NOTE A:- The bias for the control grid of the triode section of the 6Q7G tube is -1.0 volt is supplied by a bias cell. Due to the high resistance of the cell the voltmeter will indicate only a fraction of a volt.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	83539	Condenser - mica 260 mmfd.	.20
3	85061	Condenser - mica 51 mmfd.	.15
4-5	88026	Condenser - .02 mfd. 400 V.	.25
6-18	88029	Condenser - .004 mfd. 400 V.	.25
7	88054	Switch - tone control	.30
8-9-10	88189	Condenser - .05 mfd. 200 V.	.25
11	88682	Condenser - .1 mfd. 400 volt	.25
12-13-14-15	89421	Condenser - .1 mfd. 200 volt	.25
16	89532	Condenser - .25 mfd. 200 V.	.32
19	110552	Resistor 47,000 ohm 1/4 watt	.12
20	110553	Resistor 220000 ohm 1/4 watt	.12
24	110554	Resistor - carb. 1 meg. ¼ W.	.12
22-23	110564	Resistor 100000 ohm 1/4 watt	.12
21	110566	Resistor 33,000 ohm 1/4 watt	.12
44	110569	Resistor 10,000 ohm 1/4 watt	.12
25	110580	Resistor-carb. 3.3 meg. ¼ W.	.12
26-27	110584	Resistor 330000 ohm 1/4 watt	.12
28	110629	Lamp - dial 6.3 volt .25 amp	.15
31	112898	Condenser - electrolytic 16 mfd. 150 volt	.50
32-33	112951	Resistor-carb. 400 ohms ¼ W.	.12
17	113117	Bias cell - 1.25 volts	.26
38	113119	Coil-wave trap(with trimmer)	.50

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
42	113365	Ballast tube L-49-B	.50
37	113449	Coil - antenna	.78
30	113472	Condenser - electrolytic 40 mfd. 150 volt	.56
36A-36B	113852	Volume control - 500,000 ohms (with switch)	.98
29	113853	Transformer - 1st I.F.	1.25
35	113854	Transformer - 2nd I.F.	1.20
34	113855	Coil - oscillator	.48
39A-39B	113869	Condenser - gang	3.30

INTERMEDIATE FREQUENCY 465 KC.

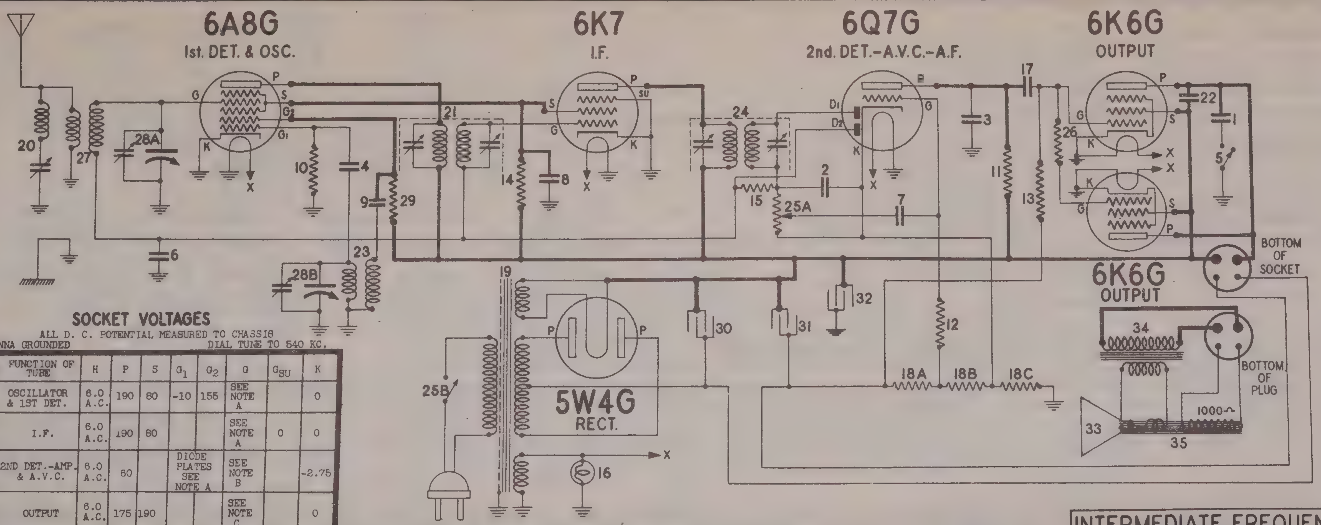


TOP VIEW OF CHASSIS.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE (Do not remove grid clip)	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1–2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3-4	1ST I.F.	
200 MMFD. MICA CONDENSER	ANTENNA LEAD	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	6	BROADCAST OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.

MODELS S7426-3,S7426-4
Chassis R313
Schematic,Voltage
Socket,Trimmers
Alignment

FIRESTONE TIRE & RUBBER CO.



INTERMEDIATE FREQUENCY
465 KC.

SOCKET VOLTAGES

ALL D. C. POTENTIAL MEASURED TO CHASSIS
ANTENNA GROUNDED DIAL TUNE TO 540 KC.

TUBES	FUNCTION OF TUBE	H	P	S	G_1	G_2	G	G_{SU}	K
6A8G	OSCILLATOR & 1ST DET.	6.0 A.C.	190	80	-10	155	SEE NOTE A		0
6K7G	I.F.	6.0 A.C.	190	80			SEE NOTE A	0	0
6Q7G	2ND DET.-AMP. & A.V.C.	6.0 A.C.	60		DIODE PLATES SEE NOTE A		SEE NOTE B		-2.75
6K6G	OUTPUT	6.0 A.C.	175	190			SEE NOTE C		0
6K6G	OUTPUT	6.0 A.C.	175	190			SEE NOTE C		0
5W4G	RECTIFIER	5.0 A.C.	335 A.C. 335 A.C.						

DROP ACROSS SPEAKER FIELD 55 VOLTS

Use a high resistance voltmeter of at least 1,000 ohms per volt.

NOTE A: The control grid bias for the 6A8G, 6K7G and the diode plates of the 6Q7G tubes is -2.75 volts measured across resistor 18C.

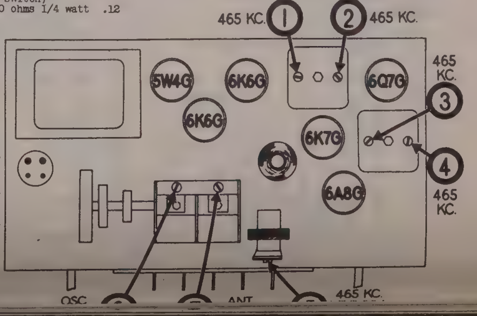
NOTE B: The control grid bias for the 6Q7G tube is -4.2 volts measured across resistors 18B and 18C.

NOTE C: The control grid bias for the 6K6G tubes is -15 volts measured across resistors 18A, 18B and 18C.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83217	Condenser - .04 mfd. 600 V.	.35
2-3	83539	Condenser - mica 260 mmfd.	.20
4	85061	Condenser - mica 51 mmfd.	.15
5	88054	Switch - tone control (Model 313)	.30
	114192	Switch - tone control (Model 313AT)	
6-7	88189	Condenser - .05 mfd. 200 V.	.25
8	88191	Condenser - .1 mfd. 300 volt	.25
9	88030	Condenser - .01 mfd. 400 V.	.25
10	110552	Resistor - 47,000 ohms ¼ W.	.12
11	110553	Resistor - 220,000 ohms ¼ W.	.12
12	110554	Resistor - 1 meg. 1/4 watt	.12
13	110559	Resistor - 470,000 ohms ¼ W.	.12
14	110566	Resistor - 33,000 ohms ¼ W.	.12
15	110580	Resistor - 3.3 meg. 1/4 watt	.12
16	110629	Lamp-dial - 6.3 volt-.25 amp.	.15
17	111252	Condenser - .05 mfd. 400 V.	.13
18A to C	113810	Resistor - Bleeder Section A - 180 ohms Section B - 25 ohms Section C - 45 ohms	.40
19	113813	Transformer - 117 V. 60 Cy.	5.00
20	113889	Coil - wave trap	.54
21	113853	Transformer - 1st I.F.	1.25
22	88030	Condenser - .01 mfd. 400 V.	.25
23	113855	Coil - oscillator	.48
24	113854	Transformer - 2nd I.F.	1.20
25A - B	113852	Volume control - 500,000 ohms (with switch)	.96
26	110560	Resistor - 100 ohms 1/4 watt	.12

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
27	113449	Coil - antenna	.78
28A - B	113869	Condenser - variable gang	3.30
29	110569	Resistor - 10,000 ohms ¼ W.	.12
30-31	113808	Cond.-elect. 8 mfd. 300 V.	.66
32	114009	Cond.-elect. 4 mfd. 300 W.V.	.72

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE (Do not remove grid clip)	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1—2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3—4	1ST I.F.	
200 MMFD. MICA CONDENSER	ANTENNA LEAD	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	6	BROADCAST OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.



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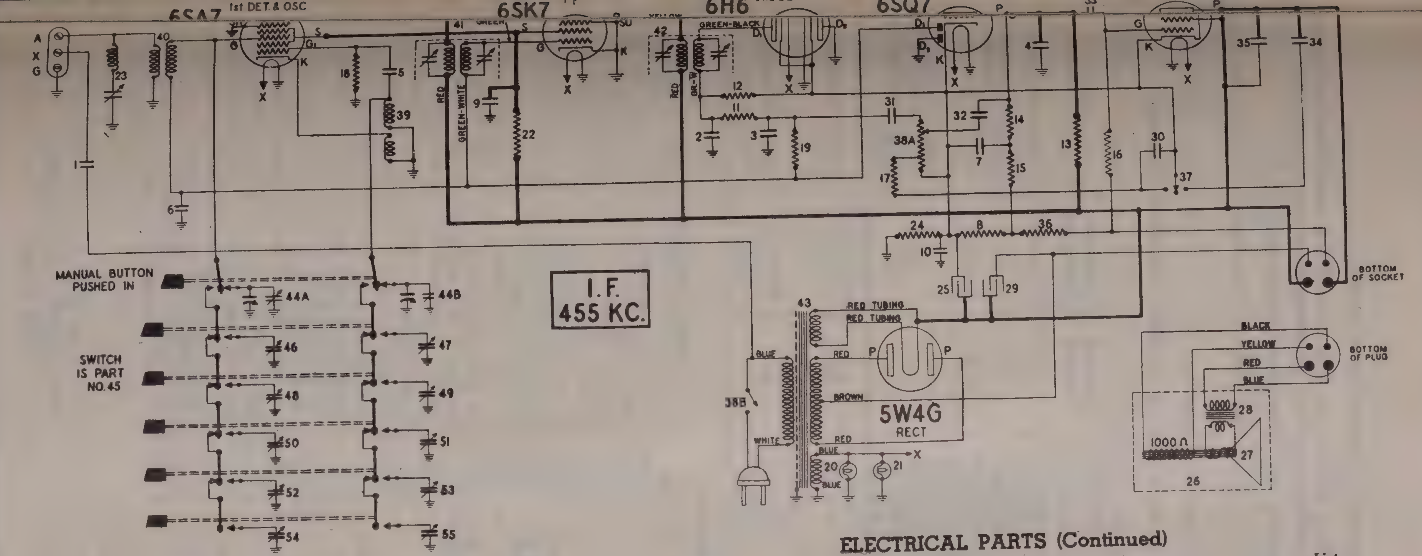
MODEL S7426-8
Schematic ,Voltage

FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3-4	83539	Condenser—mica 260 mmfd.	$0.20
5	85061	Condenser—mica 51 mmfd.	.15
6-7	88189	Condenser—paper .05 mfd. 200 volt	.25
8	88465	Resistor—wire wound 25 ohms ½ watt	.15
9	89421	Condenser—paper .1 mfd. 200 volt	.25
10	110377	Condenser—electrolytic 10 mfd. 35 volt	.80
11	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
12-13	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
14-15	110554	Resistor—carbon 1 megohm ¼ watt	.12
16	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
17-18	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
19	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
20-21	110629	Lamp—6.3 volt—.25 amps.	.15
22	112398	Resistor—carbon 20,000 ohms 1 watt	.26
23	112796	Coil—wave trap (with trimmer)	.50
24	112974	Resistor—carbon 220 ohms ¼ watt 10%	.15
25	114258	Condenser—electrolytic 8 mfd. 450 volts	.98
26	U-115063	Speaker—dynamic—6 inch	5.50
27	U-116211	Cone—voice coil assembly (for U-115063 speaker)	1.65
28	U-116212	Transformer—output (for U-115063 speaker)	1.50
29	116262	Condenser—electrolytic 16 mfd. 450 volt	.78
30	116640	Condenser—.01 mfd. 600 volt	.15
31-32-33-34	116893	Condenser—.02 mfd. 600 volt	.15
35	117022	Condenser—.002 mfd. 600 volt	.15
36	117032	Resistor—300 ohms, W.W., 1 W.	.15
37	117209	Switch—tone control	.65
38A-38B	117212	Volume control 1 meg. with switch	1.30
39	117213	Coil—oscillator	.50
40	117214	Coil—antenna	.80

ELECTRICAL PARTS (Continued)

Diagram Number	Part Number	Description	List Price
41	117215	Transformer—1st I.F.	1.50
42	117216	Transformer—2nd I.F.	1.50
43	117217	Transformer—power	5.00
44A-44B	117219	Condenser—2 gang	3.50
45	117225	Switch—push button	3.00
46-47-48-49-50-51-52-53-54-55	117236	Condenser—push button trimmer gang	4.10

SOCKET VOLTAGES

ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED

DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SA7	1st Det. & Osc.	6.0 A.C.	0	—3.5*	—8	85		255		
6SK7	I.F.	6.0 A.C.	0	—3.5*		85	0	255		
6H6	2nd Det. & A.V.C.	6.0 A.C.	—3.5*						3.5*	0
6SQ7	1st A.F.	6.0 A.C.	—3.5*	—4.5				130	3.5*	0
6F6G	Output	6.0 A.C.	—3.5*	—20		255		235		
5W4G	Rectifier	5.0 A.C.						Plates 210 V. A.C.		

*Measured across Resistor No. 24.

Use a high resistance voltmeter of at least 1000 ohms per volt.

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MODEL S7426-8
Alignment, Socket
Trimmers

FIRESTONE TIRE & RUBBER CO.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and chassis, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the connector from between the "A" and "X" terminals.
5. Push in the "MANUAL" button, and keep it depressed during the entire alignment procedure.

Dummy Ant. in Series with Sig. Gen..	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD CONDENSER	FRONT LUG ON GANG CONDENSER	455 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3-4	1st I.F.	
200 MMFD. MICA CONDENSER	"A" TERMINAL	455 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.

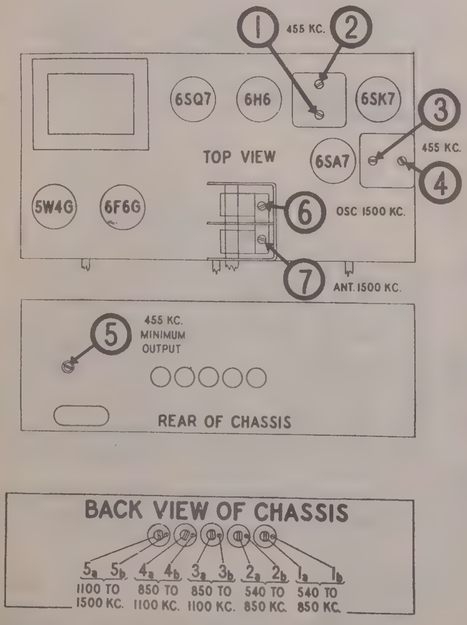


Fig. 1

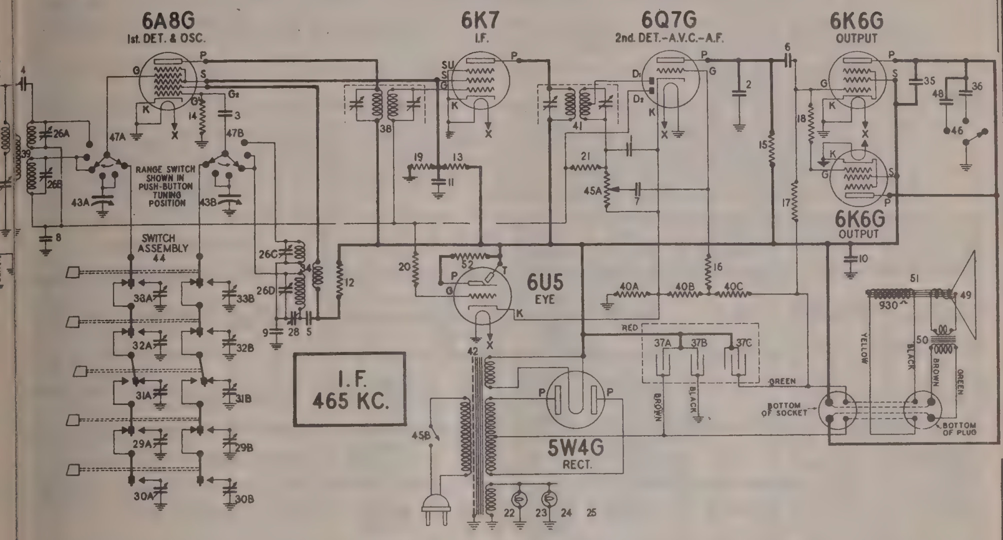
MISCELLANEOUS PARTS

Part Number	Description		List Price
117208	Background for dial		$0.05
83552	Bolt—chassis mtg. (No. 10 x 7/8)		.03
114955	Clamp—for dial cord		.01
112745	Clip—coil mounting		.01
112798	Clip—for mtg. wave trap coil		.01
116009	Clip—for antenna coil mtg.		.01
85321	Connector—for internal antenna		.01
116948	Cord—dial—6 ft. lengths		.18
117057	Cord—drive—3 ft. lengths		.15
117222	Dial scale		.60
117029	Drive drum and bushing		.50
117232	Escutcheon for dial—with glass		.75
117233	Escutcheon for push buttons		.35
117087	Knob for volume		.12
117245	Pin—push buttons		.03
117227	Pointer		.25
117234	Push button		.08
117192	Retainer for dial scale		.01
81145	Retaining ring—for drive shaft	Per C	.50
83624	Screw—self tapping 8 x 1/4		.01
85040	Screw—No. 6 Hex. Hd.	Per C	.35
85827	Set Screw—8-32 Square Head		.02
114914	Screw—special head for mtg. escutcheon	Per Doz.	.15
114117	Socket—dial lamp		.18
110501	Socket—4 prong (for spkr.)		.16
116690	Socket—(octal base) (small)		.12
111090	Spacer—steel mechanism mtg. to chassis		.02
113177	Spring—dial cord tension		.09
116536	Terminal strip (G.X.A.)		.15
116530	Washer (paper) for back of knobs		.005
111456	Washer—spring washer	Per C	.50

FOR
SETTING UP PUSH BUTTONS
SEE INDEX

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-1,Early
Chassis R314
Schematic,Voltage



SOCKET VOLTAGES

ALL D. C. POTENTIAL MEASURED TO CHASSIS
ANTENNA GROUNDED
DIAL TUNE TO 540 KC.

TUBES	FUNCTION OF TUBE	H	P	S	G_1	G_2	G	G_{SU}	K
6A8G	OSCILLATOR & 1ST DET.	6.0 A.C.	200	85	-10	150	SEE NOTE A		0
6K7G	I.F.	6.0 A.C.	200	85			SEE NOTE A	0	0
6Q7G	2ND DET.-AMP. & A.V.C.	6.0 A.C.	95		DIODE PLATES SEE NOTE A		SEE NOTE B		-2.8
6K6G	OUTPUT	6.0 A.C.	185	200			SEE NOTE C		0
6K6G	OUTPUT	6.0 A.C.	185	200			SEE NOTE C		0
5W4G	RECTIFIER	5.0 A.C.	340 A.C. 340 A.C.						

DROP ACROSS SPEAKER FIELD 65 VOLTS

Use a high resistance voltmeter of at least 1,000 ohms per volt.

NOTE A: The control grid bias for the 6A8G, 6K7G and the diode plates of the 6Q7G tubes is -2.8 volts measured across resistor 40A.

NOTE B. The control grid bias for the 6Q7G tube is -4.3 volts measured across resistors 40A and 40B,

NOTE C. The control grid bias for the 6K6G tubes is -14.5 volts measured across resistors 40A, 40B and 40C.

D GRAM PART DESCRIPTION LIST
N BER NUMBER PRICE

-2----83539---Condenser - mica 260 mmfd.-- .20
3-----85061---Condenser - mica 51 mmfd.--- .15
4-----85454---Condenser - mica 11 mmf.---- .15
-6----88030---Condenser - .01 mfd. 400 V.- .25
-8----88189---Condenser - .05 mfd. 200 V.- .25
9-----88587---Condenser - mica .0042 mfd.- .35
0-----88682---Condenser - .1 mfd. 400 volt .25
1-----89421---Condenser - .1 mfd. 200 volt .25
2-----110550--Resistor - 10,000 ohms ½ W.- .15
3-----110551--Resistor - 15,000 ohms 1 W.- .15
4-----110552--Resistor - 47,000 ohms ¼ W.- .12
5-----110553--Resistor - 220000 ohms ¼ W.- .12
6-----110554--Resistor - 1 meg. 1/4 watt-- .12
7-----110559--Resistor - 470000 ohms ¼ W.- .12
8-----110560--Resistor - 100 ohms 1/4 watt .12
9-----110562--Resistor - 22,000 ohms ½ W.- .12
0-----110570--Resistor - 2.2 meg. 1/4 watt .15
1-----110580--Resistor - 3.3 meg. 1/4 watt .12
2 23-24 25 110629--Lamp - 6.3 volt .25 amps---- .15
2 to D-112792--Condenser - trimmer (4 sec.) .60
7-----112796--Coil-wave trap(with trimmer)- .50
8-----112799--Cond.-padder (530 - 630 mmfd) .36
2 to B 3 to B 112942-{Condenser - dual push button trimmer (1100 KC-1700 KC) .36
3 to B-112943-{Condenser - dual push button trimmer (770 KC -1350 KC) .45
3 to B 3 to B 112944-{Condenser - dual push button trimmer (550 KC -1000 KC) .50
4-----113015--Coil Assembly - oscillator-- 1.00
5-----113035-{Condenser - ceramic tube .006 mfd. 600 volt------- .14
6-----113202--Condenser - .02 mfd. 600 V.- .15
3 to C-112802-{Condenser - electrolytic(dry) Sect.A-Brown-8 mfd.400 V. Sect.B-Black-4 mfd.400 V. Sect.C-Green-4 mfd.400 V.} 1.80
8-----112803--Transformer - 1st I.F.------ 1.20
9-----113011-Coil - ant. broadcast & short wave--------------- 1.20
4 to C-113974-{Resistor - bleeder Section A - 33 ohms Section B - 18 ohms Section C - 133 ohms} .45
1-----113975--Transformer - 2nd I.F.------ 1.20

42-----113978-{Transformer - power 117 volt 60 cycle----------------- 4.80
43A to B-113979--Condenser - variable gang--- 3.00
44-----113981--Push button switch assembly- 2.70
45A to B-113982-{Volume control - 500,000 ohms (with switch-------- .98
46-----113983--Switch for tone control----- .42
47A to B-113984--Switch - range-------------- 1.05
48-----114058--Condenser - .08 mfd. 600 V.- .26
49---R-114134-{Cone & Voice coil assembly (for R-115028 speaker)--- 2.75
50---R-114135--Transformer - output-------- 2.35
51---R-115028--Speaker - dynamic (10 in.)-- 7.50
52-----110554--Resistor - 1 meg. 1/4 watt-- .12

MODEL S7427-1,Early
Chassis R314
Alignment,Trimmers
Socket

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

For alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 14 MC. are required.

1- Connect the output meter across the voice coil or between the plate of either of the 6K6G tubes and ground through a .1 mfd. condenser, (these tubes are connected in parallel, not push-pull). The connection will depend upon the type of meter. (The more sensitive type should be connected across the voice coil.)

2- Connect the ground lead of the signal generator to the chassis of the receiver and keep it connected in this manner throughout the entire alignment procedure.

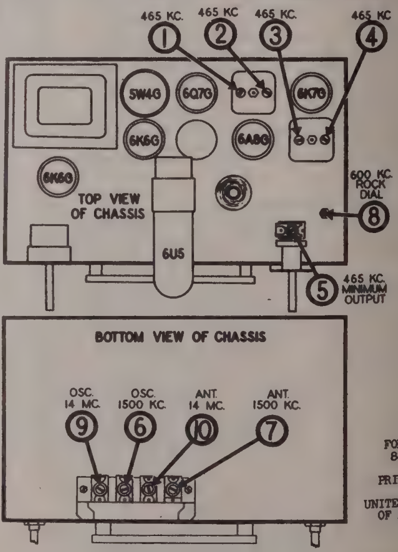
3- Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.

4- With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is only slightly off calibration, loosen the set screw in the pointer cord drive drum, and with the gang condenser in full mesh turn the drum until the pointer is in the correct position. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last division on the left end of the dial scale. Hold the pointer in place and check to see if the gang condenser is still fully meshed, then tighten the pointer clip being careful not to cut the cord. Place a drop of household or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC	AMERICAN (CENTER)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	465 KC	AMERICAN (CENTER)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	AMERICAN (CENTER)	1500 KC	6	AMERICAN OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	AMERICAN (CENTER)	TUNE TO 1500 KC GENERATOR SIGNAL	7	AMERICAN ANTENNA	ADJUST FOR MAXIMUM OUTPUT
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	600 KC	AMERICAN (CENTER)	TUNE TO 600 KC GENERATOR SIGNAL	8	AMERICAN OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	20 MC	FORIEGN (COUNTER-CLOCKWISE)	14 MC	9	FOREIGN OSCILLATOR (Shunt)	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	20 MC	FOREIGN (COUNTER-CLOCKWISE)	14 MC	10	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
81145	Retaining Ring-for drive shaft--Per C	.50
85427	Socket - octal base (standard)	.15
85827	Set Screw - 8/32 square head for tone or band indicator	.02
88348	Eyelet - for dial cord--Per dz.	.05
89746	Washer - (paper) for back of knobs	.005
110496	Plug - speaker (4 prong)	.12
110501	Socket - 4 prong (for spkr.)	.16
110829	Washer - chassis mtg.	.01
111085	Sleeve - felt for tuning eye	.03
111302	Cord - dial drive 6 or 50 ft. lengths--Per ft.	.05
111357	Spring - drive cord tension	.03
112745	Clip - coil mtg. (osc. & ant.)	.01
112865	Shield - base, for tubes	.03
112874	Bolt - chassis mtg.	.01
112879	Screw - escutcheon mtg.	.03
113025	Socket-octal base(with special ground)	.15
113077	Shield - tube	.15
113093	Socket - for dial lamp	.18
113442	Bracket - for tuning eye	.16
113710	Washer - ceramic for push button trimmer	.015
113722	Knobs - tone and band switch	.08
113723	Knob - tuning and volume	.08
113800	Escutcheon - dial	1.00
113815	Escutcheon - push button	.60
113887	Push button	.04
113890	Escutcheon - eye	.10
113973	Dial drum and bushing assembly	.45
113987	Shaft - tuning	.10
113990	Band indicator & link assembly	.30
113994	Spring - for tone indicator	.015
113996	Tone indicator & link assembly	.30
113998	Cable & plug for tuning eye	.60
114000	Dial scale	.85
114001	Clamp - for dial scale retaining	.08
114002	Pointer - for dial	.12
114007	Dial mtg. plate & bracket	.60
114041	Tabs - station call letters	.35



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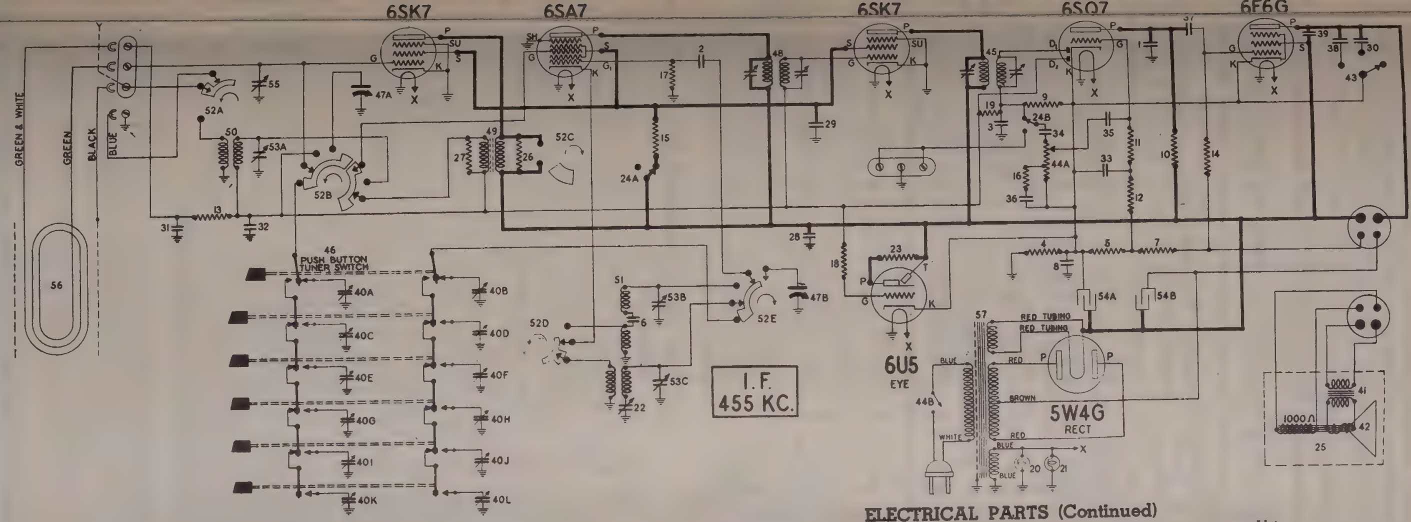


ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	85061	Condenser—mica, 51 mmfd.	.15
3	85394	Condenser—mica, 510 mmfd.	.25
4	88461	Resistor—carbon—150 ohms, ¼ W.	.12
5	88465	Wire wound resistor, 25 ohms, ½ watt	.15
6	88587	Condenser—mica, .0042 mfd.	.35
7	89762	Resistor—220 ohms, wire wound, 1 watt	.16
8	110377	Condenser—electrolytic, 10 mfd., 35 volt	.80
9-10	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
11-12	110554	Resistor—carbon, 1 megohm, ¼ watt	.12
13-14	110559	Resistor—carbon, 470,000 ohms, ¼ watt	.12
15	110561	Resistor—carbon, 15,000 ohms, 2 watt	.30
16	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
17	110566	Resistor—carbon, 33,000 ohms, ¼ watt	.12
18-19	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
20-21	110629	Lamp—6.3 volt—.25 amps.	.15
22	112799	Condenser—Padder (530 to 630 mmfd.)	.36
23	112972	Resistor—Insulated—1 megohm—¼ watt	.15
24A-24B	114141	Switch—D.P.D.T.	.44
25	M-115059	Speaker—electro dynamic, 10"	7.60
26	116053	Resistor—carbon, 68,000 ohms, 1/10 watt	.12
27	116096	Resistor—22,000 ohms, 1/10 watt	.10
28-29	116625	Condenser—.1 mfd. 600 volt	.25
30	116640	Condenser—.01 mfd. 600 volt	.15
31-32-33	116819	Condenser—.05 mfd. 600 volt	.20
34-35-36-37	116893	Condenser—.02 mfd. 600 volt	.15
38	116984	Condenser—.04 mfd. 600 volt	.20
39	117022	Condenser—0.002 mfd.—600 volt	.15
40A to 40L	117081	Push Button Trimmer Gang Cond. Assembly	5.20
41	M-117091	Transformer—output for M-115059 speaker	1.50
42	M-117092	Cone and voice coil for M-115059 speaker	2.20
43	117209	Switch—tone control	.65
44A-44B	117212	Volume control—1 meg., with switch	1.30
45	117216	Transformer—2nd I.F.	1.50

ELECTRICAL PARTS (Continued)

Diagram Number	Part Number	Description	List Price
46	117225	Switch—push button	3.00
47A-47B	117527	Condenser—variable tuning	3.25
48	118337	Transformer—1st I.F.	1.20
49	118338	Transformer—R.F.	1.00
50	118342	Coil—short wave antenna	.80
51	118343	Coil—oscillator	.70
52A to 52E	118414	Range switch	1.50
53A-53B-53C	118417	Condenser—3 section trimmer	.70
54A-54B	118421	Condenser—electrolytic, 10 mfd.—15 mfd., 450 v.	1.50
55	118431	Condenser—trimmer	.22
56	118482	Loop antenna	1.00
57	118498	Power transformer	5.00

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED

DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G₁	S	SU	P	D₁	D₂
6SK7	R.F. Amp.	6.0 A.C.	0	—3.2*		80	0	240		
6SA7	1st Det. & Osc.	6.0 A.C.	0	—3.2*	—8	80		240		
6SK7	I.F. Amp.	6.0 A.C.	0	—3.2*		80	0	240		
6SQ7	2nd DET.—A. V. C. & 1st A. F.	6.0 A.C.	—3.2	—4.5*				135	—3.2*	—3.2*
6F6G	Output	6.0 A.C.	—3.2	—19*		240		220		
6U5	Eye	6.0 A.C.	—3.2	—3.2*				T=240 Volts		
5W4G	Rectifier	5.0 A.C.						Plates 250 A.C.		

*Measured at Bias Resistor

Use a high resistance voltmeter of at least 1000 ohms per volt.

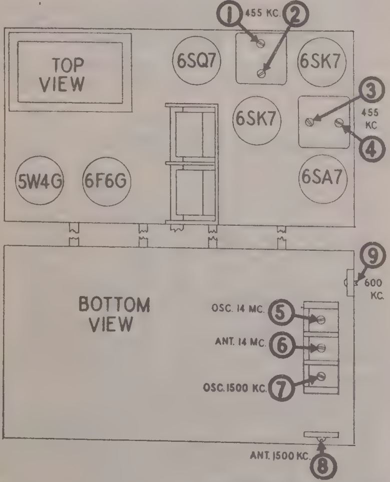
MODEL S7427-1,Late
Alignment,Trimmers
Socket,Notes

FIRESTONE TIRE & RUBBER CO.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground i series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be cor nected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entir alignment procedure.
4. Remove the blue wire from the extreme left hand screw at the rear of the chassis and allow it to float free

Dummy Ant. in Series with Sig. Gen.	Connection of Sig Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Front Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I. F.	
400 OHM Carbon Resistor	Black Wire on Antenna Terminal Strip	14 MC	Foreign	14 MC	5	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. If image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	Black Wire on Antenna Terminal Strip	14 MC	Foreign	14 MC	6	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
200 MMFD. Mica Condenser	Black Wire on Antenna Terminal Strip	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Black Wire on Antenna Terminal Strip	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Black Wire on Antenna Terminal Strip	600 KC	Broadcast	Tune To 600 KC Generator Signal	9	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.



DIAL AND MISCELLANEOUS PARTS

Part Number	Description		Lis Pric
116280	Back—cabinet		$0.3
83552	Bolt—chassis mounting No. 10 x 7/8		.0
113442	Bracket—for tuning eye		.1
114955	Clamp—for dial cord		.0
114001	Clamp—for dial scale retaining		.08
112745	Clip—coil mounting		.0
116948	Cord—dial drive (supplied in 6 ft. lengths)		.1
117057	Cord—drive		.1
118450	Dial scale		1.0
118480	Disc—for end of loop mounting		.0
117029	Drive drum and bushing		.5
113800	Escutcheon—for dial		1.0
113890	Escutcheon—for tuning eye		.1
117233	Escutcheon—for push buttons		.3
117087	Knob—for tuning or volume		.1
118483	Mounting board for loop antenna		2.5
118484	Mounting block for loop antenna		.6
117245	Pin for push buttons		.0
114002	Pointer—for dial		.1
117234	Push button		.0
81145	Retaining ring—for drive shaft	Per C	.5
83624	Screw—self tapping 8 x 1/4		.0
85040	Screw—No. 6 Hex. Hd.	Per C	.3
113191	Screw—special No. 8—32 x 1 1/8		.0
114914	Screw—special head for mounting escutcheon		.1
85827	Set screw—8-32 square head		.0
118475	Shield—for loop antenna		1.0
110501	Socket—4 prong (for speaker)		.1
114117	Socket—dial lamp		.1
116690	Socket—small octal base		.1
113177	Spring—dial cord tension		.0
117315	Station call letter tabs		.5
118416	Tuning eye cable and socket		.7
116530	Washer (paper) for back of knobs		.005
111456	Washer—spring washer	Per C	.5

PHONOGRAPH & TELEVISION CONNECTIONS

PHONOGRAPH CONNECTIONS: Connect the wires from a phonograph record player to the left hand and middle terminals on the terminal strip nearest the middle of the chassis on the back of the chassis. Push the black sliding button on the back of the chassis to the right ("TELE. PHONO" position) for phonograph or television operation. This switch must be in the "RADIO" position for radio reception.

Turn the volume knob on the record player to the maximum volume position and control volume by means of the volume control on the radio.

TELEVISION CONNECTIONS: Connect the wires from a television attachment unit to the right hand and middle terminals on the terminal strip. Operation will now be the same as for phonograph operation.

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-7
Schematic,Voltage

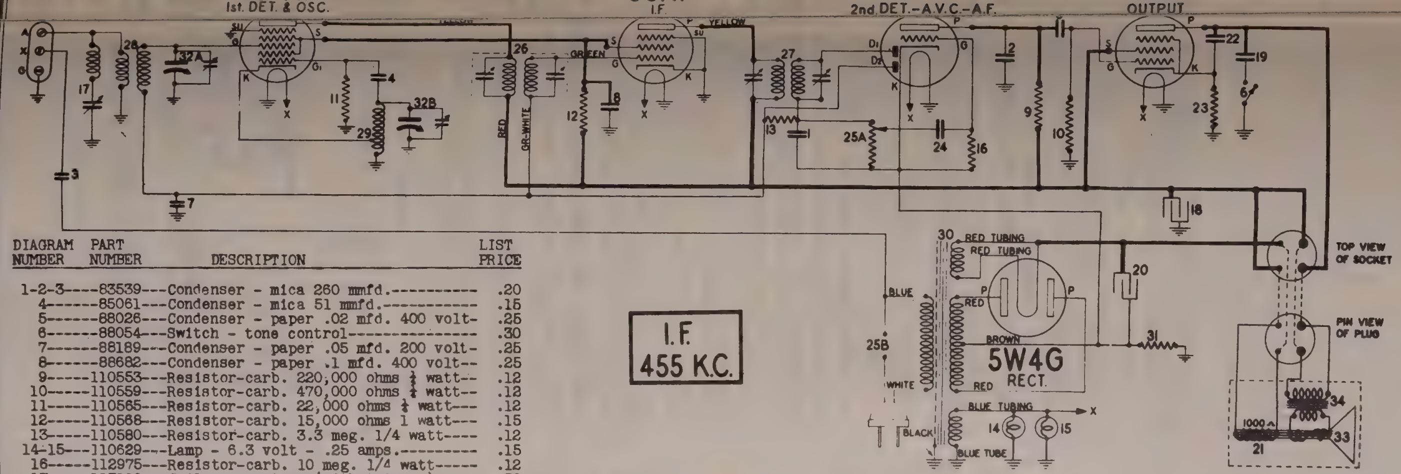


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2-3	83539	Condenser - mica 260 mmfd.	.20
4	85061	Condenser - mica 51 mmfd.	.15
5	88026	Condenser - paper .02 mfd. 400 volt	.25
6	88054	Switch - tone control	.30
7	88189	Condenser - paper .05 mfd. 200 volt	.25
8	88682	Condenser - paper .1 mfd. 400 volt	.25
9	110553	Resistor-carb. 220,000 ohms ½ watt	.12
10	110559	Resistor-carb. 470,000 ohms ½ watt	.12
11	110565	Resistor-carb. 22,000 ohms ½ watt	.12
12	110568	Resistor-carb. 15,000 ohms 1 watt	.15
13	110580	Resistor-carb. 3.3 meg. 1/4 watt	.12
14-15	110629	Lamp - 6.3 volt - .25 amps.	.15
16	112975	Resistor-carb. 10 meg. 1/4 watt	.12
17	113119	Coil - wave trap (with trimmer)	.50
18	113808	Condenser - elect. 8 mfd. 350 volts	.66
19	114108	Condenser - paper .03 mfd. 750 volts	.25
20	114972	Condenser - elect. 16 mfd. 450 volts	.78
21	115062	Speakder - dynamic	4.80
22	116647	Condenser - .004 600 volt	.15
23	116978	Resistor - 420 ohms ½ watt W.W.	.15
24	117022	Condenser - .002 mfd. 600 volt	.15
25A-25B	117086	Volume control with switch	1.25
26	117098	Transformer - 1st I.F.	1.00
27	117100	Transformer - 2nd I.F.	1.00
28	117120	Coil - antenna	.60
29	117121	Coil - oscillator	.30
30	117124	Transformer - power	3.90
31	117148	Resistor - 68 ohms ½ W. Wire wound	.15
32A-32B	117160	Condenser - 2 gang	5.50
33	117190	Cone & voice coil for 115062 speaker	1.70
34	117191	Output transformer for 115062 speaker	2.50
	112745	Clip - coil mounting	.01
	112798	Clip - for mounting wave trap coil	.01
	116009	Clip - for antenna coil mtg.	.01
	116948	Cord - dial - in 6 foot lengths	.18
	117152	Cup, dial retaining	.05
	117166	Dial background	.08
	117158	Dial drum & bushing assembly	.42
	117155	Dial pulley & cup assembly	.20
	117165	Dial scale (glass)	.50
	113861	Dial scale retainer	.03
	113755	Escutcheon - dial	.40
	116975	Knob for tuning	.12
	113756	Escutcheon for Push Buttons	.32
	117087	Knob for volume	.12
	114914	Screw-spec. hd.-for mtg. escut.-------Per Dz.	.15
	85827	Set Screw - 8-32 Square head	.02
	85427	Socket - octal base (standard)	.15
	110501	Socket - 4 prong (for spkr.)	.16
	114027	Socket - dial lamp - with clip	.20
	114117	Socket - dial lamp	.18
	117185	Spring - compression	.03
	117157	Spring - dial cord	.03
	114041	Tabs - station call letters	.35
	116536	Terminal strip (G.X.A.)	.15
	117164	Tuning roller indicator	.60
	114254	Washer - "C" washer for tuning shaft---Per Dz.	.10
	116530	Washer (paper) for back of knobs	.005
	113762	Push buttons	.04

ALL D. C. VOLTAGES MEASURED TO CHASSIS
ANTENNA GROUNDED
DIAL TUNED TO 540 KC.

TUBES	FUNCTION OF TUBE	H	P	S	G	G1	SU	K
6SA7	OSCILLATOR & 1st DET.	6.0 A.C.	220	90	NOTE A	-8		0
6SK7	I.F.	6.0 A.C.	220	90			0	0
6SQ7	2ND DET.AVC & 1ST A.F.	6.0 A.C.	95			DIODE PLATES SEE NOTE B		NOTE A
6F6G	OUTPUT	6.0 A.C.	210	220	0			14
5W4G	RECTIFIER	5.0 A.C.	265 265	A.C. A.C.				

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: This voltage is measured across resistor No. 31 and is 3.1 volts.

NOTE B: The voltage on diode plates at no signal is 3.1 volts.

Voltage across speaker field = 52 volts.

CHASSIS R312
CHASSIS R313
CHASSIS R315
Tuner Data
Drive Cord Data

FIRESTONE TIRE & RUBBER CO.

HOW TO SET UP THE PUSH BUTTON TUNER

1. Be sure that your set is connected to a good antenna system.

2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.

3. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak stations will generally give better results when tuned manually. Also BE SURE TO SELECT STATIONS FALLING WITHIN THE TUNING RANGE OF THE INDIVIDUAL BUTTONS, AS INDICATED IN Fig. 1.

Each of the buttons on your Push-Button Tuner has a definite range of frequencies to which it can be tuned as shown in Fig. 1. It is imperative that in setting up the buttons, you select stations whose frequency is in the indicated tuning range of that button. FAILURE TO SELECT THE PROPER BUTTON WILL RESULT IN THE INCORRECT SETTING OF THE TRIMMER ADJUSTING SCREW AND WILL ALSO CAUSE "DRIFTING". The correct frequencies of your local stations may be obtained from your newspaper of radio call magazine. For example, suppose you want to set a button to station WLW whose frequency is 700 kilocycles. Refer to Fig. 1 which shows that this frequency falls within the operating range of buttons No. 3 or No. 4, whose range is 500 to 1000 KC. Therefore either button No. 3 or No. 4 can be used for the automatic tuning of WLW.

4. Remove the escutcheon around the push buttons by taking out the six screws holding it to the cabinet. This will expose to view six pairs of adjusting screws, each pair of which is used to tune in a station that you wish to set-up on a particular button.

5. Turn the band switch (Right hand knob) clockwise until the word "BROADCAST" appears in the lower opening in the dial scale. Then using the tuning knob (Center) tune in the station you desire to set to button No. 3. This is done so that you may identify the station by hearing its program.

6. Now turn the band switch knob to the extreme clockwise position (the word "AUTOMATIC" will now appear in the center dial scale opening). You will note when this switch is turned, the station previously tuned in will not be heard.

7. Now push in the third button from the left (No. 3 in Fig. 10). Using a small screw driver, insert it in the second screw from the left (No. 3a in Fig. 1). Rotate the screw SLOWLY until the program that you have previously tuned in manually is again tuned in. If it cannot be heard, advance the volume control. BE SURE THAT YOU ADJUST THIS PARTICULAR SCREW (3a) UNTIL THE INVERTED "V" SHADOW IN THE "TUNING EYE" IS NARROWEST. It is advisable that you turn the screw in and out so that you will tune across the station several times in order that you may be sure that you have located the correct tuning point.

8. Next insert the screw driver in the first screw on the left (No. 3b, Fig. 1) and turn it until the program is received with maximum volume. The correct position is indicated by the ends of the inverted "V" in the "Tuning Eye" being closest together. Now go back to screw No. 3a and see if any improvement in the reception can be made by adjusting it. Also repeat this adjustment for screw No. 3b.

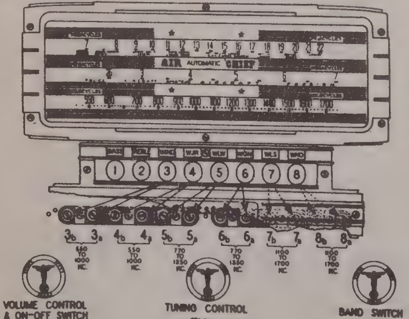


FIG. I

9. Set up button No. 4 for the selected station in a s lar manner, using screws No. 4a and 4b, and proceed to se the remaining buttons in the same fashion, always tuning in station initially with the "a" screw for that particular but

10. Replace the escutcheon with its six retaining scre

11. Label each button with the call letters of the stat you have selected, using the call letter tabs packed with receiver. These tabs are to be moistened on their gummed and inserted in the recesses in the escutcheon, directly a the push buttons.

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON

The operating range of a button may be changed by merely cha ing the dual trimmer used with that button. Dual trimmers the ranges indicated below can be obtained from your Firest Dealer or serviceman under the following part numbers:

Part Number	Tuning Range	List Price
112942	1100 to 1700 KC.	$0.36
114505	770 to 1350 KC.	.45
112944	550 to 1000 KC.	.50

To make the change proceed as follows:

1. Remove the chassis from the cabinet.

2. By referring to Fig. 1, determine the dual trimmer assc ated with the button whose range you wish to change.

3. Unsolder the lead from the four terminals on the back this dual trimmer.

4. Remove the 6/32 machine screw holding the dual trimmer the front of the chassis.

5. From the above list select a dual trimmer which will co the desired range.

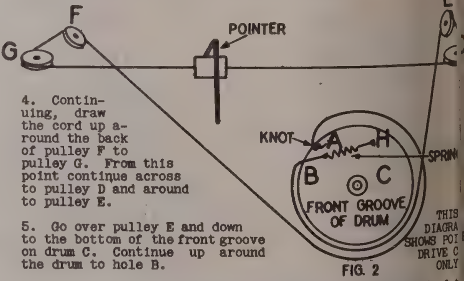
6. Mount it on the front of the chassis with the 6/32 mach screw, and solder the leads to its four terminals. .
The button is now ready to be set to any strong station wh frequency is within the range of this new trimmer unit.

REPLACING THE DIAL POINTER DRIVE CORD

1. Tie a large knot in one end of about 51" of special cord, part No. 111302.

2. Thread the free end of the cord through hole A in dr (threading from the inside of the drum out) See Fig. 2.

3. After pulling the cord through hole A, make one half around the drum C in a clockwise direction (viewed from front), using the front groove in the drum.



4. Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.

5. Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.

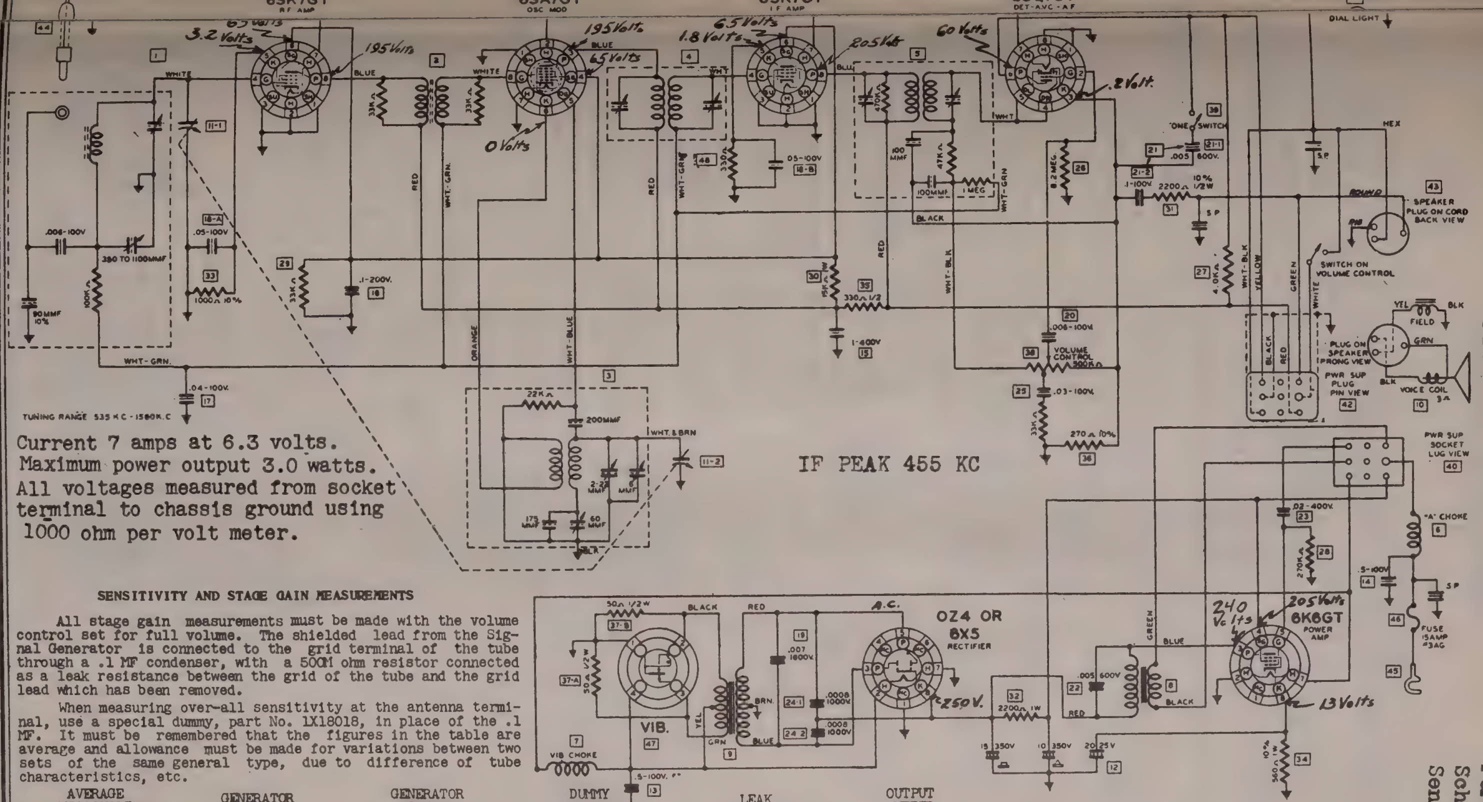
THIS DIAGRA SHOWS POI DRIVE C ONLY

FIG. 2

6. Draw the cord through hole B and tie it to the end of t tension spring in such a manner that when the spring is cli ped on to lug H it will be extended to about 1½" long.

MODEL 25F
Ford, Mercury
Schematic,Voltage
Sensitivity,Gain

GALVIN MFG. CORP.



IF PEAK 455 KC

Current 7 amps at 6.3 volts.
Maximum power output 3.0 watts.
All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
10,000	455 K.C.	I.F. Grid	.1	.5 Meg	1.76
200	455 K.C.	MOD. Grid	.1	.5 Meg	1.76
310	600 K.C.	MOD. Grid	.1	.5 Meg	1.76
26	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
5	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output. ** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or M434B Booster Coil No. 17908 in series with a 25 MMF condenser.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

Motorola

Model 25-F

TO INSTALL IN 1940 FORD & MERCURY

MODEL 25F
Alignment, Socket
Trimmers, Notes
Dial Assembly

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

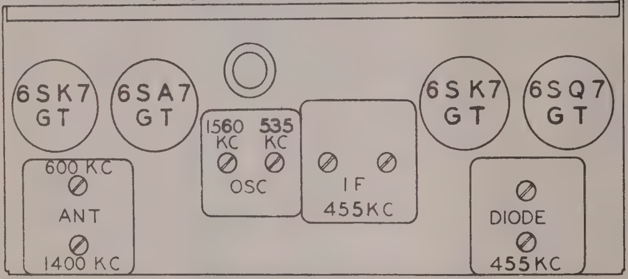
Remove the back cover (D) and place the radio on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid. (terminal No. 8) of the 6SA7GT oscillator -- modulator tube and to chassis ground using a .1 MFD. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.).
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 should be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1560 K.C. and with the condenser gang still completely out of mesh, adjust the 1560 K.C. trimmer in the oscillator coil can to the point showing the highest output reading.
3. Turn condenser gang to fully meshed position. Set the signal generator at 535 K.C. and adjust the 535 K.C. oscillator pad in the oscillator coil can to point showing highest reading.
4. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the 1400 K.C. antenna trimmer in the antenna coil can to point showing highest reading.
5. Set the signal generator at 600 K.C. and turn the condenser gang until the pointer reads 600 K.C. while adjusting the antenna padder to point showing highest output reading. Rock the gang while making this adjustment. Recheck trimmer adjustment at 1400 K.C.



TO REMOVE THE CHASSIS FROM THE HOUSING

1. Place the radio in an upside down position on the service bench. (See Fig. 4)
2. Disconnect the speaker plug.
3. Remove the speaker mounting bracket (C) from the set housing and speaker support bracket (B). (4 screws)
4. Pull the push-buttons off.
5. Remove the chrome medallion plate (2 screws)
6. Remove the celluloid dial background (2 snap-in plugs)
7. Remove the top cover (A) (13 screws). Lift the dial light assembly off of the front cover.
8. Remove the speaker support bracket (B). (2 screws)
9. Turn radio over in an upright position. Remove 11 screws from the back cover (D).
10. Lay set on side and remove the remaining 3 screws on the back cover - (14 screws.)
11. Remove the remaining 8 screws from the housing and unsolder the various leads from the spark plate assembly. (See Fig. 5)

Note: When remounting, the long screw is to be used in position along side the antenna receptacle.

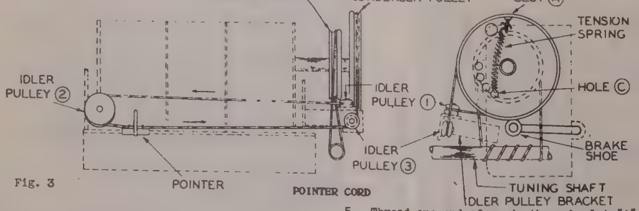


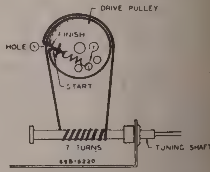
Fig. 3

POINTER CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully closed position.
4. Cut a length of 30 lb. silk fish cord 27 inches long.
5. Thread one end of cord through slot "A" in condenser pulley and with an ordinary paper clip fasten it to the idler pulley bracket to hold in place. (See Fig. 3)
6. In a clock-wise direction run cord around condenser pulley, under brake shoe and over to idler pulley No.1 and around it in a clockwise direction.
7. Route string across chassis to idler pulley No. 2 and around it in a counterclockwise direction.
8. Route cord back across chassis and up under idler pulley No. 3.
9. Route cord up and around condenser pulley 1/4 turn to slot "A".
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley. Fasten one end of the tension spring (41A 11091) to cord and the other end to hole "C" in the condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord thru hole (X) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clock-wise direction, wind cord one half turn around drive pulley and down to tuning shaft. (See Fig. 2)
7. Route cord 7 turns around tuning shaft as shown in Fig. 2 and up to drive pulley.
8. Continue in a clock-wise direction, one full turn to hole (X).
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole (Y) in drive pulley.
10. Cut off surplus cord.



(FIG. 2)

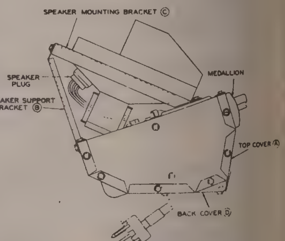


Fig. 4

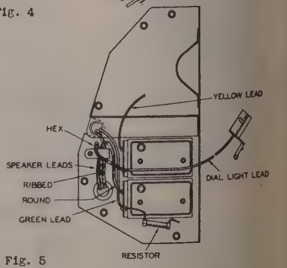
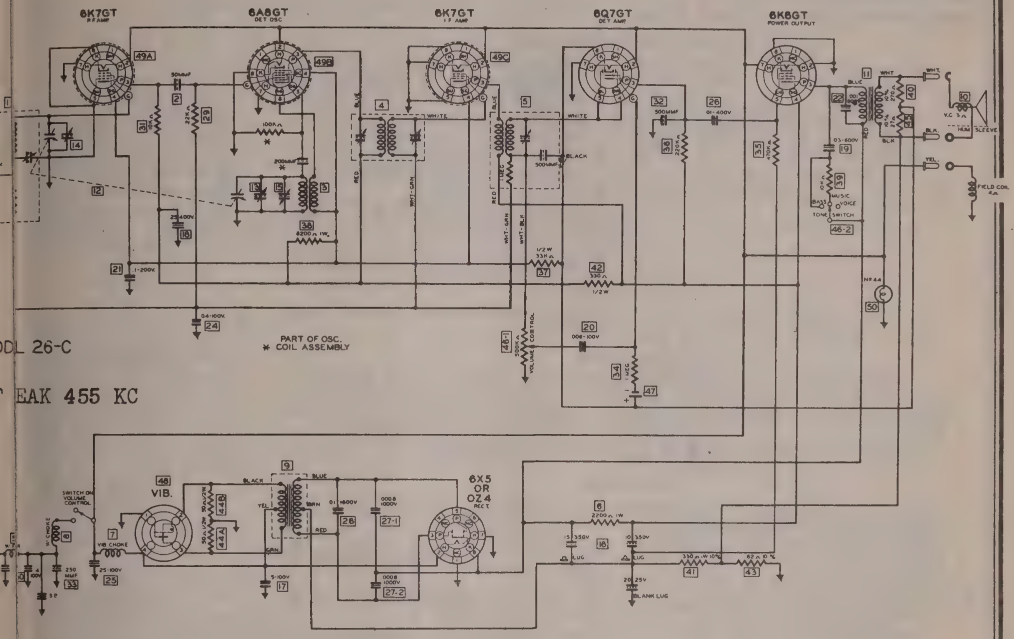


Fig. 5

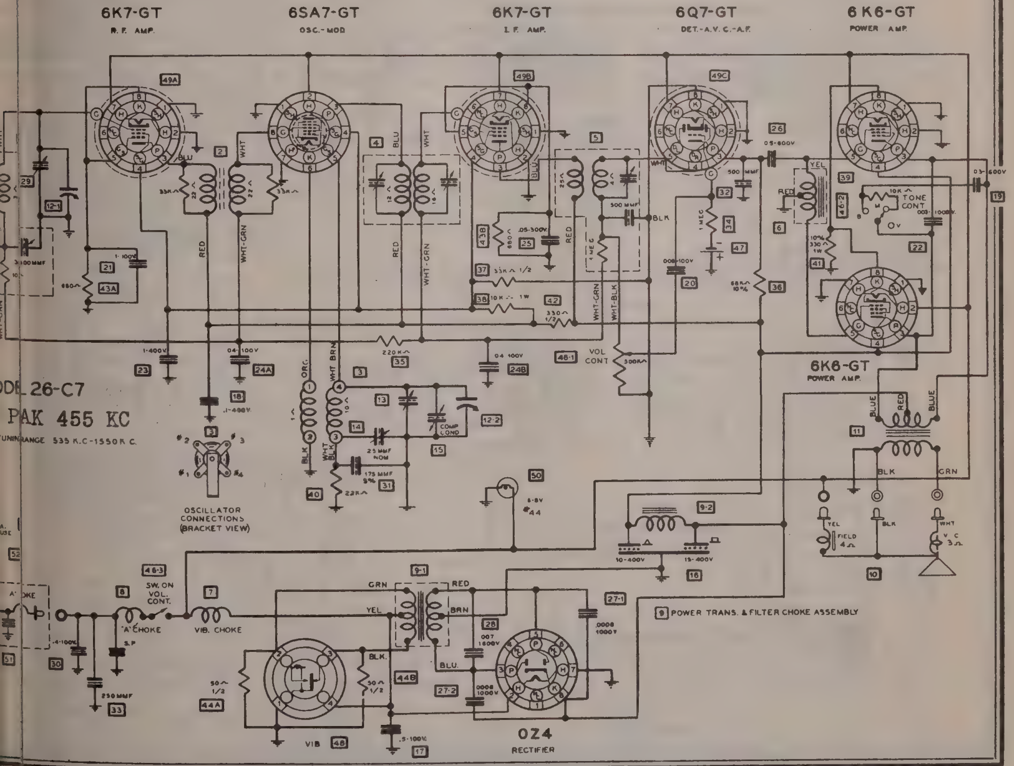
GALVIN MFG. CORP.

MODEL 26-C
MODEL 26-C7
Chevrolet
Schematics



ODEL 26-C

EAK 455 KC



ODEL 26-C7

PAK 455 KC

UNING RANGE 535 K.C-1550 K.C.

MODEL 26-C
MODEL 26-C7
Alignment,Trimmers
Voltage,Socket,Gain
Sensitivity,Drive Cord Data

GALVIN MFG. CORP.

TO REMOVE CHASSIS FROM HOUSING

1. Lay the radio face down on the service bench and remove the back cover by removing the two thumb screws.
2. Remove the rattle clip from the housing which is bonded to the push button assembly, and pull the speaker pin terminals from their receptacles. Also remove the dial light from its mounting bracket.
3. Remove the eliminode assembly (2 screws).
4. Remove the screw along side of the antenna receptacle.
5. Turn the radio over on its back.
6. Pull the push buttons out.
7. Remove the four housing screws located near the medallion plate, but do not remove the four screws that hold the medallion plate to the housing.
8. Remove the 3 screws from each side of the housing (12 screws).
9. Remove the volume control bushing.
10. Turn the set over on its face.
11. Pull the wrap around housing off from the back.
12. Lift the front cover off.

CAUTION: When the front plate is reassembled to the chassis, make sure the tuning shaft does not bind in its bushing, thereby causing the push buttons to work hard.

NOTE: Some screws are longer than others and they must be put back in original positions so that no short circuits will occur.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the oscillator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading.
5. Adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading.

NOTE: Step No. 4 is for Model 26-C-7 only. There is no 600 K.C. oscillator padder in the 26-C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volumn control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500 M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

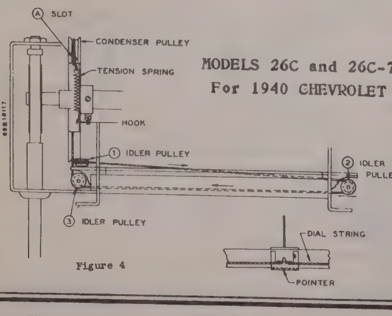
When measuring overall-sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same type, due to difference of tube characteristics, etc.

26-C Average Microvolt Input *	26C-7 Average Microvolt Input *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
8200	7000	455 K.C.	I.F. Grid	.1	.5 Meg	1.76
145	190	455 K.C.	MOD. Grid	.1	.5 Meg	1.76
160	215	600 K.C.	MOD. Grid	.1	.5 Meg	1.76
42	35	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
5	3	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or M434B Booster Coil No. 17908 in series with a 25 MMF condenser.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 27 inches long.
5. Thread one end of cord thru Slot B in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clock-wise direction, wind cord one full turn around drive pulley and up to tuning shaft. (See Fig. 3.)
7. Route cord 7 turns around tuning shaft as shown in Fig. 3 and down to drive pulley.
8. Continue in a clock-wise direction, three quarter turns to slot "B".
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring to cord and the other end to hole (C) in condenser pulley.
10. Cut off surplus cord.



MODELS 26C and 26C-7
For 1940 CHEVROLET

Figure 4

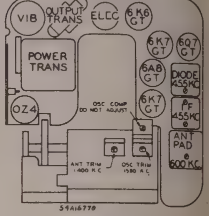
	26C			26C-7		
TUBE POSITION	PLATE	SCREEN	CATHODE	PLATE	SCREEN	CATHODE
R.F.	115	95	0	200	80	2.75
Osc. Mod.	180	95	0	200	80	0
I.F.	180	95	0	200	80	2.75
Det.AVC A.F.	60	-	2.3	112	-	0
Output	230	180	.6	210	200	13.5
Output	-	-	-	210	200	13.5
Rect.	A.C.	-	235	A.C.	-	210

VOLTAGE CHART

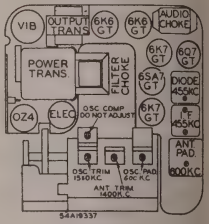
26C: Current 6 amps at 6.3 volts. Maximum power output 3.5 watts.

26C-7: Current 7 amps. at 6.3 volts. Maximum power output 5.5 watts.

All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter.



MODEL 26-C
Figure 1



MODEL 26-C7
Figure 2

POINTER CORD

1. Remove the chassis from housing and place c service bench.
2. Remove broken string.
3. Set condenser gang to fully open position.
4. Cut a length of 30 lb. silk fish cord 29 inche long.
5. Thread one end of cord thru slot A in conden ser pulley and with an ordinary paper cli fasten it to the tuning shaft bracket to hold in place. (See Fig. 4.)
6. In a clock-wise direction run cord around con denser pulley, under brake shoe and over t idler pulley No. 3 and around it in counter clockwise direction.
7. Route string across chassis to idler pulley No and around it in a counter-clockwise directio
8. Route cord back across chassis and down ov idler pulley No. 1.
9. Route cord down and around condenser pulley 1 turn to slot "A".
10. Remove the paper clip from end of cord and kn the two ends of cord together inside of dri pulley and fasten one end of spring to cord a the other end to hook in condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in station of known frequency and adjust point on string.

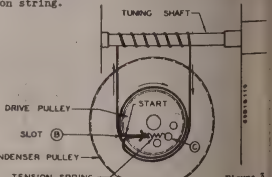
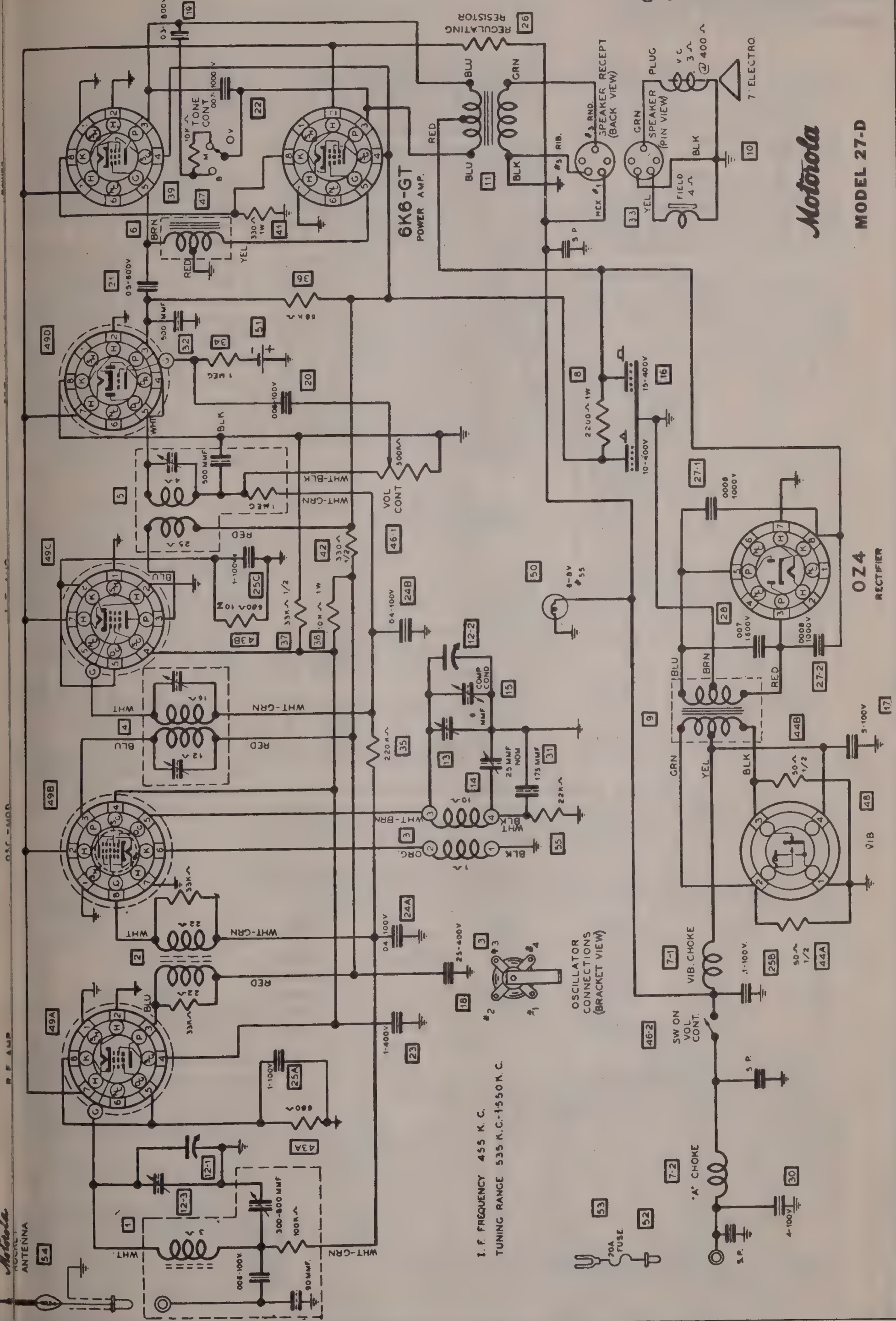


Figure 3

GALVIN MFG. CORP.

MODEL 27-D
Chrysler,DeSoto,Plymouth
Dodge,1940. Schematic



MODEL 27-D
Alignment,Trimmers
Voltage,Socket,Gain
Sensitivity,Dial Drive

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary. Fig. 1 shows trimmer locations.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube thru a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

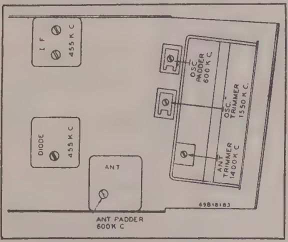
NOTE:—A special dummy antenna, Motorola part 1X18018 should be used in series with the lead from the signal generator to the antenna receptacle, if the receiver is to be operated on a Motorola Booster antenna. If the car antenna is not Booster equipped, use a 50 MMF condenser instead. See Fig. 2.

1. Change the signal generator connection to the antenna lead, using the special dummy.

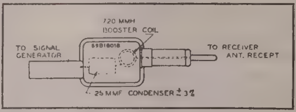
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (DO NOT ROCK GANG FOR EITHER ADJUSTMENT).



(FIG. 1)



(FIG. 2)

REMOVING CHASSIS FROM HOUSING

1. Lay the radio on the service bench on its right side.
2. Remove the left hand side of the housing by taking off the thumb nut.
3. Leave the radio in this position.
4. Remove the seven screws on the right hand side of the housing, including the two which hold the "A" lead clips.
5. Now remove the six screws from the other side.
6. Turn the radio over so that it is in an upright position.
7. Remove speaker cable and grommet from slot in housing.
8. Remove right hand side of housing, after removing the hex nut. *Do not remove the two screws in the right hand side of the control head.*
9. Now pull chassis out of housing, guiding "A" lead out carefully.
10. When placing the chassis back in the housing, the long self-tapping screw is to be used in the position along side of the antenna receptacle.
11. Be sure "A" battery wire is routed as it was originally and held securely under the cable clips.

SENSITIVITY AND STAGE GAIN MEASUREMENT

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy part *#1X18018* in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

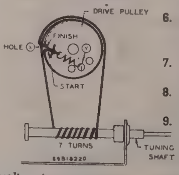
AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
13000	455 K.C.	I.F. Grid	.1 MF	.5 Meg	1.76 Volts
350	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
400	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
25	600 K.C.	R.F. Grid	.1 MF	.5 Meg	1.76 Volts
3	600 K.C.	Ant. Lead	***	None	1.76 Volts

**For one watt output*
***Meter connected across voice coil*
1.76 Volts equals 1 watt output for 3 ohm voice coil
****Use special dummy part No. 1X18018, or M434B booster coil Part No. 17908 in series with 25 MMF cond. (See Fig. 2)*

VOLTAGE CHART

POSITION	PLATE	SCREEN	CATHODE
R.F.	[illegible]	70	2.3
Osc. Mod.	[illegible]	70	0
I.F.	180	70	2.3
Det. AVC A.F.	110	......	0
Output	[illegible]	180	12
Output	220	180	12
Rect.	A.C.	......	225

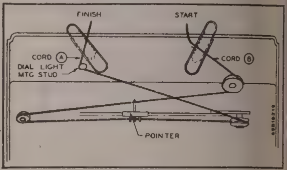
All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.
Current consumption—8 amps. Battery voltage—6.3.
Maximum power output—5 watts.



(FIG. 3)

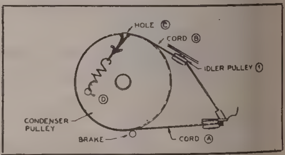
POINTER CORD

1. Remove push buttons and dial light assembly
2. Cut broken dial cord and remove control hea from chassis.
   (This requires removal of 2 self-tapping screw from right hand side of head and removal o "C" washer from volume control shaft.)
3. Cut 30 inch length of 30# test silk fish cord.
4. Lay control head on service bench and route cord around the three idler pulleys exactly a shown in Fig. 4.
5. Adjust cord so both ends are approximately equal length and clip to control head as shown in Fig. 4.
6. Set dial pointer at approximately 550 K.C. on dial scale and interlace cord in pointer clips.
7. Mount control head assembly back on chassis with 2 self tapping screws. Replace "C" washer on volume control shaft.



(FIG. 4)

8. Set gang to fully meshed position. This will place hole in condenser pulley at the top.
9. Remove paper clip from cord "A" and fish end of cord under brake shoe and around condenser pulley ½ turn to hole "C". Thread end of cord thru hole (C) and clip to control head. (See Fig. 5)
10. Remove paper clip from cord "B" and route cord the short distance from idler pulley No. 1 to hole "C" in condenser pulley.
11. Tie both ends of cord together inside pulley, then tie in tension spring (41A11091). Hook other end of spring in hole (D). Cut off surplus cord.
12. Replace dial light.
13. Tune in station of known frequency and adjust dial pointer to correct dial reading.
14. Reassemble in housing.



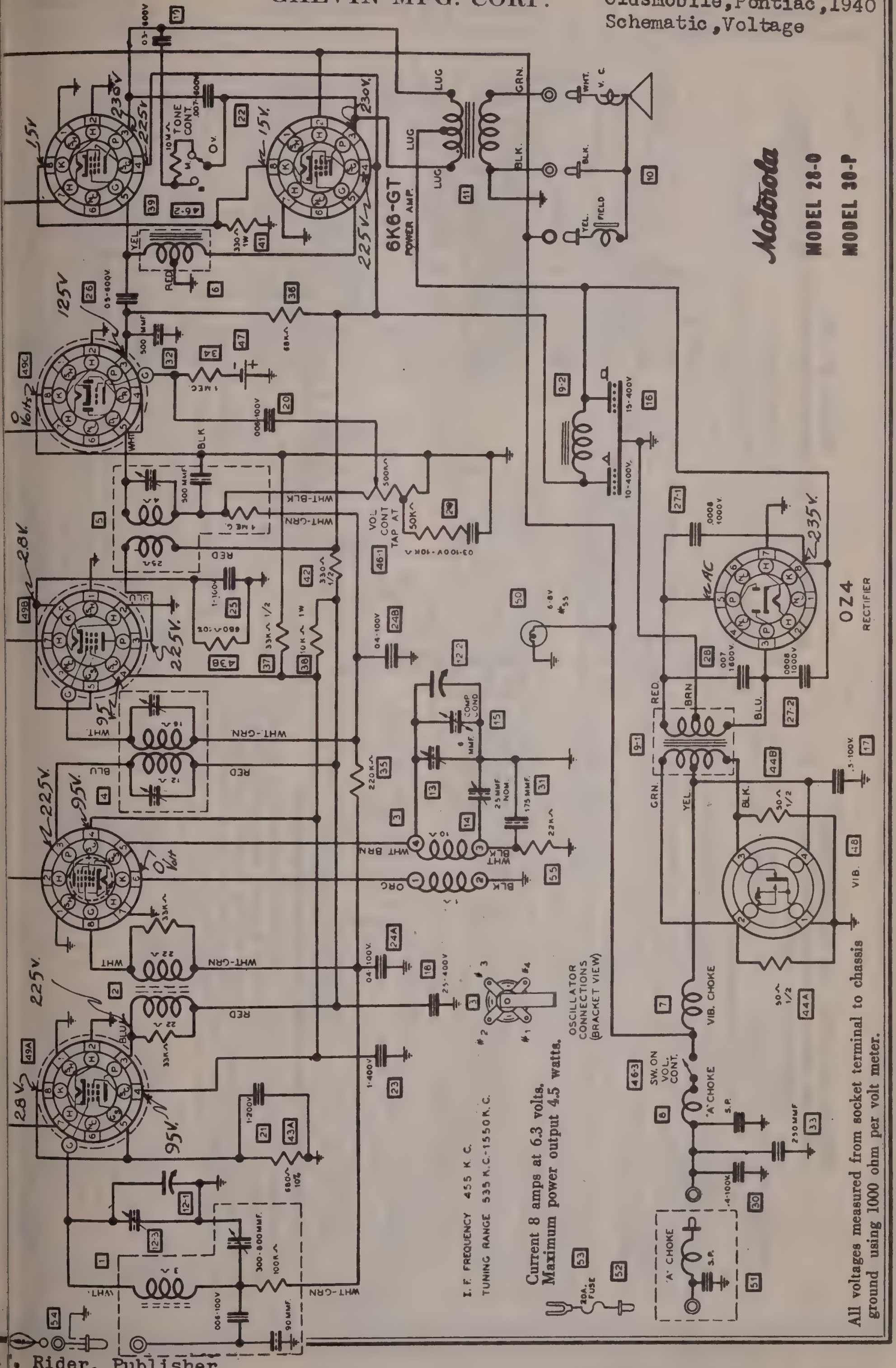
(FIG. 5)

TUNING CORD

1. Remove the chassis from the housing, and place on service bench with the tubes up.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30# silk fish cord 25 inches long.
5. Thread one end of cord thru hole (x) in drive pulley and with an ordinary paper clip fasten to volume control bracket so that cord will stay in place.
6. In a counter-clockwise direction, wind cord one full turn around drive pulley and down to tuning shaft. (See Fig. 3)
7. Wind cord in clockwise direction 7 turns around tuning shaft and up to drive pulley.
8. Continue in a counter-clockwise direction, three quarter turns to hole (x).
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole (Y) in condenser pulley.
10. Cut off surplus cord.

GALVIN MFG. CORP.

MODELS 28-0,30-P
Oldsmobile,Pontiac,1940
Schematic,Voltage



I. F. FREQUENCY 455 K C.
TUNING RANGE 535 K.C.-1550 K.C.

Current 8 amps at 6.3 volts.
Maximum power output 4.5 watts.

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

MODEL 28-O FOR 1940 OLDSMOBILE
MODEL 30-P FOR 1940 PONTIAC
ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator—modulator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. See Fig. 2. Change the signal generator connection to the antenna lead, using the special dummy.

2. Set the signal generator at 1560 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (Do not rock gang for either adjustment.)

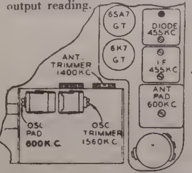


Fig. 1

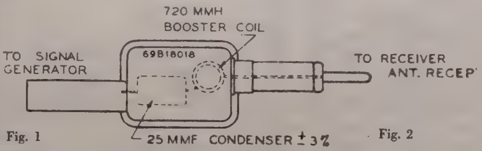


Fig. 2

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
7000	455 K.C.	I. F. Grid	.1	.5 Meg	1.76
190	455 K.C.	MOD. Grid	.1	.5 Meg	1.76
215	600 K.C.	MOD. Grid	.1	.5 Meg	1.76
35	600 K.C.	R. F. Grid	.1	.5 Meg	1.76
3	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or M434B Booster Coil No. 17908 in series with a 25 MMF condenser.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 50 MMF condenser for the Special Dummy.

Model 35-N
SPECIFICALLY DESIGNED TO INSTALL IN 1940 NASH

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No.8) of the 6SA7GT oscillator—modulator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the diode coil can to the point showing the highest reading on the output meter. See Fig.1 (Advance the signal generator attenuator, if necessary, to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

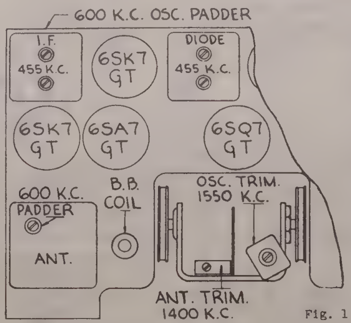


Fig. 1

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No.1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

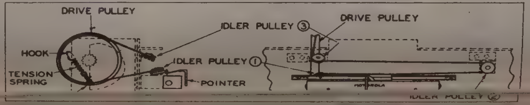
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (Do not rock gang for either adjustment.)

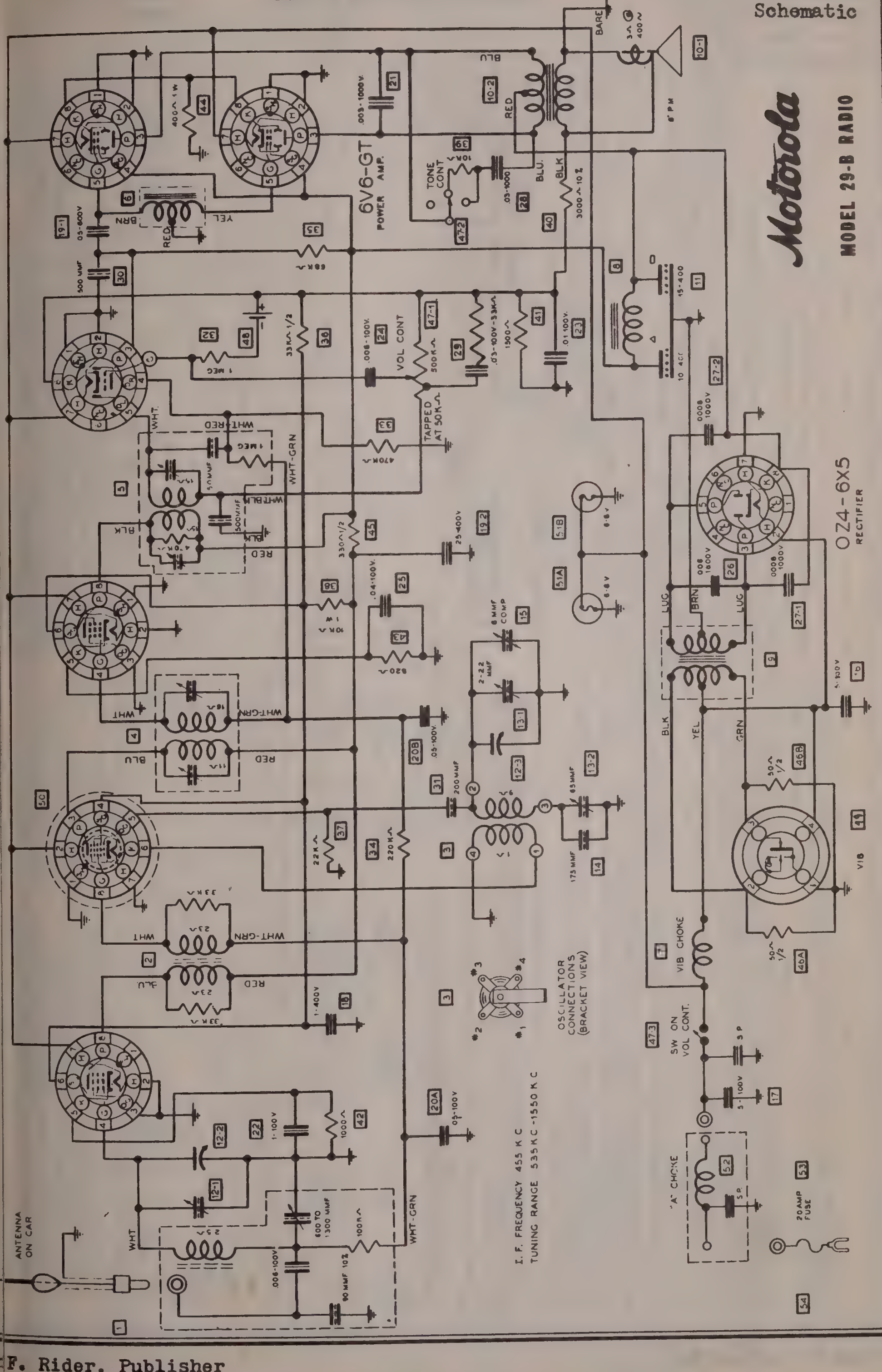
DIAL CORD INSTRUCTIONS

1. Remove the chassis from the housing.
2. Remove the front cover, after first removing the following items:
   - (a) Dial scale (4 self-tapping screws)
   - (b) Two self-tapping screws above the volume and tuning shafts.
   - (c) Knobs.
   - (d) "C" washer on volume control shaft.
   - (e) Speaker pin terminals.
3. Remove broken cord.
4. Set gang in 3/4 mesh position.
5. Cut a 26 inch length of silk fish cord and thread through hole "A", temporarily clipping the end to the push-button assembly to hold in place.
6. Wind cord counter-clockwise around condenser pulley and through slot in front of push-button assembly.
7. Run cord around pulley 1, counter-clockwise and across chassis to idler pulley 2. See Fig.2.
8. Continue cord around idler pulley 2, in counter-clockwise direction.
9. Run cord across chassis to idler pulley 3.
10. Continue cord around idler pulley 3, in clockwise direction.
11. Wind cord around condenser pulley in counter-clockwise direction and down to slot "A".
12. Knot both ends of cord together inside of pulley and tie in tension spring.
13. Attach other end of spring to hook and cut off surplus cord.
14. To set pointer to correct frequency, tune in a station of known frequency, and adjust pointer on string to correct dial reading.
15. Reassemble in housing.



MODEL 29-B
Buick,1940
Schematic

GALVIN MFG. CORP.



ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube and to chassis ground. Turn the condenser gang completely out of mesh. Connect and output meter across the speaker voice coil. Use .1 MF condenser in signal generator lead.
2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change the signal generator connection to the antenna lead, using a 50 MMF condenser in series with it.
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang (Through hole in chassis base) to the point showing the highest output reading.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (DO NOT ROCK GANG FOR EITHER ADJUSTMENT)

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 50 MMF condenser in place of .1 MF.

The figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO Model 29-B-6	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
10,000 12,500⊙	455 K.C.	6SK7GT Grid (IF) I.F. Grid	.1 MF	.5 Meg	1.76 Volts
200	455 K.C.	6SA7GT " Mod. Grid	.1 MF	.5 Meg	1.76 Volts
100 225⊙	600 K.C.	6SA7GT " Mod. Grid	.1 MF	.5 Meg	1.76 Volts
10 16⊙	600 K.C.	6SK7GT " (RF) R.F. Grid	.1 MF	.5 Meg	1.76 Volts
3	600 K.C.	Antenna Lead Ant. Lead	50 MMF 40 MMF⊙***	None	1.76 Volts

* For 1 Watt output.
** Output meter connected across voice coil.
1.76 volts equals 1 Watt output for 3 ohm voice coil.

⊙ FOR MODEL 29-B-6

*** NOTE: If A Motorola Booster antenna is used substitute a special Motorola dummy part No. 1X18018.

VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE
* 6SK7GT	R.F.	230	100	4
6SA7GT	Osc. Mod.	230	100	0
6SK7GT	I.F.	230	100	4
6SQ7GT	Det.-AVC	125	-	4
6V6GT	Power	235	230	16
6V6GT	Power	235	230	16
0Z4 or 6X5	Rect.	AC	-	240

* 7A7 Loctal tube was used in some chassis.

Current 7.1 Amp. at 6.1 Volts

Maximum power output 10 Watts.

TO REMOVE CHASSIS FROM HOUSING

1. Remove the eliminode assembly on the right side of chassis. (2 screws)
2. Remove the bottom cover (4 thumb screws) Then pull back.
3. Remove the 9 screws around the top and 2 sides of the front.
4. Remove the 3 remaining screws on the right side of the housing.
5. Remove the 3 remaining screws on the left side of the housing, including the one adjacent to the antenna receptacle.
6. Remove the 3 screws on the back of the housing.
7. Lay the radio face down on the service bench and lift the housing off.
8. When remounting, the long screw is to be used in position along side of antenna receptacle.
9. The eliminode assembly is to be mounted last.

POINTER CORD

1. Remove the chassis from housing.
2. Pull out the five push-buttons.
3. Remove the four screws which hold the escutcheon and remove same from front cover.
4. Remove broken cord.
5. Rotate condenser gang to fully meshed position.
6. Cut 28 inch length of 30 pound silk fish cord.
7. Thread one end of cord through slot (A). This is the slot nearest the front of chassis when condenser is fully meshed.
8. Run cord up and over rear idler pulley No. 1 in clockwise direction.
9. Continue cord across chassis to idler pulley No. 2 and around it in a clockwise direction.
10. Run cord back across chassis to front idler pulley No. 3 and around it in clockwise direction.
11. Run cord under brake shoe and around condenser pulley to slot (A).
12. Thread through slot (A).
13. Knot both ends of cord securely inside the slot.
14. Tie in one end of tension spring (41A11091) and hook other end of tension spring onto hook in condenser pulley.
15. Lace dial cord through hooks in dial pointer.
16. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
17. Remount escutcheon plate.

Model 29-B

TO INSTALL IN 1940 BUICK

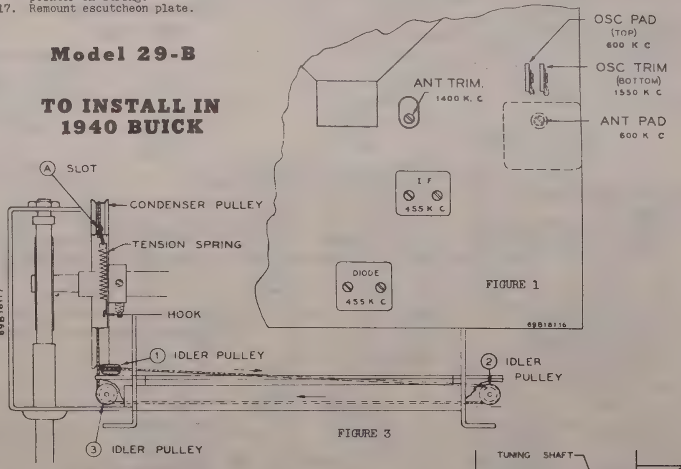


FIGURE 1

FIGURE 3

DIAL DRIVE CORD

1. Remove the chassis from the housing,and place on service bench with the tubes up.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30# silk fish cord 26 inches long.
5. Thread one end of cord through slot in drive pulley and with an ordinary paper clip fasten to tuning shaft bracket so that cord will stay in place.
6. In a counter clock-wise direction wind cord one full turn around drive pulley and up to tuning shaft.
7. Wind cord in clock-wise direction 7 turns around tuning shaft and down to drive pulley.
8. In a counter clock-wise direction, wind cord around drive pulley to slot (B).
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole in condenser pulley.

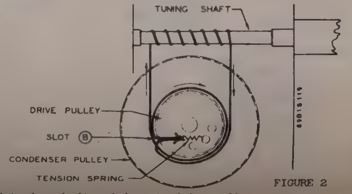


FIGURE 2

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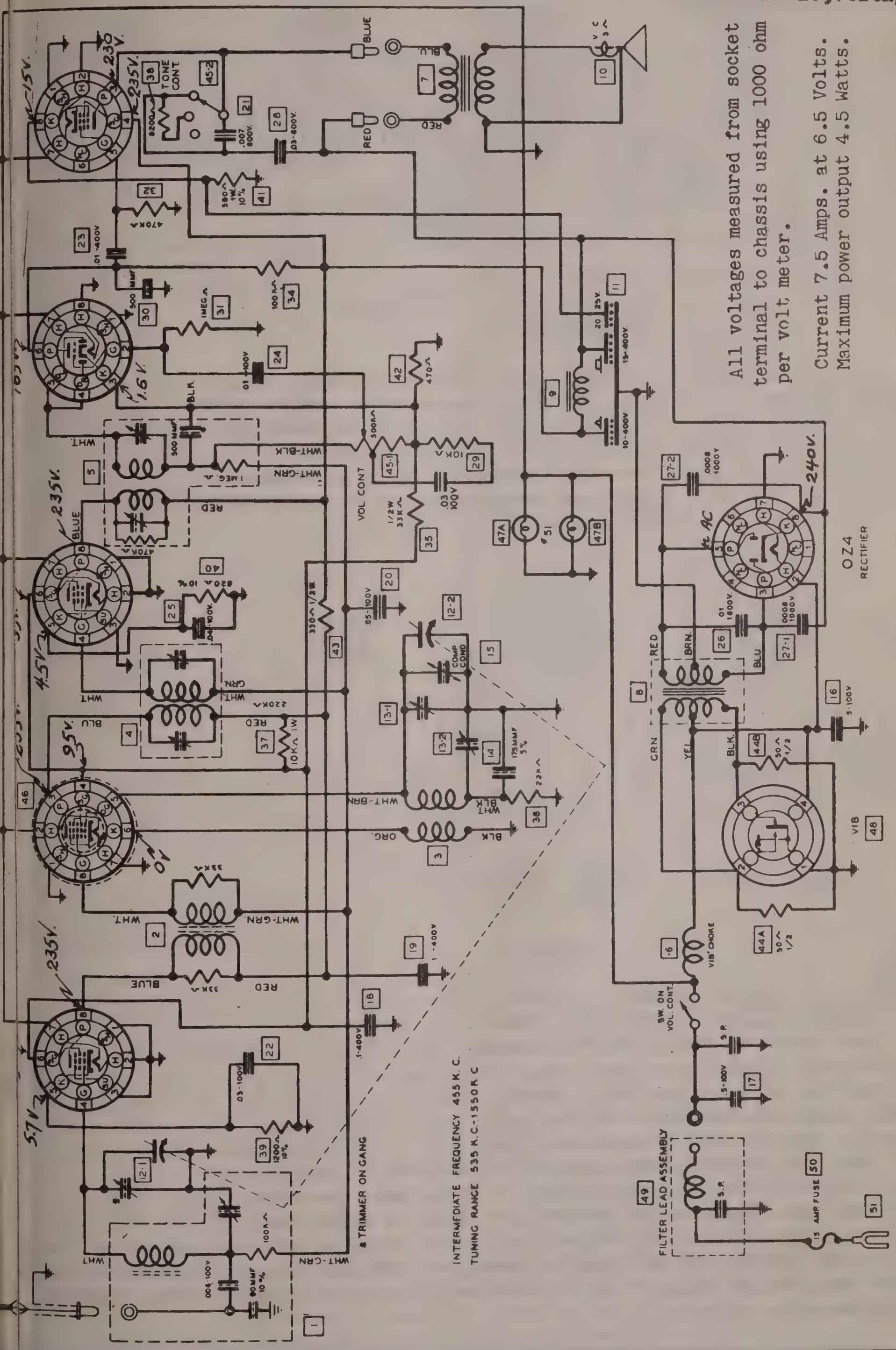
MODEL 29-B-6
Buick,1940
Schematic,Voltage

GALVIN MFG. CORP.



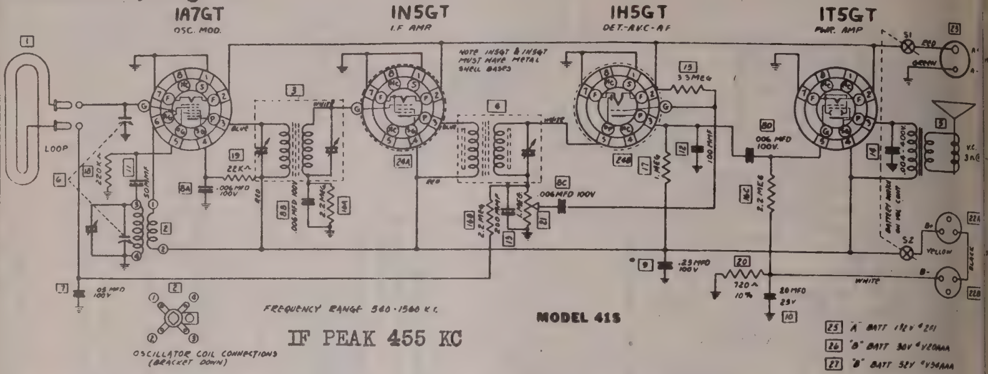
All voltages measured from socket terminal to chassis using 1000 ohm per volt meter.

Current 7.5 Amps. at 6.5 Volts.
Maximum power output 4.5 Watts.

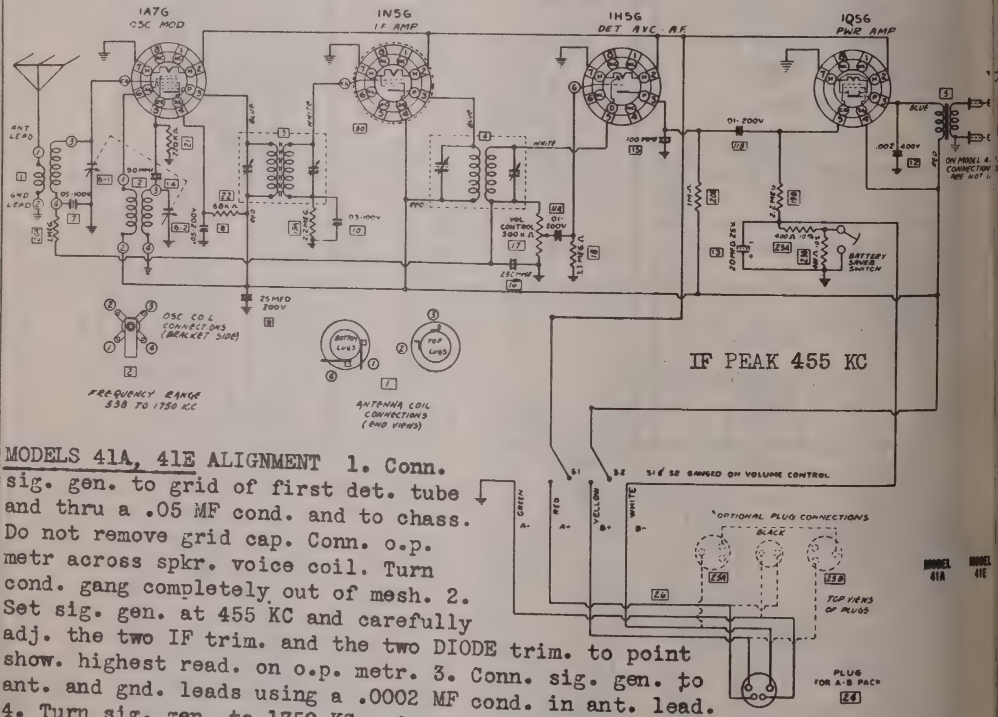
FOR ALIGNMENT PROCEDURE, DIAL CORD INSTRUCTIONS, SENSITIVITY AND GAIN MEASUREMENTS, SEE INDEX.

MODELS 41A,41E
MODEL 41S
Schematics,Alignment

GALVIN MFG. CORP.



MODEL 41S ALIGNMENT 1. Conn. sig. gen. to grid of first det. tube thru a .0 cond. Do not remove grid cap. Conn. o.p. meter across spkr. voice coil. Turn cond. gang completely out of mesh. Loop must be conn. to chass. at all times 2. Set sig. gen. at 455 K.C.; carefully adj. the two I.F. trim. and the one DIODE trim. to point showing highest read. on o.p. metr. 3. Turn sig. gen to 1560 K.C. and with cond. gang completely out of mesh, adj. OSC. trim. until 1560 K.C. sig. is heard. 4. No further adjustments.

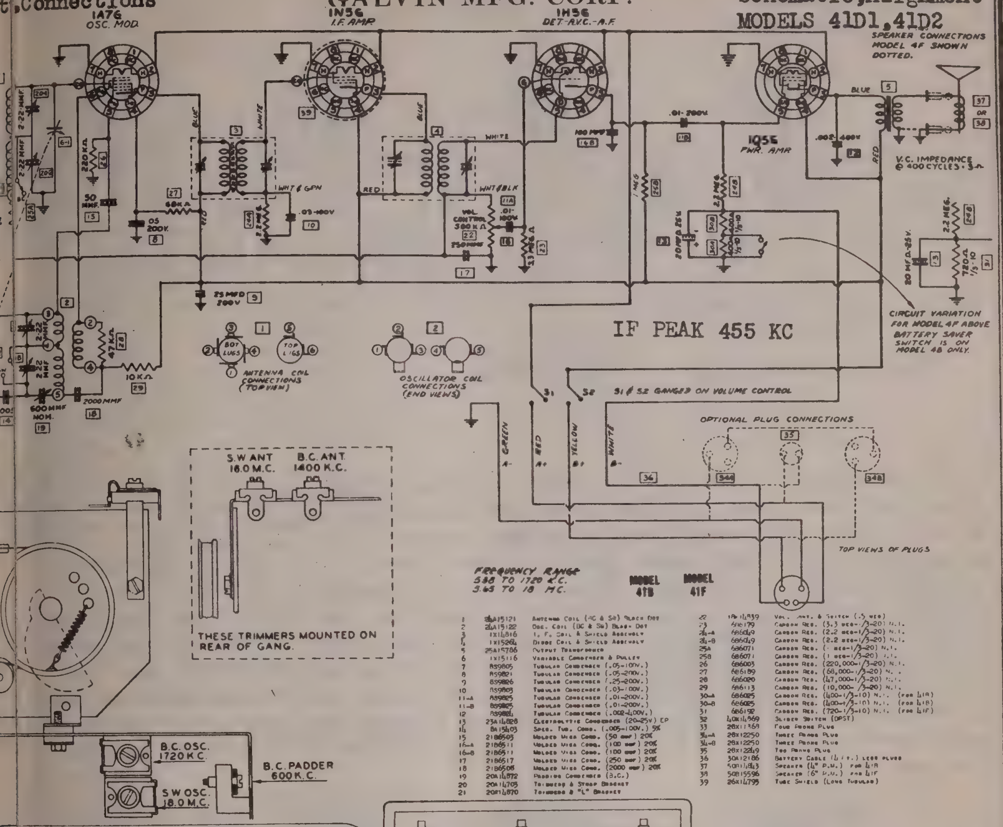


MODELS 41A, 41E ALIGNMENT 1. Conn. sig. gen. to grid of first det. tube and thru a .05 MF cond. and to chass. Do not remove grid cap. Conn. o.p. metr across spkr. voice coil. Turn cond. gang completely out of mesh. 2. Set sig. gen. at 455 KC and carefully adj. the two IF trim. and the two DIODE trim. to point show. highest read. on o.p. metr. 3. Conn. sig. gen. to ant. and gnd. leads using a .0002 MF cond. in ant. lead. 4. Turn sig. gen. to 1750 KC and with cond. gang completely out of mesh adj. OSC. trim. until 1750 KC sig. is heard. 5. Set sig. gen. at 1400 KC and turn cond. gang to the sig. at 1400 KC. Adj. ANT. trim. to point show. highest read. on o.p. metr.

S 51D1,51D2
t,Connections

MODELS 41B,41F
Schematic,Alignment
MODELS 41D1,41D2

GALVIN MFG. CORP.

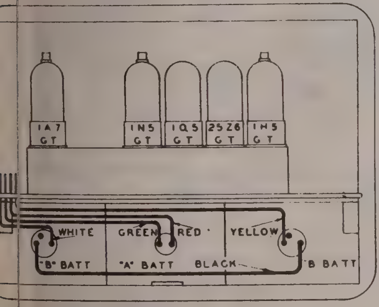


FREQUENCY RANGE
538 TO 1720 K.C.
3.65 TO 18 M.C.

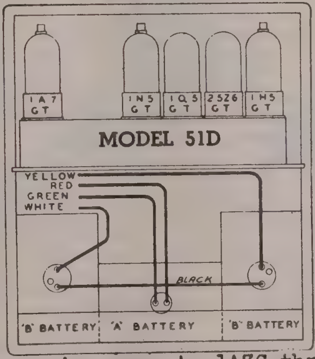
MODEL 41B

MODEL 41F

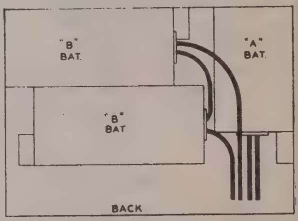
1	24A15121	Antenna Coil (BC & SW) Black Dot
2	24A15122	Osc. Coil (BC & SW) Black Dot
3	1X14816	I. F. Coil & Shield Assembly
4	1X15264	Diode Coil & Shield Assembly
5	25A15786	Output Transformer
6	1X15116	Variable Condenser & Pulley
7	8S9805	Tubular Condenser (.05-100V.)
8	8S9821	Tubular Condenser (.05-200V.)
9	8S9826	Tubular Condenser (.25-200V.)
10	8S9803	Tubular Condenser (.03-100V.)
11-A	8S9825	Tubular Condenser (.01-200V.)
11-B	8S9825	Tubular Condenser (.01-200V.)
12	8S9824	Tubular Condenser (.002-400V.)
13	23A14828	Electrolytic Condenser (20-25V) EP
14	8A15403	Spec. Tub. Cond. (.005-100V.) 5%
15	21B6503	Molded Mica Cond. (50 mmf) 20%
16-A	21B6511	Molded Mica Cond. (100 mmf) 20%
16-B	21B6511	Molded Mica Cond. (100 mmf) 20%
17	21B6517	Molded Mica Cond. (250 mmf) 20%
18	21B6508	Molded Mica Cond. (2000 mmf) 20%
19	20A14872	Padding Condenser (B.C.)
20	20A14703	Trimmer & Strap Bracket
21	20A14870	Trimmer & "L" Bracket
22	18A14939	Vol. Cont. & Switch (.5 meg)
23	686179	Carbon Res. (3.3 meg-1/3-20) N.I.
24-A	686049	Carbon Res. (2.2 meg-1/3-20) N.I.
24-B	686049	Carbon Res. (2.2 meg-1/3-20) N.I.
25A	686071	Carbon Res. (1 meg-1/3-20) N.I.
25B	686071	Carbon Res. (1 meg-1/3-20) N.I.
26	686003	Carbon Res. (220,000-1/3-20) N.I.
27	686189	Carbon Res. (68,000-1/3-20) N.I.
28	686020	Carbon Res. (47,000-1/3-20) N.I.
29	686113	Carbon Res. (10,000-1/3-20) N.I.
30-A	686025	Carbon Res. (400-1/3-10) N.I. (for 41B)
30-B	686025	Carbon Res. (400-1/3-10) N.I. (for 41B)
31	686192	Carbon Res. (720-1/3-10) N.I. (for 41F)
32	40X14969	Slider Switch (DPST)
33	28X11369	Four Prong Plug
34-A	28X12250	Three Prong Plug
34-B	28X12250	Three Prong Plug
35	28X12249	Two Prong Plug
36	30A12186	Battery Cable (4 ft.) less plugs
37	50A14843	Speaker (4" P.M.) for 41B
38	50B15596	Speaker (6" P.M.) for 41F
39	26X14795	Tube Shield (Long Tubular)



MODEL 52D



POSITION AND CONNECT BATTERIES AS SHOWN

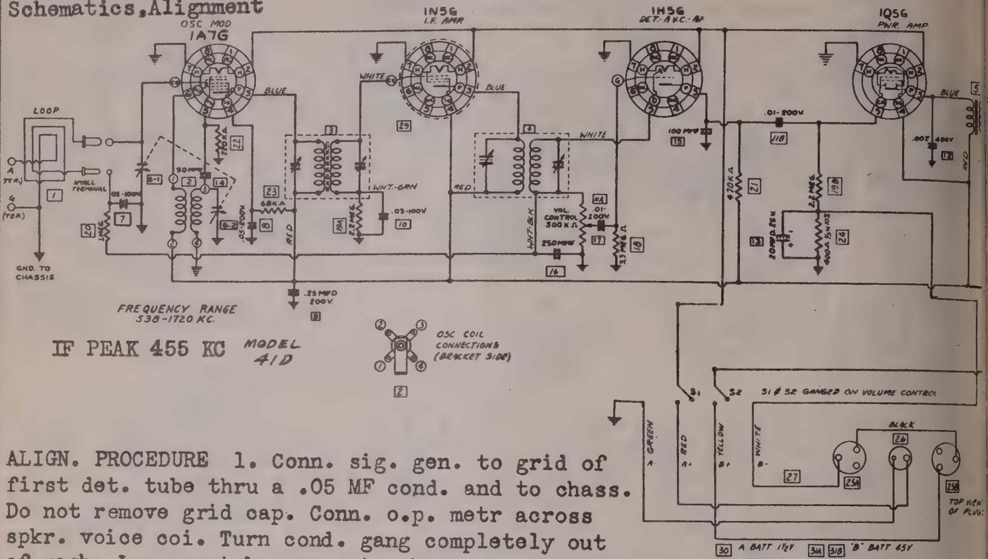


MODEL 41D

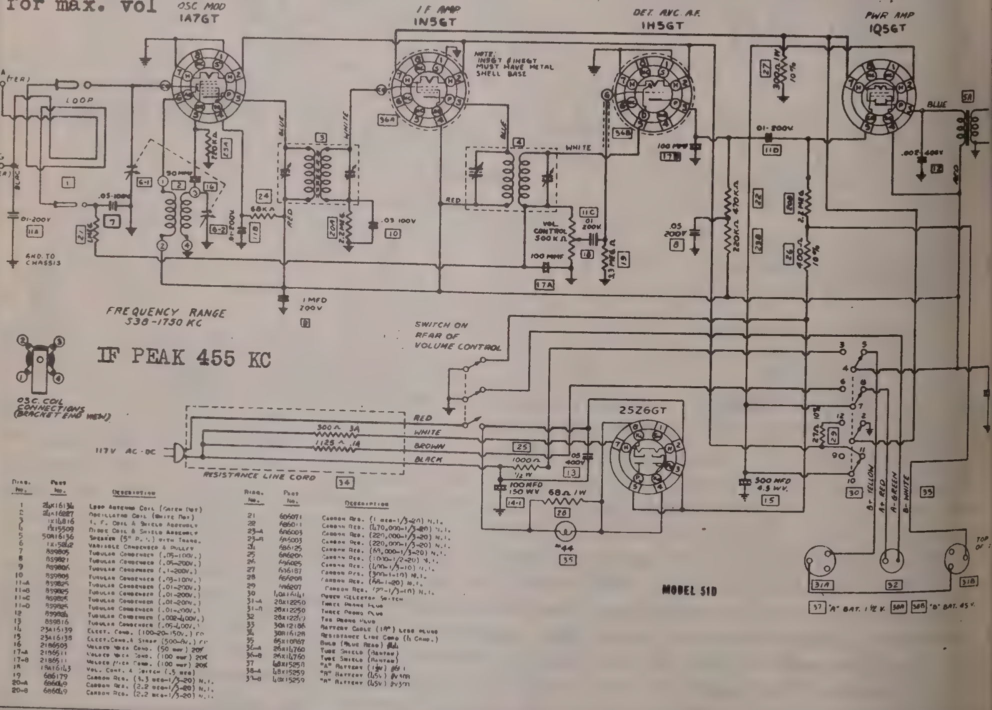
DLS 41B, 41F ALIGNMENT 1. Conn. sig. gen. to 1A7G thru .05 MF cond.
nd to chassis. Conn. o.p. meter across spkr. voice coil. Turn cond. gang out
esh. Set band swi. in B.C. pos. UP pos. is for S.W. DOWN pos. is for B.C.
ig. gen. at 455 KC, adj. 4 I.F. trims. top of I.F. coil cans for max. read.
Bnd swi. in S.W. pos. Sig. gen. to ant. and tnd terms, using 400 ohm carbon
es in ant. lead. 4. Sig. gen. at 18.0 MC, cond. gang out of mesh adj. the S.W.
SC trim. until the 18.0 MC sig. is heard. 5. Sig. gen. at 16.0 MC, turn cond.
an to sig. at 16.0 MC. Adj. S.W. ANT. for max. read. 6. Band swi. in B.C. pos
epace 400 ohm res. in sig. gen. lead with .0002 MF cond. 7. Sig. gen. at 1720
C urn cond. gang to out of mesh pos. Adj. B.C. OSC. trim until 1720 KC sig. is
ead. 8. Sig. gen. at 600 KC - rock pointer at 600 KC pos. on dial scale, while
dj B,C, padder for highest o.p. read. If noise at 600 KC padder can be adj.
o ax. noise without rocking gang and without use of sig. gen.

MODELS 41D1,41D2
MODELS 51D1,51D2
Schematics,Alignment

GALVIN MFG. CORP.



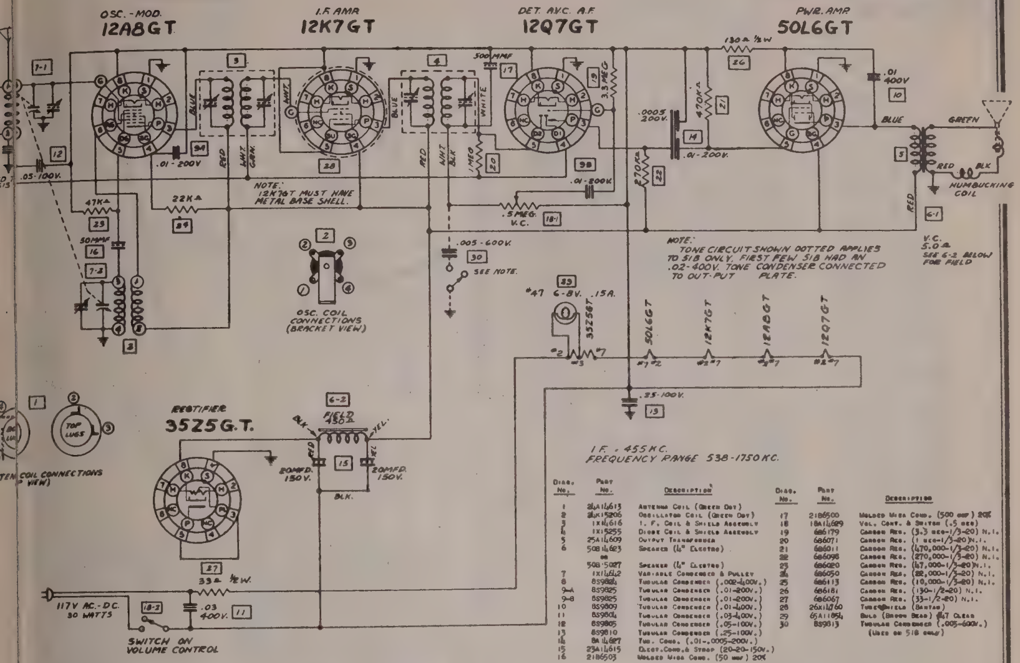
ALIGN. PROCEDURE 1. Conn. sig. gen. to grid of first det. tube thru a .05 MF cond. and to chass. Do not remove grid cap. Conn. o.p. metr across spkr. voice coi. Turn cond. gang completely out of mesh. Loop must be conn. to chass. at all times. 2. Set sig. gen. at 455 KC; carefully adj. the two IF trim. and the two DIODE trim. to point show. highest read. on o.p. meter. 3. Turn sig. gen. to 1720 KC and with cond. gang completely out of mesh adj. OSC. trim until 1720 KC sig. is heard. 4. Place chass. in cab., conn. loop terms. and fasten back on cab. 5. Remove plug butt. from side of cab. to expose ANT. trim.;6 — Tune in a weak station near 1400 or 1500 KC and adj. ANT. trim. thru hole in cab. for max. vol



Diag. No.	Part No.	Description
1	24K16134	Loop Antenna Coil (Green Dot)
2	24K16227	Oscillator Coil (White Dot)
3	1K14816	I. F. Coil & Shield Assembly
4	1K15509	Diode Coil & Shield Assembly
5	50A16136	Speaker (5" P.M.) with Trans.
6	1K15842	Variable Condenser & Pulley
7	8S9805	Tubular Condenser (.05-100V.)
8	8S9821	Tubular Condenser (.05-200V.)
9	8S9806	Tubular Condenser (.1-200V.)
10	8S9803	Tubular Condenser (.03-100V.)
11-A	8S9825	Tubular Condenser (.01-200V.)
11-B	8S9825	Tubular Condenser (.01-200V.)
11-C	8S9825	Tubular Condenser (.01-200V.)
11-D	8S9825	Tubular Condenser (.01-200V.)
12	8S9824	Tubular Condenser (.002-400V.)
13	8S9816	Tubular Condenser (.05-400V.)
14	23A16139	Elect. Cond. (100-20-150V.) FP
15	23A16138	Elect. Cond. & Strap (500-4V.) FP
16	21B6503	Molded Mica Cond. (50 MMF) 20%
17-A	21B6511	Molded Mica Cond. (100 MMF) 20%
17-B	21B6511	Molded Mica Cond. (100 MMF) 20%
18	19A16143	Vol. Cont. & Switch (.5 Meg)
19	6B6179	Carbon Res. (3.3 Meg-1/3-20) N.I.
20-A	6B6049	Carbon Res. (2.2 Meg-1/3-20) N.I.
20-B	6B6049	Carbon Res. (2.2 Meg-1/3-20) N.I.
21	6B6071	Carbon Res. (1 Meg-1/3-20) N.I.
22	6B6011	Carbon Res. (470,000-1/3-20) N.I.
23-A	6B6003	Carbon Res. (220,000-1/3-20) N.I.
23-B	6B6003	Carbon Res. (220,000-1/3-20) N.I.
24	6B6125	Carbon Res. (68,000-1/3-20) N.I.
25	6B6206	Carbon Res. (1000-1/2-20) N.I.
26	6B6025	Carbon Res. (400-1/3-10) N.I.
27	6B6187	Carbon Res. (300-1-10) N.I.
28	6B6208	Carbon Res. (68-1-20) N.I.
29	6B6207	Carbon Res. (27-1/3-10) N.I.
30	40A16641	Power Selector Switch
31-A	28K12250	Three Prong Plug
31-B	28K12250	Three Prong Plug
32	28K12210	Two Prong Plug
33	30A12186	Battery Cable (18") Less Plugs
34	30A16128	Resistance Line Cord (4 Cond.)
35	65K10867	Bulb (Blue Bead) #44
36-A	26K14760	Tube Shield (Bantam)
36-B	26K14760	Tube Shield (Bantam)
37	48K15258	"A" Battery (1½V) #61
38-A	48K15259	"B" Battery (45V) #V40B
38-B	48K15259	"B" Battery (45V) #V30

MODELS 51A,53A,54A
Chassis 5A,5AA
Schematics

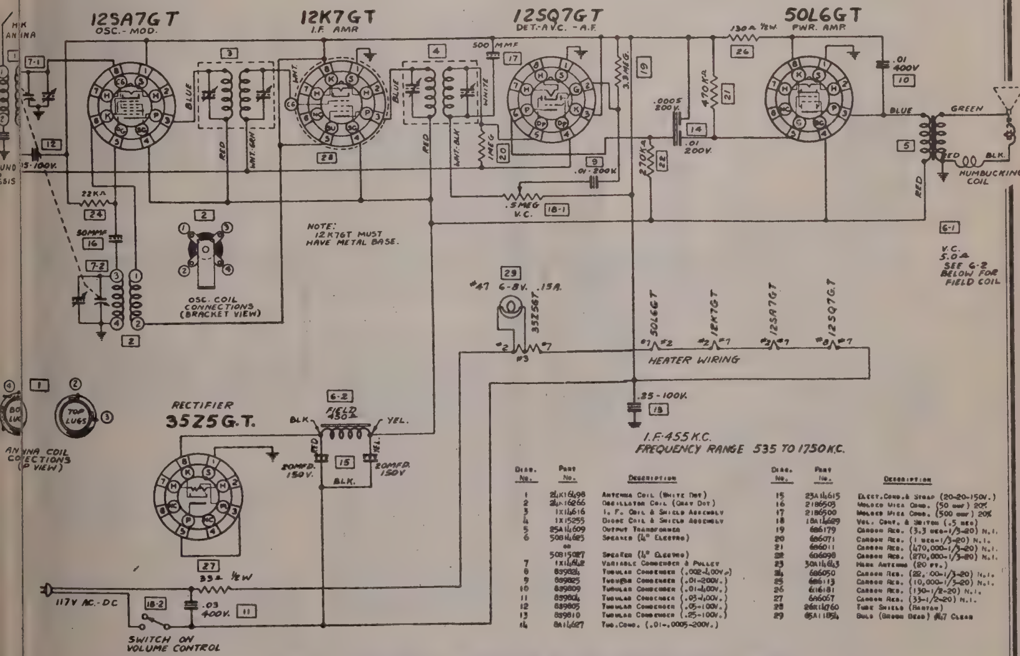
GALVIN MFG. CORP.



I.F. - 455 KC.
FREQUENCY RANGE 538-1750 KC.

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
1	24A14613	Antenna Coil (Green Dot)			
2	24K15206	Oscillator Coil (Green Dot)	17	2186500	Molded Mica Cond. (500 mmf) 20%
3	1X14616	I. F. Coil & Shield Assembly	18	18A14629	Vol. Cont. & Switch (.5 meg)
4	1X15255	Diode Coil & Shield Assembly	19	686179	Carbon Res. (3.3 meg-1/3-20) N.I.
5	25A14609	Output Transformer	20	686071	Carbon Res. (1 meg-1/3-20) N.I.
6	50B14623 or	Speaker (4" Electro)	21	686011	Carbon Res. (470,000-1/3-20) N.I.
			22	686098	Carbon Res. (270,000-1/3-20) N.I.
	50B5027	Speaker (4" Electro)	23	686020	Carbon Res. (47,000-1/3-20) N.I.
7	1X14642	Variable Condenser & Pulley	24	686050	Carbon Res. (22,000-1/3-20) N.I.
8	8S9824	Tubular Condenser (.002-400V.)	25	686113	Carbon Res. (10,000-1/3-20) N.I.
9-A	8S9825	Tubular Condenser (.01-200V.)	26	686181	Carbon Res. (130-1/2-20) N.I.
9-B	8S9825	Tubular Condenser (.01-200V.)	27	686067	Carbon Res. (33-1/2-20) N.I.
10	8S9809	Tubular Condenser (.01-400V.)	28	26X14760	Tube Shield (Bantam)
11	8S9804	Tubular Condenser (.03-400V.)	29	65A11054	Bulb (Brown Bead) #47 Clear
12	8S9805	Tubular Condenser (.05-100V.)	30	8S9813	Tubular Condenser (.005-600V.) (Used on 51B only)
13	8S9810	Tubular Condenser (.25-100V.)			
14	8A14627	Tub. Cond. (.01-.0005-200V.)			
15	23A14615	Elect. Cond. & Strap (20-20-150V.)			
16	2186503	Molded Mica Cond. (50 mmf) 20%			

5A Chassis (Models 51A, 53A and 54A)



I.F. 455 K.C.
FREQUENCY RANGE 535 TO 1750 K.C.

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
1	24K16498	Antenna Coil (White Dot)	15	23A14615	Elect. Cond. & Strap (20-20-150V.)
2	24K16266	Oscillator Coil (Gray Dot)	16	2186503	Molded Mica Cond. (50 mmf) 20%
3	1X14616	I. F. Coil & Shield Assembly	17	2186500	Molded Mica Cond. (500 mmf) 20%
4	1X15255	Diode Coil & Shield Assembly	18	18A14629	Vol. Cont. & Switch (.5 meg)
5	25A14609	Output Transformer	19	686179	Carbon Res. (3.3 meg-1/3-20) N.I.
6	50B14623 or	Speaker (4" Electro)	20	686071	Carbon Res. (1 meg-1/3-20) N.I.
			21	686011	Carbon Res. (470,000-1/3-20) N.I.
	50B15027	Speaker (4" Electro)	22	606098	Carbon Res. (270,000-1/3-20) N.I.
7	1X14642	Variable Condenser & Pulley	23	30A14643	Wire Antenna (20 ft.)
8	8S9824	Tubular Condenser (.002-400V.)	24	686050	Carbon Res. (22,000-1/3-20) N.I.
9	8S9825	Tubular Condenser (.01-200V.)	25	686113	Carbon Res. (10,000-1/3-20) N.I.
10	8S9809	Tubular Condenser (.01-400V.)	26	616181	Carbon Res. (130-1/2-20) N.I.
11	8S9804	Tubular Condenser (.03-400V.)	27	6A6067	Carbon Res. (33-1/2-20) N.I.
12	8S9805	Tubular Condenser (.05-100V.)	28	26K14760	Tube Shield (Bantam)
13	8S9810	Tubular Condenser (.25-100V.)	29	65A11054	Bulb (Brown Bead) #47 Clear
14	8A14627	Tub. Cond. (.01-.0005-200V.)			

5AA Chassis (Models 51A, 53A and 54A)

CHASSIS 5A,5AA
CHASSIS 5C
CHASSIS 6A,6B
CHASSIS 6E

Sensitivity,Gain Voltage,Dial Drive Trimmers

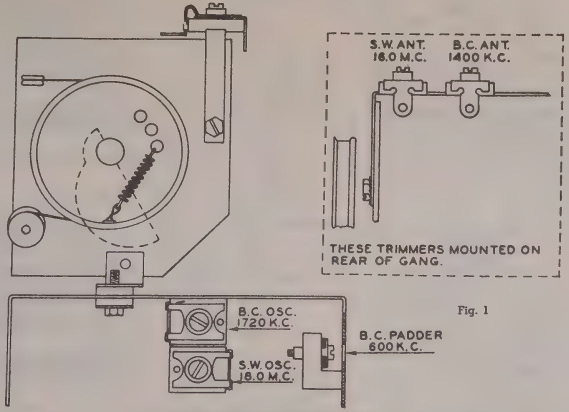


Fig. 1

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 200 MMF condenser in place of .1 MF.

To measure over-all sensitivity of loop models, connect the signal generator to the coupling turn in the loop, using a 400 ohm dummy. The lead, including the resistor should be thoroughly shielded and the receiver must be at least 3 ft. away from the signal generator.

The figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Models 5A and 5AA

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4500	455 K.C.	IF Grid	.1 MF	.5 Meg	.45 Volts
75	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
85	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
25	600 K.C.	Ant. Lead	200 MMF	None	.45 Volts

Model 5C

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4500	455 K.C.	IF Grid	.1 MF	.5 Meg	.45 Volts
75	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
85	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
150	600 K.C.	Ant. Lead	400 Ohms	None	.45 Volts

Model 6A and 6B

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4500	455 K.C.	IF Grid	.1 MF	.5 Meg	.45 Volts
75	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
85	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
25	600 K.C.	Ant. Lead	200 MMF	None	.45 Volts

Model 6E

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4500	455 K.C.	IF Grid	.1 MF	.5 Meg	.45 Volts
75	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
85	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.45 Volts
100	600 K.C.	Ant. Lead	400 Ohms	None	.45 Volts

* For .05 Watt output.
** Output meter connected across voice coil.
.45 Volts equals 1 Watt output.
V.C. resistance — 5 ohms.

6 Tube Chassis

TO RESTRING DIAL DRIVE CORD

1. Remove dial crystal, pointer, dial scale and plate.

2. Cut a length of silk fish cord approximately 24 inches long.

3. Thread one end of cord through hole "A" in condenser pulley and clip it to the chassis with a paper clip.

4. Continue other end of cord over idler pulley "B" and down to tuning shaft. Make two turns counter-clockwise around tuning shaft. (See Fig. 3.)

5. Continue cord up to pointer pulley making one turn around it counter-clockwise.

6. Take cord over idler pulley "C" and around condenser pulley to the hole "A".

7. Tie both ends of cord together inside hole "A".

8. Tie in one end of tension spring and hook the free end of the spring in hole "D". Cut off surplus cord.

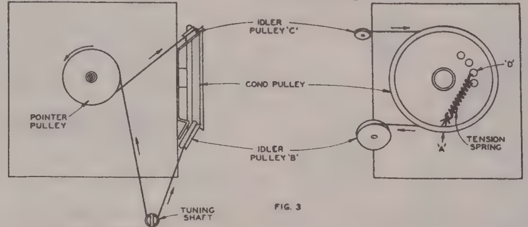


FIG. 3

5 Tube Chassis

TO RESTRING DIAL DRIVE CORD

1. Remove dial crystal, pointer, dial scale, and plate.

2. Cut a length of silk fish cord approximately 12 inches long.

3. Make two turns with cord around tuning shaft. (See Fig. 2.)

4. Continue both ends of cord around condenser pulley in opposite directions until they meet at the hole (A) in the rim of the pulley.

5. Thread both ends through the hole and tie them securely together inside the hole.

6. Tie in the dial cord tension spring and hook the free end of the spring in the hole (B). Cut off surplus cord.

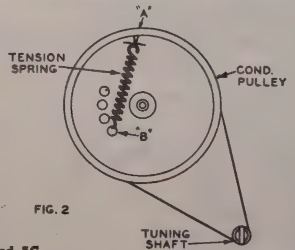


FIG. 2

5A and 5C

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
12A8GT	Osc.-Mod.	85	65	0	80
12K7GT	IF	85	85	0	—
12Q7GT	Det.-Avc.	55	—	0	—
50L6GT	Output	85	85	5	—
35Z5GT	Rect.	AC	—	120	—

5AA

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
12SA7GT	Osc.-Mod.	105	65	0	105
12K7GT	IF	105	105	0	—
12SQ7GT	Det.-Avc.	50	—	0	—
50L6GT	Output	95	105	6	—
35Z5GT	Rect.	AC	—	130	—

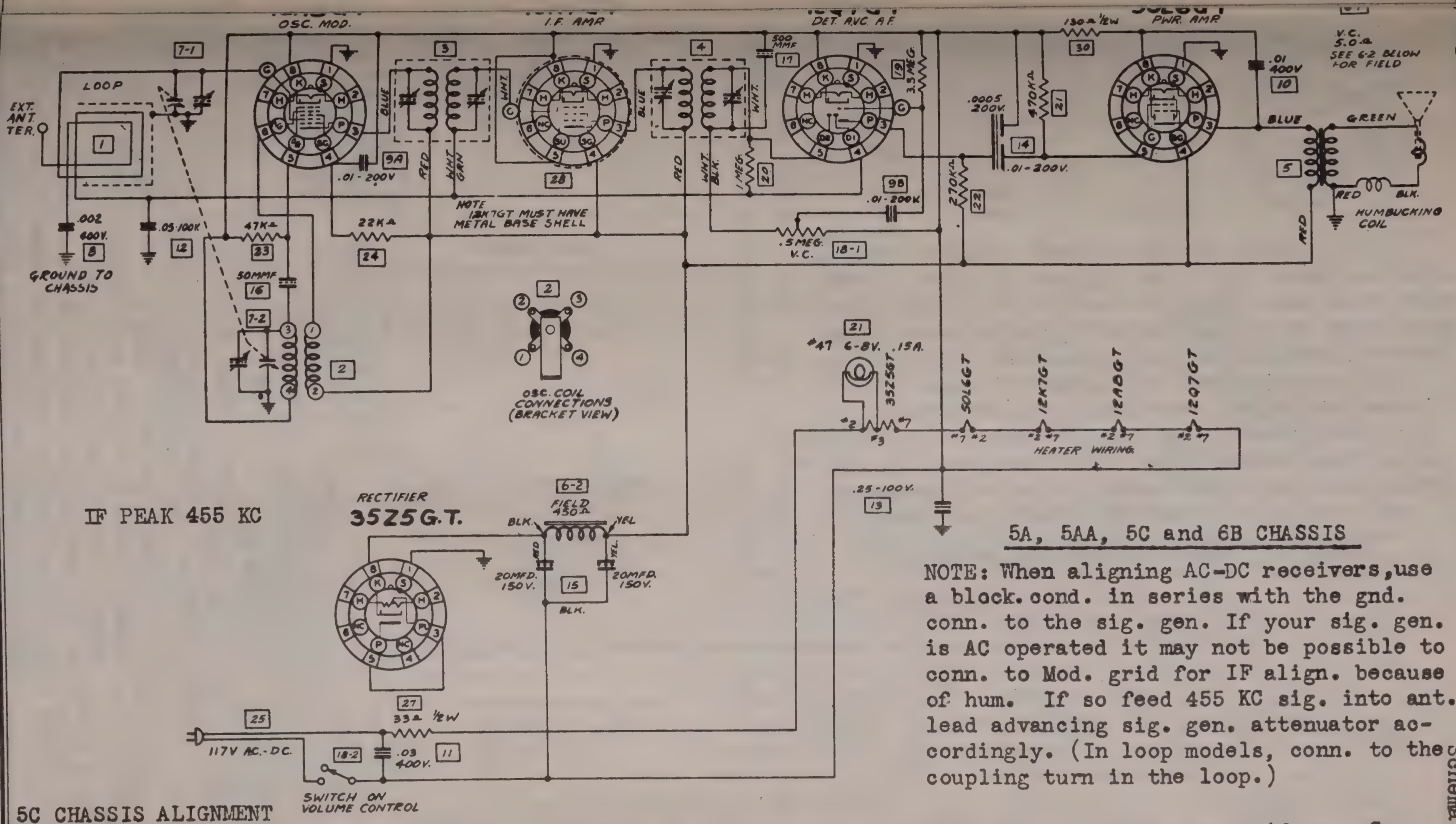
6A, 6B and 6E

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
6A7	Osc.-Mod.	105	65	0	105
6D6	IF	105	105	0	—
75**	Det. Avc.	50	—	0	—
25L6G	Output	95	105	6	—
25Z5	Rect.	AC	—	130	—

SIS 5A,5AA,6B
ning Note

GALVIN MFG. CORP.

MODELS 51C,52C,53C
Chassis 5C
Schematic,Alignment



IF PEAK 455 KC

5A, 5AA, 5C and 6B CHASSIS

NOTE: When aligning AC-DC receivers,use a block.cond. in series with the gnd. conn. to the sig. gen. If your sig. gen. is AC operated it may not be possible to conn. to Mod. grid for IF align. because of hum. If so feed 455 KC sig. into ant. lead advancing sig. gen. attenuator accordingly. (In loop models, conn. to the coupling turn in the loop.)

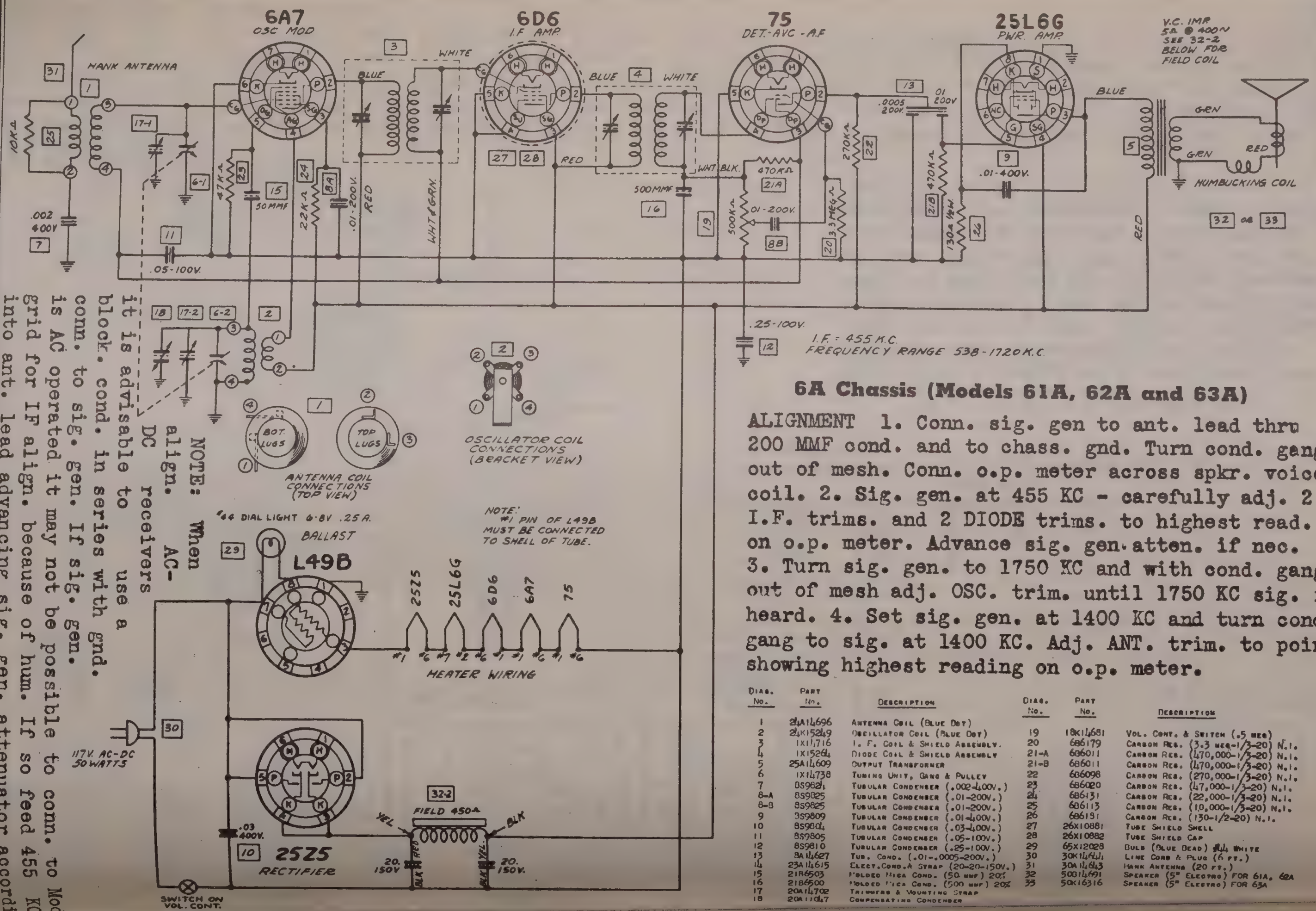
5C CHASSIS ALIGNMENT

1. Conn. sig. gen. to grid of first det. tube thru a .05 MF cond., and to chass. Do not remove grid cap. Conn. o.p. meter across spkr. voice coil. Turn cond. gang completely out of mesh. Loop must be conn. to the chass. at all times. 2. Set sig. gen. at 455 KC and carefully adj. the two IF trims. and the two DIODE trims. to point show. highest read. on o.p. meter. 3. Turn sig. gen. to 1720 KC and, with cond. gang completely out of mesh, adj. OSC. trim. until 1720 KC sig. is heard. 4. Disconn. sig. gen. and tune in weak station near 1400 or 1500 KC Adj. ANT. trim. for max. volume.

MODELS 61A,62A,63A
Chassis 6A
Schematic,Alignment

GALVIN MFG. CORP.

CHASSIS 5A
Alignment



6A Chassis (Models 61A, 62A and 63A)

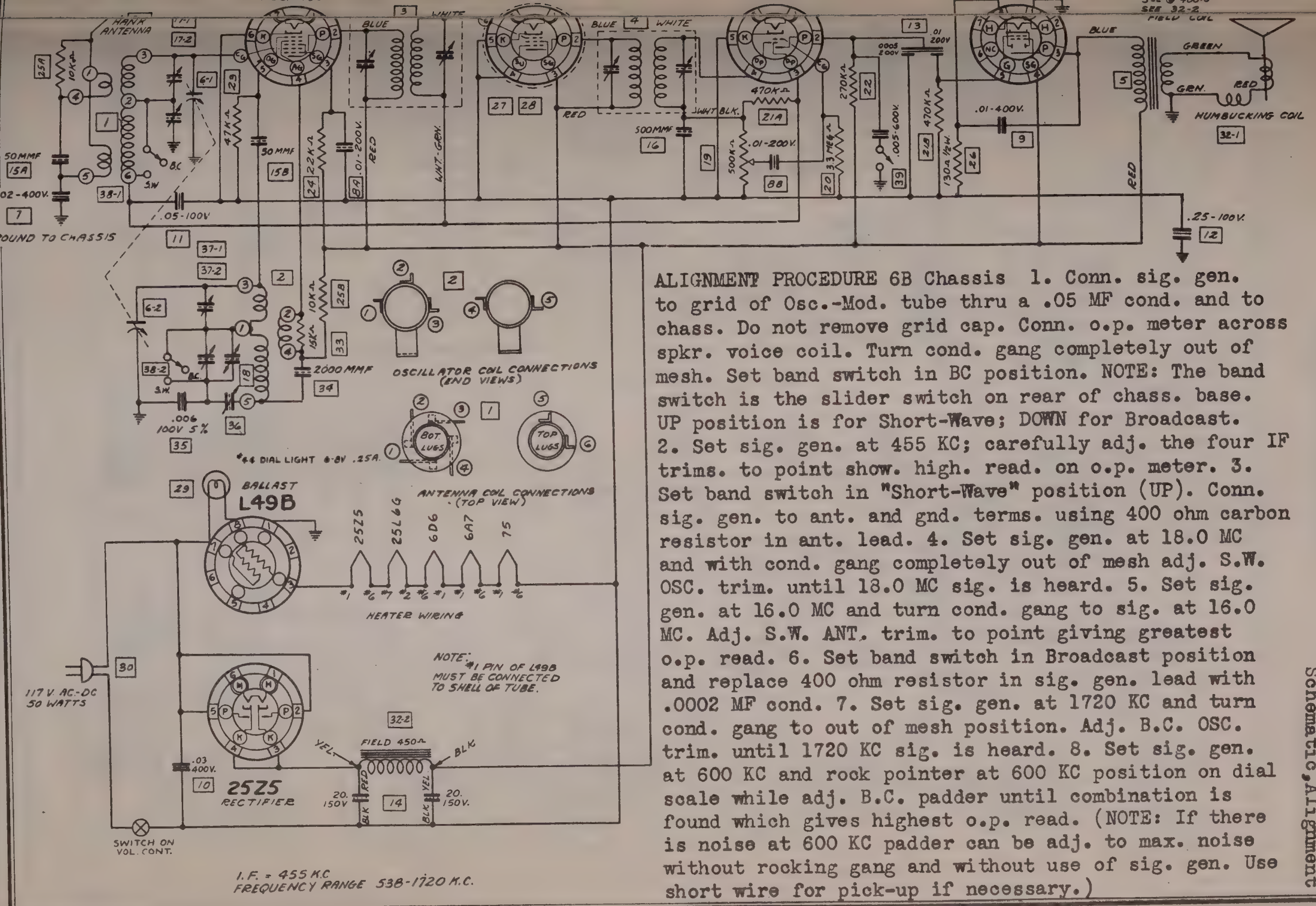
ALIGNMENT 1. Conn. sig. gen to ant. lead thru 200 MMF cond. and to chass. gnd. Turn cond. gang out of mesh. Conn. o.p. meter across spkr. voice coil. 2. Sig. gen. at 455 KC - carefully adj. 2 I.F. trims. and 2 DIODE trims. to highest read. on o.p. meter. Advance sig. gen. atten. if nec. 3. Turn sig. gen. to 1750 KC and with cond. gang out of mesh adj. OSC. trim. until 1750 KC sig. is heard. 4. Set sig. gen. at 1400 KC and turn cond. gang to sig. at 1400 KC. Adj. ANT. trim. to point showing highest reading on o.p. meter.

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
1	24A14696	Antenna Coil (Blue Dot)			
2	24K15249	Oscillator Coil (Blue Dot)	19	18K14681	Vol. Cont. & Switch (.5 meg)
3	1X14716	I. F. Coil & Shield Assembly.	20	686179	Carbon Res. (3.3 meg-1/3-20) N.I.
4	1X15264	Diode Coil & Shield Assembly	21-A	686011	Carbon Res. (470,000-1/3-20) N.I.
5	25A14609	Output Transformer	21-B	686011	Carbon Res. (470,000-1/3-20) N.I.
6	1X14738	Tuning Unit, Gang & Pulley	22	686098	Carbon Res. (270,000-1/3-20) N.I.
7	8S9824	Tubular Condenser (.002-400V.)	23	686020	Carbon Res. (47,000-1/3-20) N.I.
8-A	8S9825	Tubular Condenser (.01-200V.)	24	686131	Carbon Res. (22,000-1/3-20) N.I.
8-B	8S9825	Tubular Condenser (.01-200V.)	25	686113	Carbon Res. (10,000-1/3-20) N.I.
9	8S9809	Tubular Condenser (.01-400V.)	26	686191	Carbon Res. (130-1/2-20) N.I.
10	8S9804	Tubular Condenser (.03-400V.)	27	26X10881	Tube Shield Shell
11	8S9805	Tubular Condenser (.05-100V.)	28	26X10882	Tube Shield Cap
12	8S9810	Tubular Condenser (.25-100V.)	29	65X12028	Bulb (Blue Bead) #44 White
13	8A14627	Tub. Cond. (.01-.0005-200V.)	30	30K14644	Line Cord & Plug (6 ft.)
14	23A14615	Elect. Cond. & Strap (20-20-150V.)	31	30A14643	Hank Antenna (20 ft.)
15	21B6503	Molded Mica Cond. (50 mmf) 20%	32	50B14691	Speaker (5" Electro) for 61A, 62A
16	21B6500	Molded Mica Cond. (500 mmf) 20%	33	50K16316	Speaker (5" Electro) for 63A
17	20A14702	Trimmers & Mounting Strap			
18	20A11047	Compensating Condenser			

NOTE: When align. AC-DC receivers it is advisable to use a block. cond. in series with gnd. conn. to sig. gen. If sig. gen. is AC operated it may not be possible to conn. to Mod grid for IF align. because of hum. If so feed 455 KC into ant. lead advancing sig. gen. attenuator accordi

MODELS 61B,62B
Chassis 6B
Schematic,Alignment

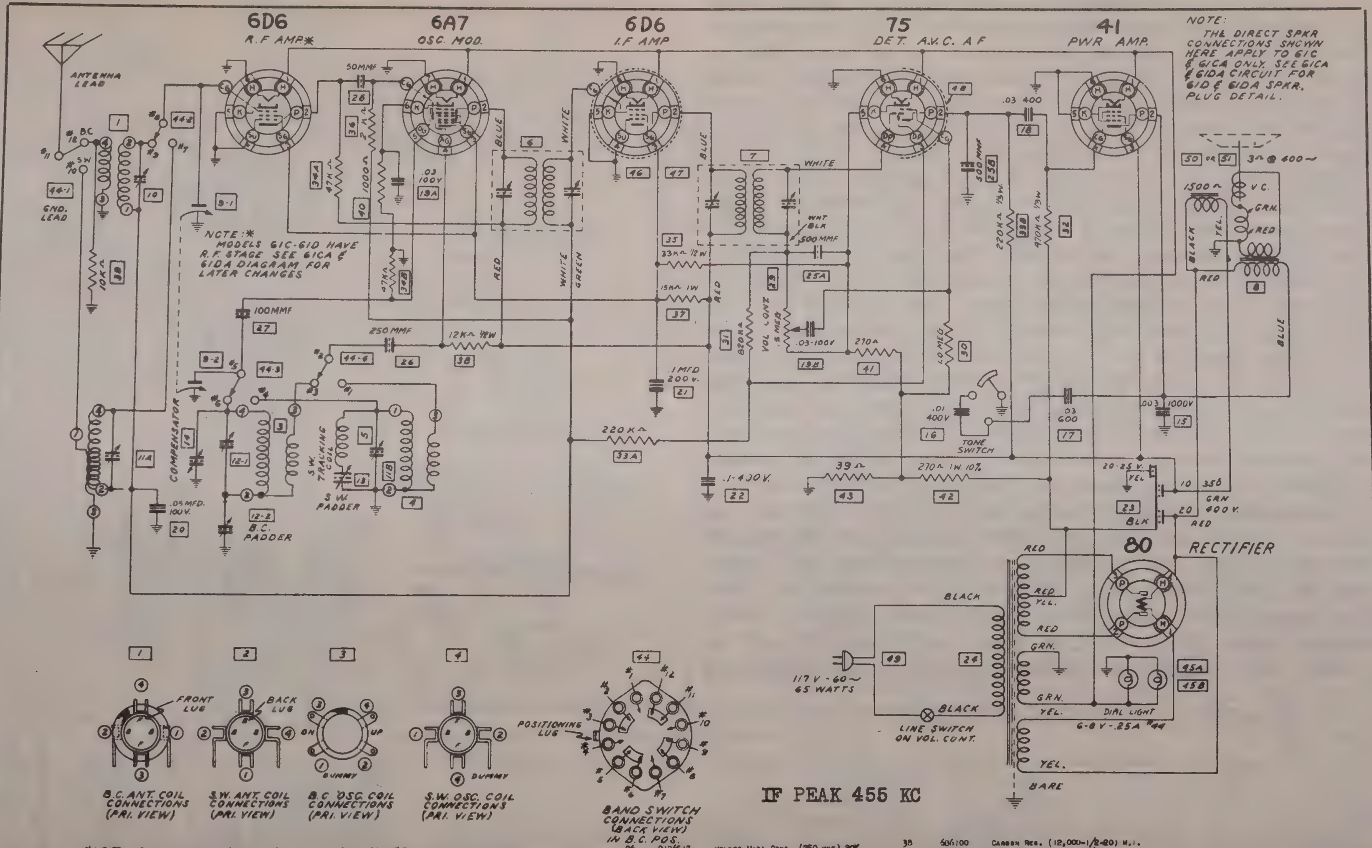
GALVIN MFG. CORP.



ALIGNMENT PROCEDURE 6B Chassis 1. Conn. sig. gen. to grid of Osc.-Mod. tube thru a .05 MF cond. and to chass. Do not remove grid cap. Conn. o.p. meter across spkr. voice coil. Turn cond. gang completely out of mesh. Set band switch in BC position. NOTE: The band switch is the slider switch on rear of chass. base. UP position is for Short-Wave; DOWN for Broadcast. 2. Set sig. gen. at 455 KC; carefully adj. the four IF trims. to point show. high. read. on o.p. meter. 3. Set band switch in "Short-Wave" position (UP). Conn. sig. gen. to ant. and gnd. terms. using 400 ohm carbon resistor in ant. lead. 4. Set sig. gen. at 18.0 MC and with cond. gang completely out of mesh adj. S.W. OSC. trim. until 18.0 MC sig. is heard. 5. Set sig. gen. at 16.0 MC and turn cond. gang to sig. at 16.0 MC. Adj. S.W. ANT. trim. to point giving greatest o.p. read. 6. Set band switch in Broadcast position and replace 400 ohm resistor in sig. gen. lead with .0002 MF cond. 7. Set sig. gen. at 1720 KC and turn cond. gang to out of mesh position. Adj. B.C. OSC. trim. until 1720 KC sig. is heard. 8. Set sig. gen. at 600 KC and rock pointer at 600 KC position on dial scale while adj. B.C. padder until combination is found which gives highest o.p. read. (NOTE: If there is noise at 600 KC padder can be adj. to max. noise without rocking gang and without use of sig. gen. Use short wire for pick-up if necessary.)

MODELS 61C,61D
(With R-F Stage)
Schematic,Coils

GALVIN MFG. CORP.

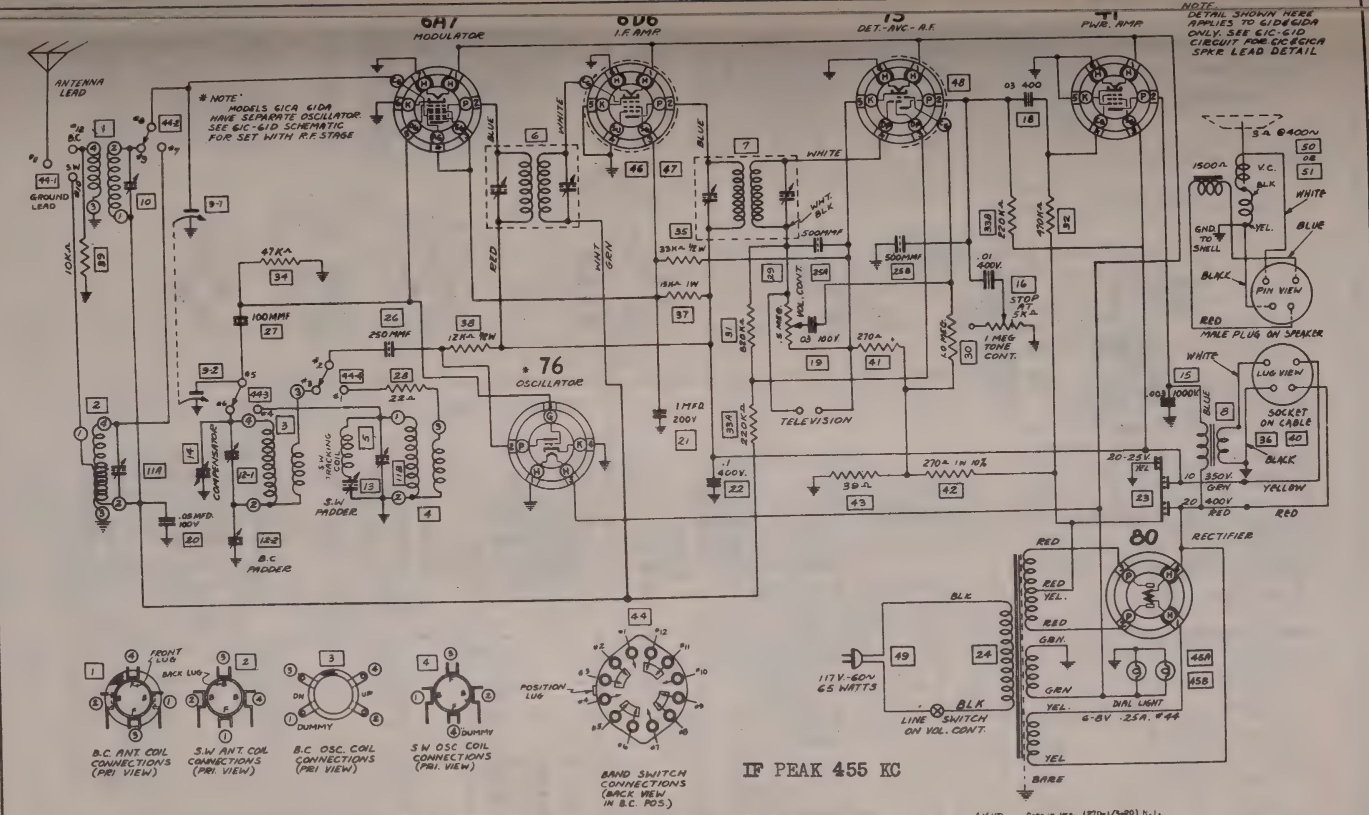

6D6
R.F AMP*
6A7
OSC. MOD.
6D6
I.F AMP
75
DET. A.V.C. A F
41
PWR AMP.
NOTE: THE DIRECT SPKR CONNECTIONS SHOWN HERE APPLY TO 61C & 61CA ONLY. SEE 61CA & 61DA CIRCUIT FOR 61D & 61DA SPKR. PLUG DETAIL.
NOTE:* MODELS 61C-61D HAVE R.F. STAGE SEE 61CA & 61DA DIAGRAM FOR LATER CHANGES
ANTENNA LEAD
GND. LEAD
COMPENSATOR
S.W. TRACKING COIL
S.W. PADDER
B.C. PADDER
TONE SWITCH
VOL CONT .5 MEG
LINE SWITCH ON VOL. CONT.
117 V - 60~ 65 WATTS
DIAL LIGHT 6-8 V - .25A #44
80
RECTIFIER
3Ω @ 400~
1500Ω
V.C.
BLACK
RED
YEL.
GRN.
BLUE
WHITE
GREEN
BARE
IF PEAK 455 KC
B.C. ANT. COIL CONNECTIONS (PRI. VIEW)
S.W. ANT. COIL CONNECTIONS (PRI. VIEW)
B.C. OSC. COIL CONNECTIONS (PRI. VIEW)
S.W. OSC. COIL CONNECTIONS (PRI. VIEW)
FRONT LUG
BACK LUG
DUMMY
POSITIONING LUG
BAND SWITCH CONNECTIONS (BACK VIEW) IN B.C. POS.

1	24A15173	B. C. Antenna Coil (Black Dot)
2	24A15090	S. W. Antenna Coil (Black Dot)
3	24A11002	B. C. Oscillator Coil
4	24A11955	S. W. Oscillator Coil
5	24A10998	S. W. Tracking Coil
6	1X16588	I. F. Coil & Shield Assembly
7	1X16167	Diode Coil & Shield Assembly
8	25A15072	Output Transformer
9	1X14887	Tuner, Gang & Pulley
10	20A10040	Trimmer & L Bracket (2-22 mmf)
11-A	20A11011	Trimmer & Z Bracket (2-22 mmf)
11-B	20A11011	Trimmer & Z Bracket (2-22 mmf)
12	20X10996	Trimmer & Padder. (B.C.Osc.)
13	20X12535	Padder & Z Bracket (70 mmf nom)
• 14	20A11047	Compensator Condenser
15	839800	Tubular Condenser (.003-1000V.)
16	839809	Tubular Condenser (.01-400V.)
• 17	839828	Tubular Condenser (.03-600V.)
18	839804	Tubular Condenser (.03-400V.)
• 19-A	839805	Tubular Condenser (.03-100V.)
19-B	839805	Tubular Condenser (.03-100V.)
20	839805	Tubular Condenser (.05-100V.)
21	839806	Tubular Condenser (.1-200V.)
22	839807	Tubular Condenser (.1-400V.)
23	23A15246	Electrolytic Condenser (EP)
24	25A15086	Power Transformer
25-A	2136500	Molded Mica Cond. (500 mmf) 20%
25-B	2136500	Molded Mica Cond. (500 mmf) 20%
26	2136517	Molded Mica Cond. (250 mmf) 20%
27	2136511	Molded Mica Cond. (100 mmf) 20%
• 28	2136503	Molded Mica Cond. (50 mmf) 20%
29	15K15053	Vol. Cont. & Switch (.5 meg)
30	686071	Carbon Res. (1 meg-1/3-20) N.I.
31	686000	Carbon Res. (820,000-1/3-20) N.I.
32	686188	Carbon Res. (470,000-1/3-20) N.I.
33-A	686003	Carbon Res. (220,000-1/3-20) N.I.
33-B	686003	Carbon Res. (220,000-1/3-20) N.I.
• 34-A	686020	Carbon Res. (47,000-1/3-20) N.I.
34-B	686020	Carbon Res. (47,000-1/3-20) N.I.
35	686061	Carbon Res. (33,000-1/2-20) N.I.
• 36	686050	Carbon Res. (22,000-1/3-20) N.I.
37	686013	Carbon Res. (15,000-1-20) N.I.
38	686100	Carbon Res. (12,000-1/2-20) N.I.
39	686113	Carbon Res. (10,000-1/3-20) N.I.
• 40	686053	Carbon Res. (1000-1/3-20) N.I.
41	686102	Carbon Res. (270-1/3-20) N.I.
42	686035	Carbon Res. (270-1-10) N.I.
43	686200	Carbon Res. (39-1/3-20) N.I.
44	40A15073	Band Switch (4 pole - 2 pos.)
45-A	65X10367	Bulb (Blue Bead) #44 Clear
45-B	65X10367	Bulb (Blue Bead) #44 Clear
46	26X10881	Tube Shield Shell
47	26X10802	Tube Shield Cap
48	26X14616	Tube Shield Half
49	30K14644	Line Cord & Plug (6 ft.)
50	50B15059	Speaker (6" Electro) FOR 61C-A
51	50B15170	Speaker (10" Electro) FOR 61D-A

Motorola
MODEL 61 C
MODEL 61 D
WITH R. F. STAGE

MODELS 61CA,61DA
(With Separate Osc)
Schematic,Coils

GALVIN MFG. CORP.


6A7 MODULATOR
6D6 I.F. AMP.
75 DET.-AVC-A.F.
41 PWR. AMP.
* 76 OSCILLATOR
80 RECTIFIER
ANTENNA LEAD
GROUND LEAD
* NOTE: MODELS 61CA 61DA HAVE SEPARATE OSCILLATOR. SEE 61C-61D SCHEMATIC FOR SET WITH R.F. STAGE
NOTE: DETAIL SHOWN HERE APPLIES TO 61D&61DA ONLY. SEE 61C-61D CIRCUIT FOR 61C&61CA SPKR LEAD DETAIL
MALE PLUG ON SPEAKER
PIN VIEW
LUG VIEW
SOCKET ON CABLE
TELEVISION
VOL. CONT.
1 MEG TONE CONT.
STOP AT 5KΩ
117V.-60~ 65 WATTS
LINE SWITCH ON VOL. CONT.
DIAL LIGHT 6-8V .25A. #44
B.C. PADDER
S.W. PADDER
S.W. TRACKING COIL
COMPENSATOR
B.C. ANT. COIL CONNECTIONS (PRI VIEW)
S.W. ANT. COIL CONNECTIONS (PRI. VIEW)
B.C. OSC. COIL CONNECTIONS (PRI VIEW)
S.W. OSC COIL CONNECTIONS (PRI. VIEW)
BAND SWITCH CONNECTIONS (BACK VIEW IN B.C. POS.)
POSITION LUG
FRONT LUG
BACK LUG
DUMMY

IF PEAK 455 KC

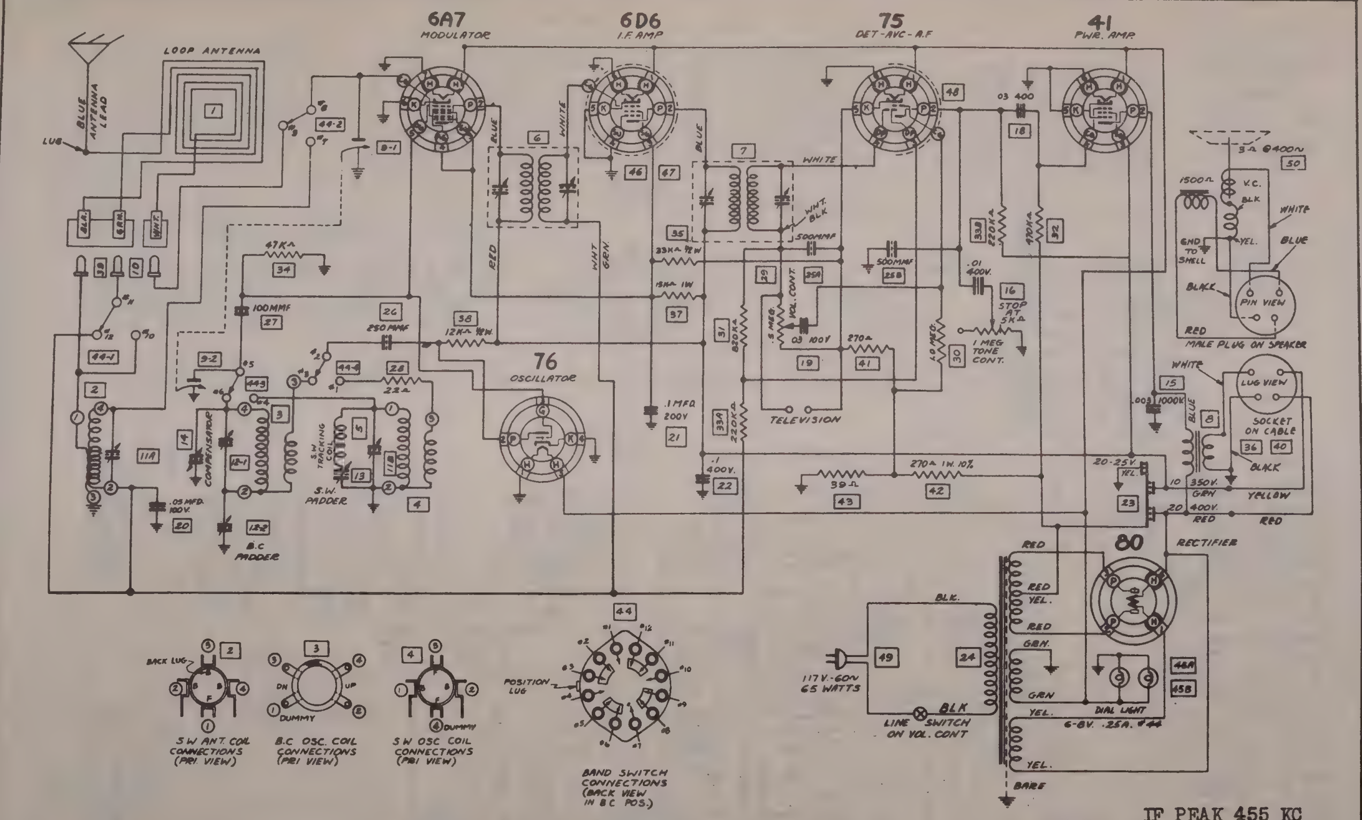
1	24A15173	B. C. Antenna Coil (Black Dot)
2	24A15090	S. W. Antenna Coil (Black Dot)
3	24A11002	B. C. Oscillator Coil
4	24A11955	S. W. Oscillator Coil
5	24A10998	S. W. Tracking Coil
6	1X16538	I. F. Coil & Shield Assembly
7	1X16137	Diode Coil & Shield Assembly
8	25A15072	Output Transformer
9	1X14887	Tuner, Gang & Pulley
10	20A10040	Trimmer & L Bracket (2-22 mmf)
11-A	20A11011	Trimmer & Z Bracket (2-22 mmf)
11-B	20A11011	Trimmer & Z Bracket (2-22 mmf)
12	20K10796	Trimmer & Padder (B.C.Osc.)
13	20K12393	Padder & Z Bracket (70 mmf nom.)
• 14	20K16315	Compensating Condenser
15	8S9800	Tubular Condenser (.003-1000V.)
16	8S9809	Tubular Condenser (.01-400V.)
• 17	18A16003	Tone Control (1 meg.)
18	8S9804	Tubular Condenser (.03-400V.)
19	8S9803	Tubular Condenser (.03-100V.)
20	8S9805	Tubular Condenser (.05-100V.)
21	8S9806	Tubular Condenser (.1-200V.)
22	8S9807	Tubular Condenser (.1-400V.)
23	23A15246	Electrolytic Condenser (EF)
24	25A15086	Power Transformer
25-A	21B6500	Molded Mica Cond. (500 mmf) 20%
25-B	21B6500	Molded Mica Cond. (500 mmf) 20%
26	21B6517	Molded Mica Cond. (250 mmf) 20%
27	21B6511	Molded Mica Cond. (100 mmf) 20%
• 28	21B6503	Molded Mica Cond. (50 mmf) 20%
29	18K15058	Vol. Cont. & Switch (.5 meg)
30	6B6071	Carbon Res. (1 meg-1/3-20) N.I.
31	6B6000	Carbon Res. (820,000-1/3-20) N.I.
32	6B6139	Carbon Res. (470,000-1/3-20) N.I.
33-A	6B6003	Carbon Res. (220,000-1/3-20) N.I.
33-B	6B6003	Carbon Res. (220,000-1/3-20) N.I.
34	6B6020	Carbon Res. (47,000-1/3-20) N.I.
35	6B6061	Carbon Res. (33,000-1/2-20) N.I.
36	1X15172	Speaker Cable Assembly (For 61DA)
37	6B6013	Carbon Res. (15,000-1-20) N.I.
38	6B6100	Carbon Res. (12,000-1/2-20) N.I.
39	6B6113	Carbon Res. (10,000-1/3-20) N.I.
40	9K11092	Speaker Cable, Receptacle (For 61DA)
41	6B6102	Carbon Res. (270-1/3-20) N.I.
42	6B6035	Carbon Res. (270-1-10) N.I.
43	6B6200	Carbon Res. (39-1/3-20) N.I.
44	40A15073	Band Switch (4 Pole - 2 Pos.)
45-A	65X10867	Bulb (Blue Bead) #44 Clear
45-B	65X10867	Bulb (Blue Bead) #44 Clear
46	26X10881	Tube Shield Shell
47	26X10882	Tube Shield Cap
48	26X4316	Tube Shield Half
49	30K14644	Line Cord & Plug (6 ft.)
50	50B15059	Speaker (6" Electro) FOR 61CA
51	50B15170	Speaker (10" Electro) FOR 61DA

Motorola
MODEL 61D
MODEL 61C
WITH SEPARATE OSCILLATOR

MODELS 61C and 61D (with separate oscillator)

MODEL 61D(With Loop)
Schematic,Coils

GALVIN MFG. CORP.



•	1	1X16743	Loop Antenna (Less Back)
	2	24A15090	S. W. Antenna Coil (Black Dot)
	3	24A11002	B. C. Oscillator Coil
	4	24A11955	S. W. Oscillator Coil
	5	24A10998	S. W. Tracking Coil
	6	1X16588	I. F. Coil & Shield Assembly
	7	1X16187	Diode Coil & Shield Assembly
	8	25A15072	Output Transformer
	9	1X14887	Tuner, Gang & Pulley
•	10	31A16715	Loop Terminal Strip (Single)
	11-A	20A11011	Trimmer & Z Bracket (2-22 mmf)
	11-B	20A11011	Trimmer & Z Bracket (2-22 mmf)
	12	20K10996	Trimmer & Padder (B. C. Osc.)
	13	20K12383	Padder & Z Bracket (70 mmf Nom.)
	14	20K16315	Compensating Condenser
	15	8S9800	Tubular Condenser (.003-1000V.)
	16	8S9809	Tubular Condenser (.01-400V.)
	17	18A16083	Tone Control (1 meg)
	18	8S9804	Tubular Condenser (.03-400V.)
	19	8S9803	Tubular Condenser (.03-100V.)
	20	8S9805	Tubular Condenser (.05-100V.)
	21	8S9806	Tubular Condenser (.1-200V.)
	22	8S9807	Tubular Condenser (.1-400V.)
	23	23A15246	Electrolytic Condenser (EP)
	24	25A15086	Power Transformer
	25-A	2185500	Molded Mica Cond. (500 mmf) 20%
	25-B	2186500	Molded Mica Cond. (500 mmf) 20%
	26	2186517	Molded Mica Cond. (250 mmf) 20%
	27	2186511	Molded Mica Cond. (100 mmf) 20%
•	28	2136503	Molded Mica Cond. (50 mmf) 20%
	29	18A15058	Vol. Cont. & Switch (.5 meg)
	30	6B6071	Carbon Res. (1 meg-1/3-20) N.I.
	31	6B6000	Carbon Res. (820,000-1/3-20) N.I.
	32	6B6188	Carbon Res. (470,000-1/3-20) N.I.
	33-A	6B6003	Carbon Res. (220,000-1/3-20) N.I.
	33-B	6B6003	Carbon Res. (220,000-1/3-20) N.I.
	34	6B6020	Carbon Res. (47,000-1/3-20) N.I.
	35	6B6161	Carbon Res. (33,000-1/2-20) N.I.
	36	1X15172	Speaker Cable Assembly
	37	6B6013	Carbon Res. (15,000-1-20) N.I.
	38	6B6100	Carbon Res. (12,000-1/2-20) N.I.
	39	31A16716	Loop Terminal Strip (Double)
	40	9X11092	Speaker Cable Receptacle
	41	6B6102	Carbon Res. (270-1/3-20) N.I.
	42	6B6035	Carbon Res. (270-1-10) N.I.
•	43	6B6200	Carbon Res. (39-1/3-20) N.I.
•	44	40A15073	Band Switch (4 Pole - 2 Pos.)
•	45-A	65X10067	Bulb (Blue Bead) #44 Clear
•	45-B	65X10067	Bulb (Blue Bead) #44 Clear
	46	26X10381	Tube Shield Shell
	47	26X10382	Tube Shield Cap
	48	26X4616	Tube Shield Half
	49	30K1644	Line Cord & Plug (6 ft.)
	50	50B15170	Speaker (10" Electro)

IF PEAK 455 KC

Motorola

MODEL 61 D

(with loop antenna)

MODEL 61D (with loop antenna)

MODELS 61C,61D
MODEL 81C
Socket,Trimmers
Alignment,Voltage
Sensitivity,Gain

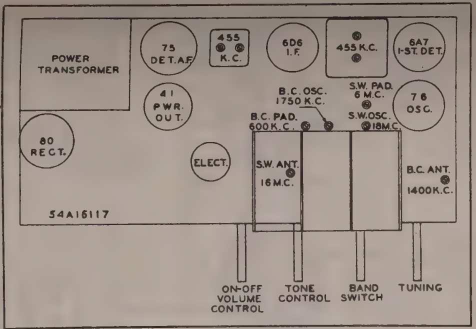


FIG 2 TRIMMERS 6C and 8C Chassis

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 200 MMF condenser in place of .1 MF.

To measure over-all sensitivity of loop models, connect the signal generator to the coupling turn in the loop, using a 400 ohm dummy. The lead, including the resistor should be thoroughly shielded and the receiver must be at least 3 ft. away from the signal generator.

The figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

MODELS 61C AND 61D

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3000	455 K.C.	IF Grid	.1 MF	.5 Meg	.38 Volts
35	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.38 Volts
45	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.38 Volts
15	600 K.C.	Ant. Grid	200 MMF	None	.38 Volts

MODEL 61D (WITH LOOP)

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3000	455 K.C.	IF Grid	.1 MF	.5 Meg	.38 Volts
35	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.38 Volts
45	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.38 Volts
15	600 K.C.	Ant. Lead	400 Ohms	None	.38 Volts

MODEL 81C (SQUARE LOOP)

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2500	455 K.C.	IF Grid	.1 MF	.5 Meg	.63 Volts
35	455 K.C.	Mod. Grid	.1 MF	.5 Meg	.63 Volts
40	600 K.C.	Mod. Grid	.1 MF	.5 Meg	.63 Volts
15	600 K.C.	Ant. Lead	400 Ohms	None	.63 Volts

* For .05 Watt output.

** Output meter connected across voice coil.

ALIGNMENT PROCEDURE

MODELS 61C AND 61D (WITHOUT LOOP ANTENNA)

1. Connect signal generator to control grid of 1st Det. tube (6A7) through a .05 MF. condenser. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.
2. Set signal generator at 455 K.C. and carefully adjust the four I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.
3. Leave band switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead. (Antenna — blue wire; ground — black wire.)
4. Set signal generator at 1750 K.C. Adjust BC OSC. trimmer until 1750 K.C. signal is heard.
5. Set signal generator at 1400 K.C. and turn condenser gang to signal at 1400 K.C. Adjust BC ANT. trimmer to point showing highest reading on output meter.
6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. Use short wire for pick-up if necessary.
7. Turn band switch to "Short Wave" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.
8. Set signal generator and receiver dial both at 18.0 MC. Adjust S.W. OSC. trimmer until 18.0 MC signal is heard.
9. Set signal generator at 16.0 MC and turn condenser gang to signal at 16.0 MC. Adjust S.W. ANT. trimmer to point giving greatest output reading.
10. Set signal generator at 6.0 MC and rock pointer at 6.0 MC position on dial scale, while adjusting S.W. padder, until combination is found which gives highest output reading. (NOTE: May also be adjusted to maximum noise.)

MODEL 61D WITH LOOP ANTENNA

1. Loop should be connected to chassis during alignment.
2. Alignment procedure is the same as above except for step 5, which should be omitted, as there is no BC ANT. trimmer in the loop version of this model.

MODEL 81C WITH CYLINDRICAL LOOP

1. When the chassis is aligned on the service bench, the loop may be disconnected if the WHITE and BLUE pin terminals are clipped or wired together. See Fig. 2 for trimmer locations.
2. Alignment procedure is the same as for Model 61C, plus the wave trap adjustment which is as follows:
3. Feed 455 KC signal into antenna lead and adjust wave trap trimmer to minimum reading on output meter.

MODEL 81C WITH SQUARE LOOP

1. Loop should be connected to chassis during alignment.
2. Alignment procedure is the same as for Model 61C, except for Step 5, which should be omitted, as there is no BC ANT. trimmer in this model.
3. There is no wave trap adjustment.

VOLTAGE CHARTS

61C AND 61D

Tube	Position	Plate	Screen	Cathode
[illegible]	OSC	150	....	0
6A7	Mod	250	85	0
6D6	I.F.	250	85	0
75*	Det. AVC	100	....	2
41**	Output	285	250	0
[illegible]	Rect.	A. C.	....	800

* Bias—3.0 volts measured across resistor 43.

** Bias —19.0 volts measured across resistor 43.

81C

Tube	Position	Plate	Screen	Cathode
76	OSC	130	....	0
6A7*	Mod	260	95	0
6D6*	I.F.	260	95	0
6Q7G**	Det. AVC	65	....	3
6Q7G**	INV	120	....	3
41	Output	255	260	19
41	Output	255	260	19
80	Rect.	AC	....	330

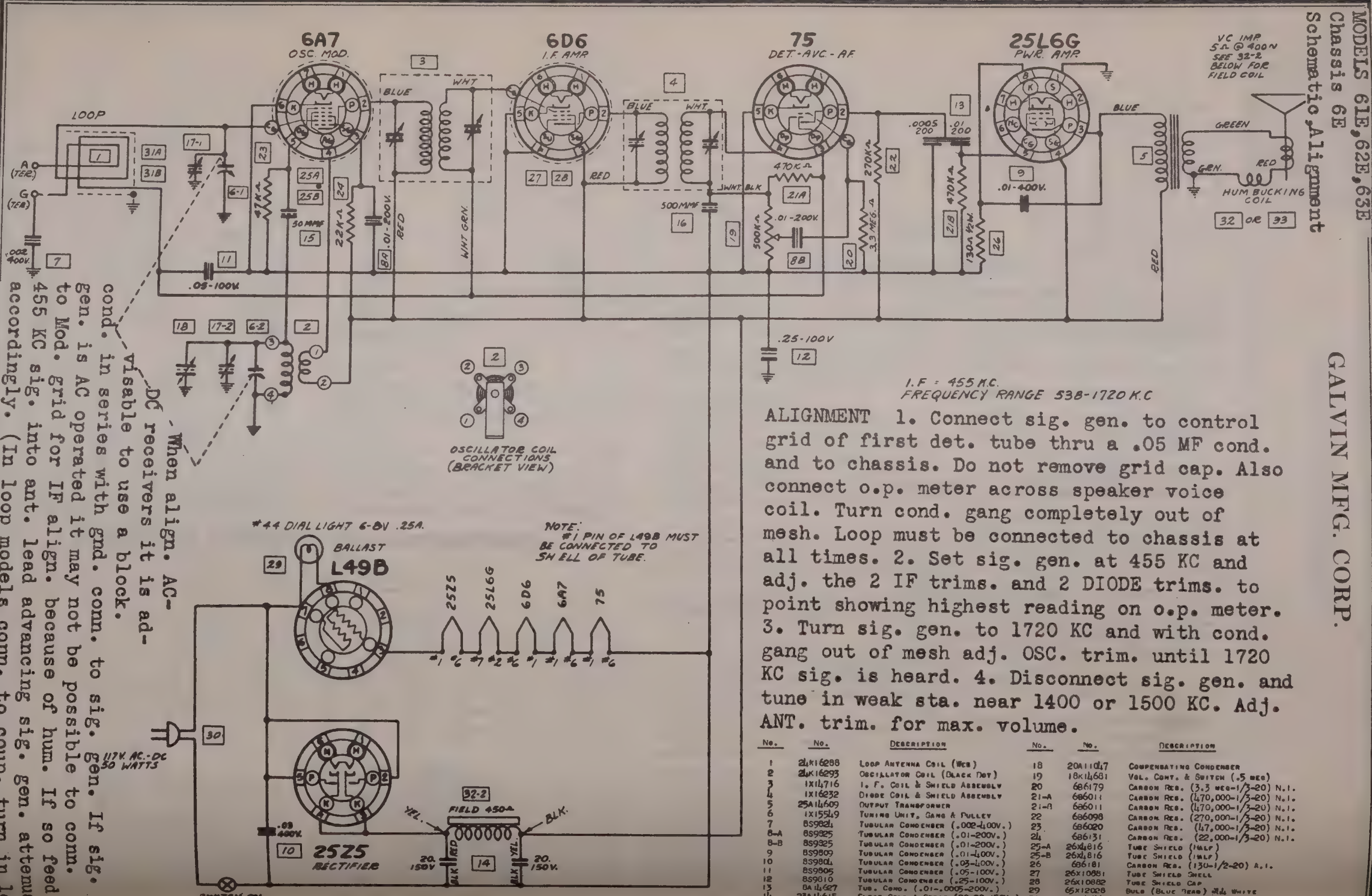
* Bias—3.0 volts measured across resistor 43.

** Bias—1.5 volt measured across resistors 43 and 44.

Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.

MODELS 61E,62E,63E
Chassis 6E
Schematic,Alignment

GALVIN MFG. CORP.



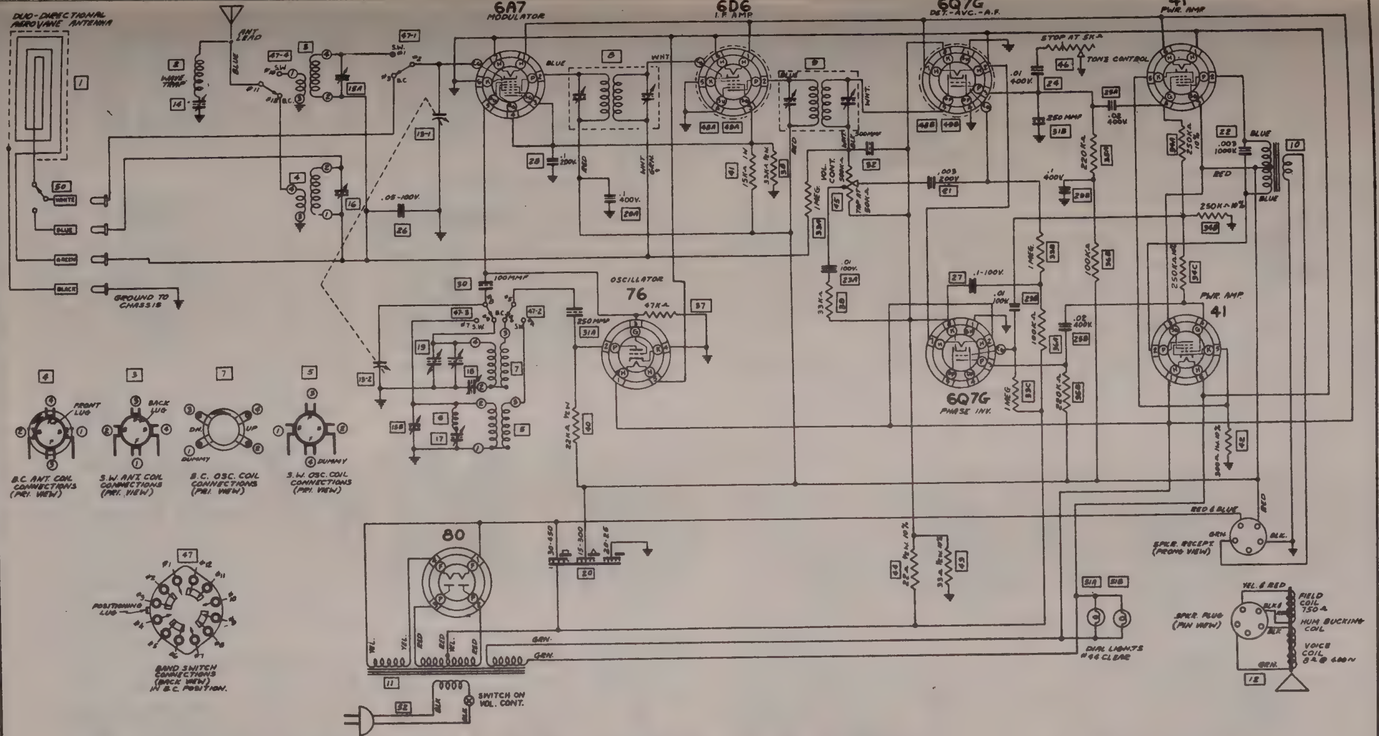
I.F. = 455 K.C.
FREQUENCY RANGE 538-1720 K.C.

ALIGNMENT 1. Connect sig. gen. to control grid of first det. tube thru a .05 MF cond. and to chassis. Do not remove grid cap. Also connect o.p. meter across speaker voice coil. Turn cond. gang completely out of mesh. Loop must be connected to chassis at all times. 2. Set sig. gen. at 455 KC and adj. the 2 IF trims. and 2 DIODE trims. to point showing highest reading on o.p. meter. 3. Turn sig. gen. to 1720 KC and with cond. gang out of mesh adj. OSC. trim. until 1720 KC sig. is heard. 4. Disconnect sig. gen. and tune in weak sta. near 1400 or 1500 KC. Adj. ANT. trim. for max. volume.

No.	No.	Description	No.	No.	Description
1	24K16288	Loop Antenna Coil (Wcb)	18	20A11047	Compensating Condenser
2	24K16293	Oscillator Coil (Black Dot)	19	18K14681	Vol. Cont. & Switch (.5 meg)
3	1X14716	I. F. Coil & Shield Assembly	20	686179	Carbon Res. (3.3 meg-1/3-20) N.I.
4	1X16232	Diode Coil & Shield Assembly	21-A	686011	Carbon Res. (470,000-1/3-20) N.I.
5	25A14609	Output Transformer	21-B	686011	Carbon Res. (470,000-1/3-20) N.I.
6	1X15549	Tuning Unit, Gang & Pulley	22	686098	Carbon Res. (270,000-1/3-20) N.I.
7	8S9824	Tubular Condenser (.002-400V.)	23	686020	Carbon Res. (47,000-1/3-20) N.I.
8-A	8S9825	Tubular Condenser (.01-200V.)	24	686131	Carbon Res. (22,000-1/3-20) N.I.
8-B	8S9825	Tubular Condenser (.01-200V.)	25-A	26X4816	Tube Shield (Half)
9	8S9809	Tubular Condenser (.01-400V.)	25-B	26X4816	Tube Shield (Half)
10	8S9804	Tubular Condenser (.03-400V.)	26	686181	Carbon Res. (130-1/2-20) A.I.
11	8S9805	Tubular Condenser (.05-100V.)	27	26X10881	Tube Shield Shell
12	8S9810	Tubular Condenser (.25-100V.)	28	26X10882	Tube Shield Cap
13	8A14627	Tub. Cond. (.01-.0005-200V.)	29	65X12028	Bulb (Blue Bead) 44 White
14	23A14615	Elect. Cond. & Strap (20-20-150V.)	30	30K1464	Line Cord & Plug (6 ft.)
15	2186503	Molded Mica Cond. (50 mmf) 20%	31-A	26B15412	Electrostatic Shield
16	2186500	Molded Mica Cond. (500 mmf) 20%	[illegible]	[illegible]	Speaker (5" Electro) for 63E

When align. AC-DC receivers it is advisable to use a block. cond. in series with gnd. conn. to sig. gen. If sig. gen. is AC operated it may not be possible to conn. to Mod. grid for IF align. because of hum. If so feed 455 KC sig. into ant. lead advancing sig. gen. attenuator accordingly. (In loop models conn. to coup. turn in loop.

MODEL 81C
(Cylindrical Loop)
Schematic



MODEL 81C (with cylindrical loop)

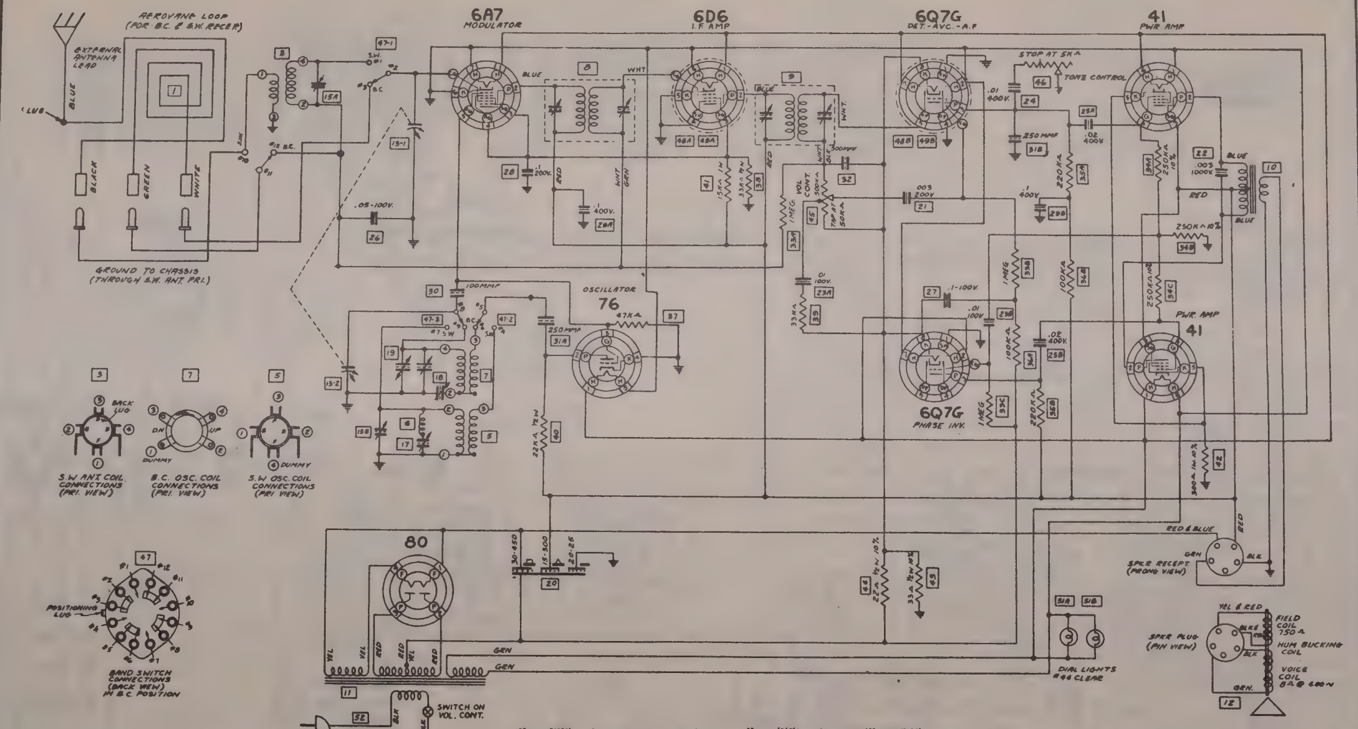
IF PEAK 455 KC

Motorola
MODEL 81C
WITH CYLINDRICAL LOOP

1	24D15842	Loop Antenna & Shield
2	24A11405	Wave Trap Coil
3	24A19829	S. W. Antenna Coil (Red Dot)
4	24A19828	B. C. Antenna Coil (Violet Dot)
5	24A16571	S. W. Oscillator Coil (Red Dot)
6	24A10998	S. W. Tracking Coil
7	24A11002	B. C. Oscillator Coil (White Dot)
8	1X16580	I. F. Coil & Shield Assembly
9	1X16187	Diode Coil & Shield Assembly
10	25A14983	Output Transformer
11	25B19829 or 25B19585	Power Transformer Power Transformer
12	50B15123	Speaker (12" Electro)
13	1X19913	Tuning Unit, Gang & Pulley
14	20A11787	Trimmer & Z Bracket (28 Nom.)
15-A	20A11011	Trimmer & Z Bracket (2-22)
15-B	20A11011	Trimmer & Z Bracket (2-22)
16	20A10040	Trimmer & L Bracket (2-22)
17	20K12383	Trimmer & Z Bracket (70 Nom.)
18	20K10996	Trimmer & Padder (8 & 450)
19	20K16515	Compensating Condenser
20	23A14963	Electrolytic Condenser (Cd)
21	859820	Tubular Condenser (.003-200V.)
22	859800	Tubular Condenser (.003-1000V.)
23-A	859801	Tubular Condenser (.01-100V.)
23-B	859801	Tubular Condenser (.01-100V.)
24	859809	Tubular Condenser (.01-400V.)
25-A	859802	Tubular Condenser (.02-400V.)
25-B	859802	Tubular Condenser (.02-400V.)
26	859805	Tubular Condenser (.05-100V.)
27	859814	Tubular Condenser (.1-100V.)
28	859806	Tubular Condenser (.1-200V.)
29-A	859807	Tubular Condenser (.1-400V.)
29-B	859807	Tubular Condenser (.1-400V.)
30	2136511	Molded Mica Cond. (100 mmf) 20%
31-A	2136517	Molded Mica Cond. (250 mmf) 20%
31-B	2136517	Molded Mica Cond. (250 mmf) 20%
32	2136500	Molded Mica Cond. (500 mmf) 20%
33-A	686071	Carbon Res. (1 meg-1/3-20) N.I.
33-B	686071	Carbon Res. (1 meg-1/3-20) N.I.
33-C	686071	Carbon Res. (1 meg-1/3-20) N.I.
34-A	686095	Carbon Res. (250,000-1/3-10) N.I.
34-B	686095	Carbon Res. (250,000-1/3-10) N.I.
34-C	686095	Carbon Res. (250,000-1/3-10) N.I.
35-A	686003	Carbon Res. (220,000-1/3-20) N.I.
35-B	686003	Carbon Res. (220,000-1/3-20) N.I.
36-A	686029	Carbon Res. (100,000-1/3-20) N.I.
36-B	686029	Carbon Res. (100,000-1/3-20) N.I.
37	686020	Carbon Res. (47,000-1/3-20) N.I.
38	686061	Carbon Res. (33,000-1/2-20) N.I.
39	686057	Carbon Res. (33,000-1/3-20) N.I.
40	686080	Carbon Res. (22,000-1/2-20) N.I.
41	686013	Carbon Res. (15,000-1-20) N.I.
42	686187	Carbon Res. (300-1-10) N.I.
43	686129	Carbon Res. (33-1/2-10) N.I.
44	686115	Carbon Res. (22-1/2-10) N.I.
45	18A15352	Volume Control & Switch (.5 meg)
46	18A16085	Tone Control (1 meg)
47	40A15073	Band Switch (Single Section)
48-A	26X10881	Tube Shield Shell
48-B	26X10881	Tube Shield Shell
49-A	26X10882	Tube Shield Cap
49-B	26X10882	Tube Shield Cap
50	1X15339	Switch & Bracket Assembly
51-A	65X10867	Bulb (Blue Bead) #44 Clear
51-B	65X10867	Bulb (Blue Bead) #44 Clear
52	30K14644	Line Cord & Plug (6 Ft.)

MODEL 81C
(Square Loop)
Schematic

GALVIN MFG. CORP.



IF PEAK 455 KC

Motorola
MODEL 81C
WITH SQUARE LOOP

1	1B16984	Loop Antenna Assembly
3	24A15829	S. W. Antenna Coil (Red Dot)
5	24A16571	S. W. Oscillator Coil (Red Dot)
6	24A10998	S. W. Tracking Coil
7	24A11002	B. C. Oscillator Coil (White Dot)
8	1X16588	I. F. Coil & Shield Assembly
9	1X16187	Diode Coil & Shield Assembly
10	25A14923	Output Transformer
11	25B15329	Power Transformer
or	25B15585	Power Transformer
12	50B15123	Speaker (12" Electro)
13	1X15913	Tuning Unit, Gang & Pulley
15-A	20A11011	Trimmer & Z Bracket (2-22)
15-B	20A11011	Trimmer & Z Bracket (2-22)
16	20A10040	Trimmer & L Bracket (2-22)
17	20K12383	Trimmer & Z Bracket (70 Nom.)
18	20K10996	Trimmer & Padder (8 & 450)
19	20K16315	Compensating Condenser
20	23A14963	Electrolytic Condenser (FP)
21	839820	Tubular Condenser (.003-200V.)
22	839800	Tubular Condenser (.003-1000V.)
23-A	839801	Tubular Condenser (.01-100V.)
23-B	839801	Tubular Condenser (.01-100V.)
24	839809	Tubular Condenser (.01-400V.)
25-A	839802	Tubular Condenser (.02-400V.)
25-B	839802	Tubular Condenser (.02-400V.)
26	839805	Tubular Condenser (.05-100V.)
27	839814	Tubular Condenser (.1-100V.)
28	8S9806	Tubular Condenser (.1-200V.)
29-A	8S9807	Tubular Condenser (.1-400V.)
29-B	8S9807	Tubular Condenser (.1-400V.)
30	2186511	Molded Mica Cond. (100 mmf) 20%
31-A	2186517	Molded Mica Cond. (250 mmf) 20%
31-B	2186517	Molded Mica Cond. (250 mmf) 20%
32	2186500	Molded Mica Cond. (500 mmf) 20%
33-A	686071	Carbon Res. (1 meg-1/3-20) N.I
33-B	686071	Carbon Res. (1 meg-1/3-20) N.I.
33-C	686071	Carbon Res. (1 meg-1/3-20) N.I.
34-A	686095	Carbon Res. (250,000-1/3-10) N.I
34-B	686095	Carbon Res. (250,000-1/3-10) N.I.
34-C	686095	Carbon Res. (250,000-1/3-10) N.I.
35-A	686003	Carbon Res. (220,000-1/3-20) N.I
35-B	686003	Carbon Res. (220,000-1/3-20) N.I
36-A	686029	Carbon Res. (100,000-1/3-20) N.I.
36-B	686029	Carbon Res.* (100,000-1/3-20) N.I
37	686020	Carbon Res.* (47,000-1/3-20) N.I
38	686061	Carbon Res. (33,000-1/2-20) N.I.
39	686037	Carbon Res. (33,000-1/3-20) N.I.
40	686088	Carbon Res. (22,000-1/2-20) N.I.
41	686013	Carbon Res. (15,000-1-20) N.I
42	686187	Carbon Res. (300-1-10) N.I.
43	686129	Carbon Res. (33-1/2-10) N.I
44	686115	Carbon Res. (22-1/2-10) N.I.
45	18A15332	Volume Control & Switch (.5 meg)
46	18A16083	Tone Control (1 meg)
47	40A15073	Band Switch (Single Section)
48-A	26X10881	Tube Shield Shell
48-B	26X10881	Tube Shield Shell
49-A	26X10882	Tube Shield Cap
49-B	26X10882	Tube Shield Cap
50	1X15839	Switch & Bracket Assembly
51-A	65X10867	Bulb (Blue Bead) #44 Clear
51-B	65X10867	Bulb (Blue Bead) #44 Clear
52	30K14444	Line Cord & Plug (6 Ft)

GALVIN MFG. CORP.

MODEL 82A
Clock Data
Tuner Notes

CHECKING CLOCK CONTINUITY

Although we have sealed the Time Tuning Clock against unauthorized tinkering, and have established a policy of voiding the guarantee if the seal is broken, it is possible to completely check the clock circuit for defects without removing the mechanism from its housing. This can be done by "ear" and by continuity.

The first step in checking a clock is to make sure that the motor runs and that it keeps accurate time. Just plug it into its receptacle on the chassis and check its time-keeping qualities against a known source of accurate time.

If this test indicates that the clock motor is not running, it would be advisable to make certain that the receptacle on the chassis base is "live" and that 110 volts, 60 cycle A.C. is available at that point.

Before attempting to check the clock continuity, it would be helpful to go through a little practice course in listening to the sounds the clock makes. First, remove the clock assembly from its mounting on the control panel of the receiver, and hold it in your hands while you turn the time set knob on the back. While turning the knob, hold the clock up to your ear, listening for the clicks. When the minute hand passes any of the four quarter-hour intervals into which each hour is divided, you will hear two clicks, the second of which falls very closely after the first one. These clicks are caused by the quarter-hour cam switch blades dropping off of the cams.

As you turn the time set knob, you will notice another single click which is a little louder and sounds a trifle more metallic than the double click which you get at the exact quarter-hour intervals. This single click will be heard when the minute hand is passing a point that is approximately half way between the quarter-hour positions. This click is caused by the contact on the twenty-four hour hand as it falls off of one time bar to make contact upon the next time bar.

If you will go through this operation several times, you will soon be able to identify these sounds. Once you are able to recognize them, you will be able to thoroughly check the continuity of the clock control circuit, without the necessity of looking inside the mechanism. Proceed as follows:

1. With the time set knob, turn the clock hands until they read fifteen minutes to twelve on the day cycle. Look through the peep-hole to make sure of this.
2. Slowly turn the time set knob forward until the minute hand indicates approximately two minutes to twelve. In the course of this movement you will hear, unless the clock is defective, a single click which indicates that the twenty-four hour contact has come to rest upon the twelve o'clock noon time bar.
3. Now *very slowly* continue to turn the time set knob forward until you hear the first click, which indicates that the top blade of the twenty-four hour cam switch has fallen off of the large cam, causing the cam switch circuit to close. As soon as you hear this first click, stop turning the time set knob, for if you turn it far enough to hear the second click, the contact will be broken. The trick is to turn it just far enough, but not too far.
4. Clear the clock of all previous settings by inserting a finger in the "OFF" position of the finger dial, and dialing counter-clockwise until the stop is reached.
5. With the round time-selecting knob on the front of the clock, turn the red time selecting pointer to 12:00 o'clock noon.
6. With a continuity meter, check continuity between Terminal No. 9 and all of the other terminals on the plug at the end of the clock cable. You should get no reading. Terminal No. 9 is connected to the common lead.
7. Dial the "OFF" position just as you would if you were setting up the clock to turn the radio off at 12:00 o'clock noon. Check continuity between Terminal No. 9 and Terminal No. 7. You should get a full scale reading indicating a complete circuit. (Terminal No. 7 connects to the off relay when the clock is plugged into the chassis).
8. Dial Station No. 1 and check continuity between Terminal No. 9 and Terminal No. 1 of the clock cable. A full scale reading should result.
9. In their respective order, dial Stations 2, 3, 4, 5, and 6, checking continuity after each dialing between Terminal No. 9 and Terminals 2, 3, 4, 5, and 6, respectively. In each case you should get a full scale deflection of your continuity meter between Terminal No. 9 and the terminal which corresponds in number to the position you have dialed on the finger ring.

The procedure through which you have gone up to this point will, if the proper readings have been obtained, tell you that the slider on the time bar which represents the 12:00 o'clock noon position, is making a proper contact with each of the station rings and the "OFF" ring in the clock.

10. Next turn the clock hands knob to the 12:15 o'clock position, also turn the red time-selecting pointer to the 12:15 o'clock position, and repeat Steps 1 to 9 for the 12:15 o'clock position. To check the clock 100%, it will be necessary to repeat the procedure ninety-six times, one for each fifteen minute interval of the twenty-four hour day.

However, if the test which you have made at the 12:00 o'clock noon position shows the mechanism to be O.K. it should not be necessary to go through the entire operation. A test made at 12:00 o'clock noon and 12:00 o'clock midnight, and tests at 6:00 A.M. and 6:00 P.M. should give you a fairly accurate test. However, it is possible that, due to damage or improper adjustment of one individual time bar or slider, the clock fails to operate at one particular quarter-hour period, although it operates as it should at all other times. In this case, a continuity test would be advisable at the particular time setting at which failure has been noted.

ELECTRIC TUNER SERVICE SUGGESTIONS

Following you will find a list of troubles you may experience with the automatic tuning system.

Each possible failure is followed by suggestions which may aid you in quickly solving your service problems with this model.

MOTOR DOES NOT RUN

1. Burned out 84 Tube (Black). This is a standby tube and should burn at all times.
2. ***Poor Contact at Push-Button Plug.*** Inspect the contacts between the plug and the receptacle on the chassis.
3. ***Open Circuit in Motor.*** Check all connections to motor and check motor winding for continuity.
4. 70 Mfd. motor starting condenser opened.
5. Motor magnet coil opened. (See Fig. 3.)
6. B plus fuse (No. 55 Pilot bulb) burned out. Accessible from rear of chassis base. (See Fig. 1.)
7. ***Magnet Fails To Release.*** If the magnet which has previously been energized, fails to release the latch bar for any reason, the motor cannot turn the mechanism.

MECHANISM RUNS SLUGGISHLY

1. ***Poor Contact Between Push-Button Plug and Receptacle.*** This will also result in voltage drop, and lessened motor power.
2. Tension on motor contact armature too great.
3. ***Gears Not Properly Meshed.*** Check all gears in assembly for binding due to improper meshing.
4. ***Defective Motor.***—Replace.

MOTOR FAILS TO REVERSE

1. ***Reversing Switch Not Properly Adjusted.*** See instructions elsewhere in this book.
2. ***Open Circuit in Motor.*** If one side of motor circuit is open, motor will run in one direction only.
3. ***Open Magnet Winding.*** An open magnet, will not pull latch down; consequently will not cause motor switch to reverse.
4. ***Latch Bar Spring Too Tight.*** If the latch bars operate under too much tension the magnet may not be able to pull the latch down.

FAILS TO RETAIN ORIGINAL SETTING

1. ***Latch Rings Not Locked Securely.*** The locking screw must be pulled down securely, otherwise, the shock of the sudden stopping will tend to slide the rings away from the original setting.
2. ***Original Setting Not Accurate.*** Resetting of magnets may be necessary after several days' use, during which time the mechanism goes thru a "Shaking down" process.
3. Cable assembly from station magnets touching latch bars. Dress cable.

IMPOSSIBLE TO SET UP STATIONS

1. ***Too Much Tension On Locking Levers.*** When the automatic locking screw is loose, the station rings should move freely. If the levers still hold the station rings partially locked, the screws which hold the levers in position should be loosened one-quarter to one-half turn.
2. ***Latch Rings "Out of Range."*** If the loosened latch rings slip on the drum until the notch falls out of reach of the latch bar, they can be brought back to position by following exactly the "setting procedure" outlined elsewhere in this book.

FAILS TO STOP AT STATION

1. ***Open Magnet Winding.*** Check for continuity and replace if necessary. Check latch bar cable assembly. See No. 6 below.
2. ***Latch Bar Defective.*** Inspect latch bar to make sure that it has not been damaged. Replace latch bar, if required.
3. ***Poor Contact at Push-Button Plug.*** A poor contact here means a voltage drop which reduces the pulling power of the magnet.
4. ***Improper Spacing of Magnet.*** Check the spacing between the latch bar armature and the magnet pole. When the tip of the latch bar is seated all the way down in the notch in the latch ring, the armature should not quite touch the magnet pole. A hair line of light should be visible between them.
5. ***Latch Rings Not Locked Securely.*** If the latch rings are very loose the motor will continue to run.
6. Cable assembly from station magnets, touching latch bars. Dress cable.

LATCH BAR STICKS IN NOTCH

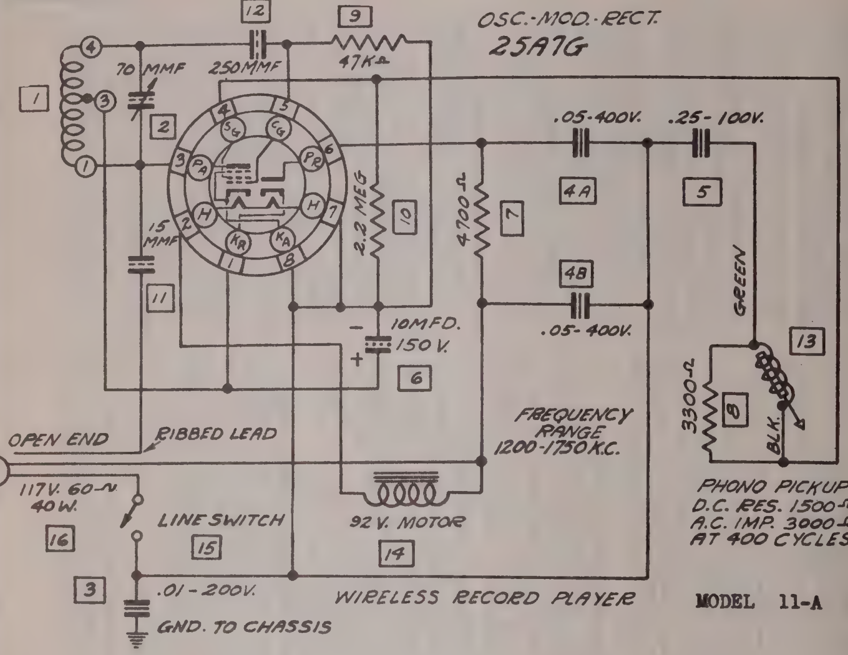
1. ***Latch Bar Spring Weak.*** Check latch bar tension spring to make sure it is pulling away from the magnet with sufficient force. Spring tension is adjustable.
2. ***Armature Rivet Worn.*** There is a brass rivet at the tip of the armature, to prevent the armature freezing to the magnet. If this rivet is worn down, permitting the steel armature to actually touch the magnet pole, it may freeze in that position.
3. ***Burr On Tip of Latch.*** Latch tip should be smooth and shiny.
4. ***Binding in Latch Bearings.*** Latch must move freely but not sloppy.
5. ***Latch Tips Not Centered On Latch Rings.*** Latch tips must not rub bakelite guide rings. The latch bar bearing shaft is adjustable.
6. ***Friction Clutch Too Tight.*** A tension washer between the motor pinion and the brass pinion collar acts as a friction clutch to absorb the shock of stopping the motor quickly when a station is tuned. If the tension is too tight, the torque of the stopped motor will hold the latch bar tip in the notch.

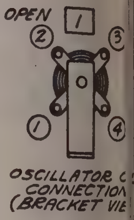
SET DOES NOT TURN ON

1. "B" Fuse burned out (No. 55 Pilot Bulb) See Fig. 1.
2. Standby rectifier (black 84 tube) burned out.
3. Defective relay. See Fig. 1. Return to your Motorola distributor or factory for service. Relay plugs into socket in chassis base.

MODEL 11A
MODEL 21A
Wireless Record Players
Schematics

GALVIN MFG. CORP.





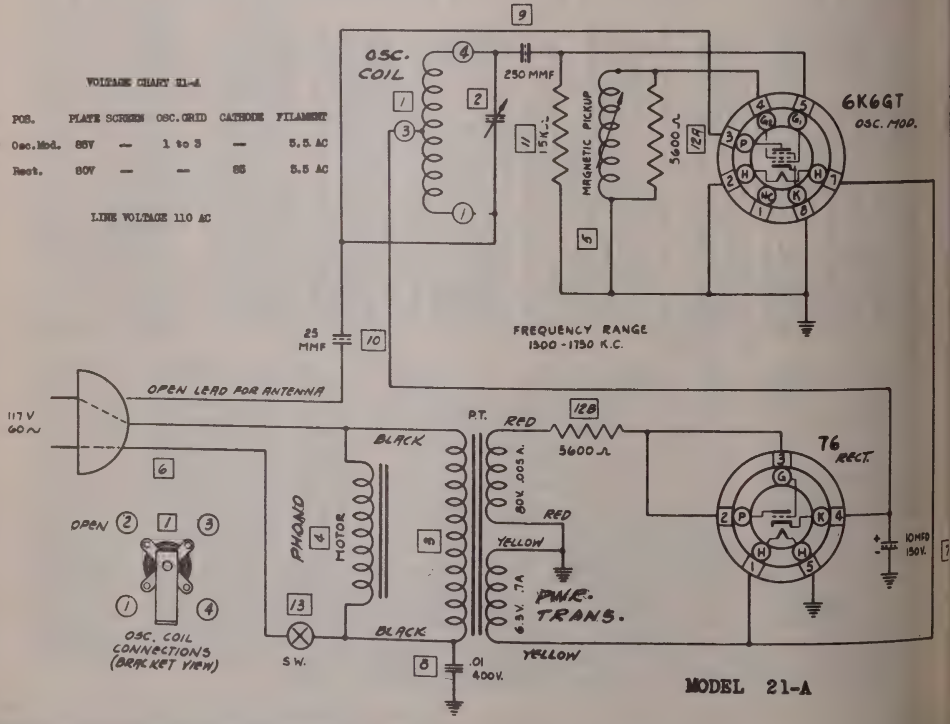
WIRELESS RECORD PLAYER

MODEL 11-A

VOLTAGE CHART 21-A

TUBE	POS.	PLATE	SCREEN	OSC.GRID	CATHODE	FILAMENT
6K6GT	Osc.Mod.	85V	—	1 to 3	—	5.5 AC
76	Rect.	80V	—	—	85	5.5 AC

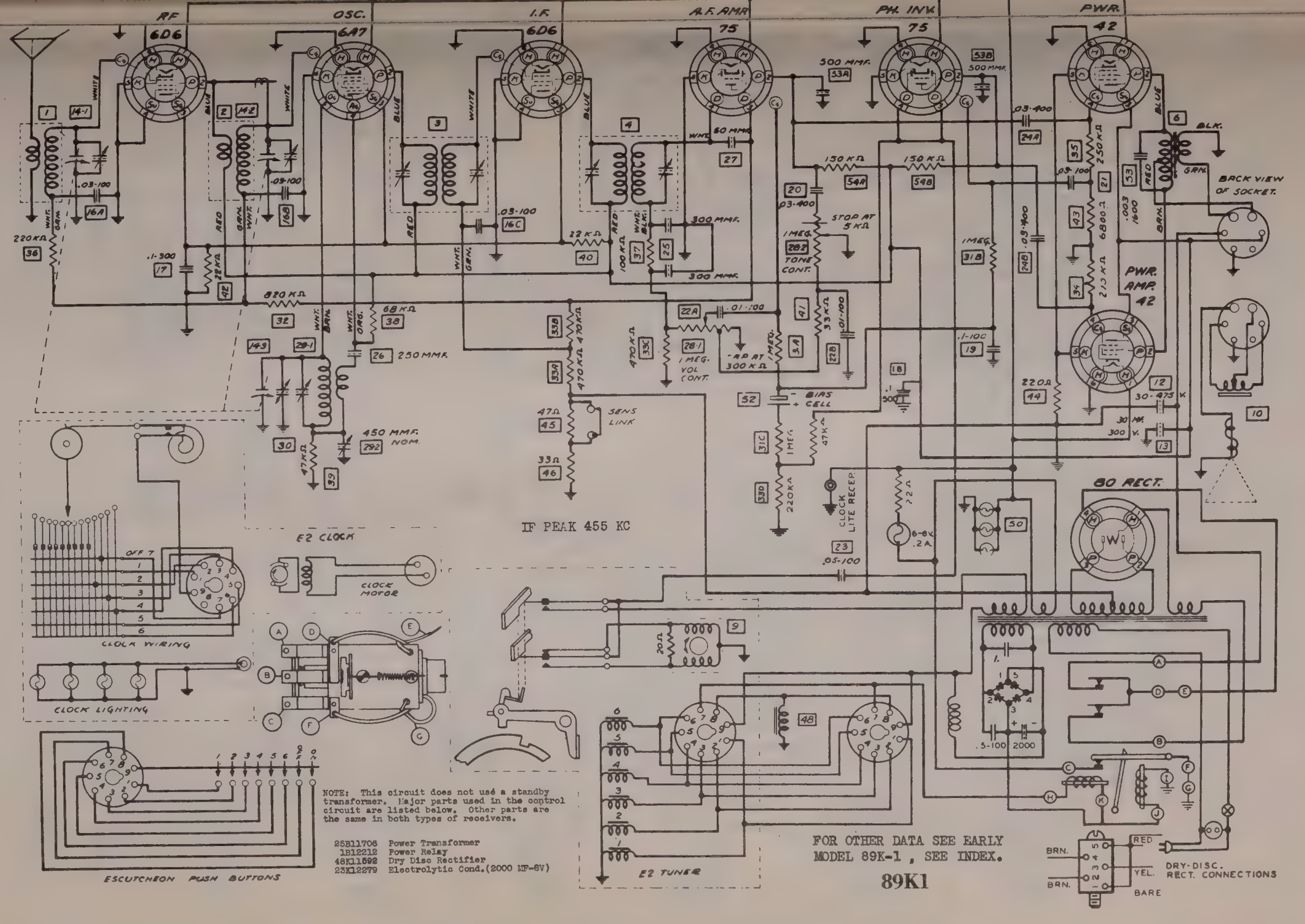
LINE VOLTAGE 110 AC



MODEL 21-A

GALVIN MFG. CORP.

MODEL 89K1,Type 2
Schematic



NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

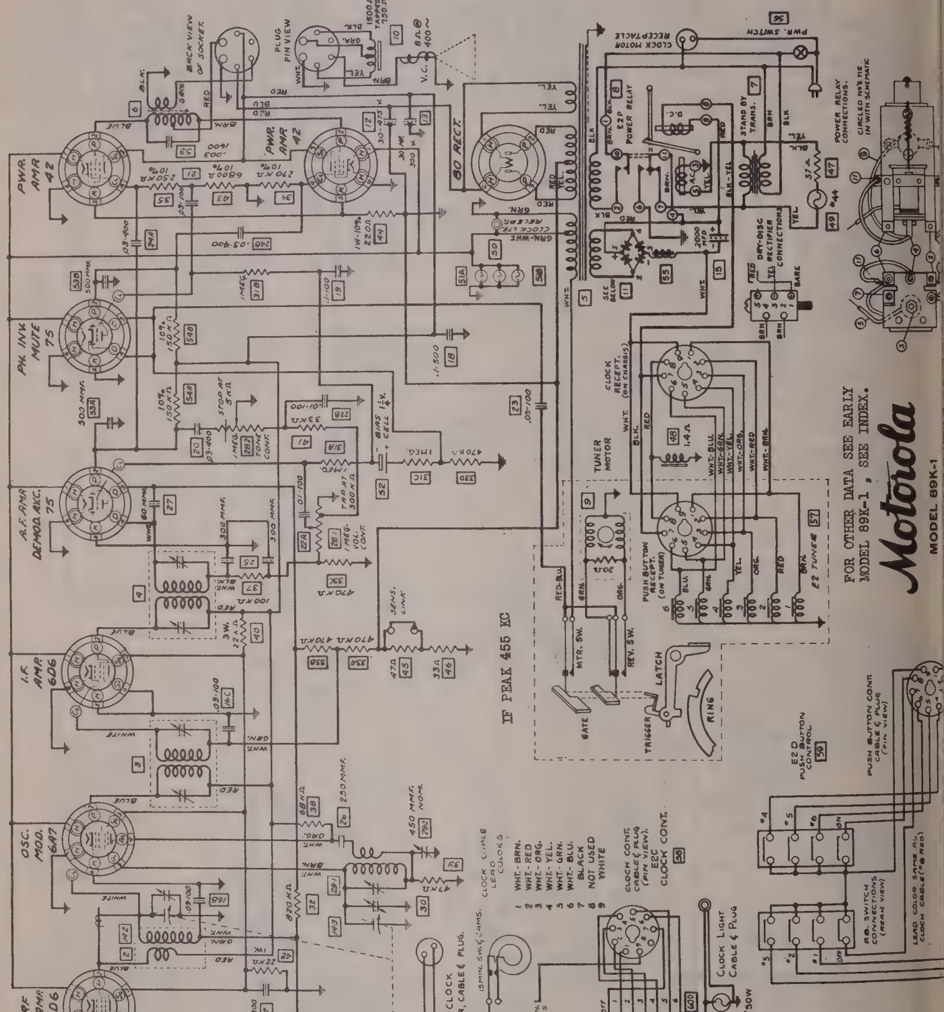
25B11706	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond.(2000 MF-6V)

FOR OTHER DATA SEE EARLY MODEL 89K-1 , SEE INDEX.

89K1

MODEL 89K1,Type 3
Schematic

GALVIN MFG. CORP.



IF PEAK 455 KC

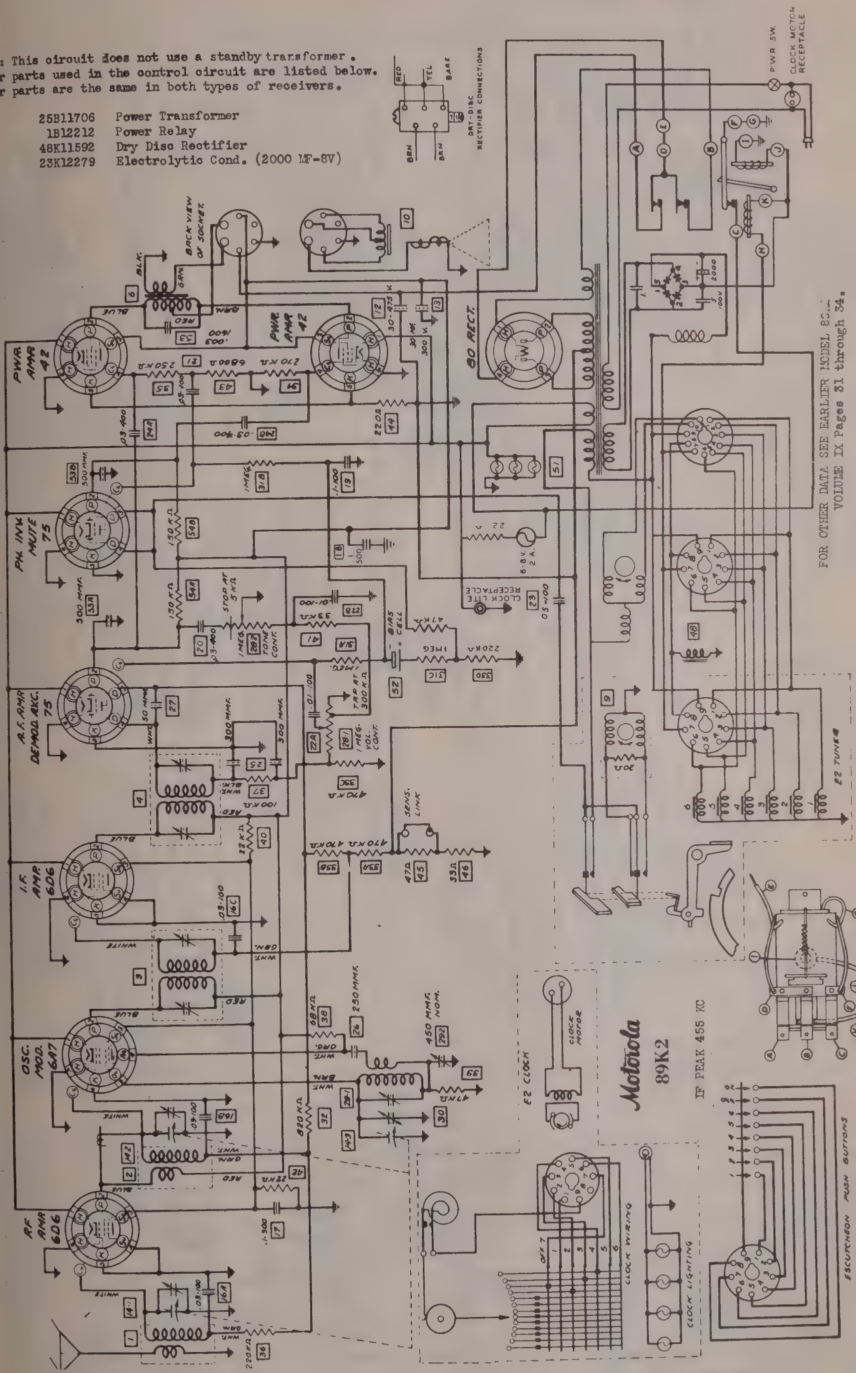
FOR OTHER DATA SEE EARLY MODEL 89K-1 , SEE INDEX.

MODEL 89K2,Type 2
Schematic

GALVIN MFG. CORP.

NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

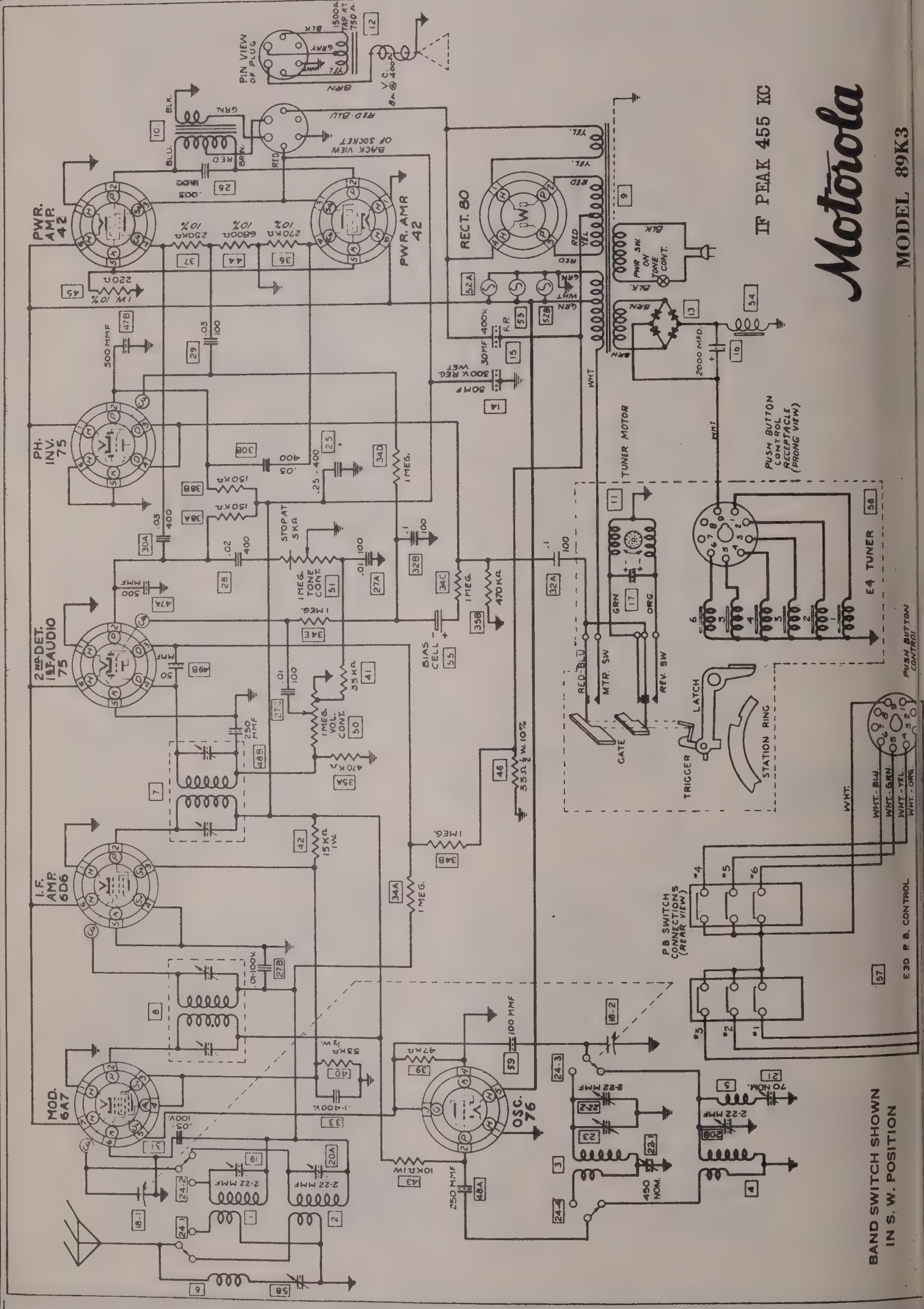
25B11706	Power Transformer
1B12212	Power Relay
48K11592	Dry Disc Rectifier
23K12279	Electrolytic Cond. (2000 MF-8V)



FOR OTHER DATA SEE EARLIER MODEL 8C..
VOLUME IX Pages 31 through 34.

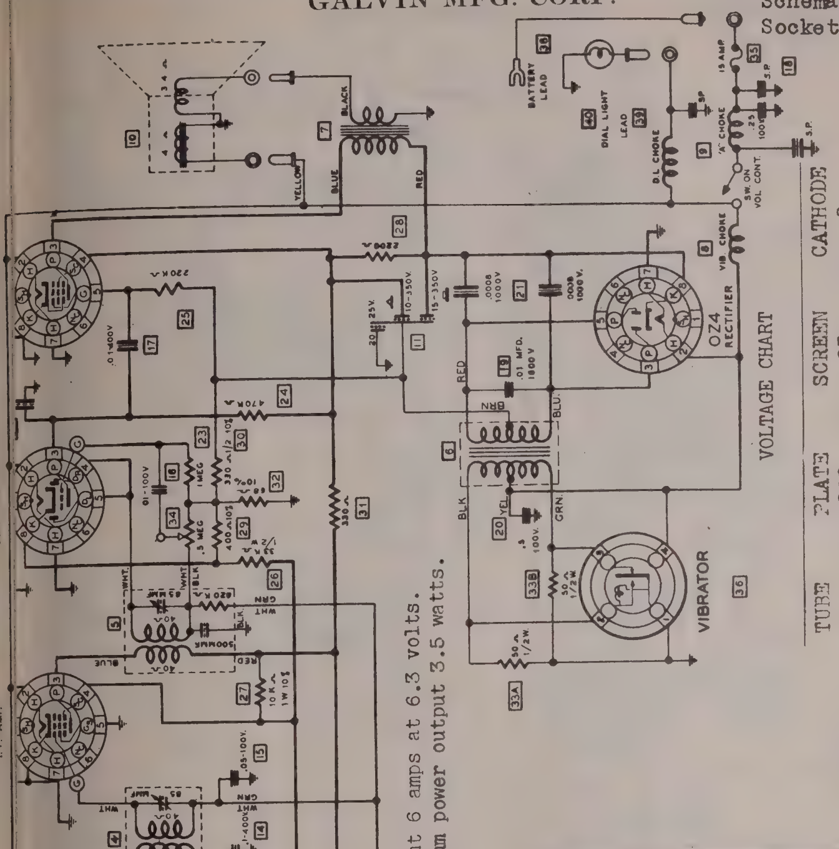
MODEL 89K3
Schematic

GALVIN MFG. CORP.

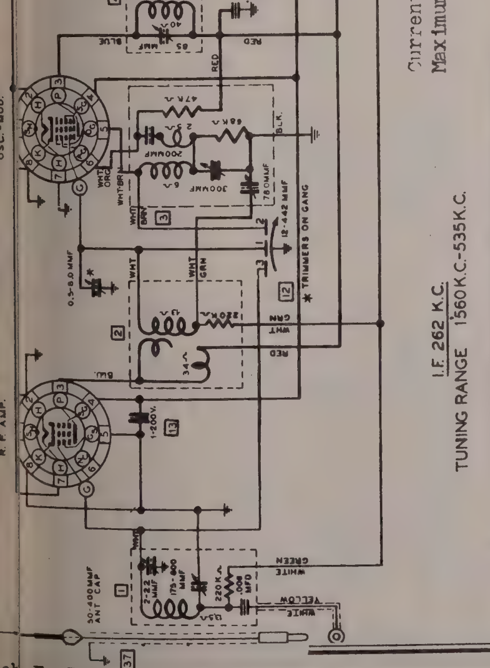


GALVIN MFG. CORP.

MODEL 300
Schematic, Voltage
Socket, Trimmers



Current 6 amps at 6.3 volts.
Maximum power output 3.5 watts.



I.F. 262 K.C.
TUNING RANGE 1560K.C.-535K.C.

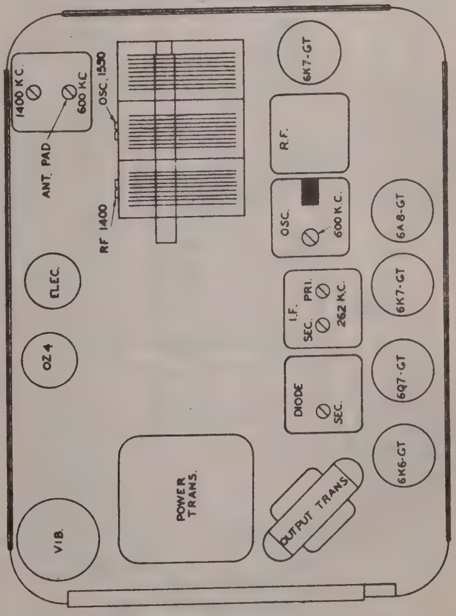


Fig. 11

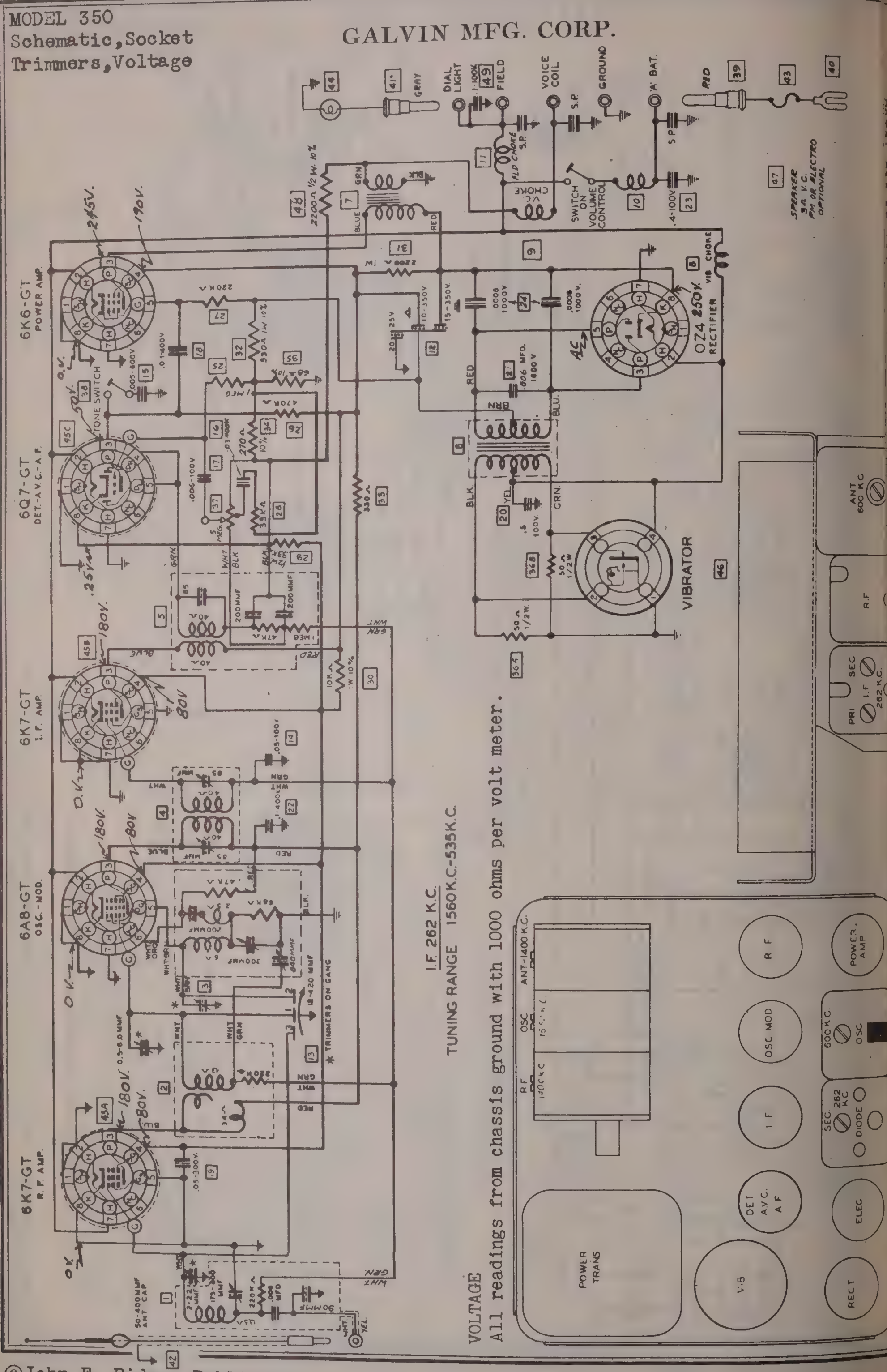
VOLTAGE CHART

TUBE	PLATE	SCREEN	CATHODE
R.F.	182	87	0
Osc. Mod.	182	87	0
I.F.	182	87	0
Det.AVC,AF	45	----	.25
Output	237	192	0
Rect.	AC	----	250

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

MODEL 350
Schematic, Socket
Trimmers, Voltage

GALVIN MFG. CORP.



I.F. 262 K.C.
TUNING RANGE 1560 K.C.-535 K.C.

VOLTAGE
All readings from chassis ground with 1000 ohms per volt meter.

Figure 1

Maximum power output - 3.5 Watts

©John F. Rider, Publisher

ALIGNMENT PROCEDURE

Place the chassis on the service bench with the speaker and battery connected to it.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary. NOTE: Do not adjust the trimmer in the Osc. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1/below, shows all trimmer locations.)

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.- Mod. tube (6A8GT) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.

2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) using the same .1 MF condenser.

2. Set the signal generator at 1550 K.C. and with the condenser gang completely out of mesh adjust the 1550 K.C. oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust the 600 K.C. oscillator padder for the highest output reading.

NOTE: The adjustments above set the range so the receiver will track with the calibrations in the control head.

R. F. AND ANTENNA ALIGNMENT

NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

1. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer in the antenna coil can for maximum output reading.

2. Adjust the 1400 K.C.R.F. trimmer on the condenser gang for maximum output reading.

3. Set the signal generator at 600 K.C. and turn the condenser gang until the signal is heard. Adjust the 600 K.C. padder in the antenna coil can for the maximum output reading.

4. Recheck steps 1, 2, and 3, for accuracy.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
38,000	262 K.C.	I.F. Grid	.1	.5 Meg	1.76
1,200	262 K.C.	Mod. Grid	.1	.5 Meg	1.76
1,200	600 K.C.	Mod. Grid	.1	.5 Meg	1.76
60	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
11	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.

** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.

*** Use special dummy part No. 1X18018.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

Place the chassis on the service bench with the speaker and battery connected to it.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

NOTE: Do not adjust the trimmer in the Osc. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1 below, shows all trimmer locations.)

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A8GT) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.

2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) using the same .1 MF condenser.

2. Set the signal generator at 1550 K.C. and with the condenser gang completely out of mesh adjust the 1550 K.C. oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust the 600 K.C. oscillator padder for the highest output reading.

NOTE: The adjustments above set the range so the receiver will track with the calibrations in the control head.

R.F. AND ANTENNA ALIGNMENT

NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

1. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer on the condenser gang for maximum output reading.

2. Adjust the 1400 K.C. R.F. trimmer on the condenser gang for maximum output reading.

3. Set the signal generator at 600 K.C. and turn the condenser gang until the signal is heard. Adjust the 600 K.C. padder on the antenna coil can for the maximum output reading.

4. Recheck steps 1, 2, and 3, for accuracy.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy part #1X18018 in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics. etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
26,000	455 K.C.	I.F. Grid	.1 MF	.5 Meg	1.76 Volts
535	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
615	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
30	600 K.C.	R.F. Grid	.1 MF	.5 Meg	1.76 Volts
7	600 K.C.	Ant. Lead	40 MMF ***	None	1.76 Volts

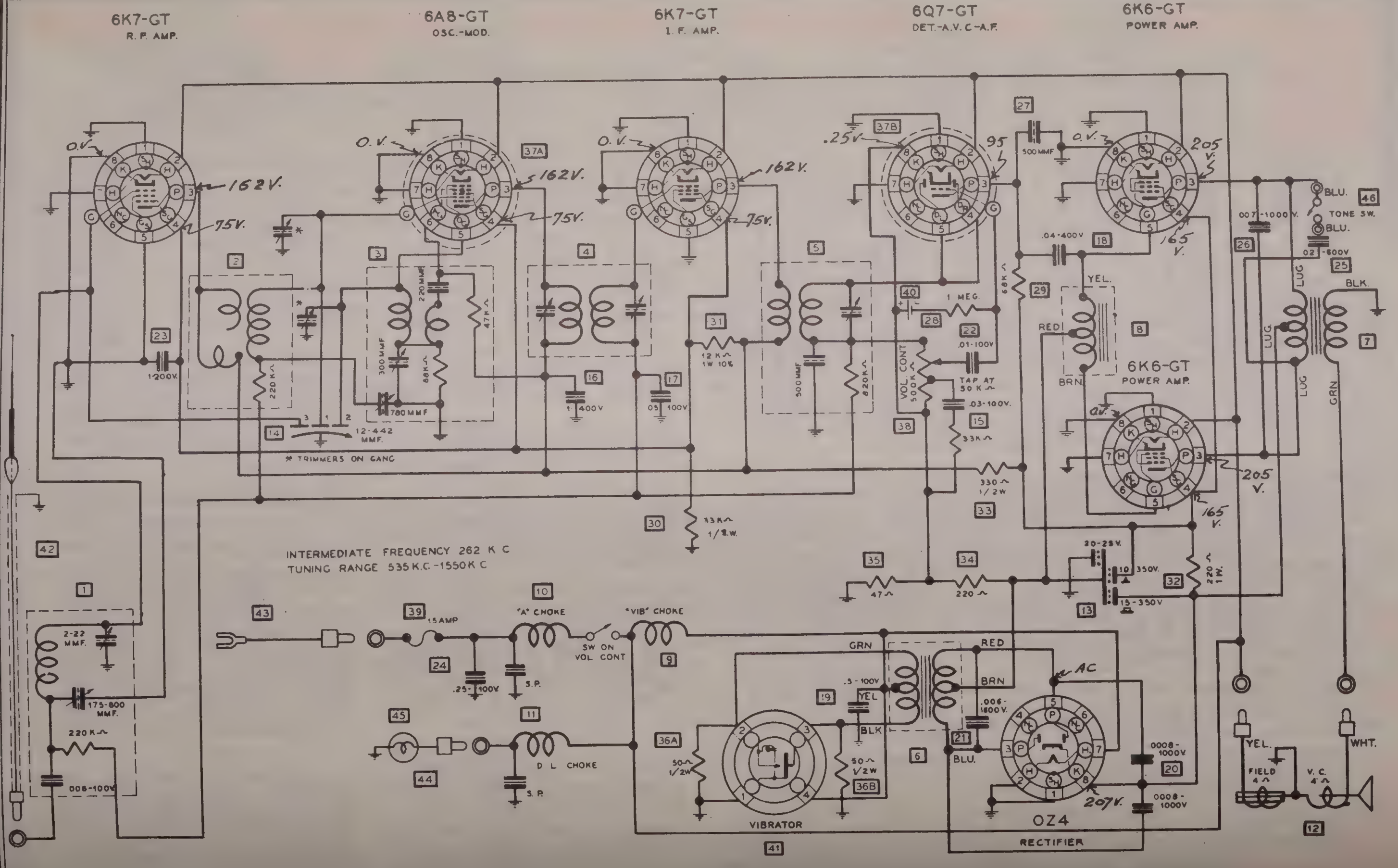
*For one watt output

**Meter connected across voice coil
1.76 Volts equals 1 watt output for 3 ohm voice coil

***Use special dummy part No. 1X18018, or M434B booster coil Part No. 17908 in series with 25 MMF cond. if a Motorola Booster antenna is used.

MODEL 400
Schematic,Voltage

GALVIN MFG. CORP.



All voltages measured from socket terminal to chassis ground using 1000 ohm per volt-meter.

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GALVIN MFG. CORP.

MODEL 450
Schematic, Voltage
Socket, Trimmers

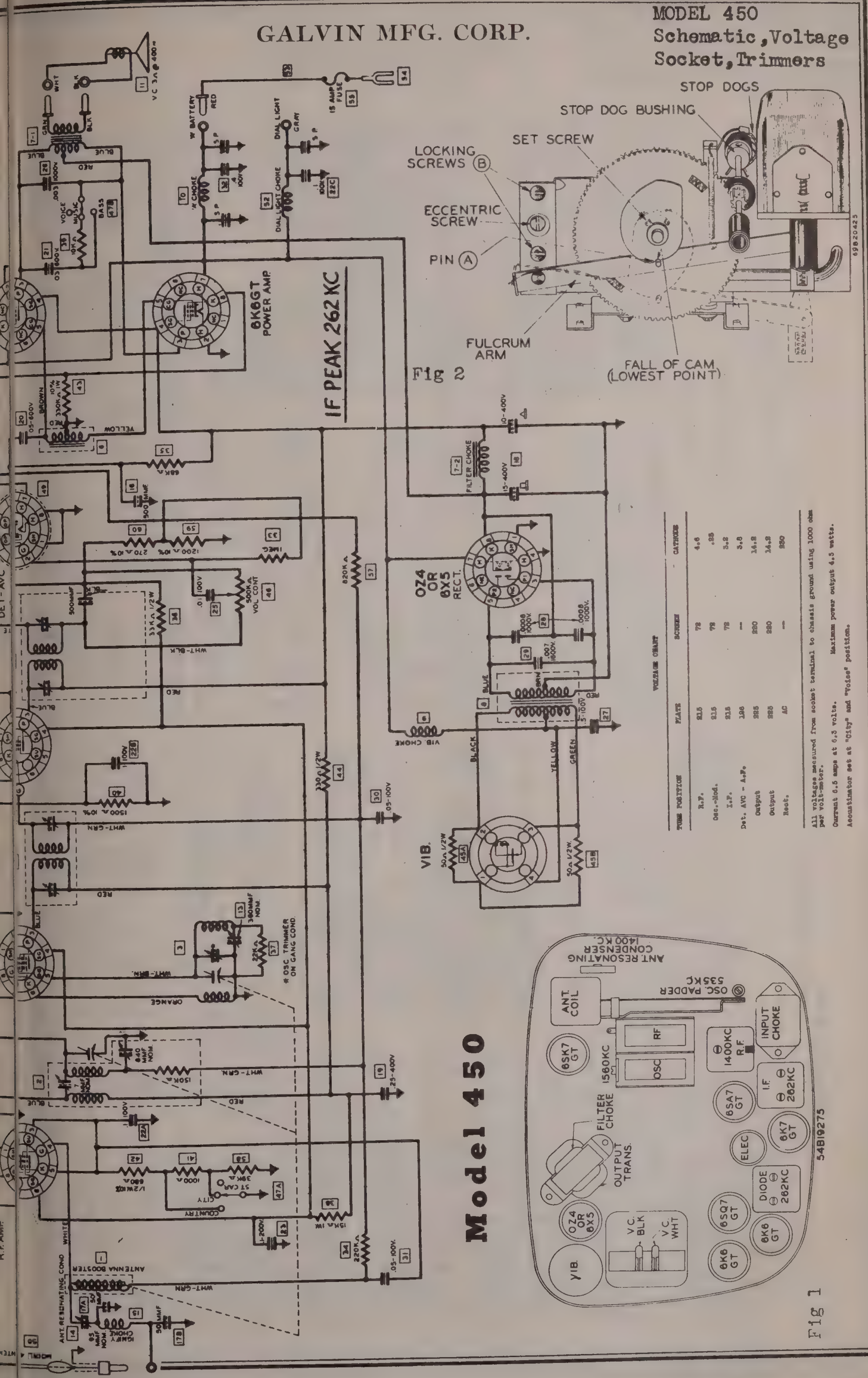


Fig 2

Model 450

Fig 1

VOLTAGE CHART

TUBE POSITION	PLATE	SCREEN	CATHODE
R.F.	215	72	4.6
Osc.-Mod.	215	72	.25
I.F.	215	72	3.2
Det. AVC - A.F.	196	—	3.8
Output	285	280	14.2
Output	285	280	14.2
Rect.	AC	—	290

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt-meter.

Current 6.5 amps at 6.3 volts. Maximum power output 4.5 watts.

Acoustinator set at "City" and "Voice" position.

MODEL 400
Alignment,Socket
Trimmers,Gain
Sensitivity

GALVIN MFG. CORP.

Model 400

ALIGNMENT PROCEDURE

Place the chassis on the service bench with the speaker and battery connected to it. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary. NOTE: Do not adjust the trimmer in the Osc. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1 below, shows all trimmer locations.)

I. F. 1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A8GT) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.

2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) using the same .1 MF condenser.

2. Set the signal generator at 1550 K.C. and with the condenser gang completely out of mesh adjust the 1550 K.C. oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust the 600 K.C. oscillator padder for the highest output reading.

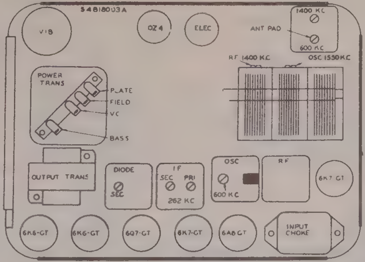


Fig. 1

NOTE: The adjustments above set the range so the receiver will track with the calibrations in the control head.

R. F. NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

1. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer in the antenna coil can for maximum output reading.

2. Adjust the 1400 K.C.R.F. trimmer on the condenser gang for maximum output reading.

3. Set the signal generator at 600 K.C. and turn the condenser gang until the signal is heard. Adjust the 600 K.C. padder on the antenna coil can for the maximum output reading.

4. Recheck steps 1, 2, and 3, for accuracy.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which had been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
32,500	262 K.C.	I.F. Grid	.1	.5 Meg	1.76
500	262 K.C.	MOD. Grid	.1	.5 Meg	1.76
550	600 K.C.	MOD. Grid	.1	.5 Meg	1.76
30	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
7	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No.1X18018.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

Model 450

ALIGNMENT PROCEDURE

Place the chassis on the service bench with the speaker, acoustinator, and battery connected to it. The acoustinator is to be set in the "City" and "Voice" position. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output, if necessary. NOTE: Do not adjust the trimmer in the R.F. coil can that is covered with scotch tape. The original adjustment made at the factory should not be tampered with. Fig. 1 shows all trimmer locations.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the modulator tube through a .1 Mfd. condenser. Connection may be made to the lug on the R.F. section of the gang condenser. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 262 K.C. and carefully adjust the trimmers in the diode coil can to the point showing the highest reading on the output meter.
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Recheck the I.F. and diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Turn gang to fully meshed position.
2. Check the pin "A" on the fulcrum arm to make sure that it rests in the fall of the cam (absolute lowest point) when the condenser gang is in fully meshed position. See Fig. 2.
NOTE: Adjustment of the pin is made by revolving the cam on the condenser gang shaft. CAUTION: Care should be taken so that the stop dogs allow the condenser gang to be turned to fully meshed position and fully opened position.
3. Set the signal generator at 1560 K.C. and connect it to the antenna receptacle through a 40 MMF condenser.
4. With the condenser gang completely out of mesh, adjust the 1560 K.C. oscillator trimmer on the gang condenser to point showing highest output reading.
5. Leaving the generator set at 1560 K.C. and the condenser gang completely out of mesh, adjust the antenna resonating condenser to maximum output.

R. F. AND ANTENNA ALIGNMENT

1. Still using the same 40 MMF condenser in the antenna lead, set the signal generator at 1400 K.C. and turn condenser gang until the signal is heard.
2. Adjust the 1400 K.C. trimmer in the R.F. coil can for highest output.
NOTE: The two locking screws "B" are to be loosened just the least bit so that the tension is released which will allow the eccentric screw to be turned but not loosened enough to allow the fulcrum arm to be moved.
3. Adjust the eccentric screw "A" to maximum output at 1400 K.C. and tighten the locking screws "B" securely.
4. Set the signal generator at 600 K.C. Turn the condenser gang until the signal is heard, and adjust the oscillator padder which is accessible through the hole in the chassis base, to maximum output.
5. Recheck steps 1, 2, 3, and 4.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume, and the acoustinator set at city and voice position. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for the variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	OUTPUT METER READING **
10,500	262 K.C.	I.F. Grid	.1 MF	1.76 Volts
150	262 K.C.	Mod. Grid	.1 MF	1.76 Volts
175	600 K.C.	Mod. Grid	.1 MF	1.76 Volts
10	600 K.C.	R.F. Grid	.1 MF	1.76 Volts
6	600 K.C.	Ant. Lead	40 MMF	1.76 Volts

* For one watt output
** Meter connected across voice coil

MODEL 450
Alignment,Gai
Sensitivi

GAMBLE-SKOGMO INC.

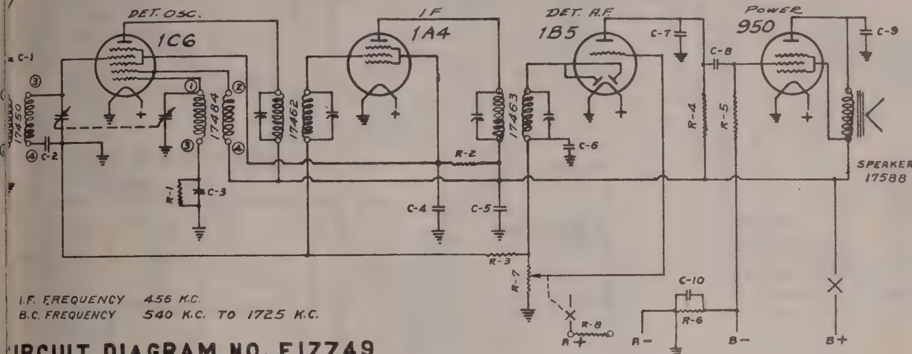
MODEL 6B Power Converter
MODEL 540,Late
Schematics

K 8-18-36

SPEAKER. This model is equipped with a balanced armature magnetic speaker. Should the armature "strike", causing a rattle or distortion, proceed as follows:

QUAM TYPES (used on early production). Bend bracket holding armature snubber cup up or down until armature centers. This bracket is located on bottom of magnet housing.

WRIGHT DECOSTER TYPE. To center armature: remove small aluminum plate on bottom of magnet housing, loosen one of the small set screws and tighten the other until the armature is floating in the center of poles.

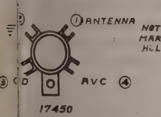


I.F. FREQUENCY 456 K.C.
B.C. FREQUENCY 540 K.C. TO 1725 K.C.

IRCUIT DIAGRAM NO. E17749

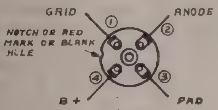
MODEL 540 LATE

C-1	.01	200V.	R-1	50000 OHMS
C-2	.05	200 V.	R-2	15 000 OHMS
C-3	500 MMF.	PAD	R-3	2000 000 OHMS
C-4	.05	200 V.	R-4	250 000 OHMS
C-5	.25	200 V.	R-5	1000000 OHMS
C-6	.0005	600 V.	R-6	400 OHMS
C-7	.0005	600 V.	R-7	500 000 OHMS VOL. CONT. #17589
C-8	.01	200 V.	R-8	2.5 V. WIRE WOUND USE WHEN SET IS USED WITH 3V. A BATTERY OR 4 DRY CELLS CONNECTED SERIES PARALLEL
C-9	.002	600 V.		
C-10	10 x 25 V. ELECTROLYTIC			

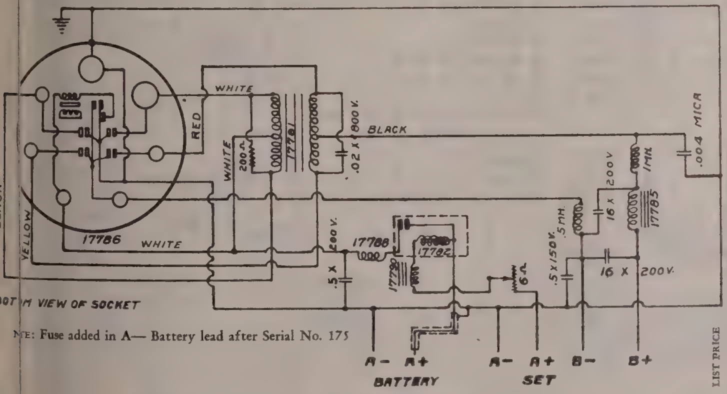


17450

OOK AT PLAIN END OF COIL



17484



OT M VIEW OF SOCKET

N E: Fuse added in A— Battery lead after Serial No. 175

CIRCUIT DIAGRAM 6 VOLT POWER UNIT

Diagnosis of Troubles

6-B POWER CONVERTER

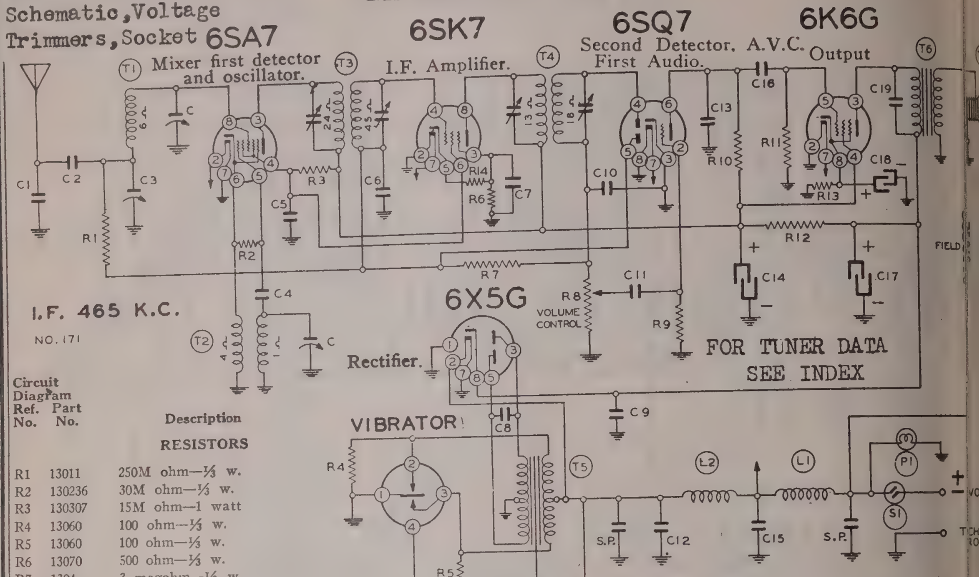
EFFECT	CAUSE
Does ot operate	Storage Battery run-down. Battery connections loose. Relay not closing—heavy red or black battery wires may be twisted inside unit and holding relay armature open. "Blown" fuse—check all wiring before inserting new fuse. A defective vibrator will also "blow" the fuse. A good vibrator will have a smooth "hum" when holding your ear close to the unit; a worn vibrator will "sputter".
. F. Hash" noise in set, sual a frying-buzzing ound	A good antenna and ground must be used on the set. Power unit should be located away from the set by the length of the cable. On sets having short wave bands, noise may always be noticed on some parts of the band but is usually not objtctionable.
High attery drain	The total drain on the six volt battery should be approximately one ampere plus the normal "A" drain of the set. Example: with model 650, 1 amp. plus .5 amp. total 1.5 amps. Excessive drain may be caused by defective transformer, vibrator, or filter condenser in the power unit or defective switch or by pass condenser in the set.

PART NO.	DESCRIPTION	LIST PRICE
17785	Assb.—"A" Choke	$ 2.50
17825	Assb.—Cable & Markers	1.50
17828	Assb.—Wire Battery "A" Plus	.70
17829	Assb.—Wire Battery "A" Minus	.50
17790	Choke—Filter "B"	.90
17788	Choke—R. F. "A"	.30
17794	Choke—.5 M. H.	.30
17795	Choke—1 M. H.	.30
17806	Clip—Battery "Plus"	.18
17807	Clip—Battery "Minus"	.18
4925	Clip—Fuse	.04
17808	Condenser—Electrolytic 16 x 200 R. H.	.90
17809	Condenser—Electrolytic 16 x 200 L. H.	.90

PART NO.	DESCRIPTION	LIST PRICE
17093	Condenser—Mica .004	.30
17811	Condenser—Tubular .02 x 800	.20
17813	Condenser—Tubular (Braid) .5 x 150	.40
17303	Condenser—Tubular .5 x 200	.30
17832	Fuse—Auto 5-Amp. Low Resistance	.06
17796	Knob—Control	.20
17782	Relay	1.60
17787	Resistor—Carbon 1 Watt 200 Ohm	.20
17757	Rheostat	.60
17789	Socket—Plain 7-Prong	.20
17781	Transformer	2.50
17786	Vibrator—Unit	3.50

MODEL 577D
Serial 214845 up
Schematic,Voltage
Trimmers,Socket

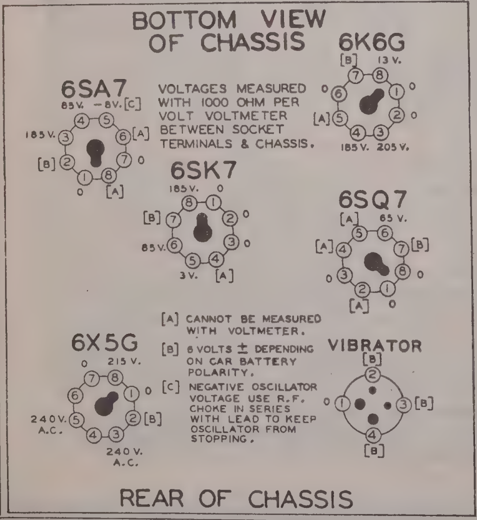
GAMBLE-SKOGMO INC.



FOR TUNER DATA SEE INDEX

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13011	250M ohm—⅓ w.
R2	130236	30M ohm—⅓ w.
R3	130307	15M ohm—1 watt
R4	13060	100 ohm—⅓ w.
R5	13060	100 ohm—⅓ w.
R6	13070	500 ohm—⅓ w.
R7	1304	3 megohm—⅓ w.
R8	101110	1 megohm volume control
R9	130257	5 megohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	1303	500M ohm—⅓ w.
R12	130199	1500 ohm—1 watt
R13	130308	750 ohm—1 watt
R14	130174	50 ohm—⅓ w.
		CONDENSERS
C	10269	2 gang variable condenser
C1	1293	.00002 mica
C2	10055	.01 x 400 volts
C3	12434	Adj. Antenna Trimmer
C4	12921	.0002 mica
C5	100115	.05 x 400 v.
C6	1009	.05 x 200 v.
C7	10020	.1 x 200 v.
C8	10034	.005 x 1200 v.
C9	12912	.00025 mica
C10	1295	.0001 mica
C11	10025	.002 x 600 v.
C12	10031	.5 x 120 v.
C13	1292	.0005 mica
C14	119105	15 ufd. lytic x 350 w. v.
C15	10031	.5 x 120 v.
C16	10078	.01 x 200 v.
C17	119105	15 ufd. lytic x 350 w. v.
C18	119105	20 ufd. lytic x 25 w. v.
C19	10087	.01 x 600 v.
		C14, C17 and C18 in same unit
		PARTS
T1	11195B	Antenna Coil
T2	110146	Oscillator Coil
T3	108139	Input I. F. Coil—465 kc.
T4	108121B	Output I. F. Coil—465 kc.
T5	104131	Power Transformer
T6	10567	Output Transformer
T7	114114-R	5" Dynamic Speaker (5.6 oh
L1	10568	"A" Choke
L2	10566	"A" Choke
S1		Switch on volume control
P1	10797	Pilot light (T51) 6-8 volts
S.P.	11749	(2) Spark Plates



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

[A] CANNOT BE MEASURED WITH VOLTMETER.

[B] 6 VOLTS ± DEPENDING ON CAR BATTERY POLARITY.

[C] NEGATIVE OSCILLATOR VOLTAGE USE R.F. CHOKE IN SERIES WITH LEAD TO KEEP OSCILLATOR FROM STOPPING.

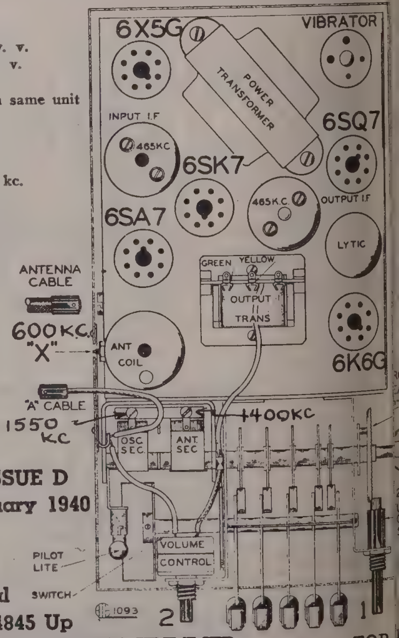


FIG. 3—TOP

577 ISSUE D
January 1940

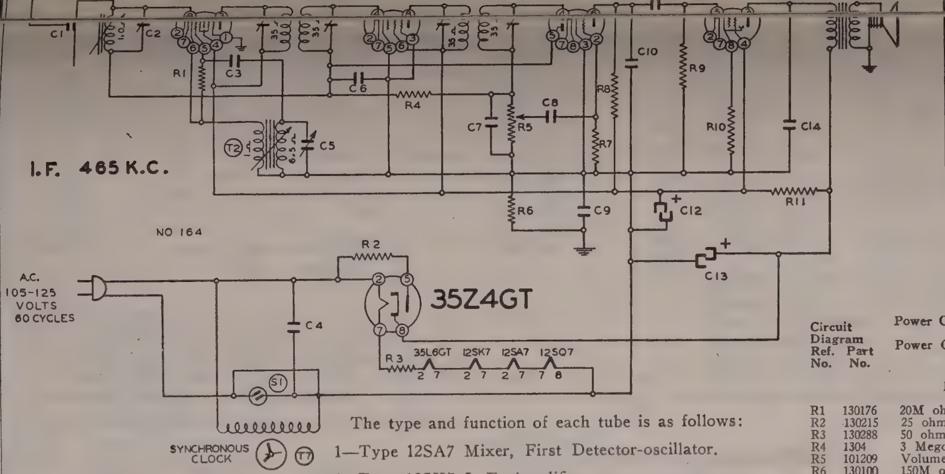
Serial
No. 214845 Up

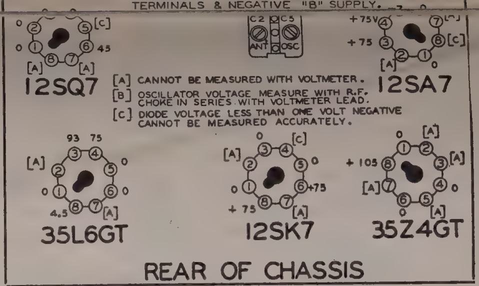
ADJUST ANTENNA TRIMMER

Tune in a weak signal at approximately 600 K volume control about three-fourths on. Adjust trimm "X" until maximum output is obtained.

GAMBLE-SKOGMO INC.

MODEL 571,Series A
Serial 189300 up
Schematic,Voltage
Socket,Trimmers





[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] OSCILLATOR VOLTAGE MEASURE WITH R.F. CHOKE IN SERIES WITH VOLTMETER LEAD.
[C] DIODE VOLTAGE LESS THAN ONE VOLT NEGATIVE CANNOT BE MEASURED ACCURATELY.

FIG. 3—BOTTOM VIEW

Power Consumption..........35 Watts

Power Output..........800 Milliwatts Undistorted, 1.2 Watts Maximum

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—⅓ w.
R2	130215	25 ohm—½ w.
R3	130288	50 ohm—1½ w.
R4	1304	3 Megohm—⅓ w.
R5	101209	Volume Control—½ Meg.
R6	130100	150M ohm—⅓ w.
R7	130257	5 Megohm—⅓ w.
R8	130100	150M ohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	130166	150 ohm—⅓ w.
R11	130199	1500 ohm—1 w.
		CONDENSERS
C1	131262	.0002 Washer Condenser (Ant. Clip on Ant. Plate)
C2	124100	Ant. Section Dual Trimmer
C3	12939	.00005 Mica
C4	1001	.1 x 400 v.
C5	124100	Osc. Section Dual Trimmer
C6	10013	.05 x 400 v.
C7	1295	.0001 Mica
C8	10025	.002 x 600 v.
C9	10091	.15 x 400 v.
C10	1292	.0005 Mica
C11	10071	.004 x 600 v.
C12	11992	20 Mfd. 'Lytic
C13	11992	40 Mfd. 'Lytic.
C14	10011	.01 x 400 v.
		C2 and C5 in one unit.
		C12 and C13 in one unit.
		PARTS
T1	111136	Antenna Coil Complete
T2	110126	Oscillator Coil
T3	108157D	Input I. F. Coil—465 Kc.
T4	108157E	Output I. F. Coil—465 Kc.
T5	105106	Output Transformer
T6	114187	4" Speaker—PM.
T7	104188	Electric Clock Complete
S1		On-Off Switch on Volume Control

The type and function of each tube is as follows:

1—Type 12SA7 Mixer, First Detector-oscillator.

1—Type 12SK7 I. F. Amplifier.

1—Type 12SQ7 Second Detector, A.V.C. and First Audio.

1—Type 35L6GT Beam Output Amplifier.

1—Type 35Z4GT Rectifier.

SERVICE NOTES:

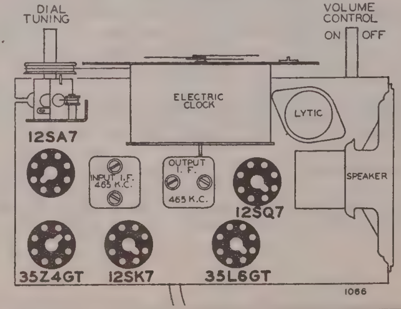
Voltages taken from different points of circuit to —B are measured with all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.



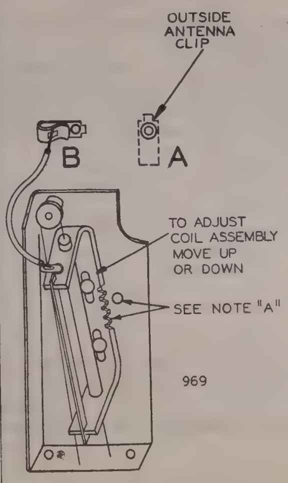


FIG. 4

MODEL 571,Series A
Alignment
MODEL 577D
Tuner Data

GAMBLE-SKOGMO INC.

MODEL 577D

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

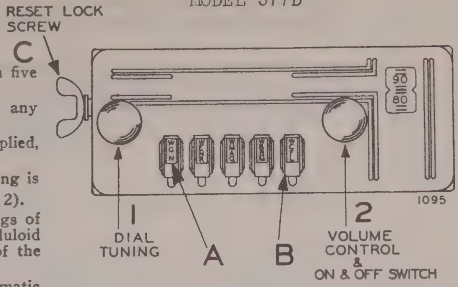


FIG. 2—FRONT VIEW

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. **Be sure to retighten the locking screw**, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

MODEL 571

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions on Page 4.

- Volume control—Maximum all adjustments.
- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. Condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mfd. and 200 mmf.

BAND	SIGNAL GENERATOR		Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
	Frequency Setting	Dummy Antenna					
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C5) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C2) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C2) (See Fig. 3)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure

the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no

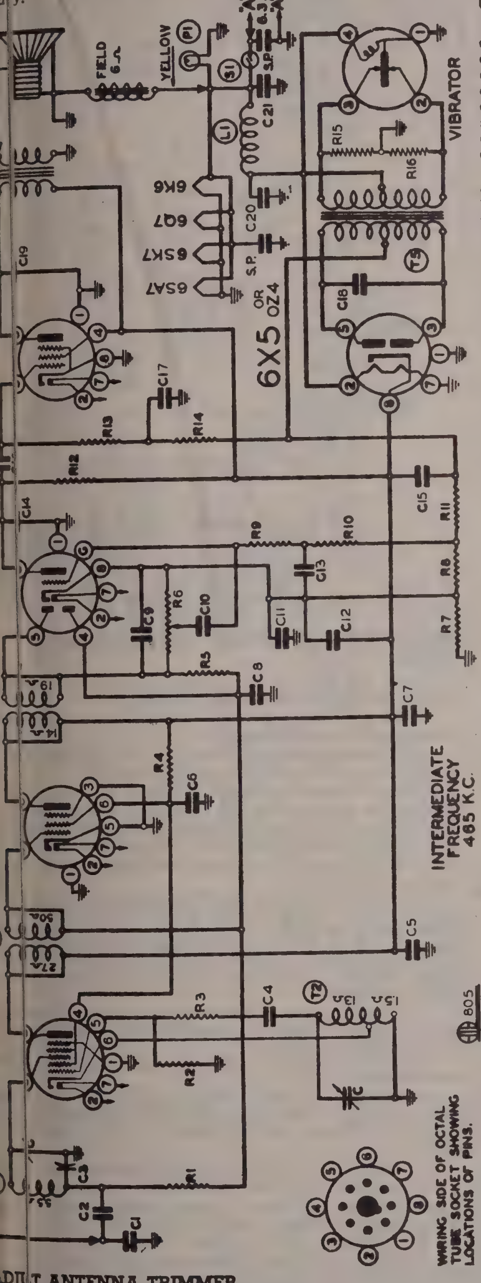
position of the antenna coil at 1400 Kc. These two adjustments should be

GAMBLE-SKOGMO INC.

MODEL 577C
Schematic,Voltage
Battery Notes

RATOR INTERFERENCE

move the generator cutout mounting screw and fasten denser (100-81) bracket on the generator cutout mount- . Replace the cutout mounting screw and tighten down y.



DJU T ANTENNA TRIMMER

The in a weak signal at approximately 600 K.C. with olun control about three-fourths on. Adjust trimmer screw X" til maximum output is obtained. (See Fig. 1, Adjust- ent K" on right side of radio)

Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 100-82, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.

Code No.	Part No.	Description
		RESISTORS
R1	13011	250M ohm - ½ w. 20%
R2	130176	20M ohm - ½ w. 10%
R3	130272	10 ohm - ½ w. 10%
R4	130245	10M ohm - 1 w. 10%
R5	1304	3 megohm - ½ w. 20%
R6	101110	1 megohm volume control
R7	130174	50 ohm - ½ w. 10%
R8	130211	30 ohm - ½ w. 10%
R9	130209	2 megohm - ½ w. 20%
R10	130210	1 megohm - ½ w. 20%
R11	130212	250 ohm - 1 watt 10%
R12	13011	250M ohm - ½ w. 20%
R13	13011	250M ohm - ½ w. 20%
R14	13011	250M ohm - ½ w. 20%
R15	13060	100 ohm - ½ w. 10%
R16	13060	100 ohm - ½ w. 10%
		CONDENSERS
C	10269	2 gang variable condenser
C1	1293	.00002 Mica 20%
C2	10055	.01 x 400 v. 25%
C3	12434	Antenna Trimmer
C4	12912	.00025 Mica 20%
C5	1001	.1 x 400 v. 25%
C6	10020	.1 x 200 v. 25%
C7	1295	.0001 Mica

Code No.	Part No.	Description
C8	1009	.05 x 200 v. 25%
C9	1295	.0001 Mica 20%
C10	10078	.01 x 200 v. 25%
C11	10020	.1 x 200 v.
C12	11950	8 mfd. lytic
C13	10078	.01 x 200 v.
C14	1292	.0005 Mica
C15	11950	8 mfd. lytic
C16	10055	.01 x 400 v. 25%
C17	10019	.006 x 600 v.
C18	10034	.005 x 1200 v.
C19	10087	.01 x 600 v.
C20	10031	.5 x 120 v. + 50-10%
C21	10031	.5 x 120 v. + 50-10%
		C12 and C15 in same unit.
		PARTS
T1	11195B	Antenna coil complete
T2	110107	Oscillator coil complete
T3	108139	Input I. F. 465 kc. - complete
T4	108121	Output I. F. 465 kc. - complete
T5	104131	Power Transformer
T6	10567	Output Transformer
T7	114114	5" Dynamic Speaker
L1	10568	"A" Filter Choke
P1	10797	6.8 v. pilot light
S1		Off-on Switch on Volume Control
SP		Spark Plates

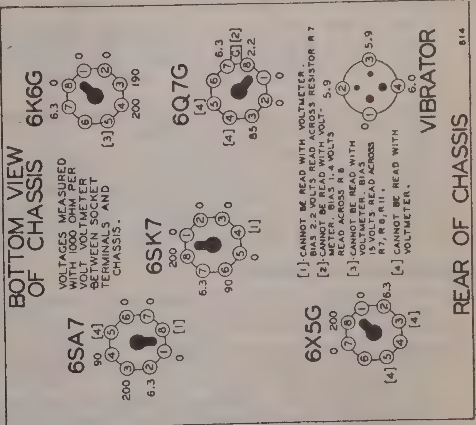

BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
6SA7
90 [4]
200
6.3
0
0 [1]
6K6G
6.3 0
0
0
[3]
200 190
6SK7
200 0
6.3
0
90
0
0 [1]
6Q7G
[4]
[4]
6.3
[2]
2.2
85
0 0
6X5G
0 200
0
6.3
[4]
[4]
VIBRATOR
5.9
5.9
0
6.0
[1]-CANNOT BE READ WITH VOLTMETER. BIAS 2.2 VOLTS READ ACROSS RESISTOR R7
[2]-CANNOT BE READ WITH VOLTMETER. BIAS 1.4 VOLTS READ ACROSS R8
[3]-CANNOT BE READ WITH VOLTMETER. BIAS 15 VOLTS READ ACROSS R7, R8, R11.
[4] CANNOT BE READ WITH VOLTMETER.
REAR OF CHASSIS
814

FIG. 4

January 1939
Serial No. 203070 Up

GAMBLE-SKOGMO INC.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the bottom view.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is probably due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

ALIGNING INSTRUCTIONS

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy"	—A .5 mfd. condenser connected in series with the test oscillator output lead.
"Broadcast Dummy"	—A 125 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

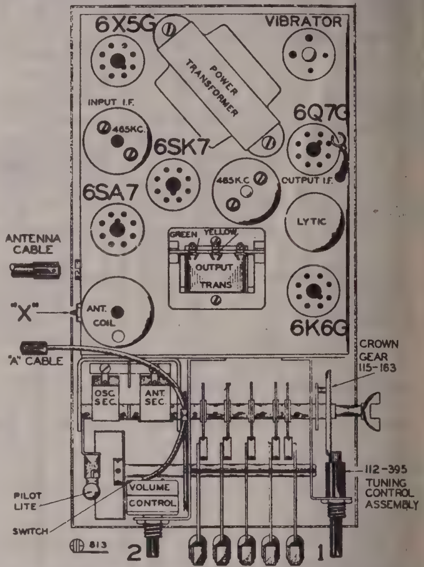
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6K6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT: (465 K.C.)

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6SK7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108121 to resonance with oscillator.
3. Move test oscillator connection to grid of 6SA7 tube and adjust trimmer condensers of input I.F. transformer No. 108139 to resonance with oscillator. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver. (See Fig. 3—top view, page 3.)

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is the rear section of the two-gang condenser—see top view, Fig. 3).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust antenna trimmer (front section of gang condenser) to resonance (see top view, Fig. 3).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad in the antenna circuit for maximum gain. This pad is mounted on the s of the antenna can, adjustment "X."
5. Go back and check 1400 K.C. If adjustment is m here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test osci tor to this frequency and picking up the signal by ro ing variable condenser. Under no circumstances b plates of variable condenser sections to correct tracki



PROCEDURE FOR SETTING THE AUTOMATIC LEVERS

There are five levers on the dial by means of which fi stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; a number up to and including five.

Punch out from the set of station call letter tabs suppli the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening provided for inserting the call letter tabs, (See "A" Fig. 2)

Insert the call letter tabs in the rectangular openings each of the automatic tuner levers. One of the small cellul tabs supplied should be snapped into place over each of station call letter tabs.

Press DOWN ALL THE WAY any one of the automa tuner levers. Holding it down FIRMLY, tune in by mea of the tuning knob (No. 1) the station you have assigned this lever. Turn the tuning knob very slowly back and for (while still holding lever in downward position) until t signal is clearest. The station will then be accurately tuned Release the lever.

Press down another automatic tuner lever. Holding down FIRMLY, carefully tune in the station assigned to th lever. Release this lever.

Follow this procedure until you have selected all of yo favorite stations.

Now rotate the tuning knob (No. 1) to the right (cloc wise) as far as it will turn, and tighten the special locki screw ("C") located on left side of tuner dial assembly (S Fig. 2).

It is VERY IMPORTANT that this locking screw turned until it is ABSOLUTELY TIGHT.

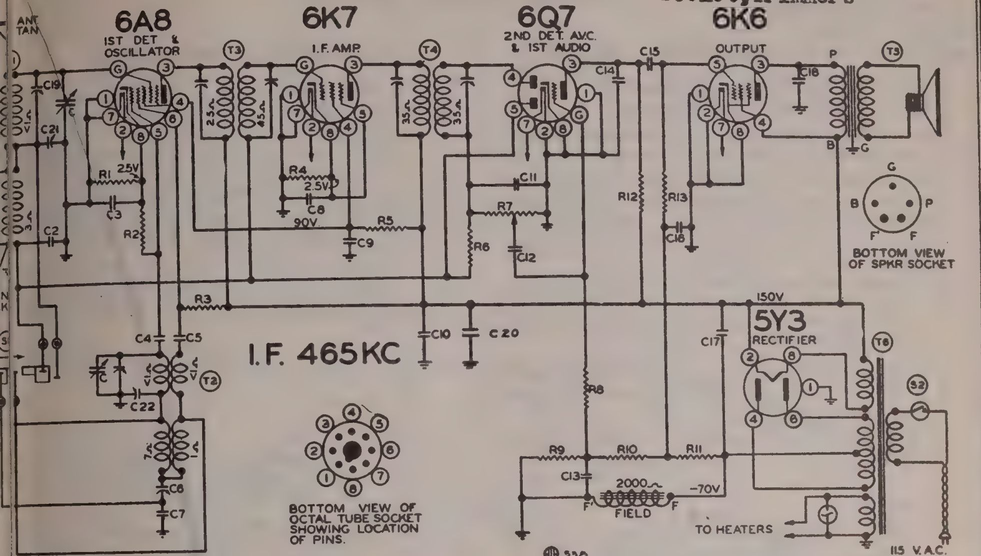
This screw will lock in place all the stations you ha selected on the automatic tuner levers. (Note: Locking scre "C" is loose when radio is shipped from factory).

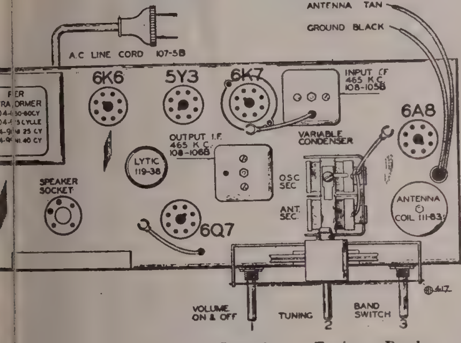
If you should desire to change any station you selected another, loosen the locking screw "C" one or two turns, sele the new station as explained. Be sure to retighten the lockin screw, otherwise the stations you have selected will not st adjusted to the levers.

The automatic dial is now set up for quick tuning. Pre down on the lever and your favorite station is selected.

MODEL 589, Series A, Iss. B
Schematic, Alignment
Socket, Trimmers

GAMBLE-SKOGMO INC.





Vol. Control On-Off Switch
Tuning Control
Band Switch

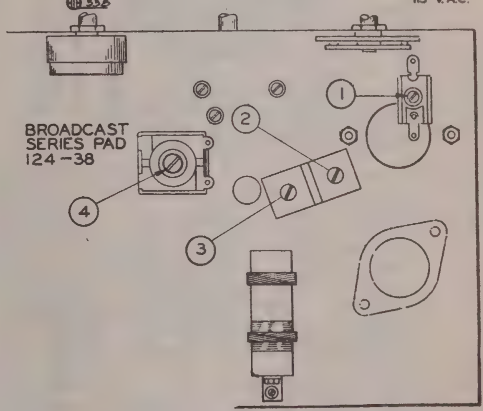


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

RESISTORS

30-83	300 ohm - 1/3 w. 10%
30-12	50M ohm - 1/3 w. 20%
30-17	10M ohm - 1/3 w. 20%
30-93	450 ohm - 1/3 w. 10%
30-149	15M ohm - 1/3 w. 20%
30-4	3 megohm - 1/3 w. 20%
01-71	1 megohm Volume control
30-4	3 megohm - 1/3 w. 20%
30-176	20M ohm - 1/3 w. 10%
30-80	150M ohm - 1/3 w. 10%
30-46	800M ohm - 1/3 w. 10%
30-9	200M ohm - 1/3 w. 20%
30-3	500M ohm - 1/3 w. 20%

CONDENSERS

102-43B	2 gang variable Condenser
129-5	.0001 Mica
100-22	.05 x 200 v. - 25%
100-20	.1 x 200 v. - 25%
129-39	.00005 - 20% - Mica
100-25	.002 x 600 v. - 20%
124-38	600 mmf. Series Pad. Adj.
129-54	.003 - 2½% Mica
100-20	.1 x 200 v. - 25%

C9	100-1	.1 x 400 v. - 50 - 10%
C10	119-38	5.0 mfd. - 250 w. v. 'Lytic
C11	129-5	.0001 - 20% Mica
C12	100-11	.01 x 400 v. - 25%
C13	100-20	.1 x 200 v. - 25%
C14	129-2	.0005 - 20% Mica
C15	100-26	.02 x 400 v. - 25%
C16	100-20	.1 x 200 v. - 25%
C17	119-38	5.0 mfd. - 250 w.v. 'Lytic
C18	100-37	.003 x 600 v. - 10%
C19	124-39B	2 - 25 mmf. Adj. Cond.
C20	100-13	.05 x 400 v. - 25%
C21	124-30C	Adj. Trimmer 1 - 10 mmf.
C22	124-30C	Adj. Trimmer 2 - 20 mmf. C21 - C22 in same unit.

PARTS

T1	111-83	Ant. Coil
T2	110-66	Osc. Coil
T3	108-105B	Input I.F. - 465 kc.
T4	108-106B	Output I.F. - 465 kc.
T5	114-61	6" Dynamic speaker (2000 OHM FIELD)
T6	104-60B	Power Transformer
S1	125-37	Wave Band Switch
S2		On-off switch on volume control

ALIGNMENT

IF adj. 465 KC thru .1mf cond.

SW Osc. adj. - 17 MC thru .1 mf cond.- trim. located on top of rear gang sect.

SW Ant. adj.- 17 MC
See Fig. 3, Adj. 1

BC Osc. adj. 1720 KC thru 200 mmf and 20 ohm res.
See Fig. 3, Adj. 3

BC Ant. adj. 1400 KC thru 200 mmf and 20 ohm res.
See Fig. 3, Adj. 2

PADDER adj. 600 KC
See Fig. 3 , Adj. 4

MODEL 601,Series A,B,C
Schematic,Voltage
Alignment,Trimmers
Socket, Notes

GAMBLE-SKOGMO INC.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83 Output I.F. Transformer
Part No. 108-82 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 78 tube, and adjust the output I.F. transformer (No. 108-83) to resonance.

   (b) Move oscillator output clip from grid of 78 grid cap of 6A7 and adjust input I.F. transformer (No. 108-82) to resonance.

   (c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-83) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. Unsolder the antenna wire from its terminal on the antenna coil and with gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 50 mmf. condenser to the antenna terminal on the antenna coil and chassis ground and make the following adjustments:

   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).

   (b) Re-set external oscillator to 1550 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).

   (c) Check sensitivity at 600 and 1000 kilocycles.

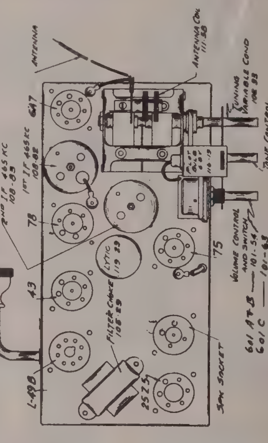
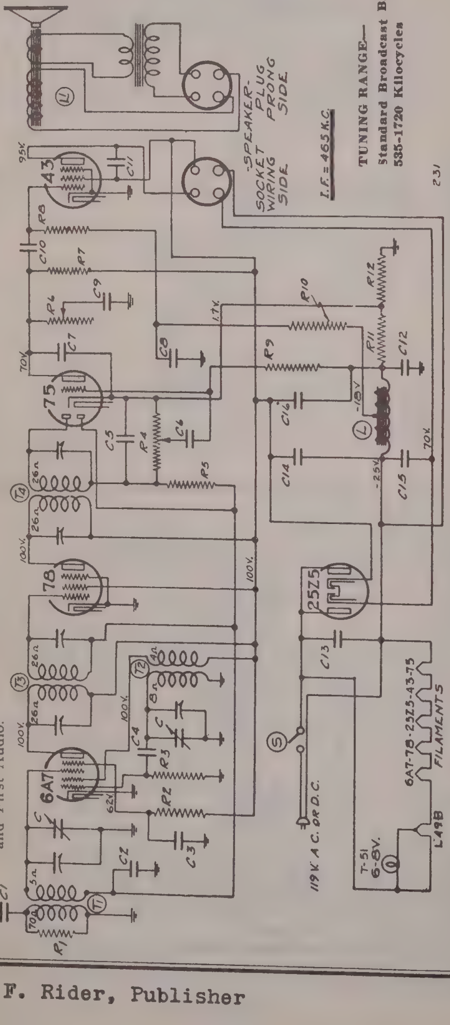


FIG. 2—TOP VIEW

Type 6A7 Pentagrid Mixer, First Detector-oscillator
Type 78 Remote Cut-Off Pentode, I.F. Amplifier (465 K.C.)
Type 75 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
Type 43 Pentode Output Amplifier
Type 25Z5 High Vacuum Rectifier.
Type L49B Ballast Tube.



TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles

No.	Part No.	Description
R1	130-12	50M Ohm—½W—20%— 20V—Carbon
R2	130-21	20M Ohm—½W—20%— 20V—Carbon
R3	130-12	50M Ohm—½W—20%— 20V—Carbon
R4	101-54	1 meg Ohm—Volume Control
R5	130-119	3 meg Ohm—½W—20%—100V—Carbon
R6	101-55	1 meg Ohm—Tone Control
R7	130-120	100M Ohm—½W—20%— 50V—Carbon
R8	130-5	300M Ohm—½W—20%—100V—Carbon
R9	130-38	2 meg Ohm—½W—20%—100V—Carbon
R10	130-9	200M Ohm—½W—20%— 20V—Carbon
R11	106-28	35 Ohm—Muter Strip
R12	106-28	50 Ohm—Muter Strip

NOTE: R11 and R12 in one unit—No. 106-28.

T4	108-83	Output I.F. Coil—465 Kc.
L	105-29	Filter Choke (Resistance 600 Ohms)
L1	114-43	Five Inch Speaker (Field resistance 3000 Ohms)
S	101-54	On and off switch on Volume Control

C1	100-23	.002 x600 Volt—25%
C2	100-22	.05 x200 Volt—25%
C3	100-22	.05 x200 Volt—25%
C4	129-12	.00025 Mica—MT—20%
C5	129-12	.00025 Mica—MT—20%
C6	100-11	.01 x400 Volt—20%
C7	129-2	.0005 Mica—MT—20%
C8	100-20	.1 x200 Volt—25%
C9	100-11	.01 x400 Volt—25%
C10	100-11	.01 x400 Volt—25%
C11	100-25	.002 x600 Volt—25%
C12	100-6	.25 x200 Volt—20%
C13	100-39	.1 x400 Volt—20%
C14	119-25	16 mfd.x100 Volt—Working Voltage
C15	119-25	5 mfd.x100 Volt—Working Voltage
C16	119-25	8 mfd.x100 Volt—Working Voltage

NOTE: C14, C15, and C16 in one unit—No. 119-25

C	102-33	One section of two gang condenser
T1	111-57	Antenna Coil
T2	110-46	Oscillator Coil
T3	108-82	Input I.F. Coil—465 Kc.

MODEL 601—SERIES A See schematic and parts above.

MODEL 601—SERIES B is the same as Series A, except for the following changes:-

1 - The C15 condenser was eliminated.

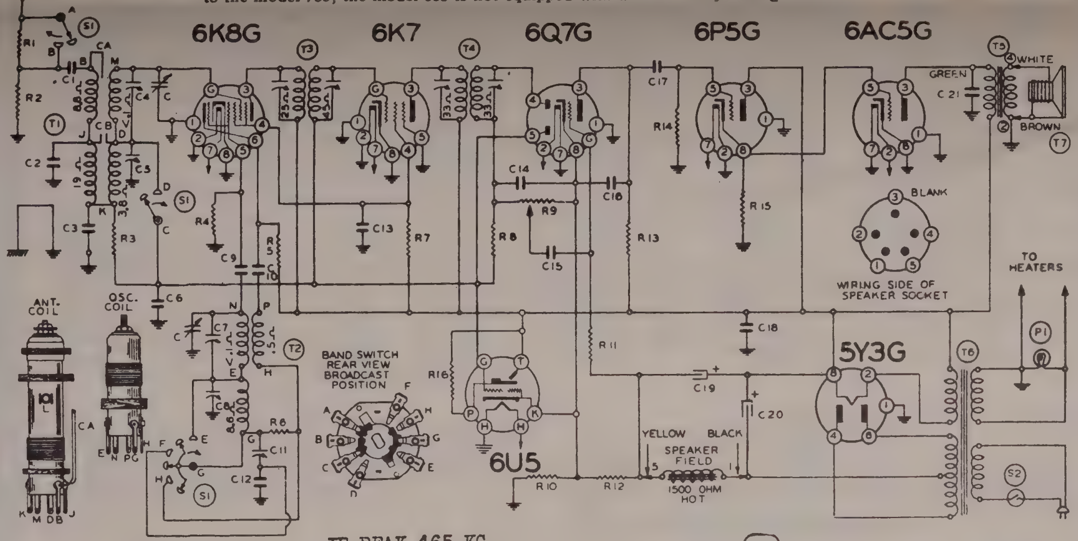
2 - The C14 condenser was replaced by a C15 (Part #119-29) 30 mfd. capacity, and the C16 was replaced by a C14 (Part #119-29) 5 mfd. capacity.

MODEL 601—SERIES C is the same as Series B (see above changes) except for the substitution of the following

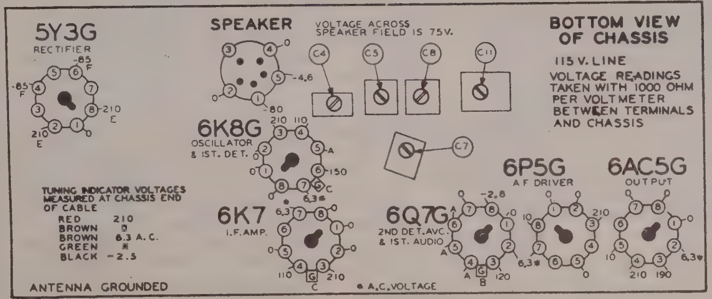
MODELS 665,765,Series A
Schematic ,Voltage
Trimmers,Socket

GAMBLE-SKOGMO INC.

NOTE: Circuit diagram and voltage chart show connections and voltage measure- to the model 765; the model 665 is not equipped with a cathode-ray tuning indicator.



IF PEAK 465 KC



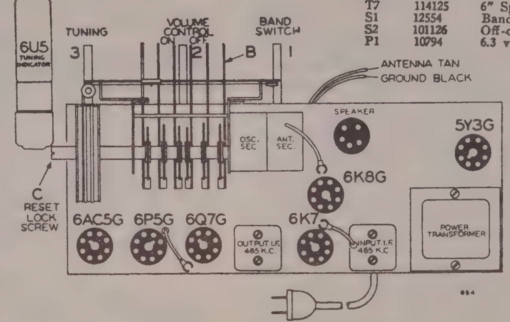
A - CANNOT BE MEASURED WITH VOLTMETER
B - BIAS OF -1.8V READ ACROSS R-12
C - BIAS OF -2.8V READ ACROSS R-10
E - 5V AC READ ACROSS TER. 2 & 8
F - 560V AC READ ACROSS TER. 4 & 6

REAR OF CHASSIS

FIG. 3

857

Power Consumption.....55 Watts (at 115 Volts 60 Cycles)
Power Output.....1.5 Watts Undistorted, 3.2 Watts Maximum



FOR SIMILAR TUNER ADJUSTMENTS SEE MODEL 761A GAMBLE PAGE 10-6 VOL. X

FOR ALIGNMENT SEE INDEX

R2	13017	10M ohm—⅓ w.
R5	13017	10M ohm—⅓ w.
R6	13031	1500 ohm—⅓ w.
R7	13042	20M ohm—½ w.
R8	1304	3 megohm—⅓ w
R9	101126	1 megohm control (volume)
R10	130233	60 ohm—⅓ w.
R11	1304	3 megohm—⅓ w.
R12	130203	40 ohm—⅓ w.
R13	1309	200M ohm—⅓ w.
R14	13019	1 megohm—⅓ w.
R15	130232	25M ohm—⅓ w.
R16	130110	1 Megohm (in Tuning Indicator Socket)
		CONDENSERS
CA		Adjustable Capacitor
CB		Adjustable Capacitor
C	10274	2 gang variable condenser
C1	12987	.000105 Mica
C2	12949	.00009 Mica
C3	10077	.00304 x 600 v.
C4	12439	SW. Antenna Trimmer 2-25 mmfd.
C5	12453	BC. Antenna Trimmer 1-10 mmfd.
C6	10022	.05 x 400 v.
C7	12439	SW. Oscillator Trimmer 2-25 mmfd.
C8	12453	BC. Oscillator Trimmer 2-25 mmfd.
C9	12938	.00005 Mica
C10	10025	.002 x 600 v.
C11	12451B	350 mmfd. W.C. B.C. Series Pad
C12	129112	.0041 Compression Type
C13	10053	.25 x 400 v.
C14	12939	.00005 Mica
C15	10011	.01 x 400 v.
C16	1292	.0005 Mica
C17	10011	.01 x 400 v.
C18	10013	.05 x 400 v.
C19	11963B	8 mfd.—350 w. v. lytic
C20	11963B	12 mfd.—350 w. v. lytic
C21	10089	.008 x 800 v.

C5 and C8 in same unit. C18 and C19 in same unit.

		PARTS
T1	11193C	SW. B. C. Antenna Coil Complete
T2	11089	SW. B. C. Oscillator Coil Complete
T3	108105G	Input I. F.—465 kc.
T4	108106D	Output I. F.—465 kc.
T5	10575	Output Transformer
T6	104124B	Power Transformer
T7	114125	6" Speaker Dynamic (1500 ohm field)
S1	12554	Band Switch
S2	101126	Off-on Switch on volume control
P1	10794	6.3 v. Pilot Light T-44

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	540 to 1720 K.C. (Kilocycles)
Short Wave	Lower	5.45 to 18.3 M.C. (Megacycles)

MODELS 665 & 765 SERIES A

DESCRIPTION

TUBES:
The tube complement of this chassis consists of the following octal base glass and metal tubes:

The type and function of each tube is as follows:

1—Type 6K8G Triode Hexode, First Detector-oscillator.
1—Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.)
1—Type 6Q7G Duplex Diode Triode Second Detector, A. V. C. and First Audio.
1—Type 6P5G Driver Stage.
1—Type 6AC5G Positive Grid Triode Output Amplifier.
1—Type 5Y3G High Vacuum Rectifier.
1—Type 6U5 Cathode-Ray Tuning Indicator Tube (for Model 765).

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts, (see parts list).

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

TO REMOVE CHASSIS FROM THE CABINET:

Remove the four bolts which are used to fasten the chassis to the cabinet shelf; pull the knob off their shafts and pull off the six button lever keys on front of dial.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non--metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	Frequency Setting	SIGNAL GENERATOR Dummy Antenna	SIGNAL GENERATOR Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short wave (Extreme right rotation)	Set dial at 17 MC	Trimmer (C 7) (See Fig. 3)	Short wave Oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short wave (Extreme right rotation)	Dial set at 17 MC	Trimmer (C 4) (See Fig. 3)	Short wave Antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C 8) (See Fig. 3)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 1400 Kc.	Trimmer (C 5) (See Fig. 3)	Broadcast Antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer (C 11) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
IMAGE REJECTION ADJUST-MENTS	2100 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1170 Kc. on dial	Wire capacitor (CB) (See circuit diagram)	Image rejection	Adjust by twisting for minimum output. (See note "B")
	2630 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1700 Kc. on dial	Wire capacitor (CA) (See circuit diagram)	Image rejection	Adjust by moving for minimum output. (See note "C")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of

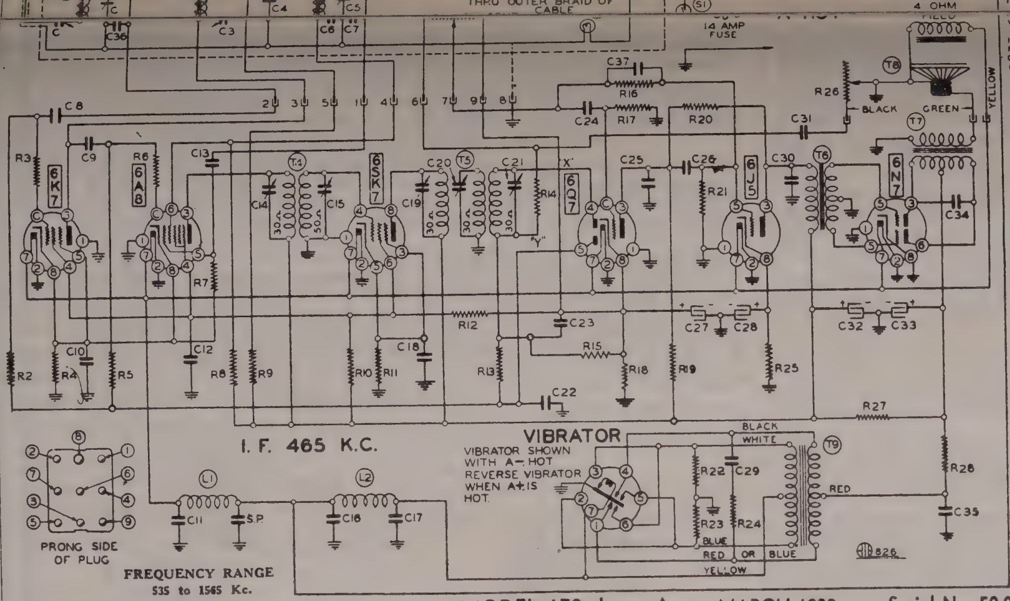
NOTE "C" 2630KC is the image frequency of 1700KC. Adjust wire capacity (CA) by moving the wire either toward or away from the antenna coil winding until a minimum output is obtained on

MODEL 678, Issue A
Schematic, Voltage
Socket, Trimmers

GAMBLE-SKOGMO INC.

Power Output.........7 Watts Undistorted, 9 Watts Maximum

Power Consumption..........7.7 Amperes at 6.3 Volts



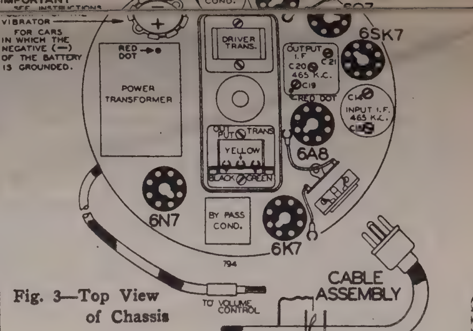
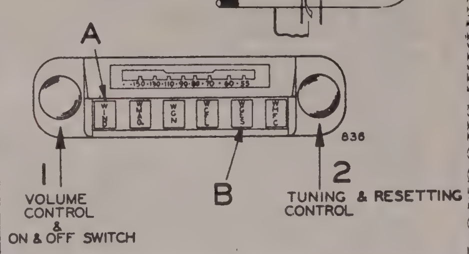


Fig. 3—Top View of Chassis



MODEL 678, Issue A MARCH 1939 Serial No. 50,001 UP

Fig. 2—Front View of Remote Tuner Unit

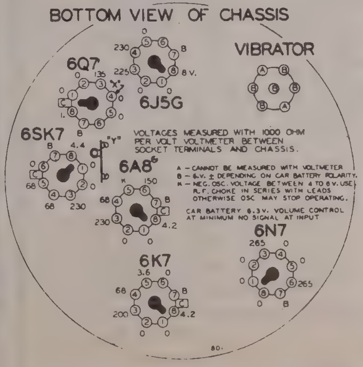

BOTTOM VIEW OF CHASSIS
6Q7
6J5G
VIBRATOR
6SK7
6A8
6N7
6K7
"X"
"Y"
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
A – CANNOT BE MEASURED WITH VOLTMETER
B – 6.V. ± DEPENDING ON CAR BATTERY POLARITY.
K – NEG. OSC. VOLTAGE BETWEEN 4 TO 8 V. USE R.F. CHOKE IN SERIES WITH LEADS OTHERWISE OSC MAY STOP OPERATING.
CAR BATTERY 6.3V. VOLUME CONTROL AT MINIMUM NO SIGNAL AT INPUT
230
225
135
8 V.
4.4
68
150
4.2
200
3.6
265
80

FIG. 5

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	101161	1.2 megohm volume control
R2	13019	1 megohm—⅓ w.
R3	130275	500 ohm—⅓ w.
R4	13079	400 ohm—⅓ w.
R5	13019	1 megohm—⅓ w.
R6	130275	500 ohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	13012	50M ohm—⅓ w.
R9	13021	20M ohm—⅓ w.
R10	130196	30M ohm—1 watt
R11	130235	1500 ohm—⅓ w.
R12	1307	40M ohm—⅓ w.
R13	13019	1 megohm—⅓ w.
R14	13020	100M ohm—⅓ w.
R15	130118	600M ohm—⅓ w.
R16	130257	5 megohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	130101	600 ohm—⅓ w.
R19	13011	250M ohm—⅓ w.
R20	13038	2 megohm—⅓ w.
R21	1303	500M ohm—⅓ w.
R22	130269	100 ohm—⅓ w.
R23	130269	100 ohm—⅓ w.
R24	13071	4M ohm—⅓ w.
R25	13092	1M ohm—⅓ w.
R26	101162	1 megohm tone control
R27	130199	1500 ohm Resistor—1 watt
R28	130231	75 ohm—⅓ w.
		CONDENSERS
C1	12480	Antenna Shunt Trimmer
C2	12481	Antenna Series Trimmer
C3	12480	R. F. Shunt Trimmer
C4	100102	.15 x 400 v.
C5	12480	Oscillator Shunt Trimmer
C6	129137	.0005 Mica
C7	129136	.00017 Mica
C8	12997	.00005 Mica—5%
C9	1292	.0005 Mica
C10	11625	.05 x 200 v.
C11	1296	.002 Mica
C12	11625	.25 x 400 v.
C13	12912	.00025 Mica
C14		Plate Trimmer on Input I.F. Trans.
C15		Grid Trimmer on Input I.F. Trans.
C16	10031	.5 x 120 v.
C17	10031	.5 x 120 v.
C18	1009	.05 x 200 v.
C19		Plate Trimmer on Output I.F. Trans.
C20		Tertiary Trimmer on Output I.F. Trans.
C21		Grid Trimmer on Output I.F. Trans.
C22	11625	.05 x 200 v.
C23	1295	.0001 Mica
C24	10011	.01 x 400 v.
C25	1295	.0001 Mica
C26	10011	.01 x 400 v.
C27	11978	20 mfd.—25 w. v. lytic
C28	11978	20 mfd.—25 w. v. lytic
C29	100101	.0055 x 1600
C30	129114	.0003 Mica
C31	10047	.002 x 600 v.
C32	11978	15 mfd.—450 w. v. lytic
C33	11978	15 mfd.—450 w. v. lytic
C34	100103	.004 x 800 v.
C35	1001	.1 x 400 volt
C36	12997	.00005 Mica—5%
C37	12967	.00004 Mica
		PARTS
T1	111118	P. B. Antenna Coil Assembly Complete
T2	10949	P. B. R. F. Coil Assembly Complete
T3	110109	P.B. Oscillator Coil
T4	108120B	Input I.F. Coil—465 kc.
T5	108115B	Output I.F. Coil—465 kc.
T6	10584	Audio Driver Transformer
T7	10583	Output Transformer
T8	114155	8" Dynamic Speaker
T9	104158	Power Transformer
L1	10566	"A" Choke
L2	10519	"A' Choke
P1	10794	6-8 v. Pilot Light
S1		Off-on Switch on volume control
	1269	Vibrator (130 cycle synchronous)

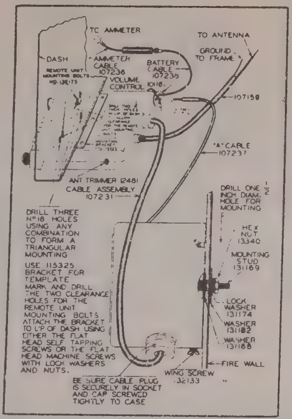

TC AMMETER
TO ANTENNA
GROUND TO FRAME
DASH
AMMETER CABLE 107236
BATTERY CABLE 107235
REMOTE UNIT MOUNTING BOLTS NO. 132175
VOLUME CONTROL 10118
107150
"A" CABLE 107237
ANT TRIMMER 12481
CABLE ASSEMBLY 107231
DRILL ONE ½ INCH DIAM. HOLE FOR MOUNTING
DRILL THREE Nº18 HOLES USING ANY COMBINATION TO FORM A TRIANGULAR MOUNTING
USE 115325 BRACKET FOR TEMPLATE MARK AND DRILL THE TWO CLEARANCE HOLES FOR THE REMOTE UNIT MOUNTING BOLTS ATTACH THE BRACKET TO LIP OF DASH USING EITHER THE FLAT HEAD SELF TAPPING SCREWS OR THE FLAT HEAD MACHINE SCREWS WITH LOCK WASHERS AND NUTS.
HEX NUT 13340
MOUNTING STUD 131169
LOCK WASHER 131174
WASHER 131182
WASHER 131168
FIRE WALL
WING SCREW 32133
BE SURE CABLE PLUG IS SECURELY IN SOCKET AND CAP SCREWED TIGHTLY TO CASE

Fig. 1A—General Installation View

CONNECTIONS TO BATTERY:

CAUTION: Before making any battery connections, check **the polarity** of the **vibrator unit** (contained in radio unit) to **determine** whether it corresponds with the **polarity** of the **storage battery** in the car.

The radio is shipped from the factory with the vibrator **inserted** in its socket so that it will operate in **cars in which** the **positive** (+) post of the **storage battery is grounded** to the **frame** of the car.

In cars in which the **negative** (—) post of the **storage battery** is **grounded** to the frame of the car, the vibrator **must be pulled out** of its socket and **rotated** and **reinserted** into its **socket** so that the (—) sign on the top of the vibrator is **opposite** the **red dot** on the top of the **transformer cover**; (see Fig. 3, top view of radio chassis).

Check the polarity of the storage battery in car either by checking the actual wire connections on the battery or by using a voltmeter.

The ammeter cable, number 107236 (red wire with fuse receptacle at one end and terminal lug at other end), must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 10082 to battery terminal of ammeter, other end of capacitor to any convenient grounded screw on back of instrument dash panel.

Make certain the fuse is in the receptacle and the ammeter cable is properly connected to the short cable (number 107238), coming from the Remote Tuner Unit. (See Fig. 1A.)

In some installations it is advisable to connect the ammeter cable to the terminal on the ammeter which will not allow the current drawn by the radio to indicate on the ammeter, as additional motor interference may be encountered.

GENERATOR INTERFERENCE:

Remove the generator cutout mounting screw and fasten the condenser (10081) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely.

Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it used to eliminate a high pitched whining noise which would rwise be heard as the motor is accelerated.

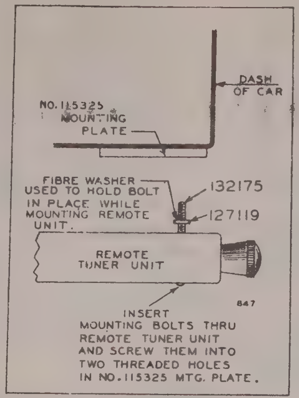

DASH OF CAR
NO. 115325 MOUNTING PLATE
FIBRE WASHER USED TO HOLD BOLT IN PLACE WHILE MOUNTING REMOTE UNIT.
132175
127119
REMOTE TUNER UNIT
847
INSERT MOUNTING BOLTS THRU REMOTE TUNER UNIT AND SCREW THEM INTO TWO THREADED HOLES IN NO. 115325 MTG. PLATE.

Fig. 1B—Remote Mounting

ANTENNA CONNECTION:

Insert the antenna plug in cable into the back of the remote tuner unit (see Fig. 1A). The wire at the other end of the antenna cable is connected to the lead-in wire from the antenna. Keep the antenna cable as far away from car wiring as possible and ground the pigtail of the antenna cable shield at the antenna end.

A 36 inch shielded antenna cable is regularly supplied. If a roof or door hinge type antenna is used, this cable will be long enough in practically all cases to reach the corner post or column at which the antenna lead comes down. The shielded cable should be pushed up into the column as far as possible. The reason for this is that ignition interference may be picked up by any unshielded portion of the antenna cable.

If an under car or running board **antenna is used,** the shielding must be extended to the **antenna** in **all cases.** The pigtail on the end of the antenna cable shield **must be well** grounded at the extreme antenna end. If it is necessary to extend the antenna cable, be sure **that a pigtail** is put on the end of the shielded **extension and that it is well grounded at** the extreme **antenna** end.

To extend the antenna cable shielding, the antenna lead wire should be covered with heavy insulation, such as loom, to properly separate the shielding from the wire. Then connect the two wires together and connect the two shields together, care being taken that no strand of the shield touches the antenna wire.

Aerials suitable for steel roof and convertible cars can be purchased from your dealer.

The majority of 1937, 1938 and 1939 cars have **steel roofs,** and a running board or other car antenna such as the fish pole, door hinge or over the top types must be used. The 1936 Chrysler Motors cars (except Plymouth—but including Chrysler, Dodge and De-Soto) have a steel roof, separated from the body proper, which is used as an antenna.

PROCEDURE FOR SETTING THE AUTOMATIC PUSHBUTTONS:

There are six pushbuttons on the Remote Tuner Unit by means of which six stations may be set up for automatic tuning (see B, Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the top of each pushbutton a slot is provided for inserting the call letter tabs, (see A, Fig. 2).

Insert the call letter tabs.

NOW, PROCEED AS FOLLOWS:—

1. Push the dial tuning knob **in hard** enough to **make it latch in.**
2. Rotate the dial tuning knob **to the left** (counter-clockwise), until the knob can not be turned **any further without forcing.**

   You will note that as the knob is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually **start unlocking** the tuner mechanism. Beyond this point the knob will turn quite easily **again** until the tuner mechanism is **completely unlocked.** At this point do not force the knob any further. The tuner mechanism is now **unlocked.**

   (NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)
3. Push in **all the way** any one of the pushbuttons and at the same time hold **in firmly** the **dial tuning** knob. **Both the dial tuning knob and the pushbutton** should **be pushed hard** enough to make them **stay latched in.** The reason for **holding** the dial tuning knob **in firmly** when the **pushbutton** is **pressed** in is due to the latching mechanism in the Remote Tuner unit which is so constructed to release the dial tuning knob entirely when a pushbutton is pressed in. When setting up stations for automatic tuning, **however,** it is necessary that both the dial **tuning knob** and the **pushbutton be latched** in **together.**
4. Press in on the **pushbutton which is latched in.** Holding it in **firmly,** tune in by means of the dial tuning knob the station indicated on the station call letter tab on this pushbutton. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the pushbutton), until the station is clearest. The station will then be accurately tuned in.
5. Push in **all the way** another pushbutton, at the **same** time holding the dial tuning knob in so that **both** the **pushbutton** and the **dial tuning knob** are **latched in together.** Holding the pushbutton in **firmly,** tune in the station indicated on the call letter **tab** on this **pushbutton.**
6. Follow this procedure until you have tuned in all of your favorite stations.
7. When the last pushbutton has **been** properly set up it is necessary to **release** it from the latched-in position **before** the tuner mechanism can be locked. To release this pushbutton, press in **very slightly** any one of the other pushbuttons. This will **trip** the latching **mechanism and all** the **pushbuttons** will be **released** to **out position.**
8. Now, Press on the dial tuning knob hard enough to make it latch in. Rotate the dial tuning knob to the right (clockwise) until the knob can not be turned any further without forcing it

   This will **lock the tuner mechanism** and all the stations that have been set up on the pushbuttons will be **locked** in place for automatic tuning.
9. Press in any one of the pushbuttons and—YOUR FAVORITE STATION IS SELECTED.

The **important** steps to remember **when setting up stations** on the pushbuttons for automatic tuning **are:**

1. **To unlock** the tuner mechanism **press** on the **dial tuning** knob hard enough to make it stay **latched in. Rotate the** dial tuning knob to the left (counterclockwise) until the knob cannot be turned any further without forcing it.
2. **To set a pushbutton,** Push in **all the way** and hold in **firmly both** the **pushbutton** and the **dial tuning knob** so that **both latch in.** Hold in **firmly** the pushbutton and tune in the station by means of the dial tuning knob. Set all the pushbuttons in the same manner.
3. **To release the last pushbutton** push in very slightly any one of the other pushbuttons. This will trip the latching mechanism.
4. To lock the tuner **mechanism** push on the dial tuning knob hard enough to make it stay latched in. Rotate the dial tuning knob to the right (clockwise) until the knob can not be turned any further **without forcing** it. (NOTE: All the **pushbuttons must be in out position** when locking the tuner mechanism.)

RADIO LOCATION AND MOUNTING:

Determine the most satisfactory mounting position.

Lift the radio case up and temporarily hold it in the proposed position. The case should be mounted high enough to avoid interference with car controls and the location of the Remote Tuner unit in respect to the radio case should be considered. The limiting factor being the length of special connector cable which connects the Remote Tuner unit to the radio case. (**This cable should not be altered in any manner**).

Mark location for the mounting bolt, drill one one-half inch (½") hole, making certain that the paint around the hole on the engine side of the fire wall is scraped clean to insure a good ground connection between receiver and the frame of the car.

CAUTION: Before fastening the radio unit read **very** carefully the paragraph on "CONNECTIONS TO BATTERY." This concerns the **polarity** of the **vibrator unit** and must be thoroughly understood as the radio **will not** operate unless the **polarity** of the **vibrator unit** corresponds with the **polarity** of the **storage battery** in the car.

TUNER UNIT MOUNTING: It may be **necessary** in some instances to move dash panel light switches or car heater control switches, however, in the majority of cases the Remote Tuner Unit will mount very satisfactorily under the dash panel to the left of the steering column. Mount the unit as close to the steering column as possible to allow clearance for the emergency brake which is mounted on the extreme left hand side of some makes of cars.

Details for mounting are shown in Fig. 1A and Fig. 1B, General Installation view.

The bracket No. 115325 for mounting the Remote Tuner Unit has three rows of holes to facilitate the best mounting in all makes of cars.

Use the bracket as a template, marking the lip of the dash for three mounting holes for the bracket and two clearance holes for the Remote Tuner unit mounting bolts. (See Fig. 1A.)

Mount the bracket using either the flat head self-tapping screws or the flat head machine screws, lockwashers and nuts supplied.

Insert the two Remote Tuner Unit mounting bolts through the holes in the unit using the two fibre washers to hold the bolts in place while mounting the unit to the bracket (see Fig. 1B). Screw the mounting bolts into the threaded holes in the mounting bracket (eight threaded holes are provided so that the remote unit can be mounted forward or further **back as desired**). Fasten the unit securely.

Connect the battery cable, number 107237 coming from the radio case to the pin on the volume control assembly on the rear of the Remote Tuner Unit.

Connect the R. F. cable assembly (cable number 107231) by inserting the plug of the cable into the receptacle socket on the side of the radio unit case. Screw the threaded cap of the cable assembly to the threaded fitting on the radio case **securely.** (See Fig. 1A.)

Important: This cable should not be altered in any manner.

This unit has been carefully designed to facilitate servicing; the entire case can be removed by loosening three wing head screws, exposing all tubes, vibrator and receiver circuits.

All adjustments are accessible being located on the side and bottom of the Remote Tuner unit (See Fig. 4), a full eight inch electro dynamic speaker is used.

The output of the receiver is 9 watts.

GAMBLE-SKOGMO INC.

DESCRIPTION:

Model 678 is a six tube superheterodyne receiver having a tuning range of 535 K. C. to 1565 K. C.; operates from a six volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a synchronous type vibrator.

The I. F. frequency used is 465 K. C. The output I. F. coil has three tuned circuits giving superior band pass qualities and selectivity as compared to the conventional two tuned circuit coils. Antenna, R. F. and oscillator circuits are permeability tuned, offering automatic tuning applications that are both accurate and stable. The entire coil assembly is mounted in the Remote Tuner control head being connected to the oscillator and R. F. circuits by an R. F. transmission cable.

The R. F. oscillator, I. F. and audio amplifier including the power supply is contained in the speaker case.

SERVICE NOTES:

chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the voltage chart.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating which is known to be good, until the defective unit is located.

due to defective tubes, the tubes making poor contact caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

IGNMENT PROCEDURE

ALIGNING INSTRUCTIONS:

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

IMPORTANT—ADJUSTING ANTENNA TRIMMER:

Tune in any weak station between 600 and 800 kc.

Make sure that the antenna shunt trimmer on the Bottom **of the Remote Tuner** is turned all the way out (counter clockwise), (see adjustment "C1," Fig. 4,).

Adjust antenna series trimmer on the side of the remote **Tuner Unit.** For maximum output. (See adjustment "C2," Fig. 4,).

NOTE: If resonance (maximum output) cannot be obtained within the range of the antenna series trimmer "C2," turn the adjustment screw all the way out (counter clockwise) and then adjust the antenna shunt trimmer "C1" on the **bottom of the remote tuner unit** for a peak of maximum output.

The above arrangement will cover any antenna capacity that is now in use.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 125 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	Trimmers C19, C20 (See Fig. 3)	Output I. F.	See note "A" Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SK7	Set dial at 1400 Kc.	Trimmer C21 (See Fig. 3)	Output I. F.	See note "B" Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6A8	Set dial at 1400 Kc.	Trimmers C14, C15 (See Fig. 2)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1565 Kc.	125 mmf.	Antenna lead	Set dial at 1565 Kc.	Trimmer C5 (See Fig. 4)	Oscillator	Adjust to maximum output
	1400 Kc.	125 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmers C1, C3 (See Fig. 4)	Antenna and R. F.	Adjust to maximum output
	600 Kc.	125 mmf.	Antenna lead	Set dial at 600 Kc.	Trimmer C2 (See Fig. 4)	Antenna series adj.	See note "C"

NOTE "A" IMPORTANT: To align the output I. F. transformer without using a cathode ray oscillograph a 10M ohm resistor must be shunted across the diode tuned circuit. Connect the resistor as indicated by points "X" and "Y" on the circuit diagram and the bottom view of the radio chassis Fig. 5. A red dot on top of output I. F. can designates location of trimmer "C19."

NOTE "B" Before adjusting trimmer C21 disconnect the 10M ohm resistor. Under no circumstances re-adjust trimmers C19 or C20 after the 10M ohm resistor has been removed.

For alignment of the output I. F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used.

NOTE "C" Maximum gain for this adjustment depends on the capacity of the antenna system of the car in which the radio is installed. For the proper alignment of this adjustment see "Adjusting Antenna Trimmer."

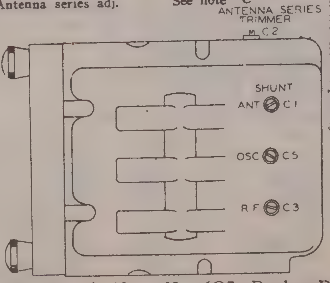


Fig. 4.—Bottom View of Remote Tuner

ALIGNMENT OF THE IRON CORES

The iron cores for the antenna, R. F. and oscillator permeability coils have been very carefully adjusted at the factory and require no further adjustment, unless it becomes necessary to replace a coil, or if the adjustments have been tampered with.

The procedure for aligning the iron cores will be supplied with replacement coils when ordered.

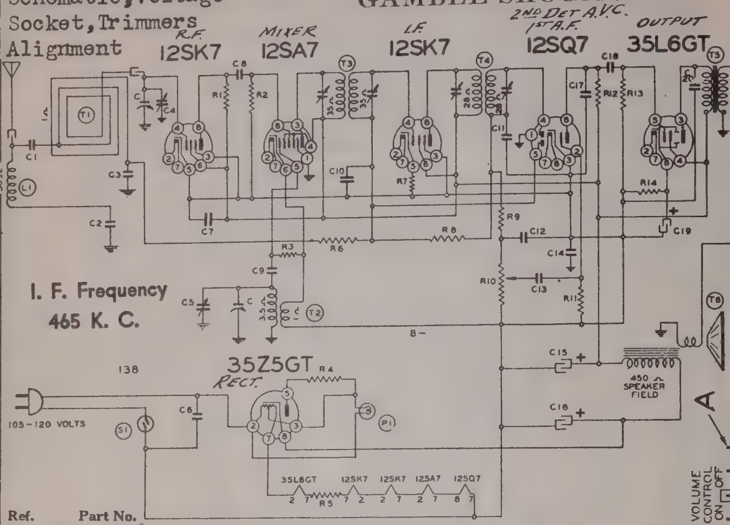
TUBE COMPLEMENT:

The tube complement of this chassis consists of the following metal and octal base glass tubes which are interchangeable with metal tubes.

1—Type No. 6K7 R. F. Amplifier.
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator).
1—Type No. 6SK7—Remote Cut-off Pentode as an I. F. Amplifier.
1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type No. 6J5G—Driver Amplifier.
1—Type No. 6N7—Push-Pull Output Amplifier.

MODEL 636
Schematic, Voltage
Socket, Trimmers
Alignment

GAMBLE-SKOGMO INC.


R.F. 12SK7
MIXER 12SA7
I.F. 12SK7
2ND DET A.V.C. 1ST A.F. 12SQ7
OUTPUT 35L6GT
I. F. Frequency 465 K. C.
35Z5GT RECT.
105-120 VOLTS
450 Ω SPEAKER FIELD
B−
138
T1 T2 T3 T4 T5 T6 L1 P1 S1
C C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14
35L6GT 12SK7 12SK7 12SA7 12SQ7

FOR TUNER ADJUSTME
SEE MODEL 677A VOL. X
GAMBLE PAGE 10 - 2

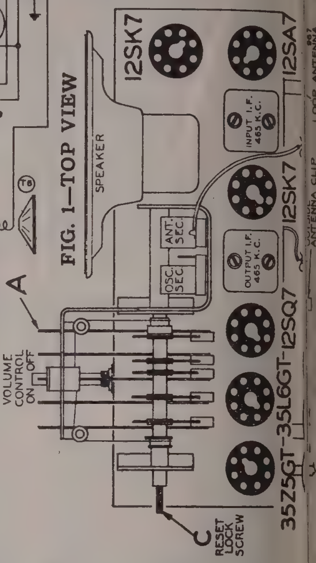


FIG. 1—TOP VIEW

Ref.	Part No.	
R1	130218	5M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	130176	20M ohm—⅓ w.
R4	130295	25 ohm—1 watt
R5	130295	25 ohm—1 watt
R6	130100	150M ohm—⅓ w.
R7	130203	40 ohm—⅓ w.
R8	1304	3 megohm—⅓ w.
R9	13012	50M ohm—⅓ w.
R10	101127	1 megohm volume control
R11	130257	5 megohm—⅓ w.
R12	13011	250M ohm—⅓ w.
R13	1303	500M ohm—⅓ w.
R14	130166	150 ohm—⅓ w.
C	102104B	2 gang variable condenser
C1	12951	.000125 Mica
C2	12912	.00025 Mica
C3	10026	.02 x 400 v.
C4		Antenna Trimmer on gang
C5		Oscillator trimmer on gang
C6	1001	.1 x 400 v.
C7	1006	.25 x 200 v.
C8	1295	.0001 Mica
C9	1295	.0001 Mica
C10	1009	.05 x 200 v.
C11	1295	.0001 Mica
C12	1295	.0001 Mica
C13	10012	.003 x 600 v.
C14	100110	.2 x 400 v.
C15	11953E	30 mfd. lytic—150 w. v.
C16	11953E	30 mfd. lytic—150 w. v.
C17	1295	.0001 Mica
C18	10078	.01 x 200 v.
C19	11953E	40 mfd.—25 w. v. lytic
C20	10026	.02 x 400 v.

C15, C16, and C19 in same unit

PARTS

T1	111139	Loop Antenna
T2	110128	Oscillator Coil
T3	108140F	Input I. F. Coil
T4	108145B	Output I. F. Coil
T5	10588B	Output Transformer
T6	114116G	5" Dynamic Speaker (450 ohm fi
L1	1237	Antenna Loading Coil
P1	107249	6-8 volt, Pilot light - T-47
S1		Off-on Switch on Volume Contro

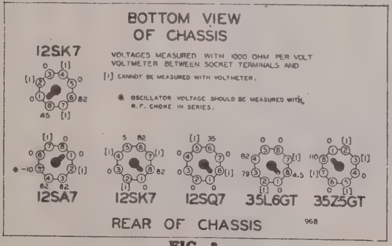


FIG. 3

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

ALIGNING INSTRUCTIONS:

Do not remove the back cover of the radio which contains the loop antenna from the chassis. It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through two holes which are provided on the bottom of the cabinet.

The two adjustments on the variable gang condenser can be reached with a long insulated type screw driver through these two holes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I.F.	Adjust to maximum ou
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer bottom of Front section of gang. (See bottom of radio)	Oscillator	Adjust to maximum ou
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer bottom of Rear section of gang. (See bottom of radio)	Antenna	Adjust to maximum ou

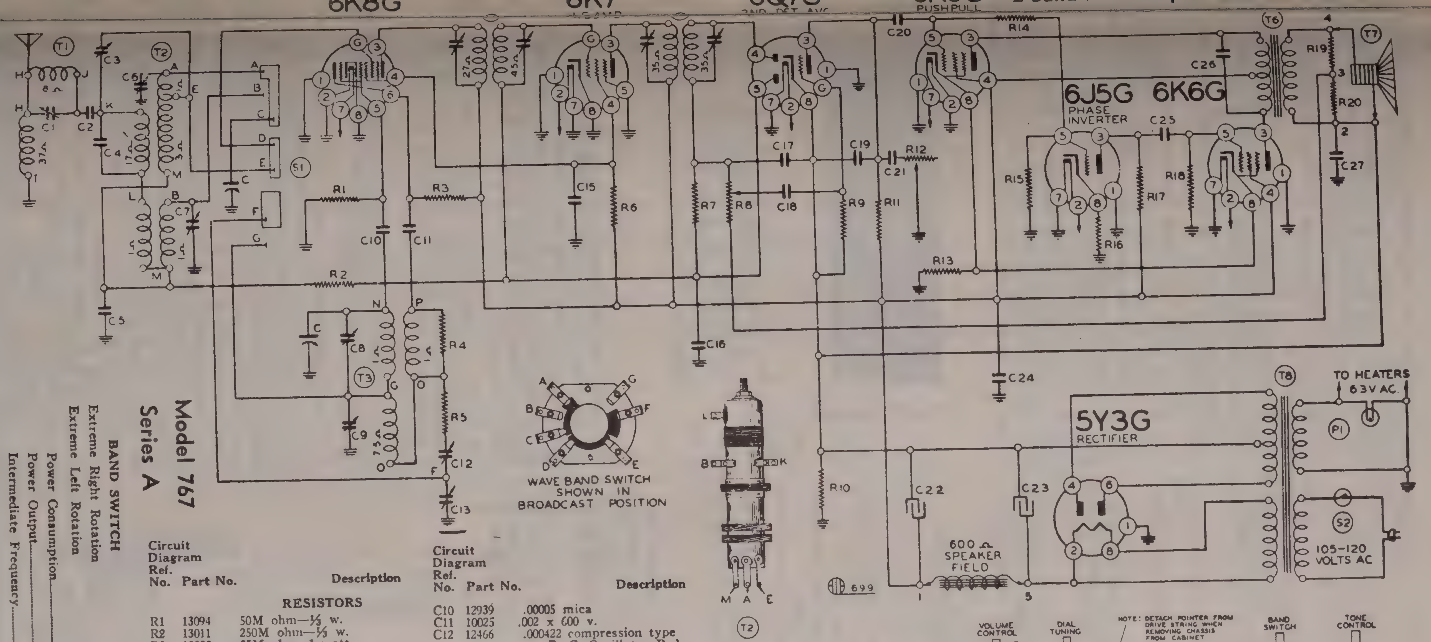
NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

FREQUENCY RAN
540 to 1650 K.C.

Power Consumption..........40 Watts
Power Output..........800 Milliwatts Undistorted, 1.5 Watts Maximum
Intermediate Frequency..........465 K.C.

MODEL 767, Series A
Schematic, Socket
Trimmers

GAMBLE-SKOGMO INC.



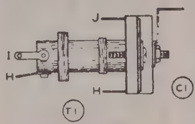
Model 767
Series A

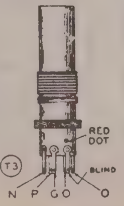
Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—⅓ w.
R2	13011	250M ohm—⅓ w.
R3	13030	25M ohm—1 watt
R4	13031	1500 ohm—⅓ w.
R5	130231	75 ohm—⅓ w.
R6	13030	25M ohm—1 watt
R7	1304	3 megohm—⅓ w.
R8	101144	1 megohm volume control
R9	130225	15 megohm—⅓ w.
R10	130240	30 ohm—⅓ w.
R11	130103	100M ohm—⅓ w.
R12	101145	1 megohm tone control
R13	130220	300 ohm—1 watt
R14	130163	400M ohm—⅓ w.
R15	130103	100M ohm—⅓ w.
R16	130218	5M ohm—⅓ w.
R17	13094	50M ohm—⅓ w.
R18	130102	500M ohm—⅓ w.
R19	130168	100 ohm —⅓ w.
R20	130215	25 ohm—⅓ w.
		CONDENSERS
C	10292	2 gang variable condenser
C1	12467	Wave Trap Trimmer
C2	10011	.01 x 400 v.
C3	12468	Image Adj. Trimmer
C4	129132	.000125 mica
C5	129131	.002775 mica
C6	12469	B. C. Antenna Trimmer
C7	12469	S. W. Antenna Trimmer
C8	12470	S. W. Oscillator trimmer
C9	12470	B. C. Oscillator Trimmer

Circuit Diagram Ref. No.	Part No.	Description
C10	12939	.00005 mica
C11	10025	.002 x 600 v.
C12	12466	.000422 compression type B. C. Oscillator Pad
C13	12466	.001366 compression type S. W. Oscillator Pad
C15	1001	.1 x 400 v.
C16	1009	.05 x 200 v.
C17	1295	.0001 mica
C18	10019	.006 x 600 v.
C19	1292	.0005 mica
C20	10026	.02 x 400 v.
C21	10013	.05 x 400 v.
C22	11974	10 mfd. lytic—350 w. v.
C23	11973	16 mfd. lytic—400 w. v.
C24	1001	.1 x 400 v.
C25	10026	.02 x 400 v.
C26	10012	.003 x 600 v.
C27	10020	.1 x 200 v.
		PARTS
T1	108125	Wave Trap
T2	111112	B. C. and S. W. Antenna Coils
T3	11098	B. C. and S. W. Oscillator Coils
T4	108105B	Input I. F.—465 kc.
T5	108106M	Output I. F.—465 kc.
T6	10554B	Output Transformer
T7	114135	8" Dynamic Speaker (600 ohm field)
T7	114134	6" Dynamic Speaker (600 ohm Field)
T8	104143B	Power Transformer
S1	12568	Wave Band Switch
S2		Off-on Switch on Vol. Control
P1	10794	6-8 v. Pilot Light

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.6 to 18 MC.
Extreme Left Rotation	Broadcast	540 to 1730 KC.

Power Consumption	80 Watts (At 115 volts 50-60 cycles)
Power Output	5 Watts Undistorted, 7 Watts Maximum
Intermediate Frequency	465 KC.





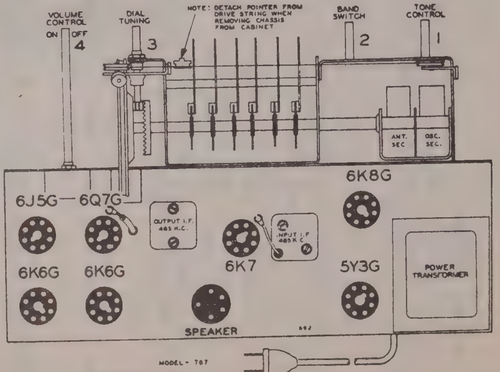


FIG. 1—TOP VIEW

MODEL 767,Series A
Tuner Data

GAMBLE-SKOGMO INC.

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts A.C. line or a fully charged 6 volt storage battery.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—Read carefully before setting the automatic levers.

There are six levers by means of which six stations may be selected. Make a list of local stations or stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever button an opening is provided for inserting the call letter tabs.

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW. PROCEED AS FOLLOWS:—

1. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig 3), and rotate the tuning knob to the left (counterclockwise) until it cannot be turned any further (See Illus. "D," Fig. 3). This will unlock the automatic tuner mechanism. (NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Press **down all the way** any one of the automatic tuner levers. Holding it down **firmly**, press in on the dial tuning knob No. 3 and tune in the station indicated on the station call letter tab on this lever. You will note that in order to tune the station, the dial tuning knob will have to be pre in (See Illus. "E," Fig. 3). Turn the dial tuning knob v slowly back and forth **(while still holding the automatic tu lever in downward position)**, noting the width of the shad on the screen of the cathode-ray tuning indicator. Minim width on the tuning indicator indicates the ideal tuning p tion (resonance). The station will then be clearest and ac rately tuned in.

KNOB NO.3 (DIAL TUNING)

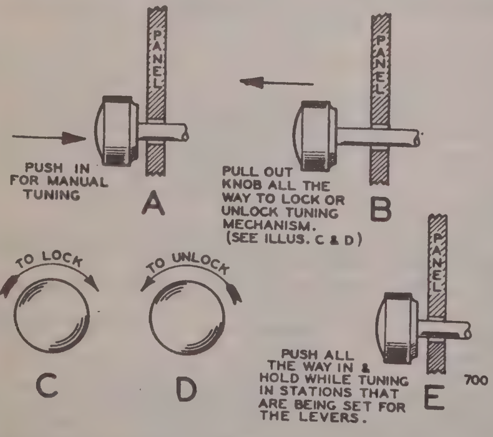

PANEL
PANEL
PANEL
PUSH IN FOR MANUAL TUNING
A
PULL OUT KNOB ALL THE WAY TO LOCK OR UNLOCK TUNING MECHANISM. (SEE ILLUS. C & D)
B
TO LOCK
TO UNLOCK
C
D
PUSH ALL THE WAY IN & HOLD WHILE TUNING IN STATIONS THAT ARE BEING SET FOR THE LEVERS.
E
700

FIG. 3

3. Press down another automatic tuner lever. Holding down **firmly, press in** on the dial tuning knob and carefu tune in the station indicated on the call letter tab on this lev

4. Follow this procedure until you have selected all of y favorite stations.

5. Pull the dial tuning knob **all the way out** (See Illus. " Fig. 3) and rotate the tuning knob to the **right** (clockwi until it cannot be turned any further (See Illus. "C," Fig. This will lock the automatic tuner mechanism and the static you have set up for automatic tuning will be locked in pla After you have locked the tuner mechanism, push the d tuning knob **in.**

6. If you should desire to change any station you sele to another, pull the dial tuning knob all the way **out** and tate the knob to the left (counterclockwise) and unlock t tuner mechanism. Select the new station as explain

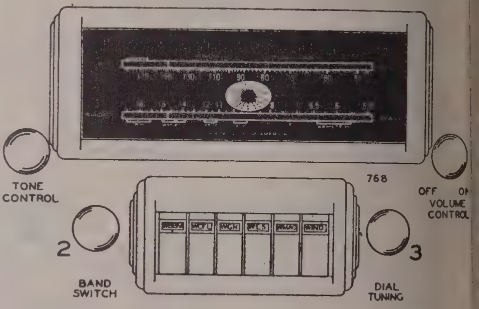


FIG. 2—FRONT VIEW

(NOTE:—If the dial mechanism works hard when setting u a new station for one of the automatic tuner levers, it is du to the tuner mechanism not being unlocked all the way. Pu the dial tuning knob out all the way and rotate the knob t the left (counterclockwise) until it will turn no further. Th dial mechanism should work freely with the tuner leve pressed down).

7. After you have selected the new station, pull the dia tuning knob all the way **out** and rotate the knob to the righ (clockwise) to lock the tuner mechanism. Be sure the knol is turned until it will turn no further, then **press** the dia tuning knob **in.**

8. The automatic tuner levers are now set up for quick tuning. Press down the lever key and—YOUR FAVORITE STATION IS SELECTED!

The **important** steps to remember when setting up stations on the tuner levers for automatic tuning are:

1. **To unlock** the tuner mechanism pull the dial tuning knob **all the way out.** You may find it necessary to rotate the knob slightly when pulling it out to make certain that the gears mesh properly. Rotate the dial tuning knob to the left (counterclockwise) as far as it will turn without forcing.

2. **To set a lever,** press down **all the way** and **hold** in this position while tuning in by means of the dial tuning knob the station you want this lever to be tuned to. (NOTE:—you will notice that it will be necessary to keep pressing in on the dial tuning knob while tuning in the station as a spring tends to push the knob out.) Set all the levers in the same manner before locking the mechanism.

3. To lock the tuner mechanism pull the dial tuning knob **all the way out.** Rotate the dial tuning knob to the right as far as it will turn making certain that it is tight, but it is not necessary to use force.

4. After locking or unlocking the tuner mechanism always return the dial tuning knob to its normal position (pushed in).

GAMBLE-SKOGMO INC.

MODEL 767,Series A
Alignment,Voltage
Trimmers

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1400KC is the image frequency of 2330KC. Adjust Trimmer (C3) until a minimum output is obtained.

IGNMENT PROCEDURE

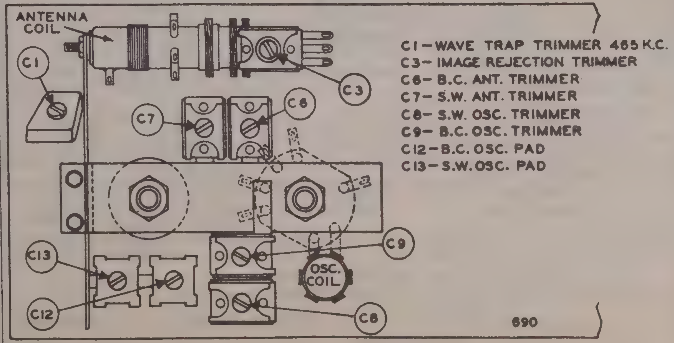
odel 767 Series A

- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C9) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C6) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C12C) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 4)	I. F. Wave Trap	Adjust for minimum output
IMAGE REJECTION ADJUST-MENTS	2330 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1400 Kc. on dial	Trimmer (C3) (See Fig. 4)	Image rejection	Adjust for minimum output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer (C8) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 Mc.	Trimmer (C7) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer (C13) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

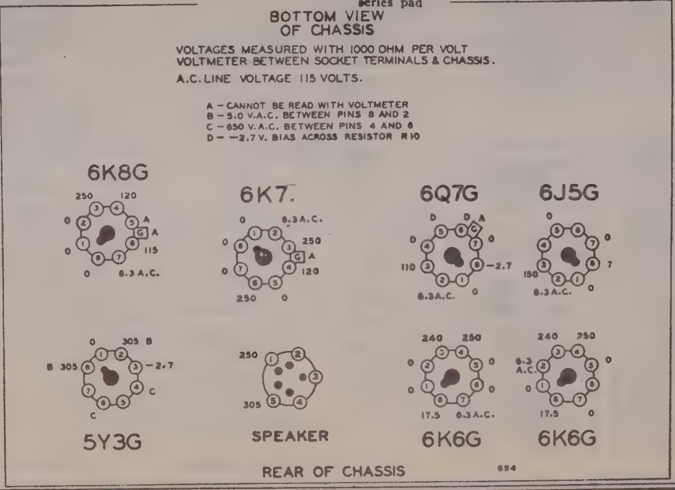
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.



C1—WAVE TRAP TRIMMER 465 K.C.
C3—IMAGE REJECTION TRIMMER
C6—B.C. ANT. TRIMMER
C7—S.W. ANT. TRIMMER
C8—S.W. OSC. TRIMMER
C9—B.C. OSC. TRIMMER
C12—B.C. OSC. PAD
C13—S.W. OSC. PAD

FIG. 4



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

A.C. LINE VOLTAGE 115 VOLTS.

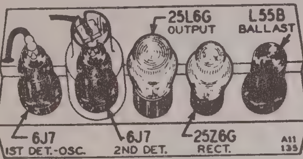
A - CANNOT BE READ WITH VOLTMETER
B - 5.0 V.A.C. BETWEEN PINS 8 AND 2
C - 650 V.A.C. BETWEEN PINS 4 AND 6
D - -2.7 V. BIAS ACROSS RESISTOR R10

REAR OF CHASSIS

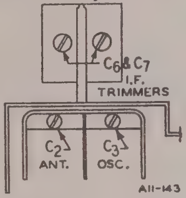
MODELS 802,804
Schematic,Voltage
Alignment,Trimmers
Socket

GAMBLE-SKOGMO INC.

DC OPERATION—Filament and ballast tube voltages will be the same as AC (for 117 volt line). The plate, screen and bias voltages will be slightly lower than those shown above. When operated on DC, the rectifier tube acts as a low resistance series resistor with a drop of approximately 6 volts between plate and cathode.



CAUTION—In any service work on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground.



MAY, 1938

VOLTAGES AT SOCKETS FOR 117 VOLT *AC LINE*

See Note Below Regarding Voltages when Operated on DC
Volume Control Maximum—Antenna Lead Grounded—Readings taken with 1000 O
per-volt Meter.

TUBE	FUNCTION	Voltage Between Socket Prong and Ground (Unless Otherwise Indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prc Nc
6J7	1st Det. & Osc.		6.3(1)	98	98			6.3(1)	6.(
6J7	2nd Det.		6.3(1)	10	13			6.3(1)	
25L6G	Output		24(1)	92	98			24(1)	
25Z6G	Rectifier		24(1)	117(2)	125	117(2)		24(1)	125
L55B	Ballast			56.6(3)				56.6(3)	4.5

(1) AC voltage across terminals 2 and 7.
(2) AC voltage to ground.
(3) AC voltage across terminals 3 anc
(4) AC voltage across terminals 7 anc

Power Consumption - 48 Watts (At 117 volts AC Supply)
Power Output - - - - - .8 Watts Undistorted
Selectivity - - 30 KC Broad at 100 times Signal.
Tuning Frequency Range - - - - 530 to 1730 KC
Sensitivity - - - - - 180 Microvolts Average

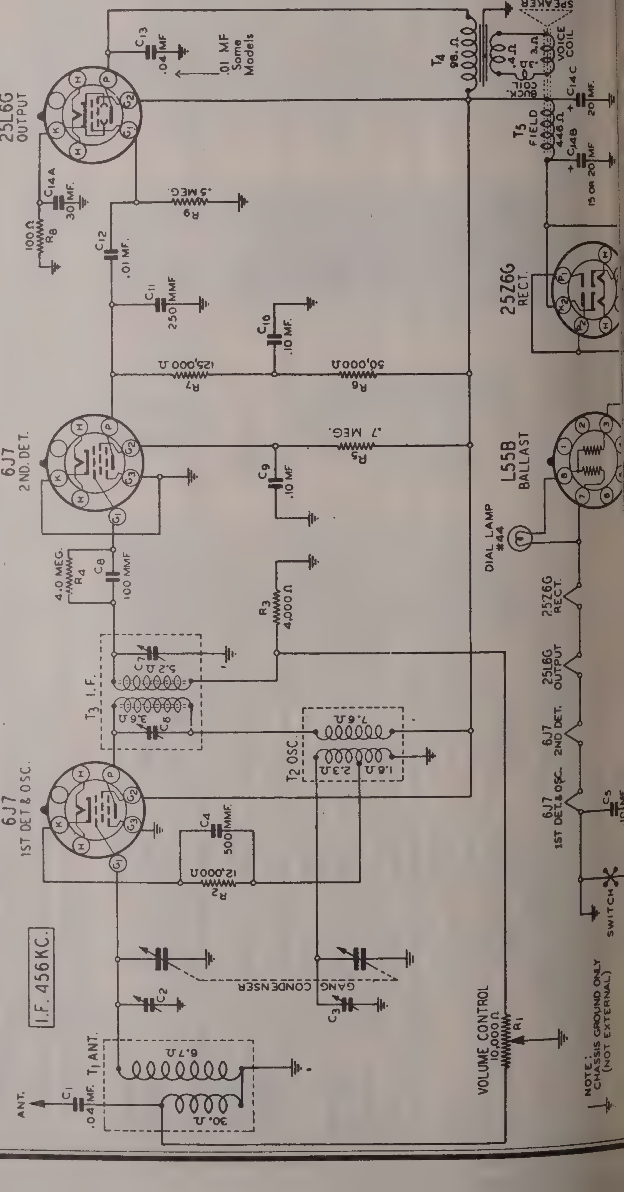
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

SIGNAL GENERATOR		DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Illustration)
FREQUENCY SETTING	CONNECTION AT RADIO			
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	I.F. (C6) & (C7)
1730 KC	Antenna Lead	200 mmf.	Turn rotor to full open	Oscillator (C3)
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C2)

The following equipment is required for aligning: Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter; Non-Metallic Screwdriver. Dummy Antennas —.1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.



MODEL 864
Schematic, Voltage
Socket, Sensitivity

GAMBLE-SKOGMO INC.

Power Output - - - - - - 8.5 Watts Undistorted
11.0 Watts Maximum

Selectivity - 32 KC Broad at 1000 times Signal
(Sharp)

Sensitivity

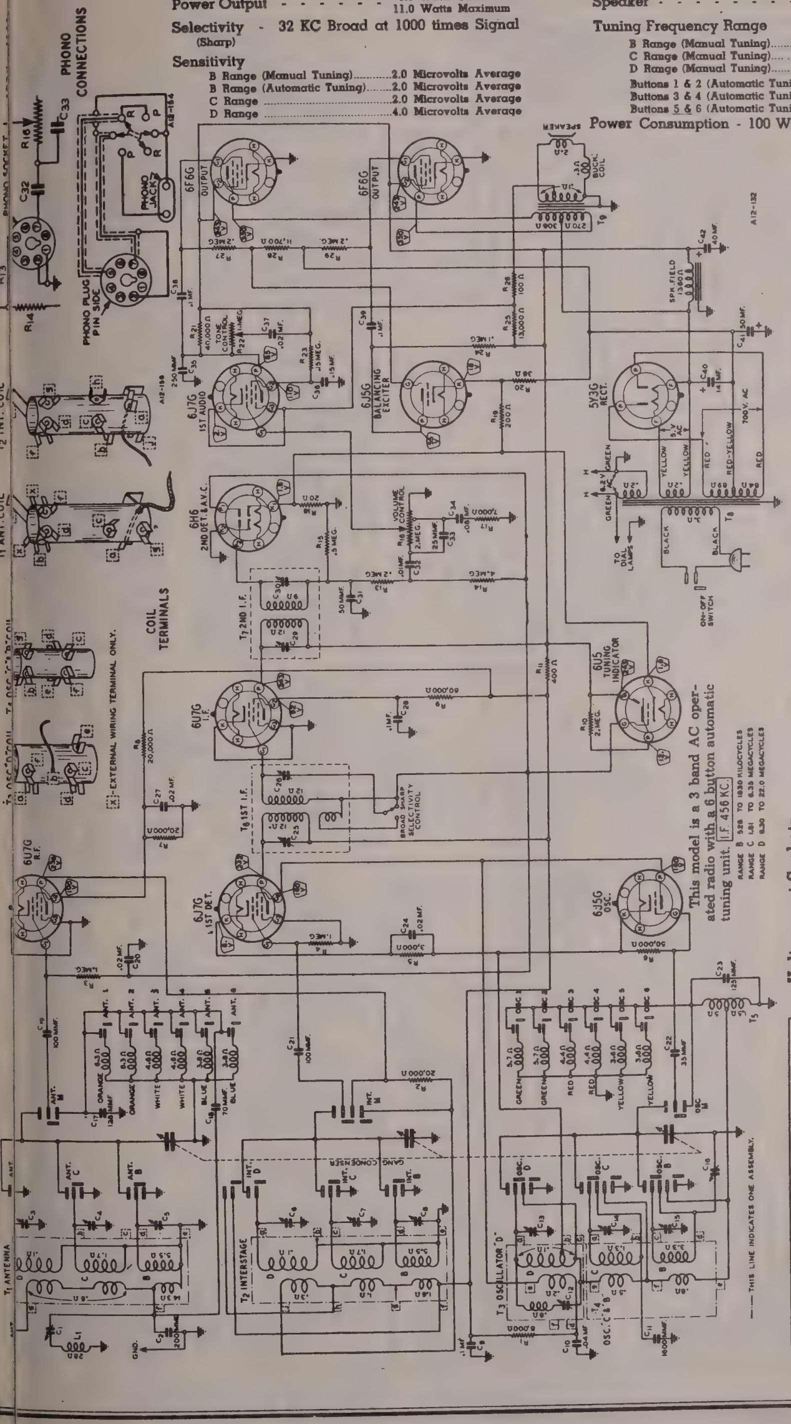
B Range (Manual Tuning)	2.0 Microvolts Average
B Range (Automatic Tuning)	2.0 Microvolts Average
C Range	2.0 Microvolts Average
D Range	4.0 Microvolts Average

Speaker - - - - - - - - - - 12" Dynamic

Tuning Frequency Range

B Range (Manual Tuning)	528	to	1830 KC
C Range (Manual Tuning)	1810	to	6350 KC
D Range (Manual Tuning)	6300	to	22000 KC
Buttons 1 & 2 (Automatic Tuning)	520	to	980 KC
Buttons 3 & 4 (Automatic Tuning)	650	to	1250 KC
Buttons 5 & 6 (Automatic Tuning)	820	to	1600 KC

Power Consumption - 100 Watts (At 117 volts 60 cycles)



This model is a 3 band AC operated radio with a 6 button automatic tuning unit. I.F. 456 KC.

RANGE B 528 TO 1830 KILOCYCLES
RANGE C 1.81 TO 6.35 MEGACYCLES
RANGE D 6.30 TO 22.0 MEGACYCLES

Oscillation on D Band

If oscillation is encountered on the D band, change the oscillator grid resistor to 35,000 ohms.

Twenty-Five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used.

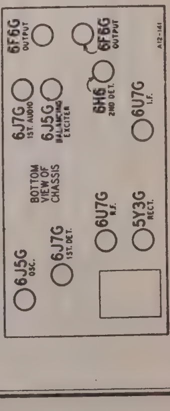
Readings taken with 1000 ohm-per-volt meter.

The voltage between the control grids of the 6J5G balancing exciter and the 6F6G output tubes and ground is 22. This voltage cannot be read at the socket terminal because of the high resistance circuit, but can be read across resistors R18, 19, and 20.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:
Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.



MODEL 864
Alignment, Trimmers
Drive Cord Data

GAMBLE-SKOGMO INC.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Selectivity Control—Sharp Position All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BUTTON DEPRESSED	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F.					
456 KC	Grid of I.F. Tube	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C29) & (C30)
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C25) & (C26)
RANGE B					
1830 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C5) Int. Range B (C8)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C16) Rock Rotor—See Note B
WAVE TRAP					
456 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to 600 KC Adjust Sig. Gen.—See Note C	Wave Trap (C1) Adjust for MINIMUM Output
RANGE C					
6350 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C4) Int. Range C (C7)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
20,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Int. Range D (C6) Rock Rotor—See Note B
7000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	7000 KC (C12) Rock Rotor—See Note B
PERMEABILITY TUNING UNIT				TURN SETTING SCREW TO MAXIMUM OUTPUT —See Instruction Book	ADJUST COIL POSITION TO MAXIMUM OUTPUT —See Note D
700 KC	Antenna Lead	200 mmf.	No. 1	Setting Screw No. 1	Antenna Coil No. 1
700 KC	Antenna Lead	200 mmf.	No. 2	Setting Screw No. 2	Antenna Coil No. 2
850 KC	Antenna Lead	200 mmf.	No. 3	Setting Screw No. 3	Antenna Coil No. 3
850 KC	Antenna Lead	200 mmf.	No. 4	Setting Screw No. 4	Antenna Coil No. 4
1100 KC	Antenna Lead	200 mmf.	No. 5	Setting Screw No. 5	Antenna Coil No. 5
1100 KC	Antenna Lead	200 mmf.	No. 6	Setting Screw No. 6	Antenna Coil No. 6

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1500 KC mark, and tighten the clamps.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Leave condenser rotor at the 600 KC setting and adjust the signal generator until maximum output is obtained at or near 456 KC.

NOTE D—At the bottom of the permeability tuning unit can be seen six "W" openings. Insert the end of a pair of long nose pliers or a screwdriver in the "W" opening of the proper button and adjust the position of the antenna (rear) coil by twisting the pliers or screwdriver until maximum output is obtained.

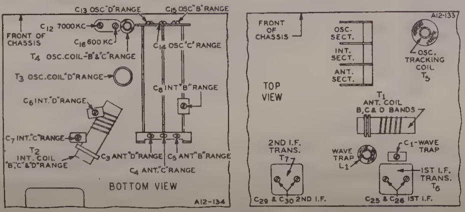


Fig. 1—Location of Trimmers

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

DISTORTION AFTER RADIO IS TURNED ON FOR ABOUT TEN MINUTES: -
If mushy reproduction is encountered, change 4 megohm resistor to a 2 megohm resistor and if this does not clear up the reproduction, replace the 6U7G R.F. tube or the I.F. tube or both. (Distortion due to grid current of these tubes)

Drive Cord Replacement

LATE MODELS—Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. The free end of the drive cord should be tied to the tension spring in such a manner that there is a distance of 56⅜ inches between the knots.

Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See Fig. 2. Bring the cord up through the slot in the drum rim and pass to the right (from back of chassis) and around pulley B. Then bring the cord to the left and over pulley C. See that the fabric tubing is now between pulleys B and C. Continue cord down to control shaft D and wind 3½ turns counter-clockwise (from back of chassis) on shaft D. Bring cord up to and over pulley E. Bring cord down to top of drive drum A and wind one turn clockwise around the drum rim.

Pass the remaining drive cord and tension spring through the slot in the drum. Place free end of spring over the hook on the condenser drive drum.

EARLY MODELS—The procedure is the same as for the late models with the following exceptions:

The distance between the knots on the drive cord should be 49¼ inches.

Leaving shaft D (Fig. 3), the drive cord is brought directly to the top of drive drum A and then continued as in late models.

Permeability Tuning and Band Switch Assemblies—Differences in Early Models

A few of the first models used a station button plunger 6¹³⁄₃₂ inches long. These models may be identified by a red paint mark on the front bracket of the tuning unit at the upper right corner. On later models, this length was changed to 6¹¹⁄₁₆ inches. These models have an orange paint mark in place of the red mark. It is important, therefore, that the length be noted when ordering this part and the correct part number, as shown in the parts list, be specified.

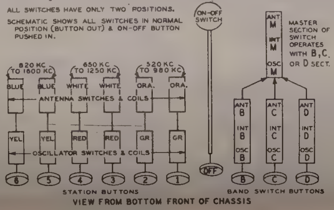

ALL SWITCHES HAVE ONLY TWO POSITIONS.
SCHEMATIC SHOWS ALL SWITCHES IN NORMAL POSITION (BUTTON OUT) & ON-OFF BUTTON PUSHED IN.
ON-OFF SWITCH
ANT M
INT M
OSC M
MASTER SECTION OF SWITCH OPERATES WITH B, C, OR D SECT.
820 KC TO 1600 KC
650 KC TO 1250 KC
520 KC TO 980 KC
BLUE
BLUE
WHITE
WHITE
ORA.
ORA.
ANTENNA SWITCHES & COILS
YEL
YEL
RED
RED
GR
GR
OSCILLATOR SWITCHES & COILS
ANT B
INT B
OSC B
ANT C
INT C
OSC C
ANT D
INT D
OSC D
6
5
4
3
2
1
OFF
B
C
D
STATION BUTTONS
BAND SWITCH BUTTONS
VIEW FROM BOTTOM FRONT OF CHASSIS

Fig. 5—Permeability Tuning Unit and Band Switch Arrangement

The plungers are replaceable only on the permeability (6 button) tuning unit. In the case of the band switch unit, if any parts require replacing, the entire assembly must be ordered. Two of these assemblies are listed, one using the early short shaft and the other using the later long shaft. The short shaft (early unit) has no paint mark on it. The long shaft (late unit) has an orange paint mark on it.

A change was also made on the tuning rod assembly (Rod on which 2 iron cores are mounted). The rod used on early models was 3¾ inches long and the back end of the rod rested in a small cup in the end of the compression spring. The rod used on late models is 4¾ inches long, extends through the compression spring and projects beyond the rear bracket of the tuning assembly. Only the later type rod complete with the compression spring and a small washer is being furnished for replacement. This complete assembly is interchangeable with the early type.

ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

Phonograph Connections

Phonograph connections are made as shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1⁹⁄₆₄ inches in diameter. An octal base socket is then mounted in this knockout opening. In the case of the early models a 1⁹⁄₆₄ inch hole must be drilled in the back panel.

A phono cable assembly may then be purchased (see parts list). On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack.

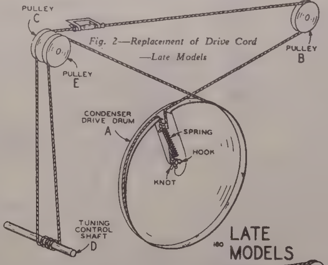


Fig. 2—Replacement of Drive Cord —Late Models

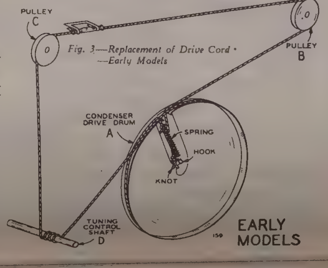
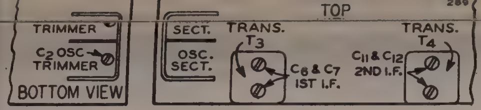


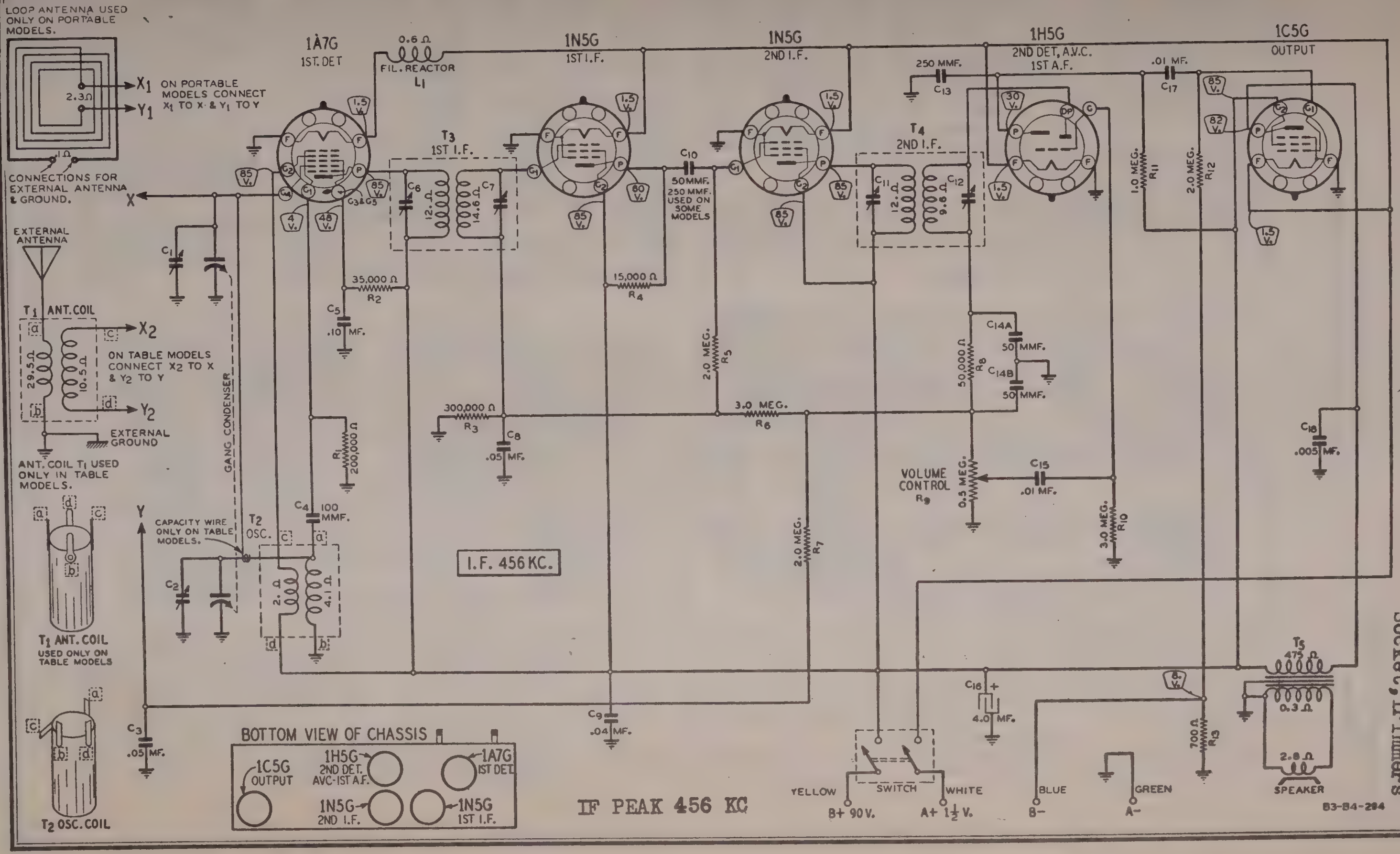
Fig. 3—Replacement of Drive Cord —Early Models

GAMBLE-SKOGMO INC.

MODEL 902
Schematic, Voltage
Socket, Trimmers



the front of the cabinet, it is necessary to take the following precautions, when removing the chassis: Pull the chassis away from the front of the cabinet until the control shafts are clear of the cabinet. Then tilt the rear the chassis base clear of the bottom of the cabinet to prevent breaking the On-Off indicator disk on the volume control shaft. Now carefully pull the chassis out of the cabinet.



IF PEAK 456 KC

MODEL 902
Alignment,Notes
MODELS 4912,4914
Alignment,Trimmers
Socket,Notes

GAMBLE-SKOGMO INC.

MODEL 902

SPECIFICATIONS

Input Voltages and Currents
"A" Battery........................1.5 Volts—.30 Amperes
"B" Battery........................90 Volts—12 to 15 Ma.
Power Output - - - 140 Milliwatts Undistorted
Selectivity - - 41 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC.
Speaker - - - - - - - - 6" P.M. Dynamic
Tuning Frequency Range - - - 540 to 1600 KC.
Sensitivity (For .05 Watt Output)
Portable Model............20 Microvolts Per Meter Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

SIGNAL GENERATOR				
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12)
1600 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn rotor to max. output	Antenna (C1)

The following equipment is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter: Non-Metallic Screwdriver.

Dummy Antenna—.1 mf.

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Connections for the output meter may be made through the opening for the outside antenna and ground connecting posts. This opening is at the bottom of the cabinet near the back. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION (For model with pointer in back of celluloid dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. IF THE POINTER IS AT A HIGHER KC MARK THAN 800 KC, grasp the drive cord below the tension spring. Hold the tuning control shaft motionless and slowly pull the drive cord down until the pointer is at the 800 KC mark. IF THE POINTER IS AT A LOWER KC MARK THAN 800 KC, grasp the drive cord above the tension spring. Hold the tuning control shaft motionless and slowly pull the drive cord up until the pointer is at the 800 KC mark.

CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

Antenna

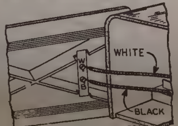
An outside antenna and ground are not required for this radio.

A loop antenna is built on the back cover of the cabinet. This makes the radio suitable for portable use.

If the radio is installed in a permanent location, a long outside antenna (50 to 100 feet) and a ground may be used. At the bottom of the cabinet near the back is an opening through which will be seen two connecting posts marked "A" and "G" for the outside antenna and ground connections respectively.

Batteries

Taking Off Back of Cabinet—To take off the back of the cabinet, first remove the wood screws which hold it in place. Then swing the back to the side as illustrated. It is not necessary to disconnect the two wires to the loop terminal strip. DO NOT TOUCH THE LOOP ANTENNA WIRES AS THEY MUST NOT BE MOVED.



Installing Batteries—To install the batteries, take off the back of the cabinet as explained above.

The following batteries are required:

Two 45 volt "B" batteries—Portable Size $4\frac{1}{8}" \times 2\frac{1}{2}" \times 5\frac{3}{8}"$ High
One $1\frac{1}{2}$ volt "A" battery—Portable Size $3\frac{7}{8}" \times 2\frac{1}{16}" \times 5\frac{3}{8}"$ High

These are connected and placed in the cabinet as shown on the label in the cabinet. Note the position of the prongs on the plugs and the holes in the sockets on the batteries. Bring the battery wires over the wood bar as shown. Then insert the plugs in the sockets. The "A" battery plug has two prongs and the "B" battery plugs have three prongs.

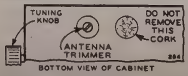
Cardboard in Back of Batteries—After the batteries are in place in the cabinet, the cardboard should be placed in back of them in order to make them fit snugly. If there is sufficient space, fold the cardboard at the score mark and use it double thickness. If this thickness is not required, cut the cardboard at the score mark and use one piece only. Then replace the back of the cabinet.

Adjusting Antenna Trimmer

After the batteries are installed and the back of the cabinet is in place, adjust the antenna trimmer.

Accurately tune in a weak station signal between 1400 and 1500 KC on the dial. With a screwdriver turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. This trimmer is reached through an opening in the bottom of the cabinet—see illustration. CAUTION: Do not remove the cork from the other opening at the bottom of the cabinet.

Readjust the antenna trimmer when a new set of batteries is installed.



BOTTOM VIEW OF CABINET

Tubes

The tube types and position of the tubes are shown on the label in the cabinet. To replace a tube, it will be necessary to remove the wood bar in back of the chassis by taking out the 2 screws which hold it in place.

MODELS 4912 and 4914

SPECIFICATIONS

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - .8 Watt Undistorted
Selectivity - - 60 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC

Speaker - - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1730 KC
Sensitivity - - 35 Microvolts per Meter Average
(For .05 Watt Output)

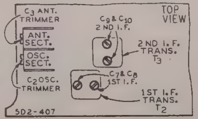
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.
Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

SIGNAL GENERATOR				
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Antenna Clip	200 mmf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	Antenna Clip	200 mmf.	Turn Rotor to max. output	Antenna (C3)

The following equipment is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter: Non-Metallic Screwdriver.
Dummy Antenna—.1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, first remove the celluloid crystal by taking out the 4 buttons at the corner. Hold the tuning knob and shift the pointer to the 800 KC mark.



Caution

The metal chassis is connected to one side of the line through a .25 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.

Antenna

A loop antenna is mounted on the back of the chassis base. For reception of local or powerful nearby stations no other antenna or ground is usually required.

However, more stations will be heard and noise will often be reduced by using an external antenna. This should preferably be on the outside of the building. For locations in the city or close to the broadcasting stations, the antenna should be 20 to 35 feet in length while for locations in the country or at a distance from the broadcasting stations, use a 35 to 60 foot antenna.

A GROUND CONNECTION IS REQUIRED if an external antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or a pipe driven into the ground.

The antenna and ground connections are made at the clips marked "A" and "G" respectively on the back of the cabinet.

Location of Radio

Place radio preferably where it gets air circulation. Do not put it in a place where it will get too hot such as on a radiator.

Power Supply

This radio will operate on a power supply of 117 volts AC, 50 to 60 cycles only, or 117 volts DC.

When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way which gives the least hum.

Radios for 25 to 60 cycle AC operation are so marked.

CAUTION—110 Volt DC Operation

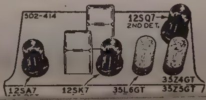
does not operate after one minute, reverse the plug.

Tubes

The type and position of the tubes are shown in the illustration.

All tubes must be in the sockets to operate the radio.

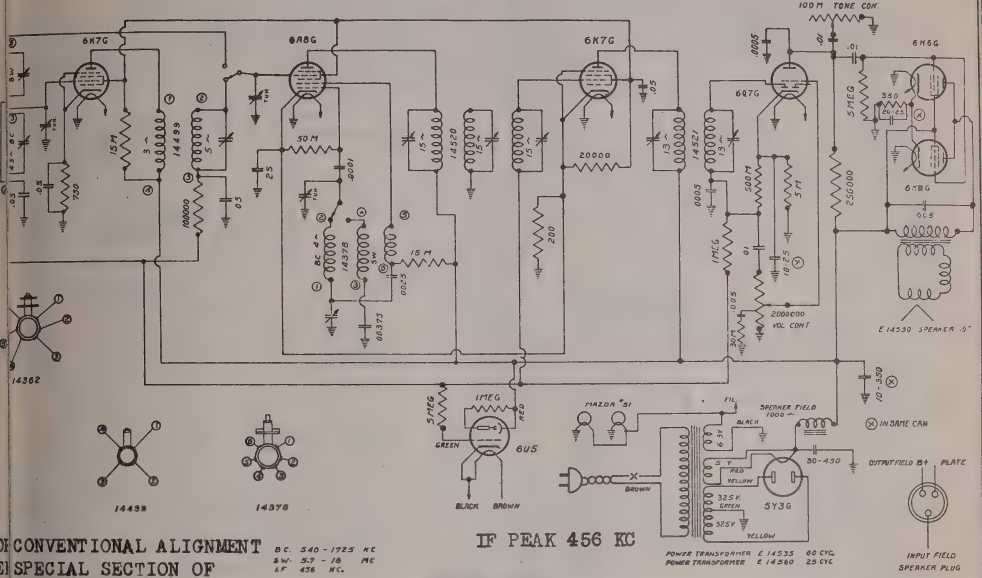
To replace tubes, first remove the back cover. Then take out the 2 screws holding the loop antenna to the mounting brackets. Move the loop antenna to one side as far as connecting wires will permit.



MODELS 816,816B
MODEL 990
Schematics,Alignment

GAMBLE-SKOGMO INC.

MODEL 816 ,816B
CIRCUIT DIAGRAM NO.14561



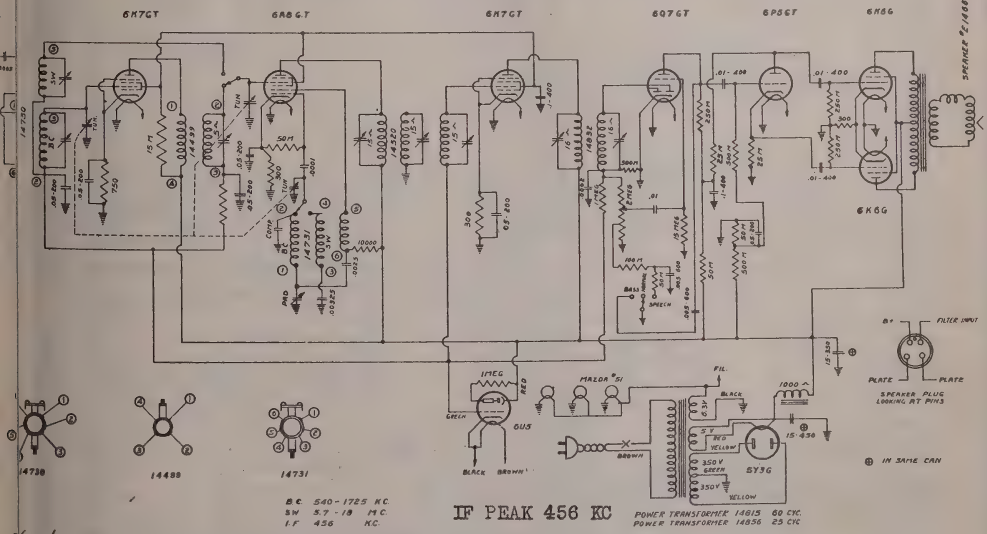
IF PEAK 456 KC

OF CONVENTIONAL ALIGNMENT
EI SPECIAL SECTION OF
VOLUME V111

MODEL 990
CIRCUIT DIAGRAM NO.14855

TELEVISION AND PHONOGRAPH JACK

The jack on the back of the chassis may be used to connect a Television "Video Adaptor", or phonograph pick up. A standard phone plug fits this jack. A crystal pick up is recommended for phonograph use.



IF PEAK 456 KC

/10/39

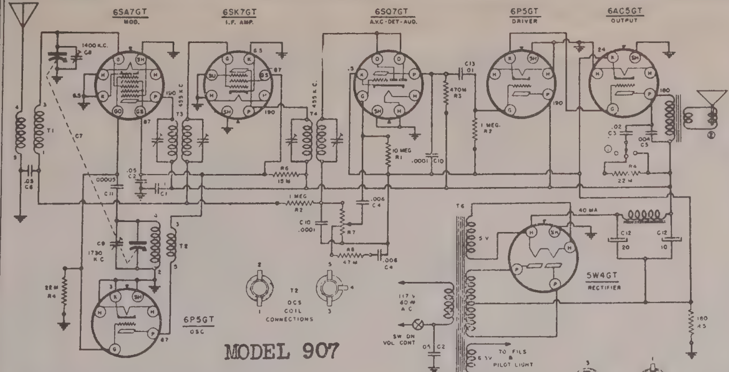
FOR SIMILAR TUNER ADJUSTMENTS SEE GAMBLE-SKOGMO MODEL 761A , PAGE 10-6.

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION OF VOLUME V111.

MODEL 907
MODEL 908

GAMBLE-SKOGMO INC.

Schematics,Vo
Alignment,Tri
Socket



MODEL 907

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS
CAPACITY VALUES ARE IN MICROFARADS

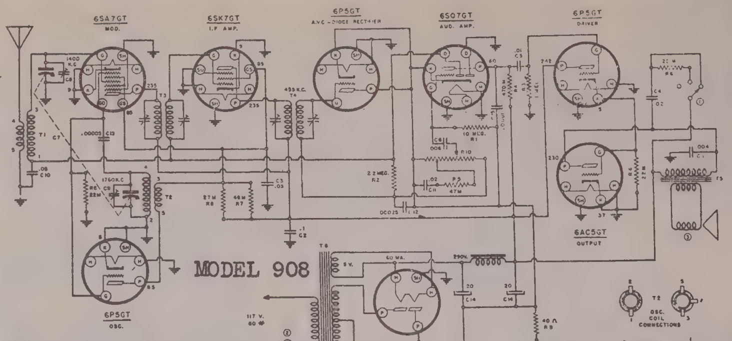
IF PEAK 455 KC

T1
ANT
COIL
CONNECTIONS

CODE	PART NO.	DESCRIPTION
C1	16-116	.1 MFD. 400 V TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	1605	.02 " " " "
C4	16-114	.006 " " " "
C5	16-125	.004 " " " "
C6	1622	.05 " 200 V. " "
C7	95-9	2 GANG VARIABLE CONDENSER ALSO C8 & C9
C10	1501	.0001 MFD. MICA CONDENSER
C11	1503	00005 " " "
C12	18-294	20 X 10 - 350 W.V. ELECTROLTIC COND
C13	16-119	.01 MFD 400 V TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W RESISTOR
R2	60-195	1 " " "
R3	60-178	470 M OHM " "
R4	60-185	22 M " " "
R5	60-230	180 " " "
R6	60-236	15 M " 1 W. "
R7	24-147	500 M " VOLUME CONTROL
R8	60-177	47 M " 1/4 W RESISTOR

CODE	PART NO	DESCRIPTION
T1	C 235	ANTENNA COIL
T2	10-316	OSCILLATOR COIL
T3	10 315	1 ST I.F TRANSFORMER
T4	10-312	2 ND " "
T5	-----	OUTPUT TRANS (ON SPKR)
T6	80-173	POWER TRANSFORMER
1	69-137	TONE CONTROL SWITCH
2	79-278	6 1/2 DYNAMIC SPEAKER



MODEL 908

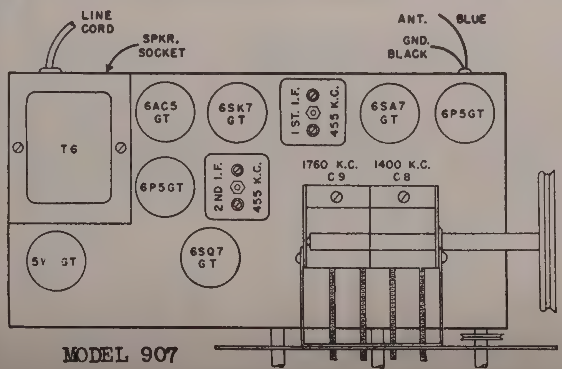
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE MICROFARADS.

IF PEAK 455 KC

CODE	PART NO	DESCRIPTION
C1	16-123	.004 MFD. 600 V. TUBULAR CONDENSER
C2	16-116	.1 " 400 V. " "
C3	1607	.05 " " " "
C4	1605	.02 " " " "
C5	16-119	.01 " " " "
C6	16-114	.006 " " " "
C7	95-10	2 GANG VARIABLE CONDENSER (ALSO C8 & C9)
C10	1622	.05 MFD. 200 V. TUBULAR CONDENSER
C11	16-123	.02 " " " "
C12	1504	.00025 MFD. MICA CONDENSER
C13	1503	.00005 " " "
C14	18-236	20 X 20 " 450 V. ELECTROLYTIC
C15	1501	.0001 " MICA CONDENSER

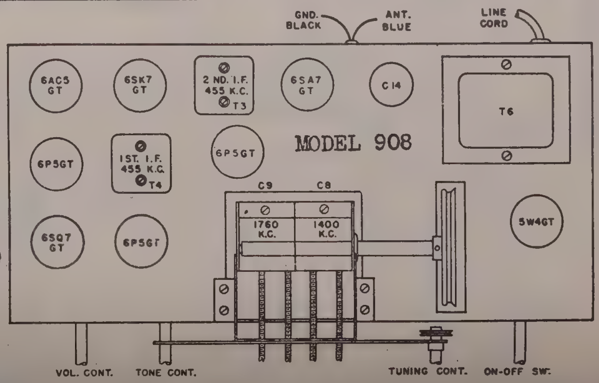
CODE	PART NO	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W CARBON RESISTOR
R2	60-179	2 2 " " " "
R3	60-198	1 " " " "
R4	60-178	470 M OHM " " "
R5	60-177	47 M " " " "
R6	60-185	22 M " " " "
R7	60-248	68 M " 1/2 W. " "
R8	60-249	27 M " 1 W. " "
R9	60-133	40 " 1/2 W. WIRE WOUND RESISTOR
R10	24-131	500 M " VOLUME CONTROL

CODE	PART NO.	DESCRIPTION
T1	10-235	ANTENNA COIL
T2	10-316	OSCILLATOR COIL
T3	10-315	1 ST I.F. TRANSFORMER
T4	10-312	2 ND " "
T5	------	OUTPUT TRANSFORMER
T6	80-180	POWER TRANSFORMER
1	69-137	TONE CONTROL
2	69-138	A.C. SWITCH
3	79-279	8" DYNAMIC SPEAKER



TUNER DATA

FOR SIMILAR
PUSH BUTTON
ADJUSTMENTS
SEE
GAMBLE*SKOGMO
MODEL 761A
page 10-6



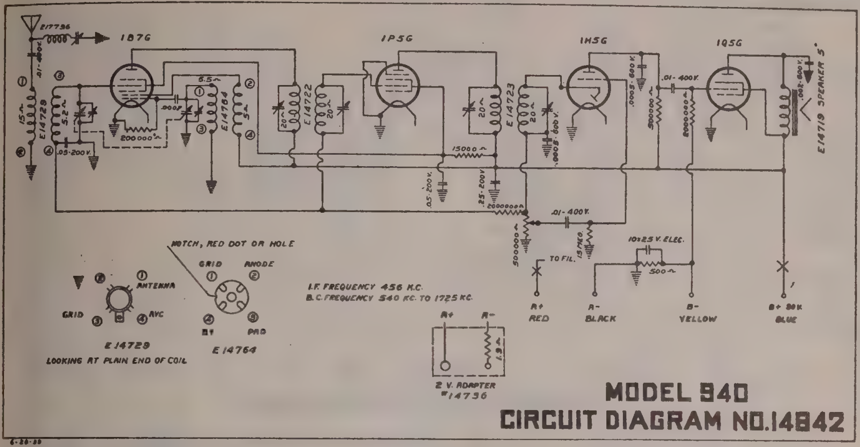
MODEL 907

Position of Variable	Generator Freq.	Dummy Antenna Mfd.	Generator Connections	Trimmer Adjustments	Trimmer Function
Closed	455 K. C.	.1	6SA7 (Grid)	T4 — T3	I. F.

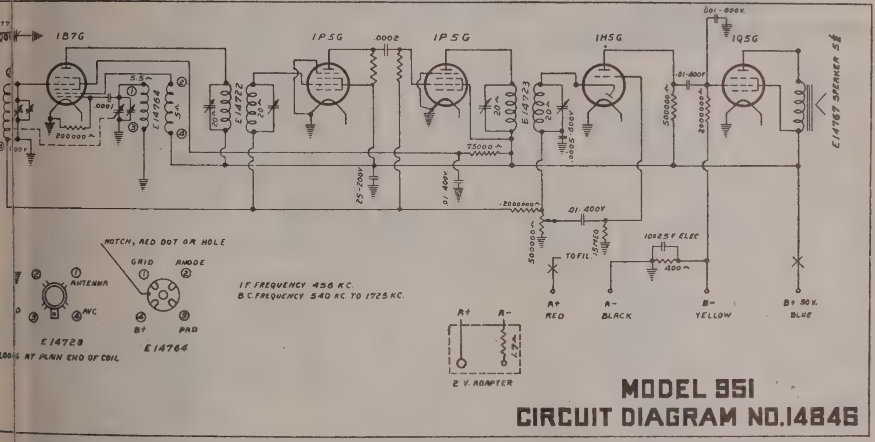
Position of Variable	Generator Freq.	Dummy Antenna Mfd.	Generator Connections	Trimmer Adjustments	Trimmer Function
Closed			Antenna	C9	Osc.

GAMBLE-SKOGMO INC.

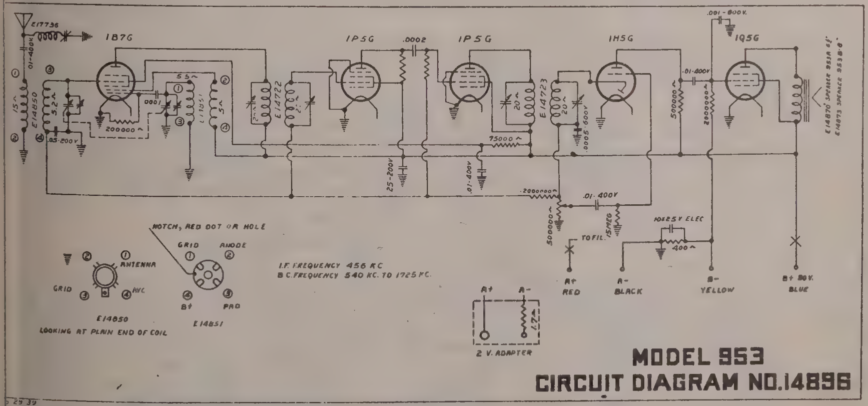
MODELS 940, 940A
MODELS 951, 951A
Schematics



MODEL 940
CIRCUIT DIAGRAM NO.14842



MODEL 951
CIRCUIT DIAGRAM NO.14846



MODEL 953
CIRCUIT DIAGRAM NO.14896

TUNER DATA MODEL 953

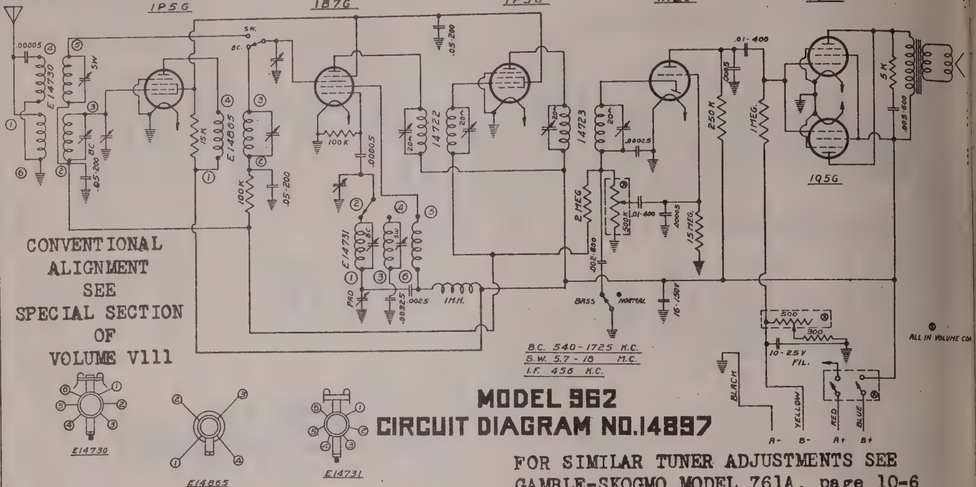
FOR SIMILAR PUSH BUTTON ADJUSTMENTS SEE MODEL 761A,
GAMBLE - SKOGMO PAGE 10-6

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

GENERAL: This receiver is equipped with the new type high efficiency battery operated tubes. Their use makes for greater economy of operation than has ever been possible before. They are designed to operate directly from a 1½ volt dry "A" battery or from a 2 volt storage battery—by properly connecting the adaptor socket #14824 which contains proper resistor. (SOCKET # 14736 FOR MODEL 940A)

MODEL 962
MODELS 970B,970BX
MODELS 980B,980BX

GAMBLE-SKOGMO INC.

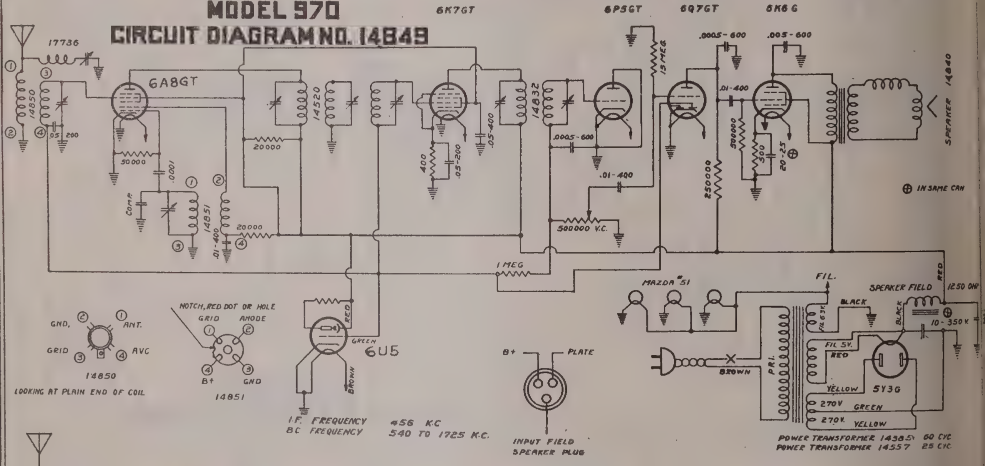


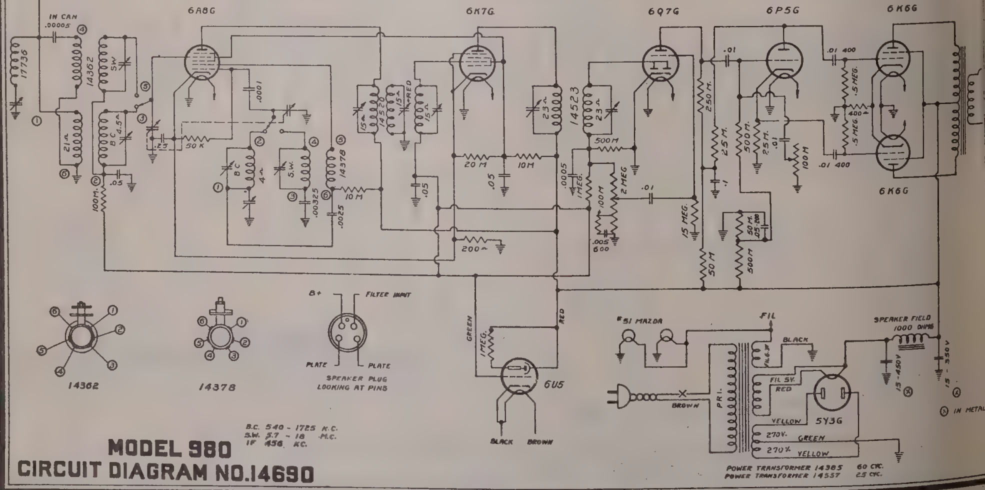
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION OF VOLUME V111

MODEL 962
CIRCUIT DIAGRAM NO.14897

FOR SIMILAR TUNER ADJUSTMENTS SEE GAMBLE-SKOGMO MODEL 761A, page 10-6

MODEL 970
CIRCUIT DIAGRAM NO. 14849

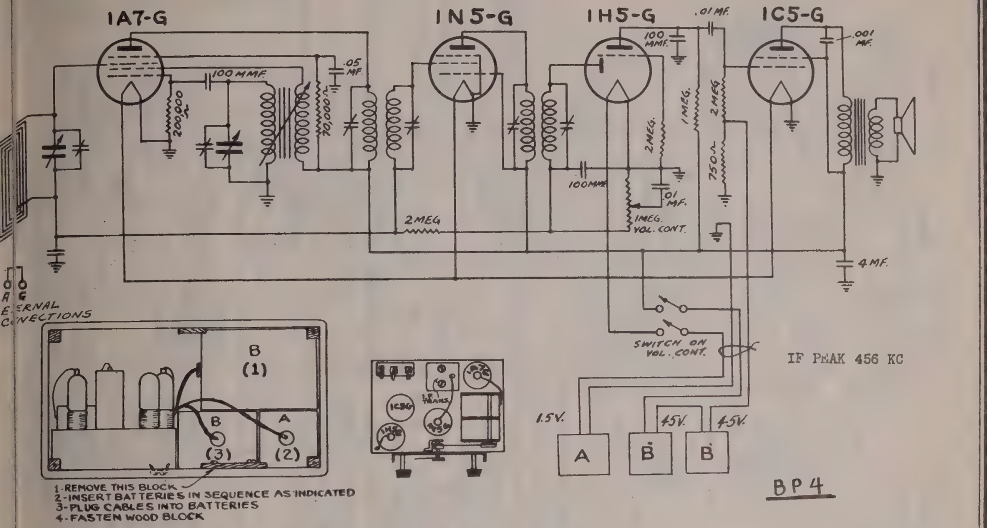




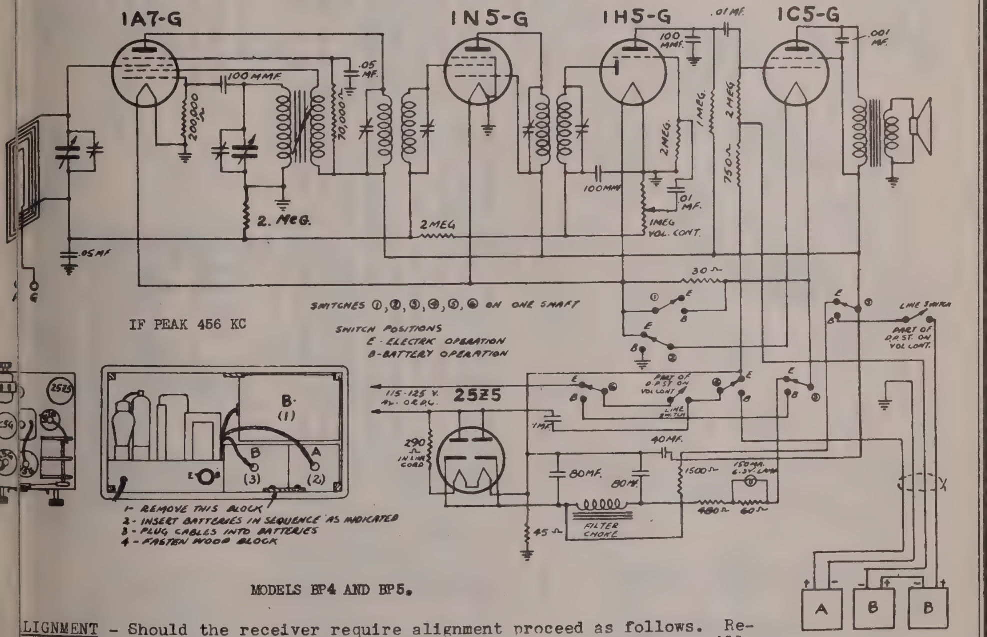
MODEL 980
CIRCUIT DIAGRAM NO.14690

GAROD RADIO CORP.

MODEL BP4
MODEL BP5
Schematics,Socket
Alignment,Chassis



1-REMOVE THIS BLOCK
2-INSERT BATTERIES IN SEQUENCE AS INDICATED
3-PLUG CABLES INTO BATTERIES
4-FASTEN WOOD BLOCK



1- REMOVE THIS BLOCK
2- INSERT BATTERIES IN SEQUENCE AS INDICATED
3- PLUG CABLES INTO BATTERIES
4- FASTEN WOOD BLOCK

MODELS BP4 AND BP5.

Rev. 4-27-39

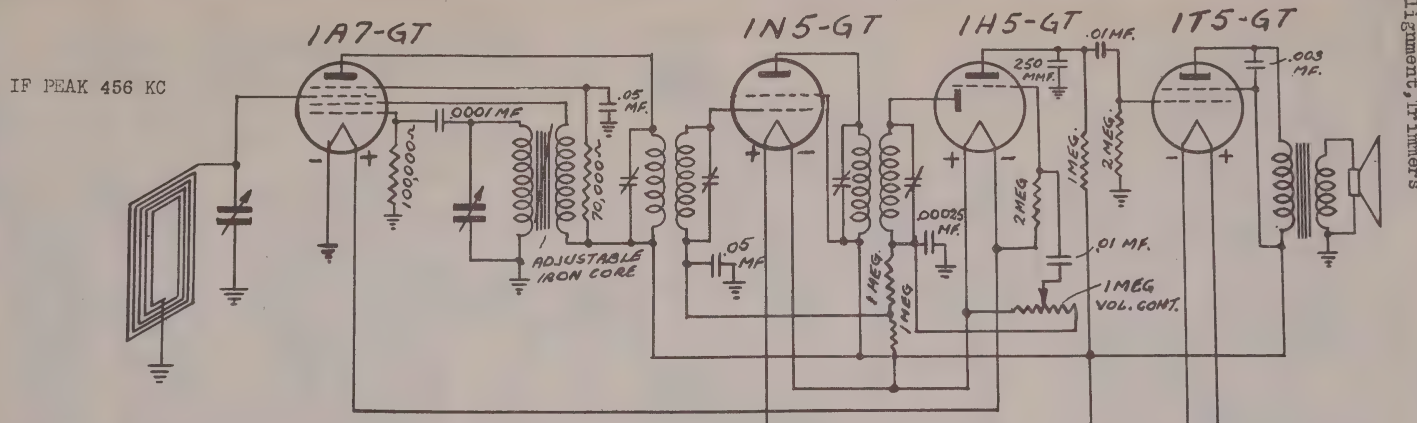
LIGNMENT - Should the receiver require alignment proceed as follows. Re-
ove the back. Remove the chassis from the cabinet. Set the test oscilla-
or at 456KC and connect it to the grid of the 1A7G. The first I.F. Trans-
ormer is located on top of the chassis, the second I.F. is on the front
pron, directly under the dial. All I.F. trimmers are aligned for maximum
utput.

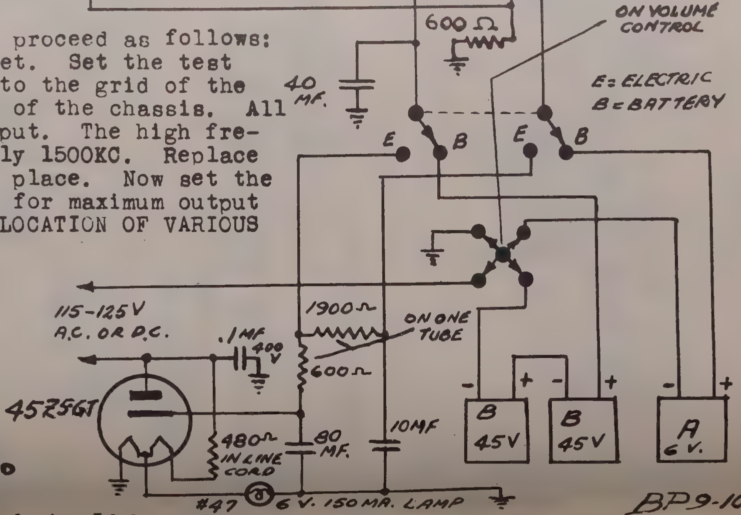
The high frequency antenna trimmer is aligned at approximately
500 KC. Replace chassis in cabinet, and put the back in place. Now tune
n a station at approximately 600 KC and adjust the OSCILLATOR through the
ole in the bottom of the cabinet for maximum signal, while rocking the dial
ack and forth.

MODELS BP9,BP10
Schematic,Socket
Alignment,Trimmers

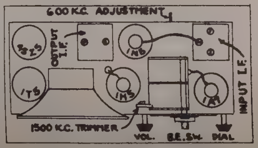
GAROD RADIO CORP.

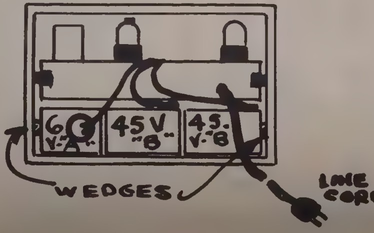
IF PEAK 456 KC





ALIGNMENT - Should the receiver require alignment, proceed as follows: Remove the back. Remove the chassis from the cabinet. Set the test oscillator at 456 KC and connect oscillator output to the grid of the 1A7G. The I.F. transformers are located on the top of the chassis. All I.F. transformers should be aligned for maximum output. The high frequency oscillator trimmer is aligned at approximately 1500KC. Replace the chassis in the cabinet and put the loop back in place. Now set the signal generator at 600KC and adjust the oscillator for maximum output while rocking the gang condenser. SEE DIAGRAM FOR LOCATION OF VARIOUS ADJUSTING SCREWS.

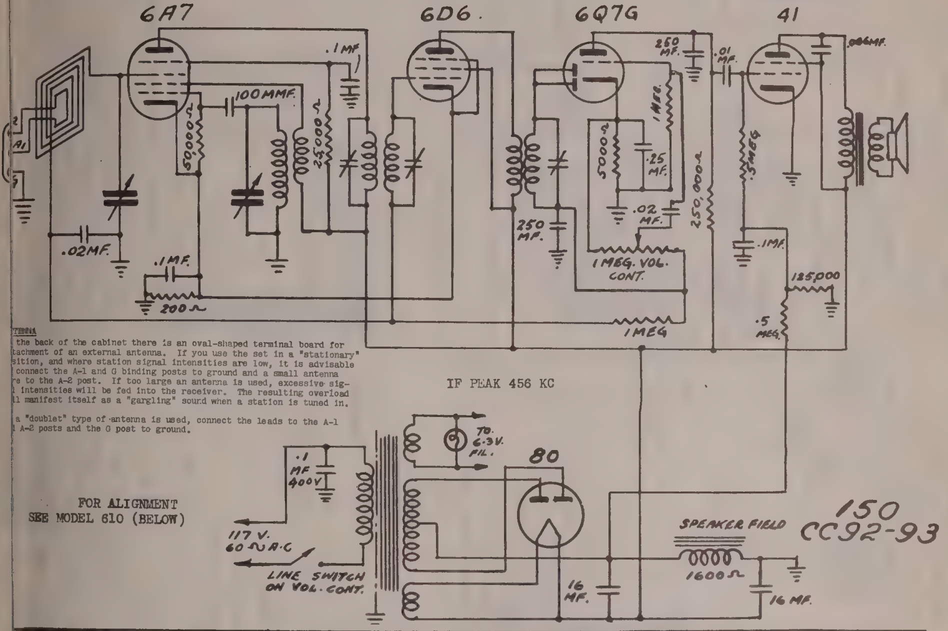




NOTE: When used in Electric operation, the line cord should be extended to its

GAROD RADIO CORP.

MODEL 150
MODEL 610
Schematics
Alignment

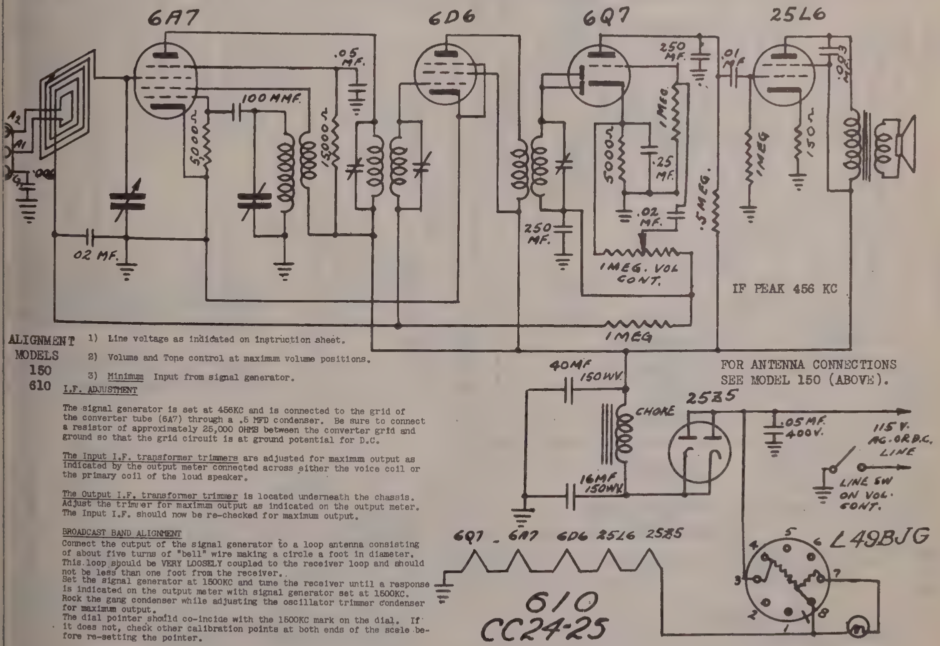


TENNA
the back of the cabinet there is an oval-shaped terminal board for
tachment of an external antenna. If you use the set in a "stationary"
sition, and where station signal intensities are low, it is advisable
connect the A-1 and G binding posts to ground and a small antenna
re to the A-2 post. If too large an antenna is used, excessive sig-
intensities will be fed into the receiver. The resulting overload
ll manifest itself as a "gargling" sound when a station is tuned in.

a "doublet" type of antenna is used, connect the leads to the A-1
A-2 posts and the G post to ground.

FOR ALIGNMENT
SEE MODEL 610 (BELOW)

150
CC92-93



FOR ANTENNA CONNECTIONS
SEE MODEL 150 (ABOVE).

610
CC24-25

ALIGNMENT MODELS 150 610

1) Line voltage as indicated on instruction sheet.
2) Volume and Tone control at maximum volume positions.
3) Minimum Input from signal generator.

I.F. ADJUSTMENT

The signal generator is set at 456KC and is connected to the grid of the converter tube (6A7) through a .5 MFD condenser. Be sure to connect a resistor of approximately 25,000 OHMS between the converter grid and ground so that the grid circuit is at ground potential for D.C.

The Input I.F. transformer trimmers are adjusted for maximum output as indicated by the output meter connected across either the voice coil or the primary coil of the loud speaker.

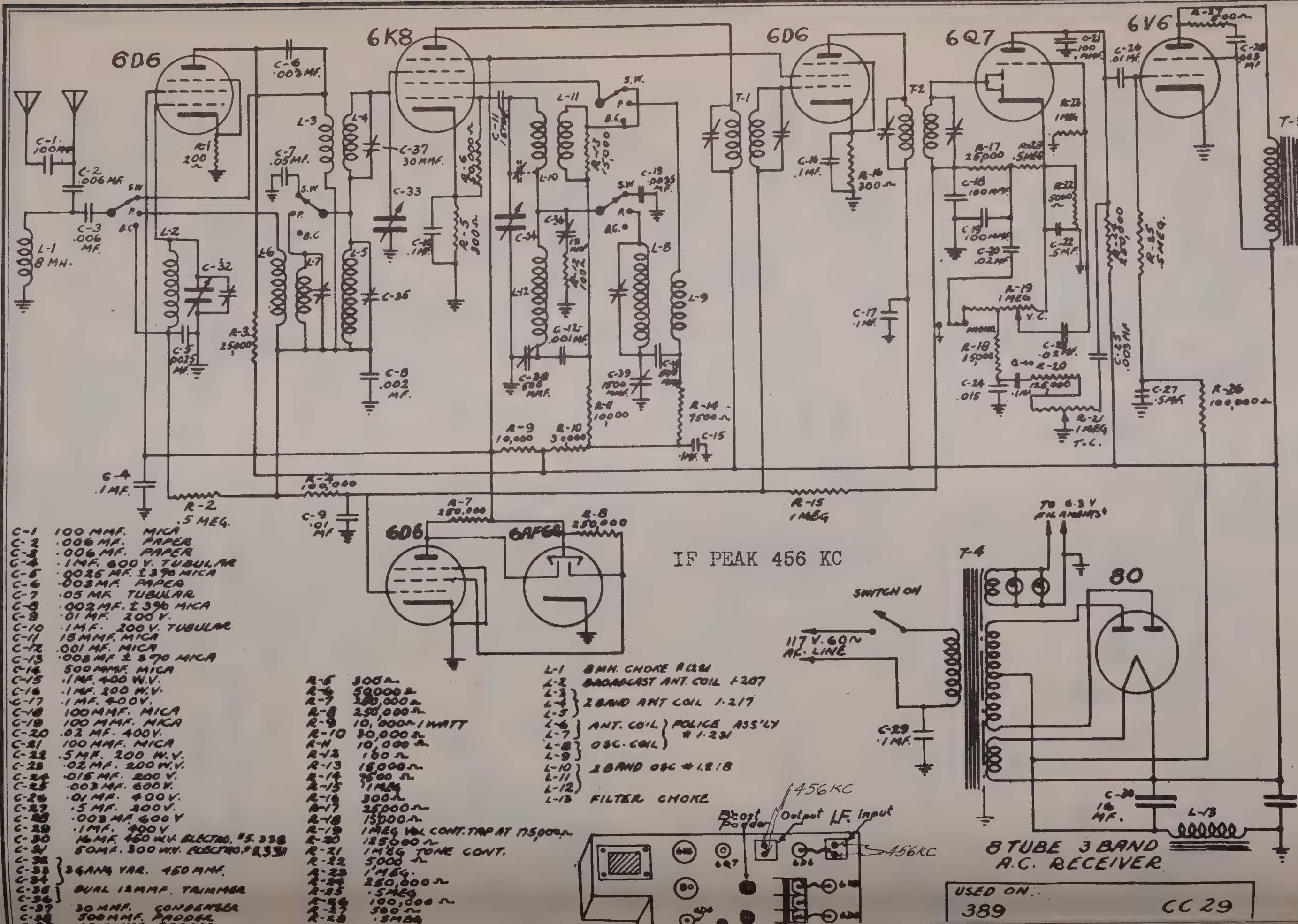
The Output I.F. transformer trimmer is located underneath the chassis. Adjust the trimmer for maximum output as indicated on the output meter. The Input I.F. should now be re-checked for maximum output.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to a loop antenna consisting of about five turns of "bell" wire making a circle a foot in diameter. This loop should be VERY LOOSELY coupled to the receiver loop and should not be less than one foot from the receiver.
Set the signal generator at 1500KC and tune the receiver until a response is indicated on the output meter with signal generator set at 1500KC. Rock the gang condenser while adjusting the oscillator trimmer condenser for maximum output.
The dial pointer should co-incide with the 1500KC mark on the dial. If it does not, check other calibration points at both ends of the scale before re-setting the pointer.

MODEL 389
Schematic, Socket

GAROD RADIO CORP.



IF PEAK 456 KC

C-1	100 MMF. MICA
C-2	.006 MF. PAPER
C-3	.006 MF. PAPER
C-4	.1 MF. 600 V. TUBULAR
C-5	.0025 MF. ± 3% MICA
C-6	.003 MF. PAPER
C-7	.05 MF. TUBULAR
C-8	.002 MF. ± 3% MICA
C-9	.01 MF. 200 V.
C-10	.1 MF. 200 V. TUBULAR
C-11	15 MMF. MICA
C-12	.001 MF. MICA
C-13	.008 MF ± 3% MICA
C-14	500 MMF. MICA
C-15	.1 MF. 400 W.V.
C-16	.1 MF. 200 W.V.
C-17	.1 MF. 400 V.
C-18	100 MMF. MICA
C-19	100 MMF. MICA
C-20	.02 MF. 400 V.
C-21	100 MMF. MICA
C-22	.5 MF. 200 W.V.
C-23	.02 MF. 200 W.V.
C-24	.015 MF. 200 V.
C-25	.003 MF. 600 V.
C-26	.01 MF. 400 V.
C-27	.5 MF. 200 V.
C-28	.003 MF. 600 V
C-29	.1 MF. 400 V
C-30	16 MF. 450 W.V. ELECTRO. #5.338
C-31	50 MF. 300 W.V. ELECTRO. #5.334
C-32 C-33 C-34	3 GANG VAR. 450 MMF.
C-35 C-36	DUAL 12 MMF. TRIMMER
C-37	30 MMF. CONDENSER
C-38	500 MMF. PADDER

R-5	300 Ω
R-6	50000 Ω
R-7	250,000 Ω
R-8	250,000 Ω
R-9	10,000 Ω 1 WATT
R-10	30,000 Ω
R-11	10,000 Ω
R-12	160 Ω
R-13	15000 Ω
R-14	7500 Ω
R-15	1 MEG
R-16	300 Ω
R-17	25000 Ω
R-18	15000 Ω
R-19	1 MEG VOL. CONT. TAP AT 175,000 Ω
R-20	125000 Ω
R-21	1 MEG TONE CONT.
R-22	5000 Ω
R-23	1 MEG.
R-24	250,000 Ω
R-25	.5 MEG
R-26	100,000 Ω
R-27	500 Ω
R-28	.5 MEG

L-1	8 MH. CHOKE #1.231
L-2	BROADCAST ANT. COIL 1-207
L-3 L-4 L-5	2 BAND ANT COIL 1.217
L-6 L-7	ANT. COIL } POLICE ASS'LY # 1.231
L-8 L-9	OSC. COIL } POLICE ASS'LY # 1.231
L-10 L-11 L-12	2 BAND OSC # 1.218
L-13	FILTER CHOKE

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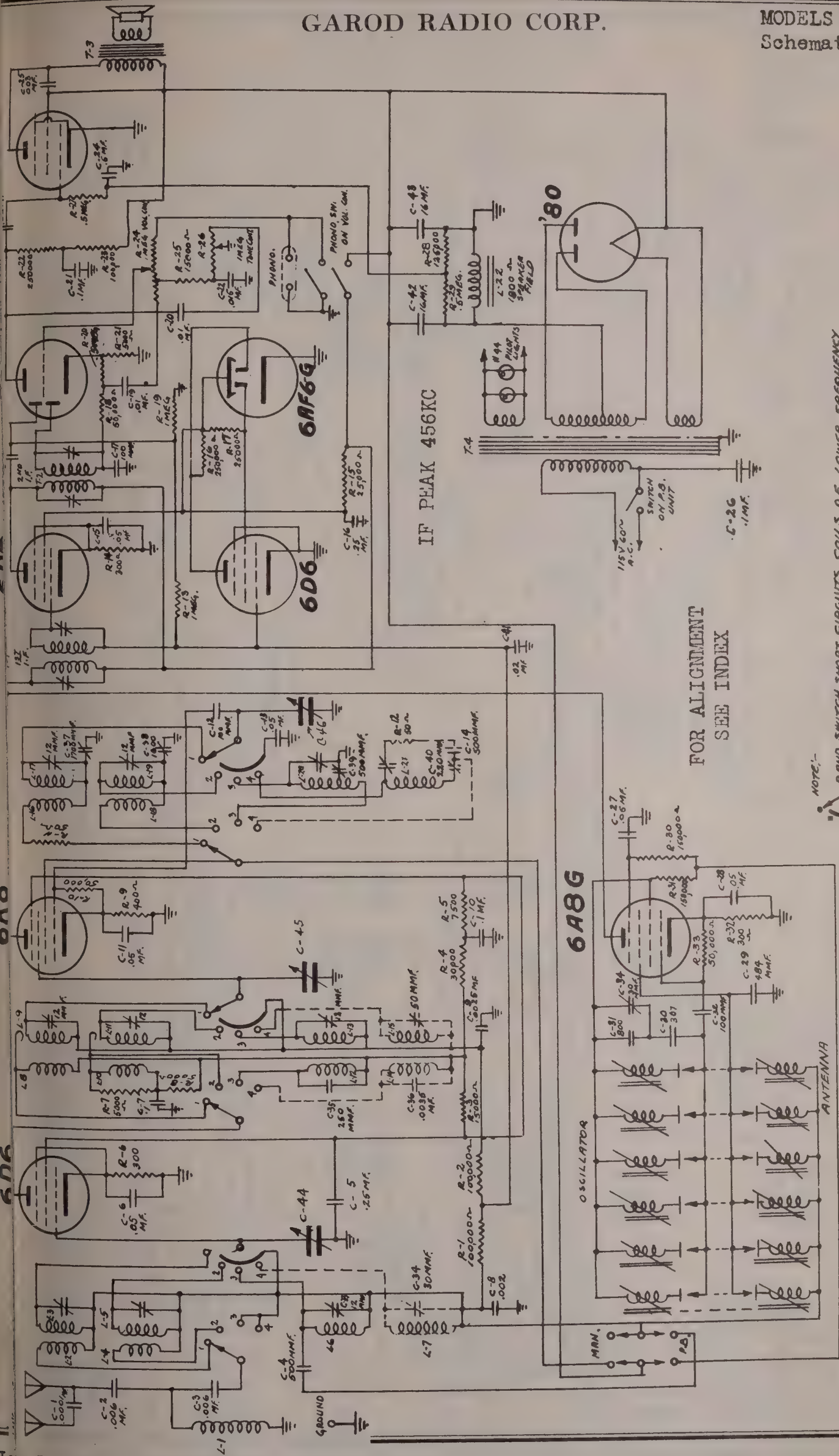
GAROD RADIO CORP.

MODELS 399,4990
Schematic



IF PEAK 456KC

FOR ALIGNMENT
SEE INDEX

NOTE:-
BAND SWITCH SHORT CIRCUITS COILS OF LOWER FREQUENCY THAN THE ONE IN USE.

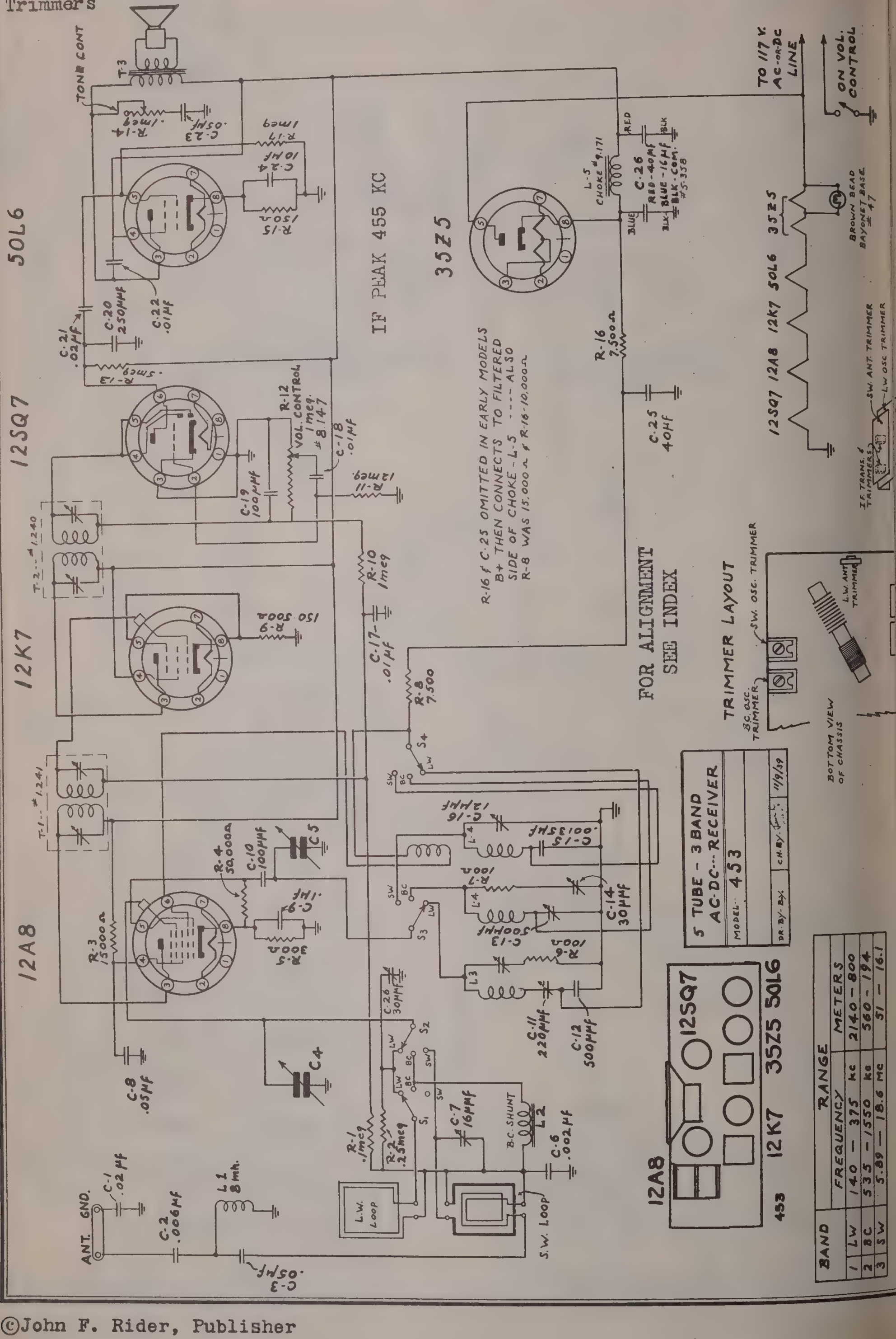
BAND 1 - 23 M.C. TO 7.2 M.C. OR 13 METERS TO 41.75 METERS
BAND 2 - 7.4 M.C. TO 2.34 M.C. OR 40.5 METERS TO 128.25 METERS
BAND 3 - 1720 K.C. TO 547.5 K.C. OR 175 METERS TO 550 METERS
BAND 4 - 375 K.C. TO 137.5 K.C. OR 800 METERS TO 2200 METERS - USE ON MODEL #4990 ONLY

9 TUBE A.C. RECEIVER
3 OR 4 BAND

USED ON:-
3 BAND 399-C-31 4 BAND 4990

MODEL 453
Schematic, Socket
Trimmers

GAROD RADIO CORP.

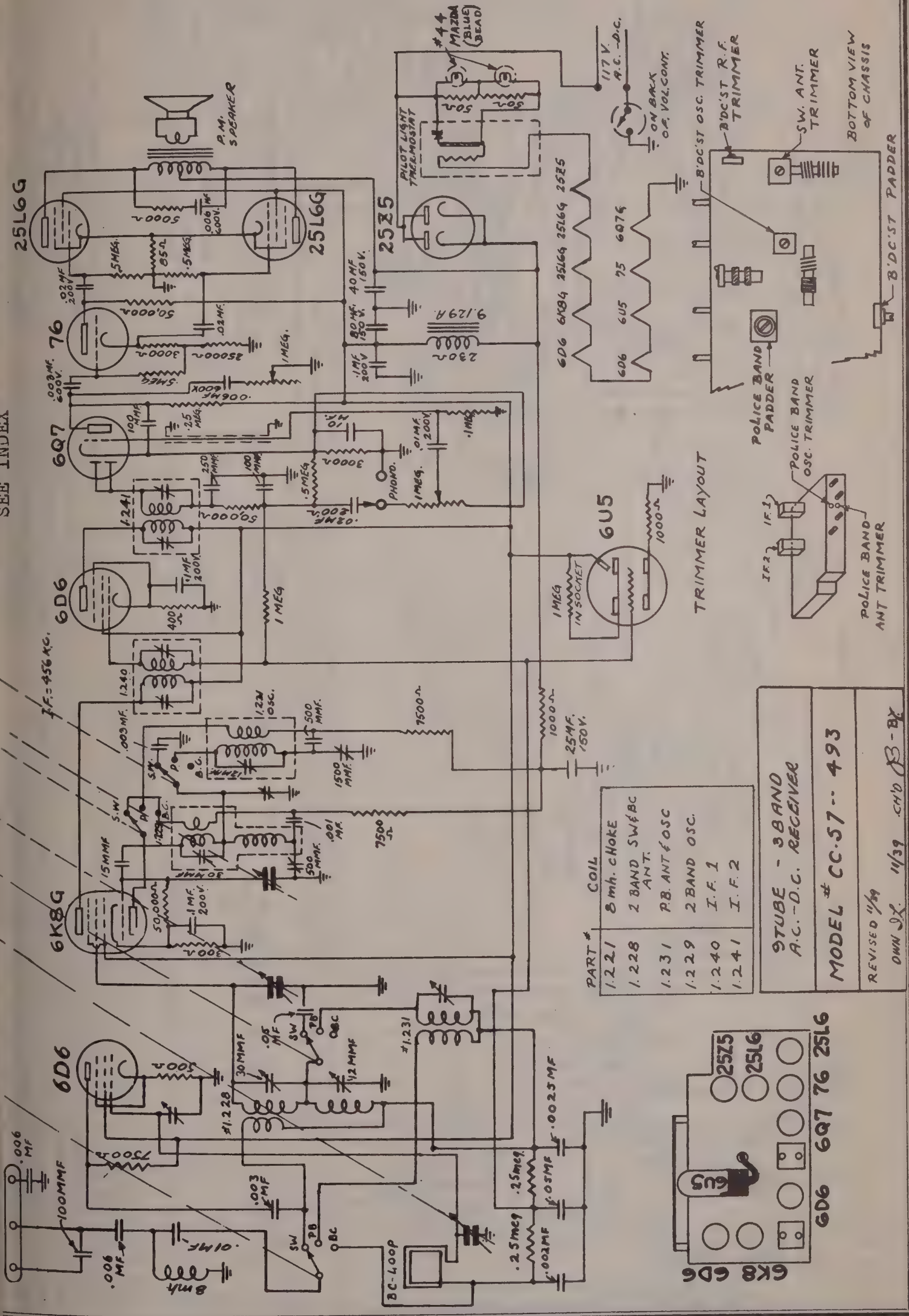


BAND		RANGE FREQUENCY	METERS
1	LW	140 — 375 kc	2140 — 800
2	BC	535 — 1550 kc	560 — 194
3	SW	5.89 — 18.6 Mc	51 — 16.1

GAROD RADIO CORP.

MODEL 493
Schematic, Socket
Trimmers

SEE INDEX



PART #	COIL
1.221	8 mh. CHOKE
1.228	2 BAND SW & BC ANT.
1.231	P.B. ANT & OSC
1.229	2 BAND OSC.
1.240	I.F. 1
1.241	I.F. 2

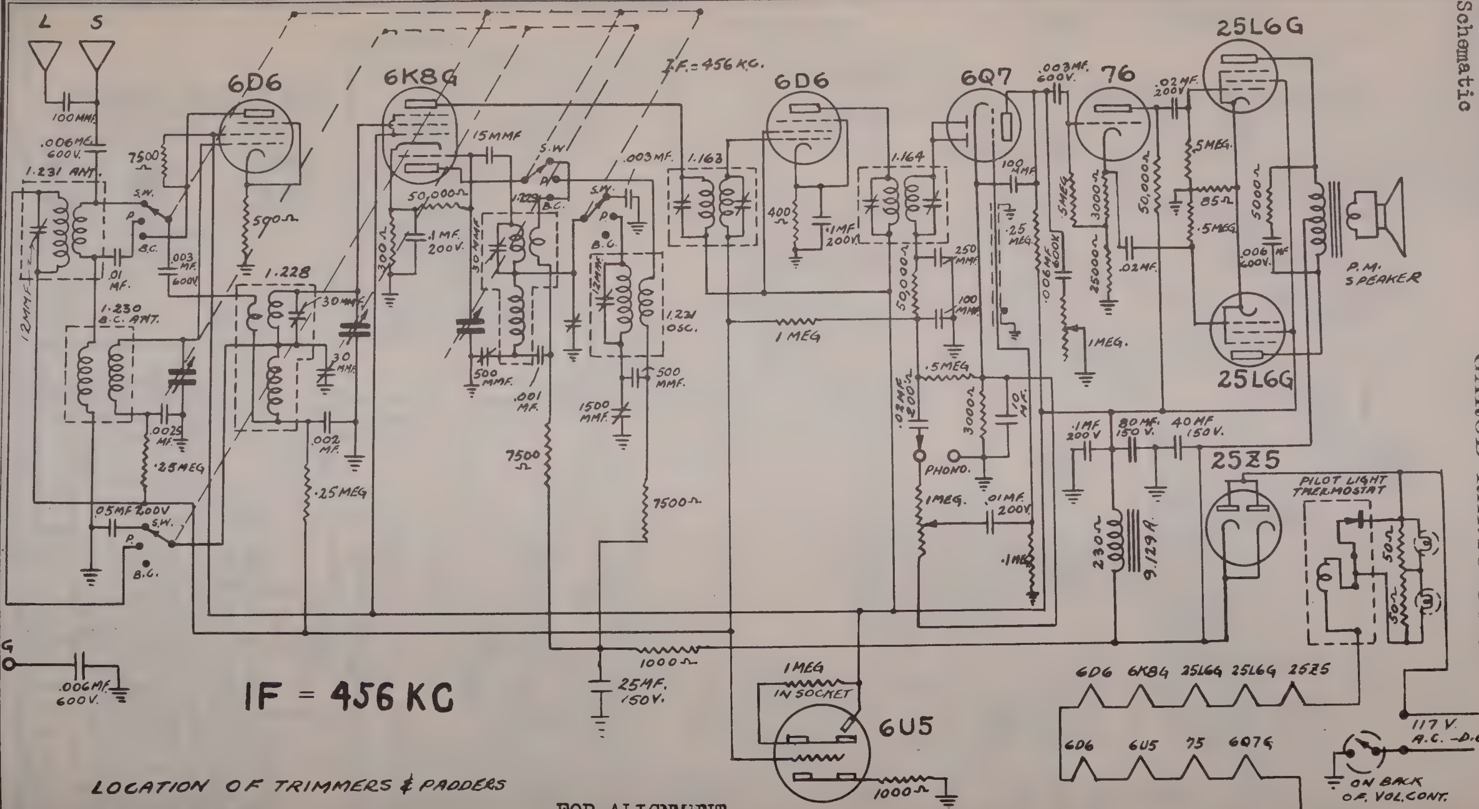
9 TUBE - 3 BAND
A.C.-D.C. RECEIVER

MODEL # CC-57 -- 493

REVISED 11/39
DWN J.L. 11/39 CH'D B-BY

MODEL 939
Schematic

GAROD RADIO CORP.



LOCATION OF TRIMMERS & PADDERS

S.W. OSC. PADDER FIXED
S.W. OSC. TRIMMER NONE
S.W. ANT. TRIMMER ON ANT. COIL UNDER CHASSIS
P.O. OSC. PADDER ON TOP OF CHASSIS
P.O. OSC. TRIMMER } ON COIL ASS'LY FRONT APRON OF CHASSIS
P.O. ANT. TRIMMER }
B.C OSC. PADDER ON REAR OF CHASSIS APRON
B.C. ANT. TRIMMER ON VAR. COND. FRONT SECTION
B.C. R.F TRIMMER ON TOP OF CHASSIS TOWARD FRONT APRON

FOR ALIGNMENT
SEE INDEX

1.228	S.W. ANT B.C R.F.
1.229	S.W. OSC. B.C. OSC
1.231	P.O. ANT ASS'LY.
1.231	P.O. OSC.
1.230	B.C.-ANT
1.163	INPUT I.F.

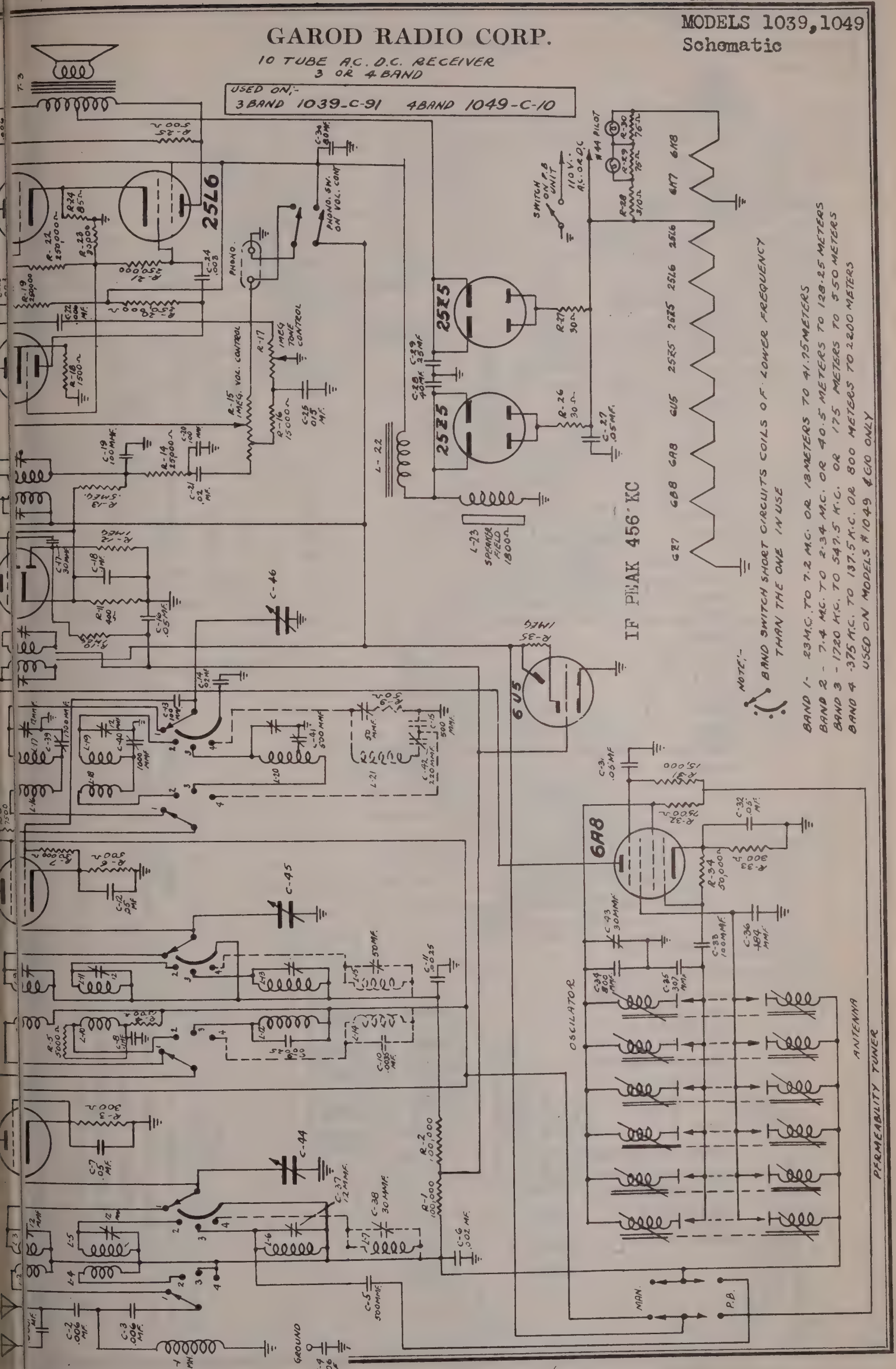
9TUBE - 3BAND
A.C.-D.C. RECEIVER

MODEL 939 CC 98

GAROD RADIO CORP.

10 TUBE A.C. D.C. RECEIVER
3 OR 4 BAND

USED ON;-
3BAND 1039-C-91 4BAND 1049-C-10



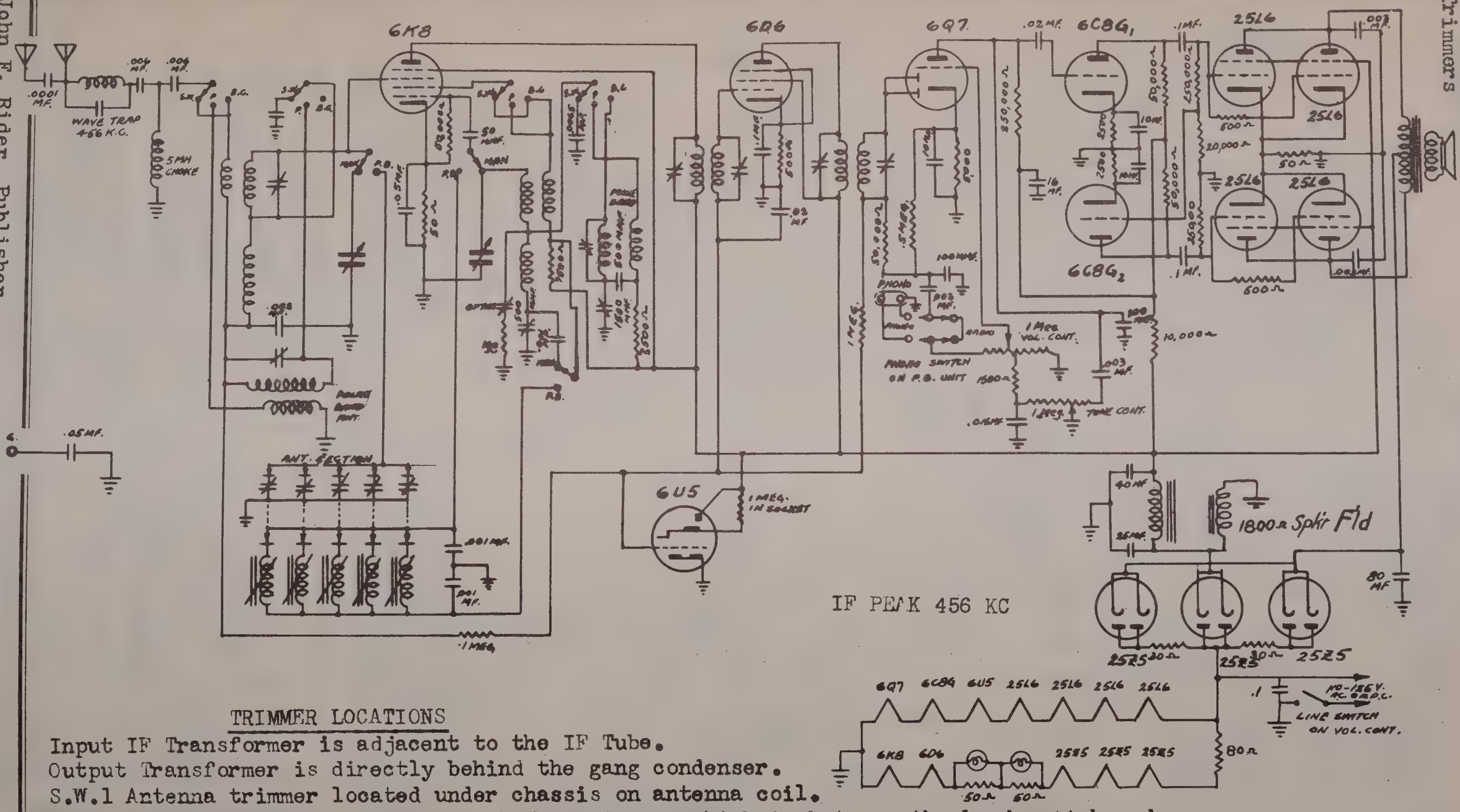
IF PEAK 456 KC

NOTE;- BAND SWITCH SHORT CIRCUITS COILS OF LOWER FREQUENCY THAN THE ONE IN USE

BAND 1- 23 M.C. TO 7.2 M.C. OR 13 METERS TO 41.75 METERS
BAND 2 - 7.4 M.C. TO 2.34 M.C. OR 40.5 METERS TO 128.25 METERS
BAND 3 - 1720 K.C. TO 547.5 K.C. OR 175 METERS TO 550 METERS
BAND 4 - 375 K.C. TO 137.5 K.C. OR 800 METERS TO 2200 METERS USED ON MODELS #1049 C10 ONLY

MODEL 1239
Schematic
Trimmers

GAROD RADIO CORP.



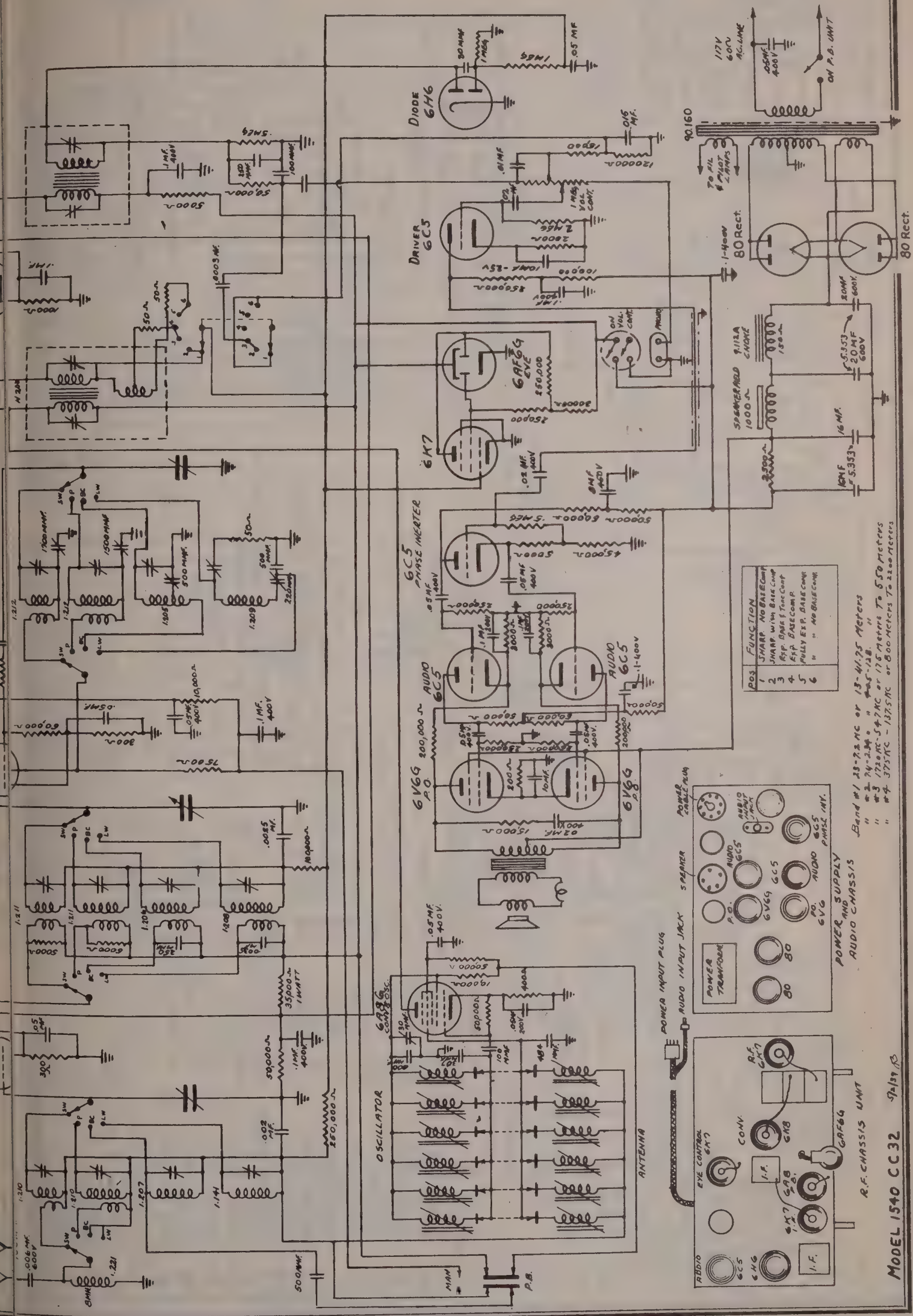
TRIMMER LOCATIONS

Input IF Transformer is adjacent to the IF Tube.
Output Transformer is directly behind the gang condenser.
S.W.1 Antenna trimmer located under chassis on antenna coil.
L.W. Osc. Trimmer under chassis on L.W. condenser which is between the band switch and padder condenser.
L.W. Padder under chassis on front apron adjacent to L.W. Oscillator coil.

FOR ALIGNMENT
SEE INDEX

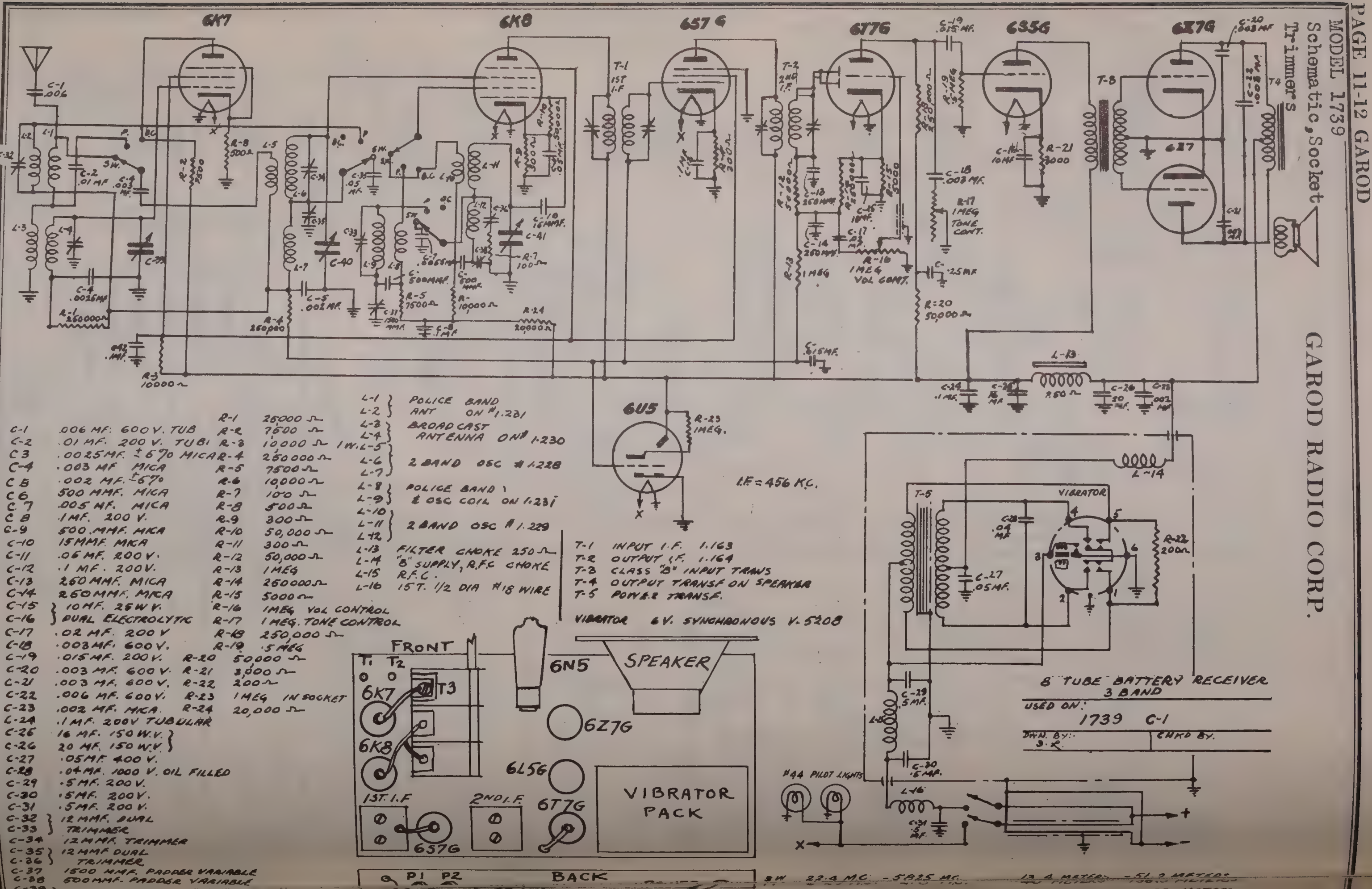
GAROD RADIO CORP.

MODEL 1540
Schematic,Socket



MODEL 1739
Schematic, Socket
Trimmers

GAROD RADIO CORP.



I.F. = 456 K.C.

C-1	.006 MF. 600 V. TUB	R-1	25,000 Ω
C-2	.01 MF. 200 V. TUBI	R-2	7500 Ω
C 3	.0025 MF. ±5% MICA	R-3	10,000 Ω 1W.
C-4	.003 MF MICA	R-4	250000 Ω
C 5	.002 MF. ±5%	R-5	7500 Ω
C 6	500 MMF. MICA	R-6	10,000 Ω
C 7	.005 MF. MICA	R-7	100 Ω
C 8	.1 MF. 200 V.	R-8	500 Ω
C-9	500 MMF. MICA	R-9	300 Ω
C-10	15 MMF. MICA	R-10	50,000 Ω
C-11	.05 MF. 200 V.	R-11	300 Ω
C-12	.1 MF. 200 V.	R-12	50,000 Ω
C-13	260 MMF. MICA	R-13	1 MEG
C-14	260 MMF. MICA	R-14	250000 Ω
C-15 }	10 MF. 25 W V.	R-15	5000 Ω
C-16 }	DUAL ELECTROLYTIC	R-16	1 MEG VOL CONTROL
C-17	.02 MF. 200 V	R-17	1 MEG. TONE CONTROL
C-18	.003 MF. 600 V.	R-18	250,000 Ω
C-19	.015 MF. 200 V.	R-19	.5 MEG
C-20	.003 MF. 600 V.	R-20	50000 Ω
C-21	.003 MF. 600 V.	R-21	3,000 Ω
C-22	.006 MF. 600 V.	R-22	200 Ω
C-23	.002 MF. MICA.	R-23	1 MEG IN SOCKET
C-24	.1 MF. 200 V TUBULAR	R-24	20,000 Ω
C-25	16 MF. 150 W.V. }		
C-26	20 MF. 150 W.V. }		
C-27	.05 MF. 400 V.		
C-28	.04 MF. 1000 V. OIL FILLED		
C-29	.5 MF. 200 V.		
C-30	.5 MF. 200 V.		
C-31	.5 MF. 200 V.		
C-32 }	12 MMF. DUAL		
C-33 }	TRIMMER		
C-34	12 MMF. TRIMMER		
C-35 }	12 MMF DUAL		
C-36 }	TRIMMER		
C-37	1500 MMF. PADDER VARIABLE		
C-38	500 MMF. PADDER VARIABLE		

L-1 } L-2 }	POLICE BAND ANT ON #1.231
L-3 } L-4 }	BROADCAST ANTENNA ON # 1.230
L-5 } L-6 L-7 }	2 BAND OSC # 1.228
L-8 } L-9 }	POLICE BAND & OSC COIL ON 1.231
L-10 } L-11 L-12 }	2 BAND OSC # 1.229
L-13	FILTER CHOKE 250 Ω
L-14	"B" SUPPLY, R.F.C CHOKE
L-15	R.F.C.
L-16	15 T. 1/2 DIA #18 WIRE

T-1	INPUT I.F. 1.163
T-2	OUTPUT I.F. 1.164
T-3	CLASS "B" INPUT TRANS
T-4	OUTPUT TRANSF ON SPEAKER
T-5	POWER TRANSF.

VIBRATOR 6V. SYNCHRONOUS V. 5208

8 TUBE BATTERY RECEIVER
3 BAND

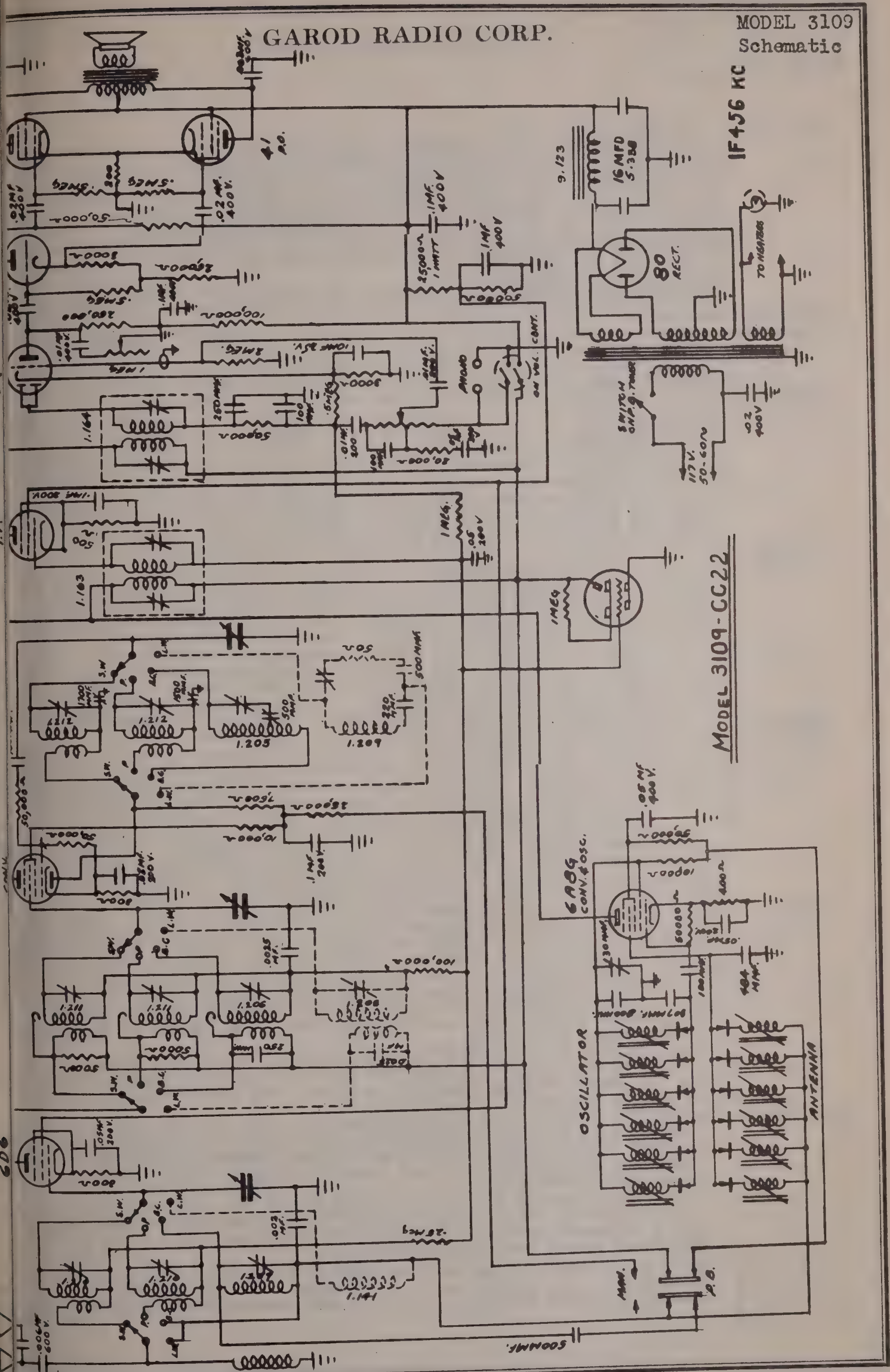
USED ON:
1739 C-1

DWN. BY: J. R.
CHKD BY.

SW 22.4 M.C. - 5.925 M.C. 13.4 METERS - 51.2 METERS

GAROD RADIO CORP.

MODEL 3109
Schematic



GAROD MODELS 389; 453; 493; 939, 1239.

If this procedure is not adhered to, all adjustments will appear very broad. This is due to the action of the automatic volume control.

I.F. ADJUSTMENT - The signal generator is set at 455① KC and is connected to the grid of the converter tube (12A8)② through a .5 MFD condenser. Be sure to connect a resistor of approximately 25,000 OHMS between the converter grid and ground so that the grid circuit is at ground potential for D.C.

The Input I.F. Transformer trimmers - are both adjusted for maximum output as indicated by the output meter connected across either the voice coil or the primary coil of the loud speaker.

The Output I.F. Transformer trimmers - are adjusted for maximum output as indicated on the output meter. The Input I.F. should now be re-checked for maximum output.

SHORT-WAVE BAND #1 MODELS 453, 493, 939 (ONLY) - Set the band switch to the extreme left-hand position which is short-wave band #1. Set the generator at 15.5③ MC, turn the condenser until a response is indicated. The pointer should co-incide with the 15.5MC mark on the dial. Adjust the antenna trimmer for the short-wave band for maximum output while rocking the condenser gang from left to right.

SHORT-WAVE BAND #1 MODEL 389 (ONLY) - Set the band switch to the extreme right hand position which is short wave band #1. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is connected to the "short-antenna" lead through a dummy antenn consisting of a 250 MMFD condenser and a 400 OHM non-inductive resistor in serie Set the generator at 19MC, turn the condenser until a response is indicated. The pointer should co-incide with the 19MC mark on the dial. Adjust the antenna trimmer for the short-wave band located under the chassis on the antenna coils for maximum output while rocking the condenser gang from left to right.

BROADCAST BAND MODEL 1239 (ONLY) The dummy antenna for this band consists of only a 250 MMFD condenser. Set the Band Switch in the middle position and condenser plates completely out of mesh. Set the generator at 1500KC. Turn the variable condenser until a response is indicated. The dial pointer should now co-incide with the 1500KC mark on the dial. Adjust the 1500KC Antenna trimmer (located under the chassis near the band switch) for maximum output. Set the generator at 600KC and turn the variable condenser control until a response is indicated. Adjust the broadcast oscillator padder condenser (located on top of the chassis between the variable condenser and the output I.F. transformer) for maximum response while "rocking" the gang condenser. The high frequency adjustments should now be re-checked.

BROADCAST BAND MODELS 389, 453, 493, 939. The dummy antenna for this band consists of only a 250 MMFD condenser. Set the Band Switch in the Broadcast position and condenser plates completely out of mesh. Set the signal generator at 1550KC④ and adjust the broadcast oscillator trimmer until a response is indicated on the output meter. The generator is now set at 1500KC. Turn the variable condenser until a response is indicated. The dial pointer should now co-incide with the 1500KC mark on the dial.⑥ Set the generator at 600KC and turn the variable condenser control until a response is indicated. Adjust the broadcast oscillator padder condenser for maximum response while "rocking" the gang condenser. The high frequency adjustments should now be re-checked.

SHORT-WAVE BAND #2 MODELS 389,493,939. - Set the band switch to the middle position. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is left connected as for band #1. The generator is set at 6.25 MC and the Band #2 osc. trimmer is opened until a response is indicated at the lower capacity setting of the trimmer.

Set the generator at 6MC and turn the variable condenser until a response is indicated. The pointer should now co-incide with the 6.MC mark on the dial. The antenna trimmer is then adjusted for maximum output while the condenser gang is rocked from right to left. ⑤

Set the generator at 2.4 MC and turn the variable condenser knob until a response is indicated. The padder for this band is now adjusted for maximum output while rocking the condenser gang from left to right. The high frequency adjustments should then be rechecked.

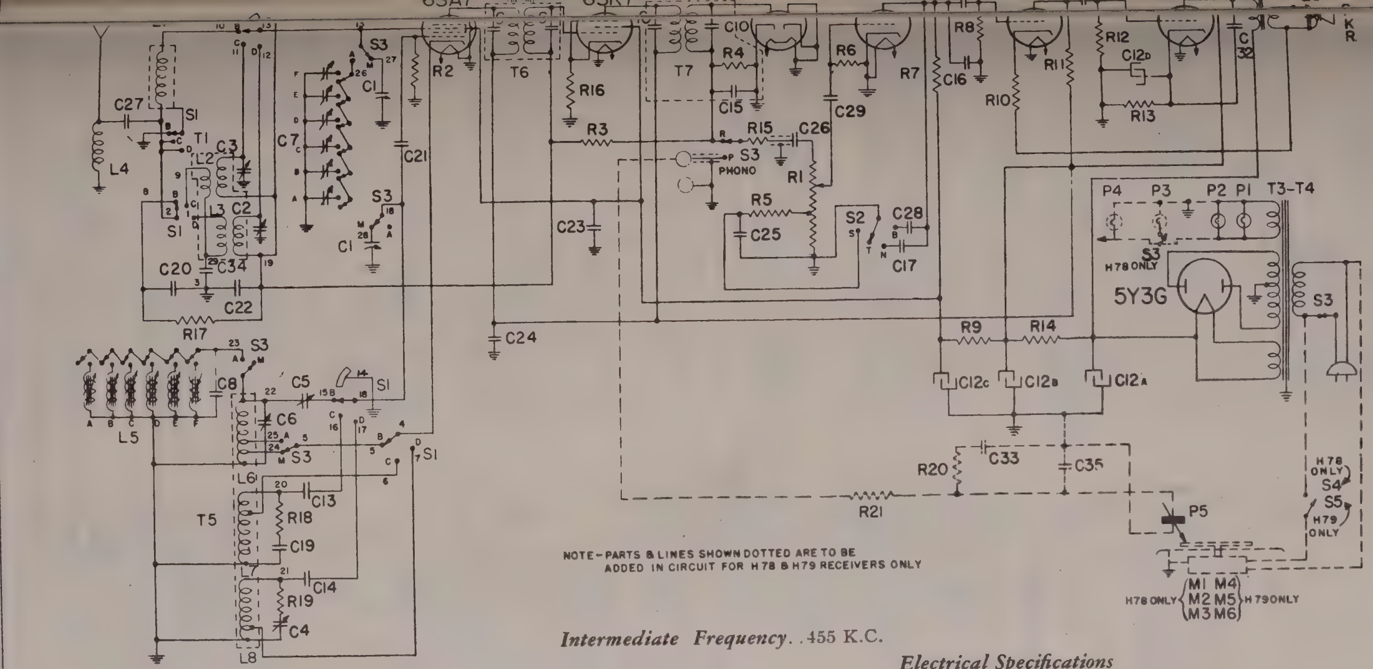
Long Wave Band: MODELS 453, 1239, The band selector switch is set in position for operation on the long wave band (extreme right hand position). The receiver and generator are both tuned to 300 kc and the oscillator trimmer is adjusted for maximum response. The antenna and first detector trimmers are adjusted in the order named for maximum output.

The signal generator is then set at 150 kc and the signal is tuned in. The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the left and right. The 300 kc adjustment should then be re-checked.

① 456 KC FOR MODELS 389, 493, 939, 1239.
② 6K8 TUBE .. ..
③ 19 MC FOR MODELS 493, 939.
④ 1720 KC FOR MODELS 389, 939.
⑤ 23 MC .. .. 493, 939.
⑥ MODEL 389-ADJUST ANTENNA TRIMMER AT 1500 KC for MAXIMUM.

GENERAL ELECTRIC CO.

MODELS H73,H77,H78
H79 (Final)
Schematic,Data



NOTE—PARTS & LINES SHOWN DOTTED ARE TO BE ADDED IN CIRCUIT FOR H78 & H79 RECEIVERS ONLY

Intermediate Frequency. . 455 K.C.

Fig. 3. Schematic Diagram

Electrical Specifications

Model	Rating	Power Supply Volts	Frequency (Cycles per Second)	Power Consumption (Watts)
H-73 H-77	A	115–125	50–60	75
	C	115–125	25–60	80
	V	103–117 118–133 134–155 188–212 213–237 238–262	50–60	75
H-78 H-79	A6	115–125	60	95
	A5	115–125	50	95
	A2	115–125	25	100

Loud-speaker—"Alnico" Magnet Dynamic

Model	H-73	H-77, H-78, H-79
Outside Cone Diameter	6½ in.	12 in.
Voice Coil Impedance		3.5 ohms at 400 cycles

Phonograph

Model	H-78	H-79
Type	Manual	Automatic
Record Capacity		
10-inch	One	Twelve
12-inch	One	Ten
Type Pick-up	Crystal	Crystal
Turntable Speed	78 R.P.M.	78 R.P.M.

Electrical Power Output

Undistorted. . . . 3.7 watts
Maximum. . . . . 5.0 watts

Tone Control. . . . 4-position

MODELS H73,H77,H78
H79 (Final)
Chassis Wiring,Voltage
Socket,Dial Drive Data

GENERAL ELECTRIC CO.

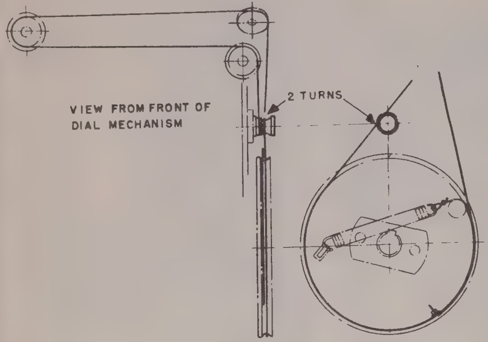
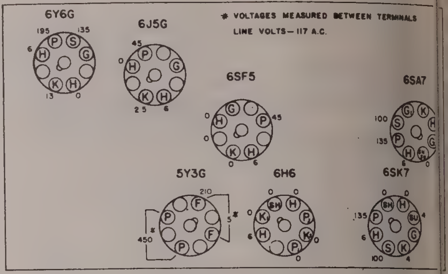


Fig. 6. Dial Drive Stringing Diagram



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS
CHASSIS.

No signal input—Max. Volume—Band "B."

Fig. 5. Socket Voltages

Models H-73, H-77, H-78, and H-79 employ three-band a-c receivers of the superheterodyne type using seven General Electric Pre-tested Tubes. Features of design include the new "Alnico" dynapower speaker, nine Feathertouch Tuning keys, six of which may be set up for favorite stations, a television audio or phonograph key, Visualux dial, iron-core I.F. transformers, iron-core oscillator trimmer coils for station keys and automatic volume control. In addition Model H-73 is equipped with the built-in "Beam-a-Scope" while Models H-77, H-78, and H-79 are equipped with the built-in '
Beam-a-scope."

Models H-78 and H-79 each contain a phonograph r
nism for reproducing records. Model H-78 phonc
manually plays 10-inch or 12-inch records. Model
phonograph incorporates an automatic record changer
will play either 10-inch or 12-inch records. Both mecha
contain high-quality crystal pick-ups and constant speec
starting, silent electric motors.

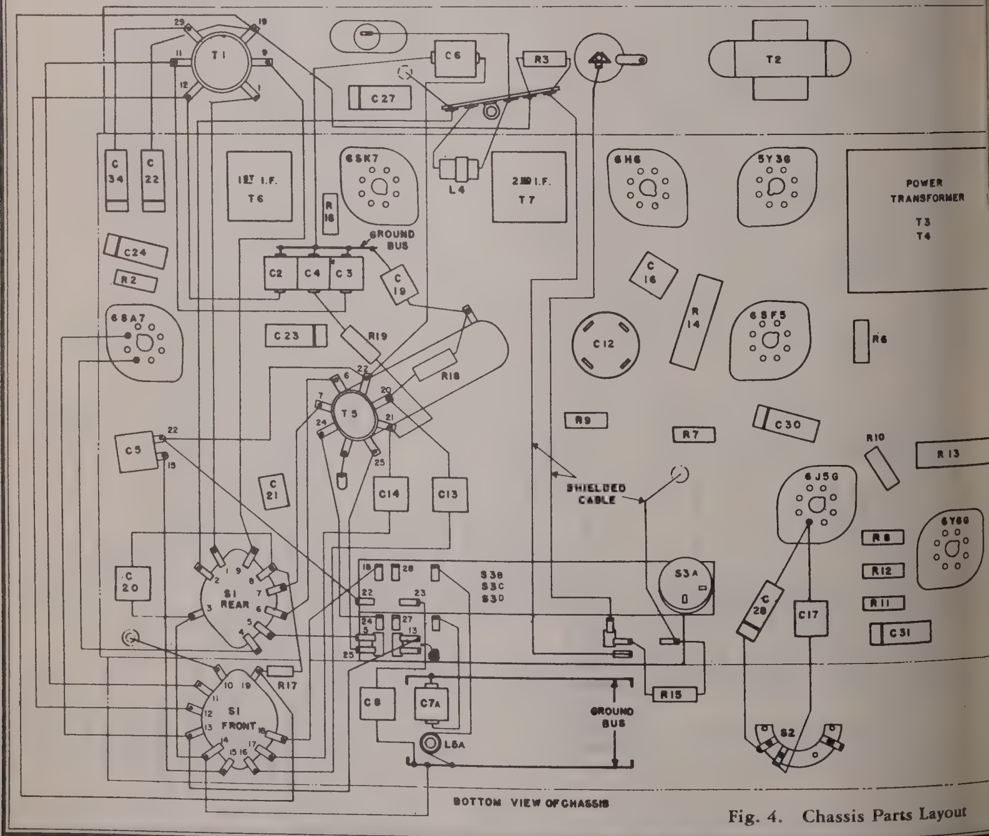


Fig. 4. Chassis Parts Layout

GENERAL ELECTRIC CO.

MODELS H73,H77,H78
H79 (Final)
Trimmers,Coils,Notes
Phono.Data,Gain

GENERAL INFORMATION

Super Beam-a-scope

The *Super* Beam-a-scope is essentially a tuned coil antenna wound on a frame and shielded by a Faraday screen against electrostatic disturbances. This construction favors the desired signal over a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and electromagnetic fields—the *Super* Beam-a-scope may be revolved so that a null point is found where no voltage is produced from these two components. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place, the *Super* Beam-a-scope eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place the *Super* Beam-a-scope discriminates against the electrostatic component of an incoming wave in comparison with the electromagnetic component, because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the electromagnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the *Super* Beam-a-scope is also the first tuned grid circuit. On the "C" and "D" bands, the *Super* Beam-a-scope is grounded at the grid end thus preventing absorption spots due to loop resonance.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

NOTE.—In no case should the magnet be removed from the assembled position without remagnetizing before replacing it.

Coil System

L is the Beam-a-Scope. T-1 is the "C" and "D" band antenna transformer while T-5 is the oscillator transformer for all bands. All band switch and coil terminals are numbered in Fig. and Fig. 4 to facilitate in locating common points.

The following table shows the coils in use for the various positions of the band and manual-automatic switch:.

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid	Oscillator Cathode	Remarks
Band "B" Manual Position		L-1	L-6	24 to Gnd. of L-6	C-1 tuning condenser in circuit
Band "B" Automatic Tuning		L-1	L-6	25 to Gnd. of L-6	C-7 and L-5 trimmers and coils in circuit.
Band "C"	L-2	L-2	L-7	6 to Gnd. of L-7	L-1 and L-6 effectively grounded through C-22 and C-5 respectively.
Band "D"	L-3	L-3	L-8	7 to Gnd. of L-8	L-1, L-2 secondary grounded through C-22. L-6, L-7 grounded through C-5 and C-13 respectively.

Phonograph or Television Audio Connections

These models are equipped with a phono-terminal (pin jack) to allow the convenient connection of record players or television audio channels. General Electric plug, Stock No. RP45, fits the pin jack. Models H-78, and H-79 use the plug connection from phonograph to radio and this plug may be readily removed to allow use of other record players, sound equipment or television sound converters.

NOTE.—A suitable load consisting of a 100,000-ohm resistor in series with .01 mfd. capacitor should be connected across the pick-up leads when using a crystal-type unit.

Alignment Procedure

The alignment procedure is given in table form

Use standard I.R.E. "dummy" antenna, Fig. 7, in making all .F. alignments. The relative position of the Beam-a-Scope with respect to the chassis materially affects R.F. alignment on "B" band; therefore, final alignment on "B band should be made after the chassis and Beam-a-Scope are mounted in the cabinet.

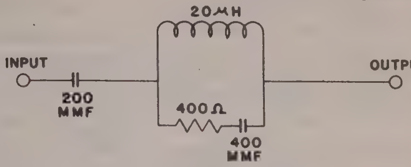


Fig. 7. I. R. E Dummy Antenna

PHONOGRAPH MECHANISM (H-78)

The phonograph mechanism used in this receiver has been designed to be as simple as possible and give long and trouble-free performance. Under normal operating conditions service difficulties should be negligible. Occasionally, however, certain adjustments may be required.

Trip Mechanism

The trip mechanism is of simple design and consists of a latch bar connected to the motor switch and a trip lever. The latch is held closed by means of a spring between the latch bar and the trip lever. The motor switch is mechanically connected to the latch bar so that when the trip mechanism is released, the motor switch is in the "Off" position. Be sure this latch bar mechanism works freely without binding.

The trip is actuated by an adjustable arm on the trip lever. When the eccentric groove in the record swings the tone arm back and forth, it pushes the latch out of engagement.

Crystal Pick-up

The crystal pick-up employs a crystal element which is coupled to a light needle chuck. The needle movement bends the crystal element thus generating voltage by the piezo-electric effect. The voltage developed is dependent upon the needle movement amplitude and the load resistance.

The crystal cartridge is a factory-sealed unit and no adjustments are provided. The cartridge is held in the tone arm by means of two screws. The pick-up and tone-arm assembly should require very little servicing and if treated with reasonable care should perform its function without attention for long periods of time.

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage-measuring instrument is available.

(1) Stage Gains
  (a) Antenna Post to Converter Grid
    Band "B" .... 6 to 9
    Band "C" .... 3 to 4
    Band "D" .... 1.5 to 3
  (b) Converter Grid to 6SK7 Grid....... 45 at 455 K.C. ‡
  (c) 6SK7 Grid to 6H6 Det. Plate....... 45 at 455 K.C. ‡

(2) A 400-cycle signal of .04 volts across the volume control will give ½ watt speaker output.‡ (Volume control turned to maximum.)

(3) Average d-c voltage developed across oscillator grid resistor (R-2)
    Band "B" .... 6 to 8 volts
    Band "C" .... 5 to 7 volts
    Band "D" .... 2.5 to 5 volts

‡ Variations of +10%, −20% permissible.

FOR RECORD CHANGER DATA SEE INDEX

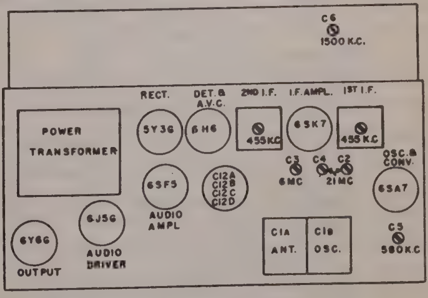


Fig. 2. Trimmer Location

ALIGNMENT PROCEDURE

I. F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. 2nd I.F. Pri. (T-7)	Gang condenser plates closed—"Manual" key depresse connect audio input of oscilloscope to chassis and to ju tion of R-3 and R-15. Adjust trimmers in order m tioned for a single symmetrical curve of maximum am tude. The resultant curve is shown in Fig. 1.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. 1st I.F. Pri. (T-6)	

I. F. ALIGNMENT WITH OUTPUT METER

1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. 2nd I.F. Pri. (T-7)	Gang condenser plates closed—connect output meter acr voice coil—keep input signal low and volume cont on as far as possible. Adjust all trimmers for maxim output.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. 1st I.F. Pri. (T-6)	

R. F. ALIGNMENT

1. Band "B"					Close gang plates—adjust pointer to first line at left e of tuning scale. Connect output meter across voice coil tone control on "Bass" position.
2. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-4) Ant. (C-2)	The image of any "D" band signal should be heard 9 K.C. below signal input when (C-4) is on proper pea Example: 18 M.C. image 17.09 M.C. Peak (C-2) wh rocking the gang condenser.
3. Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Ant. (C-3)	Peak for maximum output with a low input signal.
4. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-5)	Set dial pointer to 580 K.C. and tune in signal wi (C-5) while rocking gang condenser.
5. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6)	Peak trimmer for maximum output while rocking the ga condenser.
6. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-5)	Retrim for maximum output with a low input sign rocking gang condenser.

Stock No.	Description	List Price
	PHONOGRAPH ASSEMBLY (H-78)	
	Tone Arm Assembly	
RA-414	ARM—Tone arm	1.20
RC-8152	CORD—Tone arm lamp cord	.40
RP-505	PICK-UP—Crystal cartridge	5.40
RP-800	PIVOT—Tone arm pivot	1.20
RS-272	SOCKET—Lamp socket assembly	.50
RS-876	SCREW—Needle clamping screw (Pkg. 10)	.10
RT-915	TONE ARM—Tone arm assembly (complete)	$6.70
RX-069	ASSEMBLY—Pilot light connector assembly)	.20
	Automatic Stop Assembly	
RA-411	ARM—Trip arm tension washer and screw assembly	.25
RS-469	SPRING—Automatic stop locking spring (Pkg. 3)	.25
RX-064	ASSEMBLY—Automatic stop assembly	1.85
	Motor Turntable Assembly	
RB-184	BRACKET—Turntable drive wheel bracket assembly	.15
RB-185	BRACKET—Lower motor bearing bracket assembly complete	.40
RF-502	FIELD—60-cycle field stator assembly complete	3.60
RF-503	FIELD—50-cycle field stator assembly complete	3.60
RF-504	FRAME—Upper motor frame assembly	.60
RM-127	MOTOR—60-cycle motor assembly complete less turntable	5.85
RM-128	MOTOR—50-cycle motor assembly complete less turntable	6.40
RN-101	NEEDLE CUP—Needle cup (Model H-78)	.10
RP-151	PLATE—Motor mounting plate assembly	.45
RP-152	PLUG—Phono motor power connector plug	.25
RP-311	PULLEY—60-cycle motor pulley and setscrew	.20
RP-312	PULLEY—50-cycle motor pulley and setscrew	.25
RR-406	ROTOR—Rotor complete	1.55
RS-467	SPRING—Turntable drive tension spring	.10
RS-875	SETSCREW—Motor pulley setscrew (Pkg. 12)	.25
RS-932	SPINDLE—Turntable spindle and cotter	.30
RT-913	TURNTABLE—10-inch turntable	1.20
RW-909	WHEEL—Rubber edged drive wheel	.50
RX-065	ASSEMBLY—Turntable drive wheel bracket mounting washer, screw and nut assembly (Pkg. 5)	.20
RX-066	ASSEMBLY—Lower bearing bracket screw and nut assembly (Pkg. 3)	.05
RX-067	ASSEMBLY—Motor mounting screw, washer and grommet assembly (Pkg. 3)	.25
RX-068	ASSEMBLY—Drive wheel oil retainer, cotter and thrust washer assembly (Pkg. 5)	.10

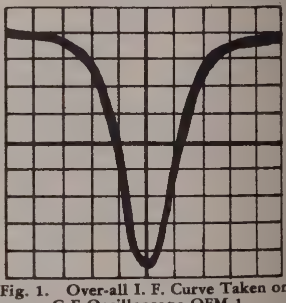


Fig. 1. Over-all I. F. Curve Taken on G-E Oscilloscope OFM-1

(Prices Subject to Change without Notice)

GENERAL ELECTRIC CO.

MODELS H73,H77,H78
H79 (Final)
Parts List
MODELS H622,H623
Dial Drive Data,Parts

REPLACEMENT PARTS LIST

MODELS H-73, H-77, H-78 AND H-79

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*R 08	BOARD—Terminal board (2 lug)	$0.10
*R 09	BOARD—Terminal board (1 lug—end mounted)	.10
*R 26	BOARD—Antenna terminal board	.10
*R 46	BOARD—Terminal board (5 lug)	.15
*R 96	BOARD—Terminal board (3 lug)	.10
*R 21	BEZEL—Pilot lamp bezel (Model H-79)	.20
R 910	BACK COVER—Cabinet back cover (Model H-73)	.30
R 929	BACK COVER—Cabinet back cover (Model H-77)	.45
R 1009	BOARD—Phono terminal board	.10
R 1010	BOARD—Beam-a-Scope terminal board (Model H-77)	.10
*R 09	CAPACITOR—.001 mfd. 600 V. paper (C-35)	.30
R 16	CAPACITOR—.002 mfd. 600 V. paper (C-28)	.25
*R 23	CAPACITOR—.005 mfd. 600 V. paper (C-26, 30)	.25
*R 39	CAPACITOR—.01 mfd. 600 V. paper (C-29, 32, 33)	.25
*R 48	CAPACITOR—.02 mfd. 600 V paper (C-31)	.30
R 57	CAPACITOR—.0072 mfd. 600 V. paper (C-25)	.25
*R 92	CAPACITOR—.05 mfd. 600 V. paper (C-22, 23, 24, 34)	.30
*R 96	CAPACITOR—0.1 mfd. 200 V. paper (C-27)	.30
*R 206	CAPACITOR—50 mmf. mica (C-21)	.35
R 233	CAPACITOR—22 mmf. mica (C-19)	.25
*R 235	CAPACITOR—100 mmf. mica (C-15, 16)	.25
R 301	CAPACITOR—680 mmf. mica (C-17)	.25
R 307	CAPACITOR—750 mmf. silvered mica (C-8)	.35
R 358	CAPACITOR—2000 mmf. mica (C-13)	.30
R 394	CAPACITOR—4700 mmf. mica (C-20)	.40
R 396	CAPACITOR—5600 mmf. mica (C-14)	.45
R 375	CORD—Power cord	.40
R 1987	CLAMP—Clamp for osc. or ant. coil (Pkg. 2)	.05
R 1989	CUSHION—Tuning condenser cushion (Pkg. 5)	.05
R 5148	CAPACITOR—40 mfd., 250 V., 20 mfd., 250 V.; 20 mfd., 250 V.; 20 mfd., 25 V.; dry electrolytic (C-12a, 12b, 12c, 12d)	1.75
R 5509	CAPACITOR—"B" band padder capacitor (C-5)	.35
R 5510	CAPACITOR—"B" band osc. trimmer (C-6)	.20
R 5526	CAPACITOR—7-65 mmf. trimmer (C-7F)	.35
R 5527	CAPACITOR—20-180 mmf. trimmer (C-7D, 7E)	.35
R 5528	CAPACITOR—100-490 mmf. trimmer (C-7A, 7B, 7C)	.35
R 7011	CONDENSER—Tuning condenser (C-1a, 1b)	2.15
R 3500	CARDS—Station letter cards (set)	.20
R 3505	CARDS—"Manual" tabs (Pkg. 10)	.05
R 3506	CARDS—"Phono-Tele" tabs (Pkg. 10)	.05
R 3507	CARDS—"Off" tabs (Pkg. 10)	.05
R 108	DIAL—Dial scale	.70
R 56	ESCUTCHEON—Dial scale escutcheon	1.25
R 57	ESCUTCHEON—Touch Tuning key escutcheon	1.15
R 208	ESCUTCHEON ASSEMBLY—Dial scale escutcheon complete	2.25
R 17	FOOT—Chassis mounting foot (Pkg. 5)	.10
R 44	KNOB—Tone control and band-change knob (Pkg. 2)	$0.40
R 204	KEY—Touch Tuning key	.10
R 83	COIL—Antenna coil "C," "D" bands (T-1)	.85
R 87	COIL—Oscillator coil "B," "C," "D" bands (T-5)	1.15
R 45	CHOKE—1½ mhy, antenna choke (L-4)	.30
R 04	BEAM-A-SCOPE—Beam-a-Scope assembly (Model H-73)	1.80
R 05	BEAM-A-SCOPE—Beam-a-Scope assembly (Model H-77)	5.85
R 15	BEAM-A-SCOPE—Beam-a-Scope assembly (Model H-78, 79)	6.60
R 510	COIL—Touch Tuning trimmer coil assembly (L-5)	1.80
R 513	COIL—Touch Tuning trimmer coil (Range: 1200-1500 K.C.) (Code—None) (L-5F)	.15
R 514	COIL—Touch Tuning trimmer coil (Range: 850-1400 K.C.) (Code—Red) (L-5D, 5E)	.15
R 515	COIL—Touch Tuning trimmer coil (Range: 540-900 K.C.) (Code—Blue) (L-5A, 5B, 5C)	.15
R 33	PLUG—Loop terminal plug (Models H-77, 78, 79)	.05
*R 42	RESISTOR—220 ohm, 2 W. carbon (R-13)	.20
R 70	RESISTOR—3300 ohm, 2 W. carbon (R-14) (Pkg. 5)	.70
*R 231	RESISTOR—68 ohm, ½ W. carbon (R-19) (Pkg. 5)	.70
*R 239	RESISTOR—150 ohm, ½ W. carbon (R-18) (Pkg. 5)	.70
*R 251	RESISTOR—470 ohm, ½ W. carbon (R-16) (Pkg. 5)	.70
*R 271	RESISTOR—3300 ohm, ½ W. carbon (R-10) (Pkg. 5)	.70
*R 273	RESISTOR—3900 ohms, ½ W. carbon (R-9) (Pkg. 5)	.70
*R 291	RESISTOR—22,000 ohms, ½ W. carbon (R-2) (Pkg. 5)	.70
*R 299	RESISTOR—7,000 ohms, ½ W. carbon (R-15, 17) (Pkg. 5)	.70
*R 301	RESISTOR—56,000 ohms, ½ W. carbon (R-5) (Pkg. 5)	.70
*R 307	RESISTOR—100,000 ohms, ½ W. carbon (R-11, 20) (Pkg. 5)	.70
*R 315	RESISTOR—220,000 ohms, ½ W. carbon (R-7) (Pkg. 5)	.70
*R 319	RESISTOR—330,000 ohms, ½ W. carbon (R-12) (Pkg. 5)	.70
*R 323	RESISTOR—470,000 ohms, ½ W. carbon (R-4) (Pkg. 5)	.70
*R 331	RESISTOR—1.0 megohm, ½ W. carbon (R-8, 21) (Pkg. 5)	.70
*R 339	RESISTOR—2.2 megohm, ½ W. carbon (R-3) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohm, ¼ W. carbon (R-6) (Pkg. 5)	.70
*RS-236	SOCKET—Pilot lamp socket	.10
RS-252	SOCKET—Octal tube socket	.15
RS-253	SOCKET—Electrolytic mounting socket	.10
RS-270	SOCKET—Phono motor connector socket	.25
RS-423	SPRING—Knob spring (Pkg. 10)	.25
RS-464	SPRING—Tuning and volume wheel spring (Pkg. 10)	.05
RS-1805	SHIELD — Beam-a-Scope electrostatic shield (Models H-78, 79)	1.10
RS-1808	SHIELD — Beam-a-Scope electrostatic shield (Model H-77)	1.10
RS-3022	SWITCH—Touch Tuning switch assembly (S-3)	7.60
RS-3023	SWITCH—Tone control switch (S-2)	.50
RS-3024	SWITCH—Band-change switch (S-1)	$1.00
RS-3055	SWITCH—Power switch on key assembly (S-3a)	.40
RT-0520	TRANSFORMER—60 cycle power transformer (T-3)	4.35
RT-0521	TRANSFORMER—25 cycle power transformer (T-4)	7.90
RT-313	TRANSFORMER—1st I.F. transformer (T-6)	1.70
RT-314	TRANSFORMER—2nd I.F. transformer (T-7)	1.90
RT-462	TRANSFORMER—Output transformer (T-2)	1.40
RT-862	TRIMMER STRIP—Ant. Touch Tuning trimmer strip (C-7)	1.20
RT-863	TRIMMER STRIP—"C," "D" band ant., "D" band osc. trimmers (C-2, 3, 4)	.45
*RT-952	TERMINAL—Beam-a-Scope pin terminal (Pkg. 10)	.05
RT-954	TERMINAL—Speaker lead terminal (Pkg. 10)	.10
RV-067	VOLUME CONTROL—2 megohm volume control (150,000 ohm tap) (R-1)	.65
*RW-101	WASHERS—Felt washers for knobs (Pkg. 10)	.05
RW-908	WHEEL—Tuning or volume control wheel.	.30
	SPEAKER ASSEMBLY	
RC-9009	CONE ASSEMBLY—Cone assembly (Models H-77, 78, 79)	.95
RC-9010	CONE ASSEMBLY—Cone assembly Model H-73)	.90
RP-128	PLUG—Speaker plug (Model H-73)	.10
RP-129	PLUG—Speaker plug (Model H-77)	.10
RS-1011	SPEAKER—12 inch P.M. speaker (Models H-77, 78, 79)	4.80
RS-1012	SPEAKER—6½ inch P.M. speaker (Model H-73)	3.25
	POINTER DRIVE ASSEMBLY	
RB-177	BRACKET—Pulley assembly mounting bracket (L.H.) (Models H-78, 79)	.15
RB-178	BRACKET—Pulley bracket assembly	.60
RB-195	BRACKET—Pulley assembly mounting bracket (L.H.) (Models H-73, 77)	.20
RB-196	BRACKET—Pulley assembly mounting bracket (R.H.) (Models H-73, 77)	.30
RB-197	BRACKET—Pulley assembly mounting bracket (R.H.) (Models H-78, 79)	.30
RB-625	BUSHING—Tuning control shaft bushing.	.10
RC-8125	CORD—Tuning drive cord assembly	.20
RD-407	DRUM—Condenser tuning drum assembly	.40
RH-006	HAIRPIN COTTER—Tuning drive shaft hairpin cotter (Pkg. 10)	.10
RM-501	MASK—Reflector mask (Pkg. 10)	.05
RP-127	POINTER—Dial scale pointer (Pkg. 5)	.25
*RP-303	PULLEY—Tuning drive pulley and pins (Pkg. 2)	.10
RS-463	SPRING—Tuning drive cord spring (Pkg. 5)	.10
RS-924	SHAFT—Tuning control shaft	.10

*Used on previous receivers.

(Prices Subject to Change without Notice)

MODELS H-622 AND H-623

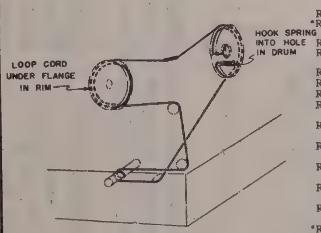


Fig. 4. Dial Drive Stringing Diagram

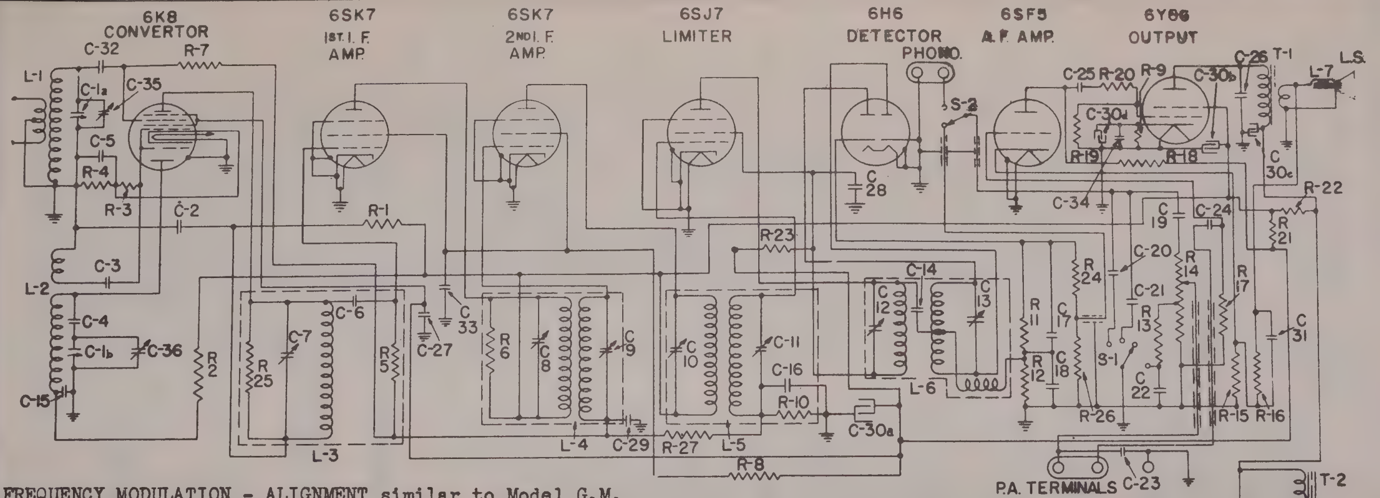
REPLACEMENT PARTS LIST

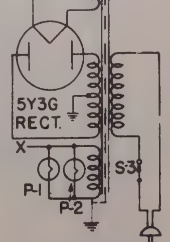
Models H-622 and H-623

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
RA-315	CONDENSER ASSEMBLY—Tuning condenser and drive unit complete	$5.75
*RB-023	BOARD—Terminal board (4 lugs)	.10
RB-041	BOARD—Terminal board (2 lugs)	.10
RB-182	BRACKET—Beam-a-Scope bracket	.10
RB-936	BACK COVER— Cardboard cabinet back.	.15
RB-1018	BOARD—Antenna terminal board	.10
*RC-011	CAPACITOR—.002 mfd. 600 V. paper (C-14)	.25
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-18, 19)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-10, 20, 25)	.25
*RC-048	CAPACITOR—.02 mfd. 600 V. paper (C-16)	.30
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-7, 24)	.30
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-8, 28)	.35
*RC-216	CAPACITOR—47 mmf. mica (C-26)	.25
*RC-250	CAPACITOR—220 mmf. mica (C-17)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-13)	.30
*RC-390	CAPACITOR—3900 mmf. mica (C-4)	.35
*RC-645	CAPACITOR—Beam-a-Scope and "B" band osc. trimmers (C-9, 21)	.15
RC-749	CONDENSER—Tuning condenser (C-1, 2)	4.15
*RC-863	CORD—Power cord	.65
RC-1995	CLAMP—Oscillator coil clamp (Pkg. 5)	.10
RC-5136	CAPACITOR—50 mfd. 150 V.; 30 mfd. 150 V. dry electrolytic (C-22a, 22b)	1.15
RC-6516	CAPACITOR—"B" band padder (C-3)	.30
RC-6517	CAPACITOR—"D" band ant. and osc. trimmers (C-5, 6)	.30
RC-8130	CABLE—Tuning drive cable assembly	.15
RC-8500	CARD—Station letter card (1 set) (Used on keys of both models)	.20
RC-8517	CARD—Station tab card (1 set) (Model H-623) (Used on escutcheon)	.60
RC-9010	CONE ASSEMBLY—6.5 inch speaker cone assembly	.90
RD-116	DIAL—Dial scale	1.00
RG-302	GROMMET—Tuning shaft drive cord grommet (Pkg. 10)	.10
RK-055	KNOB—Light oak control knob (Pkg. 5)	.50
RK-209	KEY—Light oak station selector key	.15
RK-217	KEY—Green station selector key (Model H-623)	.15
RL-098	COIL—"D" band antenna coil (Code—Orange) (L-2)	.65
RL-296	COIL—Oscillator coil (L-3)	.70
RL-346	CHOKE—Antenna choke (L-8)	.30
RL-522	BEAM-A-SCOPE—Beam-a-Scope antenna (L-1)	.85
RL-937	LUG—Key pin binding lug (Pkg. 10)	.10
RM-503	MASK—Dial scale mask (Pkg. 10)	.10
RN-200	NAMEPLATE—Dial scale metal nameplate (Model H-622)	.20
RN-201	NAMEPLATE—Dial scale metal nameplate (Model H-623)	.25
RP-134	PIN—Station selector key pin (Pkg. 10)	.05
RP-144	POINTER—Dial scale pointer (Pkg. 5)	$0.25
RP-307	PULLEY—Condenser drive cord pulley (Pkg. 5)	.25
RP-308	PULLEY—½ inch drive cord idler pulley (Pkg. 5)	.10
RP-309	PULLEY—11⁄16 inch drive cord idler pulley (Pkg. 5)	.10
*RQ-1235	RESISTOR—100 ohms, ½ W. carbon (R-16) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms, ½ W. carbon (R-12) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½ W. carbon (R-13) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3300 ohms, ½ W. carbon (R-9) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½ W. carbon (R-1) (Pkg. 5)	.70
*RQ-1297	RESISTOR—39,000 ohms ½ W. carbon (R-10) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½ W. carbon (R-5, 7, 11, 15) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms, ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohms, ¼ W. carbon (R-6) (Pkg. 5)	.70
RR-772	RESISTOR—BL42D ballast resistor (R-14)	.45
RR-941	REFLECTOR—Dial scale reflector	.30
*RS-200	SOCKET—Octal tube socket (Pkg. 5)	.75
RS-256	SOCKET—Electrolytic mounting socket (Pkg. 5)	.25
RS-261	SOCKET—Pilot lamp socket	.20
*RS-426	SPRING—Condenser drive cord spring (Pkg. 5)	.10
RS-510	SPACER—Station key spacer (Pkg. 10)	.10
RS-511	SLEEVE—Condenser bracket spacer sleeve (Pkg. 10)	.15
RS-929	SHAFT—Tuning shaft	.10
RS-1012	SPEAKER—6.5 inch P.M. speaker	3.25
RS-3036	SWITCH—Band change switch	.60
RT-328	TRANSFORMER—1st I.F. transformer (L-5)	1.00
RT-329	TRANSFORMER—2nd I.F. transformer (L-6)	1.20
RT-409	TRANSFORMER—Output transformer (T-1)	1.25
RT-954	TERMINAL—Speaker lead terminal (Pkg. 10)	.10
RV-072	VOLUME CONTROL—2.0 megohms volume control (R-4)	.80
RW-039	WINDOW—Celluloid station letter window (Pkg. 25)	.10
*RW-101	WASHER—Control shaft felt washer (Pkg. 10)	.05
*RX-035	ASSEMBLY—Condenser mounting foot assembly)	.15
RX-061	ASSEMBLY—Chassis mounting assembly.	.10
RX-062	ASSEMBLY—Speaker mounting assembly.	.10

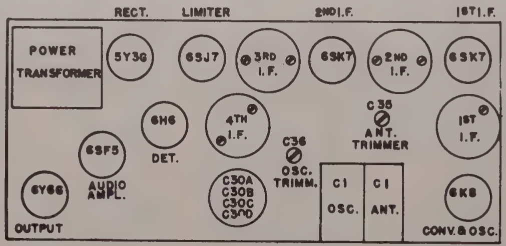
*Used on previous receivers

(Prices subject to change without notice)





FREQUENCY MODULATION - ALIGNMENT similar to Model G.M. 125 as explained on page 54 of the "How It Works" Section of Volume X. IF PEAK 2.1 MC.



Symbol	Description
C-1	- 20 mmf.
C-2	- .02 mfd.
C-3	- 47 mmf.
C-4	- 1200 mmf.
C-5	- .05 mfd.
C-6	- 500 mmf.
C-14	- 47 mmf.
C-15	- 470 mmf.
C-16	- 22 mmf.
C-17	- 100 mmf.
C-18	- 100 mmf.
C-19	- .005 mfd.
C-20	- .002 mfd.
C-21	- 470 mmf.
C-22	- .002 mfd.
C-23	- 220 mmf.

Symbol	Description
C-26	- .005 mfd.
C-27	- .005 mfd.
C-28	- .05 mfd.
C-29	- .05 mfd.
C-30a	- 20 mfd.
C-30b	- 20 mfd.
C-30c	- 40 mfd.
C-30d	- 20 mfd.
C-31	- 0.1 mfd.
C-32	- 470 mmf.
C-33	- 0.1 mfd.
C-34	- .05 mfd.
C-35	- 2-15 mmf.
C-36	- 7-23 mmf.
R-1	- 2200 ohms
R-2	- 6000 ohms

Symbol	Description
R-5	- 470 000 ohms
R-6	- 47 000 ohms
R-7	- 470 000 ohms
R-8	- 4 700 ohms
R-9	- 220 ohms
R-10	- 330 000 ohms
R-11	- 100 000 ohms
R-12	- 100 000 ohms

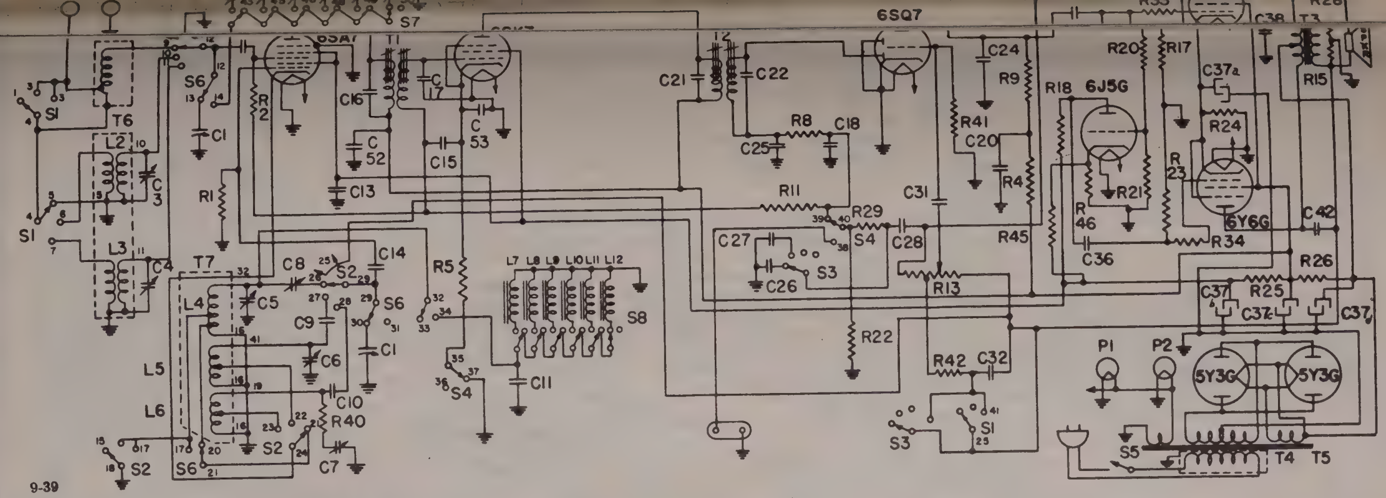
Symbol	Description
R-15	- 82 ohms
R-16	- 220 ohms
R-17	- 15 megohms
R-18	- 220 000 ohms
R-19	- 470 000 ohms
R-20	- 1500 ohms
R-21	- 2200 ohms
R-22	- 1600 ohms

Symbol	Description
R-25	- 33 000 ohms
R-26	- 220 000 ohms
R-27	- 2.2 megohms

IF PEAK 2.1 MC

GENERAL ELECTRIC CO.

MODEL H87
Schematic, Socket
Trimmers



9-39

Symbol	Description
C-1	Tuning Capacitor
C-3	"C" Band Antenna Trimmer
C-4	"D" Band Antenna Trimmer
C-5	"B" Band Oscillator Trimmer
C-6	"C" Band Oscillator Trimmer
C-7	"D" Band Oscillator Trimmer
C-8	"B" Band Padder
C-9	1600 mmf., Mica Capacitor ±5%
C-10	4300 mmf., Mica Capacitor ±5%
C-11	750 mmf., Silvered Mica Capacitor ±5%
C-12	150 mmf., Mica Capacitor
C-13	0.1 mfd., Paper Capacitor
C-14	47 mmf., Mica Capacitor
C-15	0.1 mfd., Paper Capacitor
C-18	47 mmf., Mica Capacitor
C-20	.25 mfd., Paper Capacitor
C-24	100 mmf., Mica Capacitor
C-25	47 mmf., Mica Capacitor
C-26	.0015 mfd., Paper Capacitor
C-27	470 mmf., Mica Capacitor
C-28	.01 mfd., Paper Capacitor
C-31	.01 mfd., Paper Capacitor
C-32	.003 mfd., Paper Capacitor
C-35	.05 mfd., Paper Capacitor
C-36	.05 mfd., Paper Capacitor
C-37a	20 mfd., 25 V. Dry Electrolytic
C-37b	20 mfd., 250 V. Dry Electrolytic
C-37c	20 mfd., 250 V. Dry Electrolytic
C-37d	40 mfd., 250 V. Dry Electrolytic
C-38	.02 mfd., Paper Capacitor

Symbol	Description
C-42	.01 mfd., Paper Capacitor
C-43	7–65 mmf., Antenna Trimmer
C-45	20–180 mmf., Antenna Trimmer
C-46	20–180 mmf., Antenna Trimmer
C-48	100–490 mmf., Antenna Trimmer
C-49	100–490 mmf., Antenna Trimmer
C-50	100–490 mmf., Antenna Trimmer
C-52	.25 mfd., Paper Capacitor
C-53	.08 mfd., Paper Capacitor
L-1	Beam-a-Scope
L-2	"C" Band Antenna Coil
L-3	"D" Band Antenna Coil
L-4	"B" Band Oscillator Coil
L-5	"C" Band Oscillator Coil
L-6	"D" Band Oscillator Coil
L-7	Tuning Coil (Code—None)
L-8, 9	Tuning Coil (Code—Red)
L-10, 11, 12	Tuning Coil (Code—Blue)
R-1	22,000 ohms, Carbon Resistor
R-2	1.0 megohm, Carbon Resistor
R-4	47,000 ohms, Carbon Resistor
R-5	330 ohms, Carbon Resistor
R-8	47,000 ohms, Carbon Resistor
R-9	220,00 ohms, Carbon Resistor
R-11	2.2 megohms, Carbon Resistor
R-13	2 megohms, Volume Control
R-15	15 ohms, Carbon Resistor
R-17	330,000 ohms, Carbon Resistor
R-18	68,000 ohms, Carbon Resistor

Symbol	Description
R-20	3.3 megohms, Carbon Resistor
R-21	270,000 ohms, Carbon Resistor
R-22	220,000 ohms, Carbon Resistor
R-23	150,000 ohms, Carbon Resistor
R-24	100 ohms, 3.4-W. Wire Wound
R-25	2400 ohms, 2-W. Carbon Resistor
R-26	2200 ohms, 2.6-W Wire Wound
R-28	68 ohms, Carbon Resistor
R-29	47,000 ohms, Carbon Resistor
R-33	1000 ohms, Carbon Resistor
R-34	1000 ohms, Carbon Resistor
R-40	33 ohms, Carbon Resistor
R-41	4.7 megohms, Carbon Resistor
R-42	100,000 ohms, Carbon Resistor
R-44	4.7 megohms, Carbon Resistor
R-45	15,000 ohms, 1-W. Carbon Resistor
R-46	270 ohms, Carbon Resistor
P-1	Pilot Light, Mazda No. 44
P-2	Pilot Light, Mazda No. 44
S-1	Antenna Band Switch
S-2	Oscillator Band Switch
S-3	Tone Switch
S-4	Phono. Switch
S-5	Power Switch
S-6	Manual Switch
S-7	Antenna Section, Touch Tuning Switch
S-8	Oscillator Section, Touch Tuning Switch

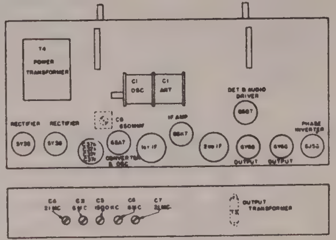


Fig. 1. Trimmer Location

Tubes

Converter and Osc. . . . GE-6SA7
I.F. Amplifier. GE-6SK7
Det., Aud., AVC. GE-6SQ7
Phase Inverter. GE-6J5G
Power Output. . . . . (2) GE-6Y6G
Rectifier. . . . . (2) GE-5Y3G

MODEL H87
Chassis Wiring

GENERAL ELECTRIC CO.

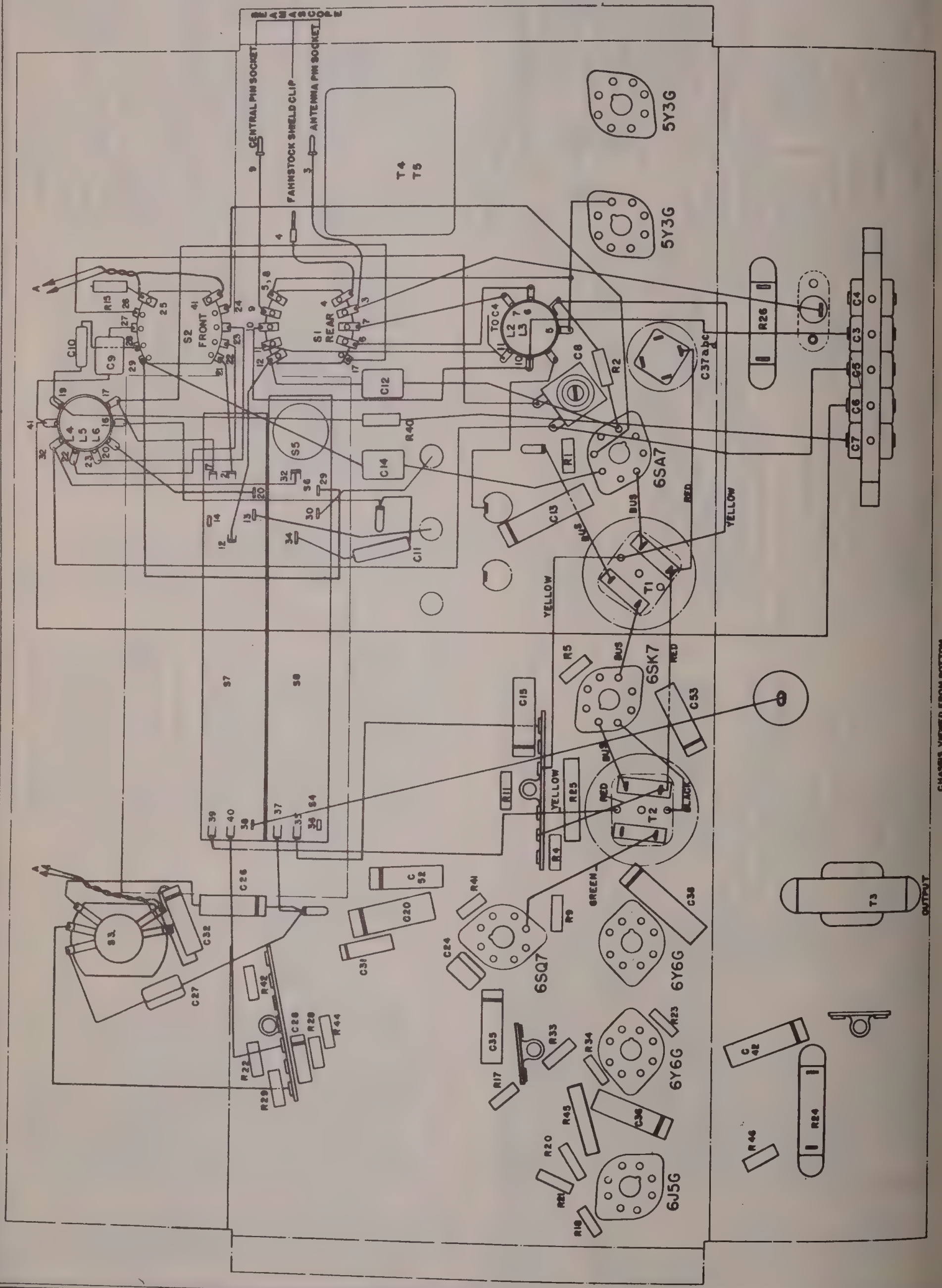
Manual Tuning Drive Ratio...........7:1

Tuning Frequency Range

Band "B"..........................540–1600 K.C.
Band "C"..........................2300–7000 K.C.
Band "D"..........................7000–22,000 K.C.

Electrical Specifications

Rating "A"—110–125 volts, 50–60 cycles, 125 w
Rating "C"—110–125 volts, 25–60 cycles, 125 w



CHASSIS VIEWED FROM BOTTOM

Loud-speaker—"Alnico" Magnetic Dynamic

Electrical Power Output

GENERAL ELECTRIC CO.

MODEL H87
MODEL HJ1005
Alignment,Gain
Coils,Dial Drive

The Model H-87 is a three-band a-c operated receiver employing eight General Electric Pre-tested Tubes in a superheterodyne circuit. This receiver is equipped with nine favorite stations. The three remaining keys allow power control, manual tuning and phonograph or television audio reception. The new *Super* Beam-a-scope, which is a highly efficient self-contained antenna circuit, is standard equipment on this model. Other features of design include: "Alnico" dynapower speaker, floodlighted station key finder, visualux dial, iron core I.F. transformers, automatic tone compensation, automatic volume control and push-pull output.

SUPER BEAM-A-SCOPE
MODELS H-87; HJ1005

The *Super* Beam-a-scope is essentially a tuned coil antenna wound on a frame and shielded by a Faraday screen against electrostatic disturbances. This construction favors the desired signal over a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and electromagnetic fields—the *Super* Beam-a-scope may be revolved so that a null point is found where no voltage is produced from these two components. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place the *Super* Beam-a-scope eliminates the external return path to ground present in the case of an unshielded antenna. This reduces or eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place the *Super* Beam-a-scope discriminates against the electrostatic component of an incoming wave in comparison with the electromagnetic component because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the electromagnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the *Super* Beam-a-scope is also the first tuned grid circuit. On the "C" and "D" bands, the *Super* Beam-a-scope is grounded at the grid end thus preventing absorption spots due to loop resonance.

Loud-speaker MODELS H87; HJ1005

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil [illegible] necessary to replace the entire cone and voice-coil assembly.

Note.—In no case should the magnet be removed from the assembled position without remagnetizing before replacing it.

Coil System MODELS H 87; HJ1005

The "C" and "D" band antenna coils are wound on a single coil form T-6 as shown (Schematic) T-7 is the oscillator transformer for the "B," "C" and "D" bands. All switch points are numbered to facilitate in locating these switch points on the pictorial wiring diagram.

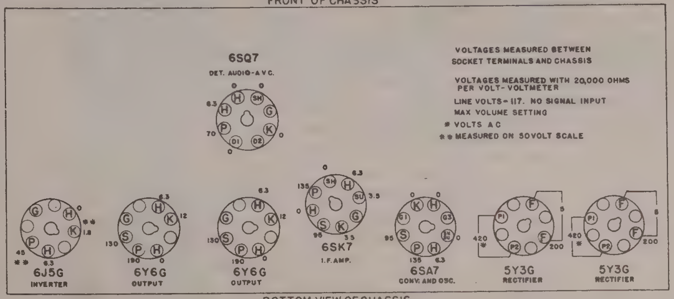
The following table gives the coils in use for the various positions of the band switch.

Band-switch Position	Antenna Primary	Antenna Secondary	Oscillator Primary	Oscillator Secondary
Band "B"	Lower portion of L-1	Upper portion of L-1	Lower portion of L-4	Upper portion of L-4
Band "C"	L-2 Primary (L-1 Primary shorted)	L-2 Secondary (Grid end of L-1 to ground)	Lower portion of L-5	Upper portion of L-5 (High side of L-4 to gnd. thru R-15. Mid tap of L-4 to gnd.)
Band "D"	L-3 Primary (L-1 Primary shorted)	L-3 Secondary (Grid end of L-1 to ground. L-2 secondary grounded)	Lower portion of L-6	Upper portion of L-6 (High side of L-4 and L-5 to gnd. thru R-15. Mid tap of L-4 to gnd.)

Alignment Procedure MODELS H87; HJ1005

The alignment procedure is given in table form on the opposite page. Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of input. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.

FRONT OF CHASSIS


6SQ7
DET. AUDIO-A V C.
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
VOLTAGES MEASURED WITH 20,000 OHMS PER VOLT-VOLTMETER
LINE VOLTS = 117. NO SIGNAL INPUT
MAX VOLUME SETTING
* VOLTS A C
** MEASURED ON 50VOLT SCALE
6J5G
INVERTER
6Y6G
OUTPUT
6Y6G
OUTPUT
6SK7
I.F. AMP.
6SA7
CONV. AND OSC.
5Y3G
RECTIFIER
5Y3G
RECTIFIER
6.3
45
130
190
135
95
420
200
12
3.5

BOTTOM VIEW OF CHASSIS

D₁—Diode Plate No. 1	K—Cathode
D₂—Diode Plate No. 2	P—Plate
F—Filament	P₁, P₂—Rectifier Plates
G—Control Grid	S—Screen
G₁—Oscillator Grid	SH—Shell
G₃—Converter Grid	SU—Suppressor
H—Heater	

MODEL H-87 (ONLY)

Fig. 6. Socket Voltages

MODEL H-87 **I.F. Alignment with Oscilloscope*** MODEL HJ-1005

Setting	Frequency	Position	Input*		
1. Band B	455 K.C. and 30 K.C. sweep	Bass	I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—Manual key depressed—vertical input to ground and junction of R-29, R-11, and R-22. Adjust trimmers in order mentioned for a single curve of maximum amplitude.
2. Band B	455 K.C. and 30 K.C. sweep	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3. Band B	455 K.C. and 30 K.C. sweep	Bass	Converter 6SA7 Grid	All I.F. Trimmers	

I.F. Alignment with Output Meter*

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input*	Trimmer	Comments
1. Band B	455 K.C. modulated	Bass	I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output.
2. Band B	455 K.C. modulated	Bass	Converter 6SA7 Grid	1st I.F. Sec. 1st I.F. Pri.	
3. Band B	455 K.C. modulated	Bass	Converter 6SA7 Grid	All I.F. Trimmers	

R.F. Alignment

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil.
2. Band C	6 MC modulated	Bass	Antenna Post**	Osc. (C-6) Ant. (C-3)	Set pointer to 6 M.C. mark and align (C-6). Peak (C-3) for maximum output.
3. Band D	21 M.C. modulated	Bass	Antenna Post**	Osc. (C-7) Ant. (C-4)	Set pointer to 21 M.C. mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the D band should be 910 K.C. below input signal. Example: 15 M.C. image 14.09 M.C.
4. Band B	580 K.C. modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Set dial pointer to 580 K.C. mark and tune in signal with (C-8).
5. Band B	1500 K.C. modulated	Bass	Antenna Post***	Osc. (C-5)	Adjust C-5 for maximum output in vicinity of 1500 K.C. while rocking gang condenser.
6. Band B	580 K.C. modulated	Bass	Antenna Post***	Osc. Padder (C-8)	Retrim (C-8).
7. Band B	1500 K.C. modulated	Bass	Antenna Post***	Osc. (C-5)	Repeak (C-5).

* Use "dummy" antenna consisting of .05 mfd. capacitor between signal generator and point of input.

** Use a "dummy" antenna consisting of 70 mmf. capacitor between signal generator and point of input with Beam-a-Scope disconnected.

*** Use an I.R.E. "dummy" antenna as shown in Fig. 2 between the signal generator and the point of input.

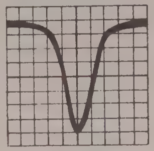


Fig. 3. I.F. Curve taken on G-E Oscilloscope OFM-1

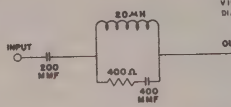
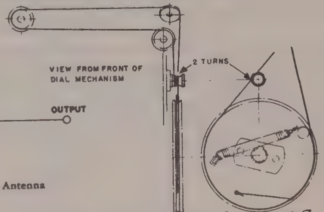


Fig. 2. I.R.E. Dummy Antenna



MODELS H-87; HJ1005

Fig. 7. Dial Drive Stringing Diagram

MODELS H-87 ; HJ1005

SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains‡

(a) Antenna Post to Converter Grid
Band "B" (Beam-a-Scope connected)*—3 at 1000 K.C.
Band "C" (Beam-a-Scope disconnected)**—3 at 4 M.C.
Band "D" (Beam-a-Scope disconnected)**—3 at 18 M.C.

(b) Converter Grid to 6SK7 Grid.........65 at 455 K.C.

(c) 6SK7 Grid to 6SQ7 Det. Plate......100 at 455 K.C.

(2) A 400-cycle signal of .05 volts across volume control will give ½-watt speaker output.‡ (Volume Control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.
Band "B"..............6.5 volts
Band "C"..............7 volts
Band "D"..............2.8 volts

*Use I.R.E. "dummy" antenna.

**Use 70 mmf. capacitor between signal generator and antenna post with Beam-a-Scope disconnected.

‡Variations of + 10%, −20% permissible.

MODEL H87
Parts List
MODELS H500U,H510U
H520U (W and X)
Alignment,Parts

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST MODELS H-500U, H-510U AND H-520U (W and X Models Included)

(For Models Using 12SA7GT Tube and 500,000 Ohm Volume Control

Symbol	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-013	BOARD—Terminal board (2 lug for Models H-500U, 510U)	.10
RB-179	BRACKET—Beam-a-Scope bracket	.10
RB-193	BRACKET—Dial lamp bracket	.05
RB-915	BACK COVER—Plastic cabinet back for Model H-520U	1.00
RB-916	BACK COVER—Plastic cabinet back for Model H-520UW	1.60
RB-917	BACK COVER—Plastic cabinet back for Model H-520UX	1.60
RB-934	BACK COVER—Cabinet back for Models H-500U, 510U (W and X inc.)	.15
RC-016	CAPACITOR—.002 mfd. 600 V. paper (C-1)	.25
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-13)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-15)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-10)	.25
*RC-060	CAPACITOR—.03 mfd. 600 V. paper (C-12)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-16)	.30
*RC-130	CAPACITOR—.2 mfd. 400 V. paper (C-19)	.30
*RC-216	CAPACITOR—47 mmf. mica (C-4)	.25
*RC-274	CAPACITOR—330 mmf. mica (C-14)	.30
*RC-294	CAPACITOR—470 mmf. mica (C-9)	.30
*RC-676	CAPACITOR—B band padder (C-20)	.35
*RC-863	CORD—Power cord	.65
RC-1990	CLAMP—Antenna coil clamp for Models H-500U, 510U (Pkg. 5)	.10
RC-5135	CAPACITOR—30 mfd. 150 V.; 40 mfd. 150 V.; 20 mfd. 25 V.; dry electrolytic (C-17a, 17b, 17c)	$1.15
RC-7019	CONDENSER—Tuning condenser for Model H-500U (C-2a, 2b)	2.05
RC-7023	CONDENSER—Tuning condenser for Models H-510U, 520U (C-2a, 2b)	4.10
RC-8508	CARDS—Station letter cards for Models H-510U, 520U (W and X inc.)	.30
RC-9013	CONE ASSEMBLY—Speaker cone assembly for all models	.80
RD-111	DIAL—Dial scale for Models H-500U, 510U (W and X inc.)	.20
RD-140	DIAL—Dial scale for Model H-520U (W and X inc.)	.20
RD-410	DRUM—Tuning condenser drive assembly for all models in brown	.20
RD-411	DRUM—Tuning condenser drive drum assembly for all models in ivory and H-510UX	.60
RD-414	DRUM—Tuning condenser drive drum assembly for all models in onyx except H-510UX	.60
RH-007	HANK—Antenna hank for Models H-500U, 510U (W & X inc.)	.20
RK-048	KNOB—Control knob for all models in ivory	.15
RK-051	KNOB—Control knob for all Models in brown and H-510UX	.15
RK-065	KNOB—Control knob for all models in onyx except H-510UX	.15
RK-206	KEY—Station selector key for Models H-510U, 510UW, 520U, 520UW (Pkg. 5)	.50
RK-208	KEY—Station selector key for Models H-510UX, 520UX (Pkg. 5)	$0.70
RL-085	COIL—Antenna coil for Models H-500U, 510U (L-1)	50
RL-518	LOOP—Beam-a-Scope antenna for Model H-520U	.80
RL-2018	COIL—Oscillator coil for all Models	.40
RP-134	PIN—Key pin for all Models with keys (Pkg. 10)	.05
*RQ-1219	RESISTOR—22 ohms, ½-W. carbon (R-11) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms, ½-W. carbon (R-8) (Pkg. 5)	.70
*RQ-1261	RESISTOR—1200 ohms, ½-W. carbon (R-9) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½-W. carbon (R-6, 7) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms, ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohms, ¼-W. carbon (R-5) (Pkg. 5)	.70
RR-351	RESISTOR—100 ohms, 3.4 W. wire wound (R-10)	.20
*RS-238	SOCKET—Octal tube socket	.15
RS-256	SOCKET—Electrolytic mounting socket	$0.05
RS-258	SOCKET—Dial lamp socket	.25
RS-951	SPACER—Speaker cabinet spacer (Pkg. 10)	.05
RS-1016	SPEAKER—4-inch speaker (L-5)	3.35
RT-321	TRANSFORMER—1st I.F. transformer for Model H-520U (L-3)	.95
RT-322	TRANSFORMER—2nd I.F. transformer for all models (L-4)	1.00
RT-323	TRANSFORMER—1st I.F. transformer for Models H-500U, 510U (L-3)	.90
RT-465	TRANSFORMER—Output transformer (T-1)	1.00
RV-086	VOLUME CONTROL—0.5 megohm volume control (R-4)	.80
RW-039	WINDOW—Celluloid station letter window for all Models with keys (Pkg. 25)	.10
RZ-152	CABINET—Cabinet for H-510U, 520U	2.90
RZ-153	CABINET—Cabinet for H-510UW, 520-UW	4.25
RZ-154	CABINET—Cabinet for H-510UX, 520-UX	4.60
RZ-155	CABINET—Cabinet for H-500U	2.90
RZ-156	CABINET—Cabinet for H-500UW	4.25
RZ-157	CABINET—Cabinet for H-500UX	4.60

SPECIAL REPLACEMENT PARTS

(For Models H-500U, 510U, and H-520U Provided with 2.0 Megohm Volume Control):

Symbol	Description	List Price
RC-016	CAPACITOR—.002 mfd. 600 V. paper (C-11)	$0.25
RQ-1324	RESISTOR—500,000 ohms ½-W. carbon (R-3) (Pkg. 5)	.70
RV-070	VOLUME CONTROL—2 megohm volume control (R-4)	$0.70

(For Models H-500U and H-510U Provided with 12A8GT Converter-Oscillator Tube)

Symbol	Description	List Price
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-18)	$0.25
RC-7013	CONDENSER—Tuning condenser (C-2a, 2b)	2.00
*RG-016	GRID CLIP—Tube control grid clip (Pkg. 5)	.10
RL-290	COIL—Oscillator coil (L-2)	$0.50
*RQ-1281	RESISTOR—8200 ohms, ½-W. carbon (R-12) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms, ½-W. carbon (R-1) (Pkg. 5)	.70

*Used on previous receivers.

(Prices Subject to Change without Notice)

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 12SK7 through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the (12A8GT) 12SA7GT and aligning the 1st I.F. transformer. Do not remove the grid lead from the converter tube. Finish alignment by over-all adjustments.

R.F. On Models H-500U and H-510U (W and X inc.) apply a 1500 KC signal through a 100 mmf. mica condenser to the antenna terminal. Rotate the gang condenser to the 1500 KC dial mark and align (C-2b). Peak (C-2a) for maximum output.

An additional alignment step is required on the Models H-500U and H-510U which use a 12SA7GT converter-oscillator tube. Tune these Models to a 580 KC signal after aligning at 1500 KC and peak (C-20) oscillator padder for maximum output while rocking the gang condenser.

On Models H-520U (W and X inc.) apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. Rotate the gang condenser to the 1500 KC dial mark and align (C-2b) Peak (C-2a) for maximum output. Retune receiver to 580 KC signal and peak (C-20) while rocking the gang condenser.

GENERAL INFORMATION

These models are compact superheterodyne receivers using five General Electric Pre-tested Tubes and operating from either a DC or AC source of power. Features of design include the new "Alnico" Dynapower speaker, single-ended and high filament-voltage tubes, and automatic volume control. Models H-510U and H-520U (W and X inc.) have four "Feathertouch Tuning" Keys. Models H-500U and H-510U (W and X inc.) have attached antennas while Model H-520 (W and X inc.) is equipped with the built-in "Beam-a-Scope."

REPLACEMENT PARTS LIST MODEL H-87

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-008	BOARD—Terminal board (2 lugs)	$0.10
*RB-026	BOARD—Antenna terminal board	.10
*RB-062	BOARD—Terminal board (6 terminals)	.10
*RB-093	BOARD—Terminal board (6 lugs)	.10
RB-1009	BOARD—Phono-terminal board	.10
RB-1010	BOARD—Loop terminal board	.10
*RC-006	CAPACITOR—.0015 mfd., 600 V. paper (C-26)	.30
*RC-039	CAPACITOR—.01 mfd., 600 V. paper (C-28, 31)	.25
*RC-042	CAPACITOR—.01 mfd., 1000 V. paper (C-42)	.30
*RC-051	CAPACITOR—.02 mfd., 1500 V. paper (C-38)	.30
*RC-055	CAPACITOR—.003 mfd., 600 V. paper (C-32)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-35, 36)	.30
*RC-094	CAPACITOR—.08 mfd., 400 V. paper (C-53)	.25
*RC-096	CAPACITOR—0.1 mfd., 200 V. paper (C-15)	.30
*RC-104	CAPACITOR—0.1 mfd., 600 V paper (C-13)	.30
*RC-148	CAPACITOR—.25 mfd., 600 V. paper (C-52) (C-20)	.35
RC-206	CAPACITOR—47 mmf. mica (C 14)	.35
*RC-216	CAPACITOR—47 mmf. mica (C-18, 25)	.25
*RC-235	CAPACITOR—100 mmf. mica (C-24)	.25
RC-242	CAPACITOR 150 mmf. mica (C-12)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-27)	.30
RC-307	CAPACITOR—750 mmf. silvered mica (C-11)	.40
RC-337	CAPACITOR—1600 mmf. mica (C-9)	.25
RC-389	CAPACITOR—4300 mmf. mica (C-10)	.40
RC-745	CONDENSER—Tuning condenser (C-1)	3.00
RC-863	CORD—Power cord	.65
*RC-992	CUSHION—Tuning condenser cushion (Pkg. 3)	.10
RC-1987	CLAMP—Ant.-Osc. coil clamp (Pkg. 2)	.05
RC-2001	CORE—Touch Tuning coil tuning core	.15
RC-5148	CAPACITOR—20 mfd. 25 V; 20 mfd. 250 V; 20 mfd. 250 V; 40 mfd. 250 V; dry electrolytic (C-37a, 37b, 37c, 37d)	1.75
RC-6512	CAPACITOR—B band padder capacitor (C-8)	.35
RC-6526	CAPACITOR—7-65 mmf. trimmer (C-43)	35
RC-6527	CAPACITOR—20-180 mmf. trimmer (C-45, 46)	.35
RC-6528	CAPACITOR—100-490 mmf. trimmer (C-48, 49, 50)	.35
RF-015	FOOT—Rubber-mounting foot for chassis	.05
RK-044	KNOB—Control knob (Pkg. 2)	.40
RK-205	KEY—Feathertouch Tuning key (Pkg. 5)	.25
RL-084	COIL—C and D band antenna coil (L-2, 3)	.75
RL-289	COIL—B, C and D band osc. coil (L-4, 5, 6)	1.10
RL-507	LOOP—Beam-a-Scope antenna (L-1)	6.60
RL-9510	COIL—Touch Tuning trimmer coil assembly (L-7 to L-12)	1.80
RL-9513	COIL—Touch Tuning trimmer coil (Range: 1200-1550 K.C.) (Code—None) (L-7)	.15
RL-9514	COIL—Touch Tuning trimmer coil (Range: 850-1400 K.C.) (Code—Red) (L-8, 9)	.15
RL-9515	COIL—Touch Tuning trimmer coil (Range: 540-900 K.C.) (Code—Blue) (L-10, 11, 12)	$0.15
RP-133	PLUG—Loop terminal plug	.05
RQ-667	RESISTOR—2400 ohms, 2-W. carbon (R-25)	.20
*RQ-1215	RESISTOR—15 ohms, ½-W. carbon (R-15) (Pkg. 5)	.70
*RQ-1223	RESISTOR—33 ohms, ½-W. carbon (R-40) (Pkg. 5)	.70
*RQ-1231	RESISTOR—68 ohms, ½-W. carbon (R-28) (Pkg. 5)	.70
*RQ-1245	RESISTOR—270 ohms, ½-W. carbon (R-46) (Pkg. 5)	.70
*RQ-1247	RESISTOR—330 ohms, ½-W. carbon (R-5) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½-W. carbon (R-33, 34) (Pkg. 5)	.70
*RQ-1291	RESISTOR—22,000 ohms, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms, ½-W. carbon (R-4, 8, 29,) (Pkg. 5)	.70
*RQ-1303	RESISTOR—68,000 ohms, ½-W. carbon (R-18) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms, ½-W. carbon	
*RQ-1311	RESISTOR—150,000 ohms, ½-W. carbon (R-17, 23) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms, ½-W. carbon (R9, 22) (Pkg. 5)	.70
*RQ-1317	RESISTOR—270,000 ohms, ½-W. carbon (R-21) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½-W. carbon (R 11) (Pkg 5)	.70
*RQ-1343	RESISTOR—3.3 megohm, ½-W. carbon (R-20) (Pkg. 5)	.70
*RQ-1347	RESISTOR—4.7 megohm, ½-W. carbon (R-41, 44) (Pkg. 5)	.70
*RQ-1487	RESISTOR—15,000 ohms, 1-W. carbon (R-45)	.20
RR-351	RESISTOR—100 ohms, 3.4-W. wire wound (R 24)	.20
RR-352	RESISTOR—2200 ohms, 2.6-W. wire wound (R-26)	.20
*RS-236	SOCKET—Pilot lamp socket assembly	.10
*RS-252	SOCKET—Tube socket	.15
RS-255	SOCKET—Electrolytic mounting socket	.05
*RS-423	SPRING—Knob spring (Pkg. 10)	.25
RS-1807	SHIELD—Beam-a Scope electrostatic shield	1.10
RS-3027	SWITCH—Band-change switch (S-1, 2)	1.10
RS-3032	SWITCH—Tone control switch (S-3)	.45
RS-3033	SWITCH—Feathertouch Tuning switch (S-7, 8)	3.40
RS-3055	SWITCH—Power switch on key assembly	.40
RT-112	TRANSFORMER—Power transformer, 50-60 cycles (T-4)	6.40
RT-113	TRANSFORMER—Power transformer, 25 cycles (T-5)	10.60
RT-324	TRANSFORMER 1st IF transformer assembly (T-1)	1.90
RT-325	TRANSFORMER—2nd IF transformer assembly (T-2)	2.20
RT-463	TRANSFORMER—Output transformer	1.50
RT-866	TRIMMER STRIP—B, C and D osc. and C and D ant. trimmers (C-3, 4, 5, 6, 7)	.70
RT-868	TRIMMER STRIP—Ant. tuning trimmer strip (C-43 to C-50)	$1.20
RV-069	VOLUME CONTROL—2 megohm volume control (R-13)	.60
	SPEAKER ASSEMBLY	
RC-9009	CONE ASSEMBLY—Speaker cone assembly for H-87	.95
RP-129	PLUG—Speaker plug for Model H-87	.10
RS-1014	SPEAKER—14-in. P.M. speaker (complete)	6.00
	DIAL SCALE AND DRIVE ASSEMBLY	
RB-172	BRACKET—Volume control bracket	.05
RB-173	BRACKET—Tuning shaft bracket	.20
RB-175	BRACKET—Reflector and pulley bracket assembly (R.H.)	.45
RB-176	BRACKET—Reflector and pulley bracket assembly (L.H.)	.40
RC-8127	CORD—Drive cord assembly	.20
RC-8501	CARDS—Station letter cards (1 set)	.25
RC-8502	CARD—"Off" tab card (Pkg. 10)	.10
RC-8503	CARD—"Manual" tab card (Pkg. 10)	.10
RC-8504	CARD—"Phono-Tele" tab card (Pkg. 10)	.10
RD-110	DIAL—Dial scale	$2.20
RD-409	DRUM—Drum and hub assembly	.30
RD-510	DIFFUSER—Large diffuser strip	.05
RD-511	DIFFUSER—Small diffuser strip	.10
RE-200	ESCUTCHEON BAND—Escutcheon band—tuning	.20
RE-201	ESCUTCHEON BAND—Escutcheon band—volume	.20
RE-202	ESCUTCHEON—Main dial escutcheon	2.00
RE-207	ESCUTCHEON ASSEMBLY—Main dial escutcheon assembly	4.50
RH-008	HAIRPIN COTTER—Tuning drive shaft hairpin cotter (Pkg. 10)	.05
RM-502	MASK—Reflector cover mask	.05
RP-132	POINTER—Tuning pointer-slider assembly	.25
*RP-303	PULLEY—Pulley and "C" clip assembly (Pkg. 2)	.10
RR-927	REFLECTOR—Dial scale reflector	.15
RS-463	SPRING—Drive cord spring (Pkg. 5)	.10
RS-464	SPRING—Dial wheel spring (Pkg. 10)	.05
RS-925	SHAFT—Tuning control shaft	.05
RS-1801	SHIELD—Pilot light shield	.10
RW-038	WINDOW—Celluloid station letter window (Pkg. 25)	.10
RW-908	WHEEL—Dial wheel assembly	.30

correctly made at the factory, and ordinarily need never be altered. Should it become necessary to remake any of these adjustments, due to accident or tampering, proceed as follows:

A. Adjusting Landing Position of Needle on the Record. (See Fig. 8.) This adjustment is made with a screwdriver from above—does not require removing Record Changer from cabinet. If needle comes down too far from edge of record, playing of records will not start at their beginning. **Turn Needle-drop Adjustment Screw very slightly counterclockwise.** If needle comes down too close to edge of record, needle may slip off edge of record. **Turn the adjusting screw clockwise.**

Compare also Paragraph 12 on page 11.

B. Adjusting Distance from Record Pin at Which Trigger Will Trip and Change-Cycle Will Begin. Turn Trip Adjusting Screw 18, **toward** the trigger for **earlier** tripping, or away from it for later tripping. This Record Changer does not depend, for automatic tripping, on the records being provided with any special grooves at end; it trips whenever needle comes within a certain distance of Record Pin. The factory adjustment is for 1⅞ in. from **center** of Record Pin. This is the most generally satisfactory distance; no modern record will then be cut off before playing is finished, and none will fail to trip at end. For certain records of early manufacture, it may not be possible to find an adjustment that will always trip and never cut off.

C. Adjusting Height to Which Tone Arm Rises. The arm should rise, during the change-cycle, high enough so that it clears by only ⅛ in. the record above it, next to be played. (Be careful, before deciding that adjustment is necessary, to see that the record at bottom of stack is not a warped one.) To make this adjustment, **loosen the lock nut** on **Pickup Sleeve 22** (see Fig. 10) and **turn the sleeve to lengthen or shorten Pickup Plunger 21.** When correct adjustment is found, **tighten lock nut** again.

Motor Replacement

The service mechanic may be called upon to adapt the Record Changer to a different power supply. For this purpose, or in case of any service fault within Motor, remove entire Motor (with Record Pin and connecting gear drive) from the Record Changer, and replace it with a suitable new Motor. (In ordering a replacement Motor, specify the power supply.)

When mounting replacement Motor, it is most important to see that Record Pin is centered between the two posts of the Record Changer, that it stands perpendicular to Main Plate 53, and that it has not become bent so as to wobble. Even though the Posts are stout and not easy to bend, it is well to check them also, with a 12-in. combination square laid clear across the concave upper surface of Main Plate. When the new Motor has been attached, with three screws through Grommet Sleeves 51 (spacers) into its frame, and Record Pin is seen to revolve without appreciable wobble (a wobble would indicate that it has been bent in transit from factory) the correct position of Pin midway between the Posts can be accurately checked in this way: Place a single 12-in. record on the Record Holder, press "R" button, and turn turntable forward by hand. Immediately after the Record Holders open and let it fall, **turn Turntable slightly backward,** and with other hand **support the record between the Record Holders;** it can then be readily seen whether Record Pin is off center. If it is, **remove the record and Turn-**

improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 in Fig. 11 showing a shim in place upon one of the Grommet Sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard. They should be inserted, around proper screws (when screws have been sufficiently loosened) between Motor Frame and metal Grommet Sleeve. **Do not insert shims next to rubber grommet.** In wiring up, consult schematic diagram for particular installation. Use only Underwriters' approved wire.

Trouble Shooting

Cases of failure to operate satisfactorily will generally be found due either to neglect of proper lubrication, or to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage) even though the utmost factory precautions are taken against it—or that setscrews may work loose due to some external vibration. Damage from tampering is likely to take the form of bent parts; never bend any part during examination. Be careful, especially, **never to push upward** from below on Cam Connecting Rod Lift 37 while mechanism is operating; bending may result, and even slight bending here might interfere with correct timing of the cycle operations.

Among the principal trouble symptoms to which such causes may give rise, are the following:

1. Mechanism Is Slow in Starting, or Stalls During a Change-cycle, But a Slight Forward Push With the Hand Starts It Again. May be caused by

a. Failure to lubricate properly. **Oil thoroughly,** per instructions above.

b. Loose setscrews.

c. Weakness of drive: line voltage may be abnormally low, or motor windings damaged.

2. Motor Fails to Run, Even When It Is Entirely Disconnected from Other Wiring and Proper Voltage Is Applied Directly to the Two Ends of Its Windings. This indicates trouble in Motor windings. Unless the damage is easily seen and repaired, replace Motor, as above described.

3. Motor Is Slow in Starting.

a. **Check oiling,** as directed above. It may not have been properly done; old oil may have become gummy.

b. Changer may have been in a very cold place, and may not yet have reached room temperature. Give it a fair chance to get warmed up, before concluding that Motor is defective, and proceeding as in Paragraph 2 above.

4. Squeaks or Other Noises, During Playing of Records.

a. **Check oiling,** as directed above. (If squeaks are heard, they will usually be found to come from the records—not from the mechanism.)

b. See that all setscrews are tight.

c. Examine Motor windings; especially the shading coils which encircle a portion of each laminated pole and make the Motor self-starting. If coils have been jarred loose at

6. Motion of Tone Arm Toward Record Pin Will Not Trip Changer Mechanism.

a. It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring 95 (joining the lugs at ends of Swivel Spreaders 90 and 91), allowing the Spreaders to open. **Increase tension of Spring 95,** by bending slightly the lug on either Spreader. If this increased tension causes needle to jump across the record, needle may be a little out of vertical, radially—it may "lean" toward center of record. To remedy this, grasp Pickup arm and twist it, very slightly, in a clockwise direction, so that it stands vertical, or even leans a little in outward direction.

b. If trigger is being properly actuated, probably Cam Lever 39 is binding against Sub-Plate 41. Look for dirt or obstructions; see that rivets are working freely. If the Lever engages Cam Lever Pawl 34, so that Lift 37 forces its roller up into the groove on Cam gear 82, and if setscrews are tight, the change-cycle must operate, as Cam Gear turns.

7. Pressing "R" Button Doesn't Trip Changer Mechanism.

a. Check Push-button Switch Unit 75: see whether there is an obstruction or a bent part which prevents "R" button from going clear down to the end of its travel.

b. Examine Reject Rod 78. If it does not trip, even when properly revolved by complete depressing of "R" button, the rod has probably been bent, and must be restored in same way. **Grasp the two ends and twist it** slightly.

c. If Trigger 16 is being properly actuated but without starting a change-cycle, see directions above, Paragraph 6-b.

8. Pressing "M" Button Fails to Put Changer Mechanism Out of Action so as to Enable Manual Operation. Check Push-button Switch Unit as in preceding paragraph. First see that button goes clear down; then follow its action through Manual Rod 77.

9. Motor Stops Immediately When Phono Switch Is Turned Off During a Change-cycle (instead of continuing to run, as it should, until needle is again upon a record, and then stopping). Or—

10. Turning Phono Switch Off Fails to Stop Changer at All. Either of these two conditions would indicate failure of Cycling Switch 85. Cycling Switch operates normally to short-circuit the manual Changer Switch (which may be located in position shown at 54, or elsewhere) during change-cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning the entire Changer to factory.

11. Changer Fails to Repeat Last Record. See Paragraph 6, above.

12. Needle Lands Properly But Fails to Move Over into Record Groove. Tone arm is normally impelled toward center of records by Lead Spring 97. Should a slight increase in its tension be found necessary, this can be easily obtained by bending the lug, to which it is attached, down against Main Plate. If tendency then appears for needle to jump across record, check angle of needle (see Paragraph 6-a above).

13. Records Fall Unevenly Upon Turntable. Seldom objectionable, this is due to Record Pin not being correctly centered between Posts. If necessary, it can be corrected as described above; see "Motor Replacement."

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14. Last Record Drops on One Side Only. This suggests a Post bent out of perpendicular to Main Plate. Test with square as directed (see "Motor Replacement"). If Post must be straightened, be careful not to bend other parts.

15. Changer Continues Cycling. Due to failure of Lift 37 to fall back out of engagement with Cam Gear. Check the various rivets at which motion occurs, to find the point where friction or binding is interfering with freedom of motion.

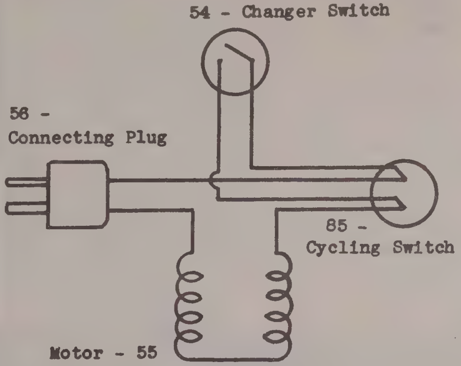

Fig. 12. Record Changer Wiring Diagram

16. Record Is Driven, But Not Heard, or Not Heard With Proper Volume. See that Pickup cord is plugged in. Check amplifier and speaker and connections to them, thoroughly. If then trouble is still suspected in pickup, test its output with a **vacuum-tube** voltmeter. Playing an average record, output should test 1 to 2.5 volts. If pickup cartridge is found not to deliver proper output, remove it and install another.

17. Selector Plate Fails to Separate Bottom Record from Stack. This is due either to a badly warped condition of the record, or to its being of a thickness very considerably different from those now in standard use. The design of both Release Levers and Record Holders is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be impracticable for use in automatic changers.

If Necessary to Disassemble the Changer

Before attempting to remove Sub-Plate Assembly 83, detach Push-button Switch Unit 75 from Main Plate. To do this, start with Switch Unit Truss Bar 80. Then take out the screw which holds left end of Adjusting Rod Lever 94. Next remove Adjusting Rod 92 and Adjusting Rod Extension 79. Take out the screw Spring 73: then the screws holding Push-button Switch Unit 75 to Main Plate. Rods 77 and 78 can then, with due care, be extracted without bending. Free the Cam Connecting Rod 58 by loosening setscrew holding Spreader and Hub Assembly 59. Sub-Plate Assembly can

Stock No.	Description	List Price
	AUTOMATIC RECORD-CHANGER ASSEMBLY	
RA-412	ARM—Swivel guide arm assembly (13, 88)	.75
RB-189	BRACKET—Adjusting rod bracket (86)	.10
RB-190	BRACKET—Manual and rejection rod spring bracket (76)	.10
RB-628	BUTTON—Switch push button (Pkg. of 4)	1.00
RC-1999	CLAMP—Crystal cartridge clamp and screws (Pkg. of 2)	.25
● RC-2000	COLLAR—Rear changer shaft collar and setscrew	.60
RC-5003 *RC-5000	CRYSTAL—Crystal cartridge assembly	6.00
RC-8146	CABLE—Pick-up cable and plug	.85
RG-109	GUIDE—Pick-up lifter guide	.40
RG-303	GROMMET—Motor mounting grommet (Pkg. of 6)	.15
RG-707	GEAR—Cam gear assembly (11, 82)	2.40
RG-708	GEAR—Drive pinion gear assembly	.75
RH-113	HINGE—Adjusting rod hinge on switch unit (Pkg. of 3)	.10
RK-069	KNOB—Changer post knob	$0.25
RM-130	MOTOR—Motor and record pin assembly with mounting accessories, 115 V., 60 cycles, 78 rpm (55)	13.60
RM-131	MOTOR—Motor and record pin assembly with mounting accessories, 115 V., 50 cycles, 78 rpm (55)	15.20
RM-132	MOTOR—Motor and record pin assembly, 115 V., 25 cycles, 78 rpm (55)	38.00
RP-158	PLATE—Tone arm lift plate	.20
RP-159	PLATE—Sub-plate and lever assembly (14, 16, 17, 32, 34, 39, 41, 42, 83)	4.40
● RG-711	GEAR—Idler gear and shoulder rivet assembly	.60
● RS-886	SCREW—Lift shoulder screw and nut	.30
RP-160	PLATE—Selector plate Assembly (Record holder and release lever)	3.80
RP-405	PIN—Tone arm hinge pin (Pkg. of 6)	.20
RP-406	POST—Front or rear changer post with mounting washer and nut (71)	.80
RP-407	POST—Swivel post with mounting washer and nut	.75
RR-932	ROLLER—Rear post spring roller (61)	.40
RR-933	ROD—Manual key rod (77)	.10
RR-934	ROD—Rejection key rod (78)	.15
RR-935	ROD—Cam connecting rod assembly (31, 35, 37, 58, 59)	1.40
RR-936	ROD—Adjusting rod assembly (79, 81, 92, 94)	1.60
RR-937	ROD—Changer connecting rod assembly (57, 72)	2.20
RR-938	REST—Tone arm rest	.20
RS-473	SPRING—Selector plate spring (Pkg. of 5)	.10
RS-474	SPRING—Release trigger spring (15) (Pkg. of 3)	.25
RS-475	SPRING—Cam connecting rod lift spring (Pkg. of 3)	.25
RS-477	SPRING—Cam lever spring (36, 84) (Pkg. of 3)	.25
RS-478	SPRING—Rod or swivel guide arm spring (96, 87) (Pkg. of 3)	.25
RS-479	SPRING—Changer spreader spring (62) (Pkg. of 2)	$0.30
RS-480	SPRING—Swivel spreader spring (95) (Pkg. of 3)	.25
RS-481	SPRING—Manual and rejection rod spring (73) (Pkg. of 3)	.25
RS-482	SPRING—Motorboard mounting spring (Pkg. of 6)	.15
RS-483	SPRING—Adjusting screw lock spring (19) (Pkg. of 12)	.25
RS-484	SPRING—Pick-up plunger spring (Pkg. of 3)	.10
RS-485	SPRING—Pick-up lead spring (97) (Pkg. of 3)	.25
RS-486	SPRING—Hinge pin spring (Pkg. of 6)	.20
RS-512	SWIVEL—Swivel shaft and head assembly (23)	.90
RS-513	SLEEVE—Motor mounting grommet sleeve (51) (Pkg. of 3)	.25
RS-514	SWIVEL SPREADERS—Upper or lower swivel spreaders (90, 91)	.20
● RS-887 *RS-859	SCREW—Needle screw	.10
RS-877	SCREW—Trunnion shoulder screw (Pkg. of 3)	.25
RS-878	SCREW—Motorboard mounting screw (Pkg. of 4)	.20
RS-935	SHAFT—Front changer shaft and pin (74)	.60
RS-936	SHAFT—Rear changer shaft and pin (60)	.60
RS-3053	SWITCH—OFF-ON switch with lockwasher and 16-inch leads (54)	.90
RS-3054	SWITCH—Push-button switch unit (75)	1.70
RT-918	TURNTABLE—11½-inch mahogany flock turntable for Model H-118	2.20
RT-220	TONE ARM—Tone arm assembly with lamp bracket and cord assembly	2.40
RX-070	ASSEMBLY—Pick-up plunger, sleeve and nut assembly (21, 22)	.65
RX-071	ASSEMBLY—Stop lever and hub assembly (93)	.55
RX-072	ASSEMBLY—Swivel tube and trunnion assembly (20, 24, 25)	1.00

● FOR MODEL HJ-119
*Used on previous receivers.

(Prices subject to change without notice)

GENERAL ELECTRIC CO.

MODELS H116,H118,HJ119
MODEL H79
Record Changer Data

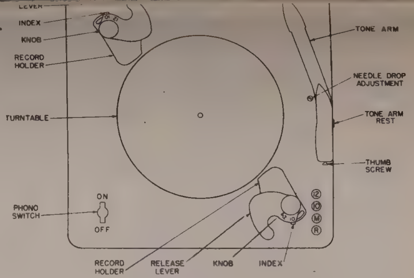

Fig. 8. Phono Compartment

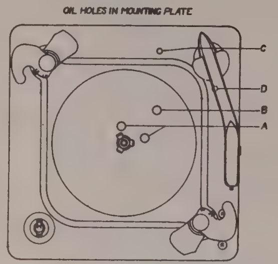

Fig. 9. Oiling Diagram

The Models H-116 and H-118 contain three-band a-c-operated receivers employing eleven General Electric Pretested Tubes in a superheterodyne circuit. The receivers are equipped with eleven Feathertouch Tuning keys, eight of which may be set up for favorite stations. The three remaining keys allow power control, manual tuning and phonograph or television audio reception. Each model is also equipped with the new *Super* Beam-a-scope; a highly efficient, self-contained antenna circuit. Other features of design include: "Alnico" dynapower speaker, floodlighted station-key finder, visualux dial, iron-core I.F. transformers, automatic tone compensation, automatic volume control, and push-pull output.

The Model H-118 also incorporates an automatic record changer which will play either 10- or 12-inch records. A feature of the phonograph design is the automatic record-rejection mechanism which permits record rejection at any time during the reproduction by merely pressing the reject button. A high-quality crystal pick-up and tone arm assures full tone range and smooth needle tracking. A constant-speed, self-starting silent electric motor provides uniform turntable operation.

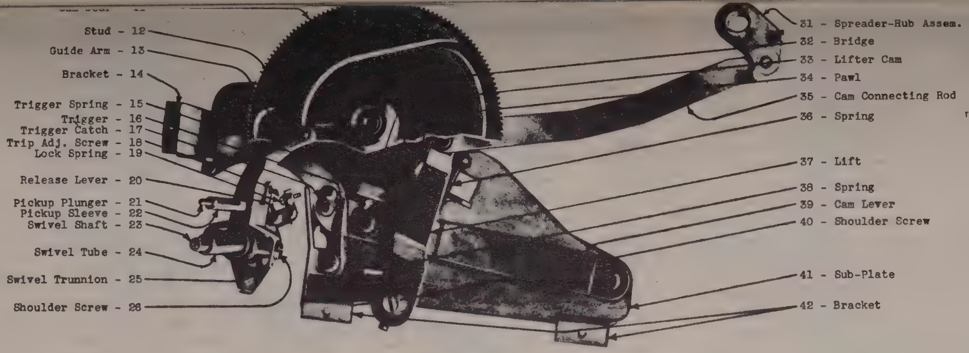

Fig. 10. Sub-Plate Assembly

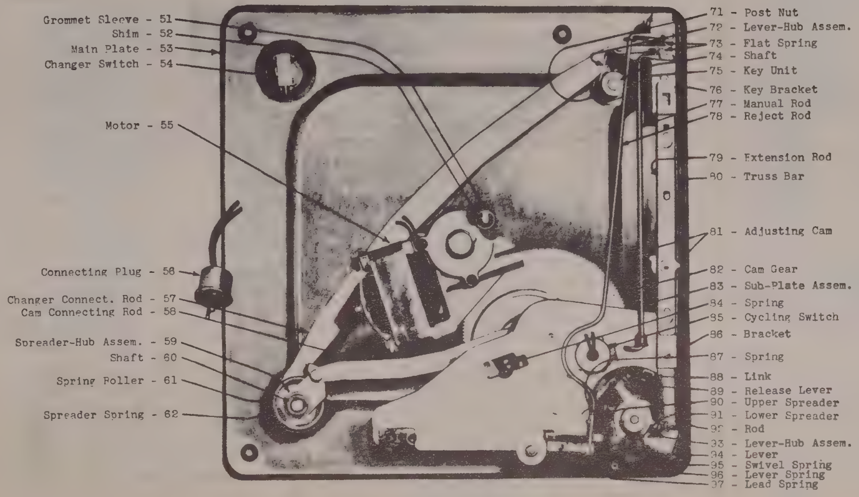

Fig. 11. Bottom View of Record Changer

MODELS H116,H118,HJ119
MODEL HJ1005
Parts Lists

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST

MODELS H-116 AND H-118

CHASSIS ASSEMBLY

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lugs)	$0.10
*RB-026	BOARD—Antenna terminal board	.10
*RB-062	BOARD—Terminal board (6 terminals)	.10
*RB-093	BOARD—Terminal board (6 lugs)	.10
RB-174	BRACKET—Tuning eye bracket	.15
*RB-621	BEZEL—Pilot lamp bezel	.20
RB-1009	BOARD—Phono-terminal board	.10
RB-1010	BOARD—Loop terminal board	.10
*RC-009	CAPACITOR—.001 mfd. 600 V. paper (C-26)	.30
RC-011	CAPACITOR—.002 mfd. 600 V. paper (C-20)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-28, 31)	.25
*RC-042	CAPACITOR—.01 mfd. 1000 V. paper (C-42)	.30
*RC-051	CAPACITOR—.02 mfd. 1500 V. paper (C-38)	.30
*RC-055	CAPACITOR—.003 mfd. 600 V. paper (C-32)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-19, 29)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-23, 35, 36)	.30
*RC-096	CAPACITOR—0.1 mfd. 200 V. paper (C-15, 33)	.30
*RC-104	CAPACITOR—0.1 mfd. 600 V. paper (C-13, 51)	.30
*RC-148	CAPACITOR—.25 mfd. 600 V. paper (C-52)	.35
RC-206	CAPACITOR—47 mmf. mica (C-14)	.35
*RC-216	CAPACITOR—47 mmf. mica (C-18, 25, 34)	.25
*RC-235	CAPACITOR—100 mmf. mica (C-24)	.25
RC-242	CAPACITOR—150 mmf. mica (C-12)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-27)	.30
RC-307	CAPACITOR—750 mmf. silvered mica (C-11)	.40
RC-337	CAPACITOR—1600 mmf. mica (C-9)	.25
RC-389	CAPACITOR—4300 mmf. mica (C-10)	.40
RC-745	CONDENSER—Tuning condenser (C-1)	3.00
RC-863	CORD—Power Cord	.65
*RC-992	CUSHION—Tuning condenser cushion (Pkg. of 3)	.10
*RC-1977	CLAMP—Tuning eye clamp	.10
RC-1987	CLAMP—Ant-Osc. coil clamp (Pkg. of 2)	.05
RC-2001	CORE—Touch-tuning coil tuning core	.15
RC-5130	CAPACITOR—40 mfd. 350 V; 20 mfd. 300 V; 20 mfd. 300 V; 20 mfd. 25 V; dry electrolytic (C-41, 40, 39, 37)	2.10
RC-6512	CAPACITOR—B band padder capacitor (C-8)	$0.35
RC-6526	CAPACITOR—7-65 mmf. trimmer (C-43, 44)	.35
RC-6527	CAPACITOR—20-180 mmf. trimmer (C-45, 46, 47)	.35
RC-6528	CAPACITOR—100-490 mmf. trimmer (C-48, 49, 50)	.35
RC-8128	CABLE—Tuning eye cable for Model (H-116)	.40
RC-8147	CABLE—Tuning eye cable for Model (H-118)	.40
RF-015	FOOT—Rubber mounting foot for chassis of Model (H-116)	.05
RF-017	FOOT—Rubber mounting foot for chassis of Model (H-118) (Pkg. of 5)	.10
RK-044	KNOB—Control knob (Pkg. of 2)	.40
RK-205	KEY—Feathertouch Tuning key (Pkg. of 5)	.25
RL-084	COIL—C and D band antenna coil (L-2, 3)	.75
RL-289	COIL—B, C and D band osc. coil (L-4, 5, 6)	1.10
RL-507	BEAM-A SCOPE—Beam-a-Scope for Model (H-116)	6.60
RL-515	BEAM-A-SCOPE—Beam-a-Scope for Model (H-118)	6.60
RL-9511	COIL—Touch Tuning trimmer coil assembly (L-7 to L-14)	2.35
RL-9513	COIL—Touch Tuning trimmer coil (Range: 1200-1550 KC) (Code—None) (L-7, 8)	.15
RL-9514	COIL—Touch Tuning trimmer coil (Range: 850-1400 KC) (Code—Red) (L-9, 10, 11)	.15
RL-9515	COIL—Touch Tuning trimmer coil (Range: 540-900 KC) (Code—Blue) (L-12, 13, 14)	.15
RN-103	NEEDLE CUP—Phono needle cup	.10
RP-133	PLUG—Loop terminal plug	.05
RP-152	PLUG—Phono motor power connector plug	.25
RQ-667	RESISTOR—2400 ohms, 2-W. carbon (R-25)	.20
*RQ-1213	RESISTOR—12 ohms, ½-W. carbon (R-27) (Pkg. of 5)	.70
*RQ-1215	RESISTOR—15 ohms, ½-W. carbon (R-15) (Pkg of 5)	.70
*RQ-1223	RESISTOR—33 ohms, ½-W. carbon (R-40) (Pkg. of 5)	.70
*RQ-1231	RESISTOR—68 ohms, ½-W. carbon (R-28) (Pkg. of 5)	.70
*RQ-1247	RESISTOR—330 ohms, ½-W. carbon (R-5) (Pkg. of 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½-W. carbon (R-7, 12, 33, 34) (Pkg. of 5)	.70
*RQ-1279	RESISTOR—6800 ohms, ½-W. carbon (R-3) (Pkg. of 5)	$0.70
RQ-1289	RESISTOR—18,000 ohms, ½-W. carbon (C-42) (Pkg. of 5)	.70
*RQ-1291	RESISTOR—22,000 ohms, ½-W. carbon (R-1) (Pkg. of 5)	.70
*RQ-1299	RESISTOR—47,000 ohms, ½-W. carbon (R-4, 8, 10, 18, 29, 31) (Pkg. of 5)	.70
*RQ-1311	RESISTOR—150,000 ohms, ½-W. carbon (R-14, 17) (Pkg. of 5)	.70
*RQ-1315	RESISTOR—220,000 ohms, ½-W. carbon (R-9, 22, 23)	.70
*RQ-1317	RESISTOR—270,000 ohms, ½-W. carbon (R-21) (Pkg. of 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½-W. carbon (R-2, 19, 30) (Pkg. of 5)	.70
*RQ-1339	RESISTOR—2.2 megohms, ½-W. carbon (R-11) (Pkg. of 5)	.70
*RQ-1343	RESISTOR—3.3 megohms, ½-W. carbon (R-20) (Pkg. of 5)	.70
*RQ-1347	RESISTOR—4.7 megohms, ½-W. carbon (R-16, 41) (Pkg. of 5)	.70
*RQ-1349	RESISTOR—5.6 megohms, ½-W. carbon (R-32) (Pkg. of 5)	.70
RR-351	RESISTOR—100 ohms, 3.4-W. wire wound, (R-24)	.20
RR-352	RESISTOR—2200 ohms, 2.6-W. wire wound, (R-26)	.20
*RS-236	SOCKET—Pilot lamp socket assembly	.10
*RS-252	SOCKET—Tube socket	.15
RS-255	SOCKET—Electrolytic mounting socket	.05
RS-270	SOCKET—Phono motor power connector-socket	.25
RS-423	SPRING—Knob spring (Pkg. of 10)	.25
*RS-864	THUMB SCREW—Tuning eye clamp thumb screw (Pkg. of 10)	.40
RS-1802	SHIELD—Tuning eye shield	.10
RS-1805	SHIELD—Beam-a-Scope electrostatic shield for model (H-118)	1.60
RS-1806	SHIELD—Metal shield on phono pin jack. (Pkg. of 5)	.25
RS-1807	SHIELD—Beam-a-Scope electrostatic shield for Model (H-116)	1.10
RS-3026	SWITCH—Tone control switch (S-3)	.60
RS-3027	SWITCH—Band-change switch (S-1, 2)	1.10
RS-3028	SWITCH—Feathertouch Tuning switch (S-7, 8)	3.90
RS-3055	SWITCH—Power switch on key assembly	.40
RT-112	TRANSFORMER—Power transformer 50-60 cycles (T-4)	6.40
RT-113	TRANSFORMER—Power transformer, 25 cycles (T-5)	10.60
RT-317	TRANSFORMER—1st I.F. transformer assembly (T-1)	2.00
RT-318	TRANSFORMER—2nd I.F. transformer assembly (T-2)	2.00
RT-463	TRANSFORMER—Output transformer (T-3)	1.50
RT-865	TRIMMER STRIP—Ant. tuning trimmer strip (C-43 to C-50)	1.60
RT-866	TRIMMER STRIP—B, C and D osc. and C and D ant. trimmers (C-3, 4, 5, 6, 7)	.70
RV-069	VOLUME CONTROL—2 megohm volume control (R-13)	.60

SPEAKER ASSEMBLY

Stock No.	Description	List Price
RC-9009	CONE ASSEMBLY—Speaker cone assembly	.95
RP-129	PLUG—Speaker plug (Pkg. of 2)	.10
RS-1014	SPEAKER—14 in. P.M. speaker (complete)	6.00

REPLACEMENT PARTS LIST

MODEL HJ-1005

CHASSIS ASSEMBLY

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lugs)	$0.10
*RB-013	BOARD—Terminal board (2 lugs)	.10
*RB-026	BOARD—Antenna terminal board	.10
*RB-062	BOARD—Terminal board (6 terminals)	.10
*RB-093	BOARD—Terminal board (6 lugs)	.10
*RB-096	BOARD—Terminal board (3 lugs)	.10
*RB-183	BRACKET—Rear condenser mounting bracket	.05
*RB-1009	BOARD—Phono-terminal board	.10
*RC-006	CAPACITOR—.0015 mfd. 600 V. paper (C-26)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-28, 31)	.25
*RC-042	CAPACITOR—.01 mfd. 1000 V. paper (C-42)	.30
*RC-051	CAPACITOR—.02 mfd. 1000 V. paper (C-38)	.30
*RC-055	CAPACITOR—.003 mfd. 600 V. paper (C-32)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-35, 36)	.30
*RC-094	CAPACITOR—.08 mfd. 400 V. paper (C-53)	.25
*RC-096	CAPACITOR—0.1 mfd. 200 V. paper (C-15)	.30
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-13)	.35
*RC-147	CAPACITOR—.25 mfd. 400 V. paper (C-20, 52)	.20
*RC-206	CAPACITOR—47 mmf. mica (C-14)	.35
*RC 216	CAPACITOR 47 mmf. mica (C-18, 25)	.25
*RC-235	CAPACITOR—100 mmf. mica (C-24)	.25
RC-244	CAPACITOR 150 mmf. mica (C-12)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-27)	.30
*RC-307	CAPACITOR—750 mmf. silvered mica (C-11)	.40
*RC-348	CAPACITOR—1600 mmf. mica (C-9)	.35
*RC-389	CAPACITOR—4300 mmf. mica (C-10)	.40
*RC-863	CORD—Power cord	.65
*RC-1987	CLAMP—Ant.-Osc. coil clamp (Pkg. 2)	.05
*RC-5148	CAPACITOR—20 mfd. 25 V.; 20 mfd. 250 V., 20 mfd 250 V.; 40 mfd. 250 V.; dry electrolytic (C-37a, 37b, 37c, 37d)	1.75
RC-6533	CAPACITOR—Padding capacitor (C-8)	.30
RC-8161	CABLE Tuning indicator cable	.40
*RF-015	FOOT—Rubber mounting foot for chassis	.05
*RK-044	KNOB—Control knob (Pkg. 2)	.40
*RL-084	COIL—C and D band antenna coil (L-2 ,3)	.75
*RL-289	COIL—B, C and D band osc. coil (L-4, 5, 6)	1.10
*RTN-001	NUT—Volume and tone control pal nut (Pkg. 5)	.10
*RQ-667	RESISTOR—2400 ohms, 2-W. carbon (R-25)	.20
*RQ-1215	RESISTOR—15 ohms, ½-W. carbon (R-15) (Pkg. 5)	.70
*RQ-1223	RESISTOR 33 ohms, ½-W. carbon (R-40) (Pkg. 5)	.70
*RQ-1239	RESISTOR - 150 ohms, ½-W. carbon (R-28) (Pkg. 5)	.70
*RQ-1245	RESISTOR—270 ohms, ½-W. carbon (R-46) (Pkg. 5)	.70
*RQ-1247	RESISTOR—330 ohms, ½-W. carbon (R-5) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½-W. carbon (R-33, 34) (Pkg. 5)	.70
*RQ-1291	RESISTOR—22,000 ohms, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1347	RESISTOR—4.7 meg. ½-W. carbon (R-41, 44) (Pkg. 5)	.70
*RQ-1487	RESISTOR—15,000 ohms, 1-W. carbon (R-45)	.20
*RR-351	RESISTOR—100 ohms, 3.4-W wire wound (R-24)	.20
*RR-352	RESISTOR—2200 ohms, 2.6-W. wire wound (R-26)	.20
*RS-223	SOCKET—Octal tube socket (Pkg. 5)	.80
*RS-236	SOCKET—Dial lamp socket assembly	.10
*RS-255	SOCKET—Electrolytic mounting socket	.05
*RS-3027	SWITCH—Band change switch (S-1, 2)	1.10
*RS-3032	SWITCH Tone control switch (S-3)	.45
*RT-112	TRANSFORMER—50–60 cycle power transformer (T 4)	6.40
*RT-113	TRANSFORMER—25-cycle power transformer (T-5)	10.60
*RT-324	TRANSFORMER—1st I.F. transformer (T-1)	1.90
*RT-325	TRANSFORMER—2nd I.F. transformer (T-2)	2.20
RT-483	TRANSFORMER—Output transformer (T-3)	1.10
*RT-866	TRIMMER STRIP—B, C and D osc. and C and D ant. trimmers (C-3, 4, 5, 6, 7)	.70
*RT-868	TRIMMER STRIP—Ant. tuning trimmer strip (C-48, 50)	1.20
*RW 113	WASHER—Felt washers for control shifts (Pkg. 25)	.10
*RQ-1299	RESISTOR—47,000 ohms, ½-W. carbon (R-4, 8, 29) (Pkg. 5)	$0.70
*RQ-1303	RESISTOR—68,000 ohms, ½-W. carbon (R-18) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms, ½-W. carbon (R-42) (Pkg. 5)	.70
*RQ-1311	RESISTOR—150,000 ohms, ½-W. carbon (R-23) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms, ½-W. carbon (R-9, 22) (Pkg. 5)	.70
*RQ-1317	RESISTOR—270,000 ohms, ½-W. carbon (R-21) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohms, ½-W. carbon (R-17) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 meg. ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 meg. ½-W. carbon (R-11) (Pkg. 5)	.70
*RQ-1343	RESISTOR—3.3 meg. ½-W. carbon (R-20) (Pkg. 5)	.70

CONDENSER-DIAL DRIVE ASSEMBLY

Stock No.	Description	List Price
*RB-172	BRACKET—Volume control bracket	.05
*RB-173	BRACKET—Tuning shift bracket	.20
*RB-174	BRACKET—Tuning indicator mounting bracket	.15
*RB-175	BRACKET—Reflector and pulley bracket assembly (R.H.)	.45
*RB-176	BRACKET—Reflector and pulley bracket assembly (L.H.)	.40
*RC-745	CONDENSER - Tuning condenser (C-1)	3.00
*RC-992	CUSHION—Tuning condenser cushion (Pkg 3)	.10
*RC-1977	CLAMP—Tuning indicator clamp	.10
*RC-8127	CABLE—Condenser drive cable assembly	.20
*RC-8501	CARD—Station letter cards (1 set)	.25
*RC-8502	CARD—"Off" tab card (Pkg. 10)	.10
*RC-8503	CARD—"Manual" tab card (Pkg. 10)	.10
*RC-8504	CARD—"Phono-tele" tab card (Pkg. 10)	$0.10
*RD-409	DRUM—Condenser drive drum assembly	.30
*RD-510	DIFFUSER—Large diffuser strip	.05
*RD-511	DIFFUSER—Small diffuser strip	.10
*RE-200	ESCUTCHEON BAND — Escutcheon band-tuning	.20
*RE-201	ESCUTCHEON BAND — Escutcheon band-volume	.20
RE-209	ESCUTCHEON ASSEMBLY—Main dial escutcheon assembly	4.15
*RH-008	HAIRPIN COTTER—Tuning drive shaft retaining cotter (Pkg. 10)	.05
*RM-500	MASK- Reflector cover mask	.05
*RP-132	POINTER—Tuning pointer assembly	.25
*RP-303	PULLEY—Pulley and "C" slip assembly (Pkg. 2)	.10
*RR-926	REFLECTOR—Dial scale reflector	.15
*RS-463	SPRING—Drive cable spring (Pkg. 5)	.10
*RS-464	SPRING—Dial wheel and knob spring (Pkg. 10)	.05
*RS-864	SCREW—Tuning indicator clamp mounting thumb screw (Pkg. 10)	.40
*RS-925	SHAFT—Tuning control shaft	.05
*RS-1801	SHIELD- Dial lamp shield and reflector	.10
*RS-1802	SHIELD- Tuning indicator shield	.10
*RV-069	VOLUME CONTROL—2 megohms volume control (R-13)	.60
*RW-038	WINDOW—Celluloid station letter window (Pkg. 25)	.10
*RW-908	WHEEL—Dial wheel assembly	.30

TOUCH-TUNING ASSEMBLY

Stock No.	Description	List Price
*RC 2001	CORE—Touch-tuning coil tuning core	.15
RC-2011	CUSHION—Touch-tuning coil cushion	.05
*RC-6526	CAPACITOR—7–65 mmf. trimmer (C-50)	.35
*RC-6527	CAPACITOR—20–180 mmf. trimmer (C-48, 49)	.35
*RC-6528	CAPACITOR—100–490 mmf. trimmer (C-43 45, 56)	.35
*RK-205	KEY—"Feathertouch" tuning key (Pkg. 5)	.25
RL-9516	COIL—Touch-tuning trimmer coil assembly (L-7 to L-12)	7 10
RL-9517	COIL—Touch-tuning trimmer coil (Range: 1200 to 1550 K.C.) (Code—none) (L-12)	$0.15
RL-9518	COIL—Touch-tuning trimmer coil (Range: 850 to 1400 K.C.) (Code—Red) (L-10, 11)	.15
RL-9519	COIL—Touch-tuning trimmer coil (Range 540 to 900 K.C.) (Code—Blue) (L-7, 8, 9)	.15
*RS-3033	SWITCH—"Feathertouch" tuning switch (S-7, 8)	3.40
*RS-3055	SWITCH—Power switch on key assembly (S-5)	.40

BEAM-A-SCOPE ASSEMBLY

Stock No.	Description	List Price
*RB-1010	BOARD—Loop terminal board	.10
RC-8162	CABLE—Beam-a-Scope drive cable (Pkg. 5)	.20
*RL-507	LOOP—Beam-a-Scope antenna (L-1)	6.60
*RP-133	PLUG—Loop terminal plug	.05
RP-319	PULLEY—Beam-a-Scope drive pulley	.20
RS-515	SPOOL—Beam-a-Scope drive spool (Pkg. 5)	.15
*RS-1807	SHIELD—Beam-a-Scope shield	1.10
RS-4004	SPRING—Beam-a-Scope drive spring (Pkg. 3)	.10
RS-9002	SHAFT—Beam-a-Scope drive shaft	.05

SPEAKER ASSEMBLY

Stock No.	Description	List Price
*RC-9009	CONE ASSEMBLY—14-inch speaker cone assembly	.95
*RC-9010	CONE ASSEMBLY—6½-inch speaker cone assembly	.90
*RP-128	PLUG—6½-inch speaker plug	.10
*RP 129	PLUG—14-inch speaker plug	.10
*RS-1012	SPEAKER—6½-inch Dynapower speaker (complete)	3.25
*RS-1014	SPEAKER—14-inch Dynapower speaker (complete)	6.00
*RT-954	TERMINAL—Speaker lead terminal (Pkg. 10)	.10
*RX-030	ASSEMBLY—6½-inch speaker mounting assembly	.10
*RX-062	ASSEMBLY—14-inch speaker mounting washer, nut, grommet assembly	.10

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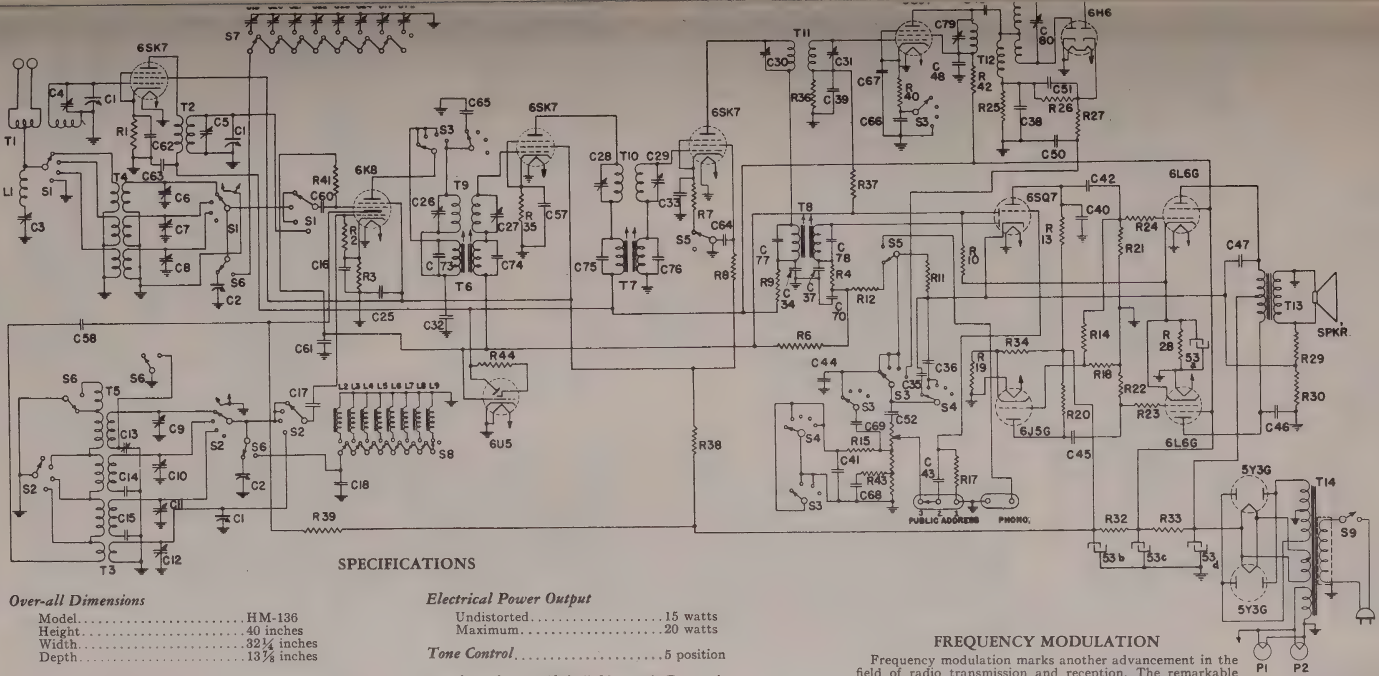
* Used on previous receivers.

MODEL HM136
Schematic, Notes

GENERAL ELECTRIC CO.



SPECIFICATIONS

Over-all Dimensions

Model	HM-136
Height	40 inches
Width	32¼ inches
Depth	13⅞ inches

Manual Tuning Drive Ratio 7:1

Electrical Specifications

115 Volts AC, 50-60 cycles, 140 watts.

Tuning Frequency Range

Frequency Modulation	39-44 MC
Short-wave	7500-22,000 KC
Police-Amateur	2400-7500 KC
Standard Broadcast	540-1700 KC

Intermediate Frequency

Frequency Modulation	2100 KC
"B," "C" and "D" Bands	455 KC

Electrical Power Output

Undistorted	15 watts
Maximum	20 watts

Tone Control ......5 position

Loud-speaker—"Alnico" Magnetic Dynamic

Type Cone	Curvilinear
Outside Cone Diameter	10 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

Tubes

R.F. Amplifier	GE-6SK7
Converter-Oscillator	GE-6K8
I.F. Amplifiers	(2) GE-6SK7
Noise Limiter	GE-6SJ7
Discriminator	GE-6H6
Det., Aud., AVC	GE-6SQ7
Phase Inverter	GE-6J5G
Power Output	(2) GE-6L6G
Rectifier	(2) GE-5Y3G
Tuning Indicator	GE-6U5
Dial Lamp	(2) Mazda No. 44

FREQUENCY MODULATION

Frequency modulation marks another advancement in the field of radio transmission and reception. The remarkable realism and lack of noise which can be attained by this form of transmission has created widespread interest.

Present-day broadcasting stations superimpose sound programs on the radio frequency carrier signal by varying the carrier amplitude at the sound frequency rate. This is known as amplitude modulation.

Frequency modulated signals are obtained by varying the frequency of the carrier signal at the sound frequency rate. The amount the carrier frequency is varied is representative of the strength of the sound. The use of frequency variations as high as 60 or 70 KC positive and negative (120 or 140 over-all) requires the use of specially designed wide-band R.F. and I.F. amplifier stages. Such band widths preclude the use of carrier signals in the neighborhood of the broadcast band where 120 KC would cover a considerable portion of the band. Therefore, transmission frequencies have been established in the short-wave band between 39 and 44 MC.

MODEL HM136
Voltage,Socket,Notes
Chassis Wiring

GENERAL ELECTRIC CO.

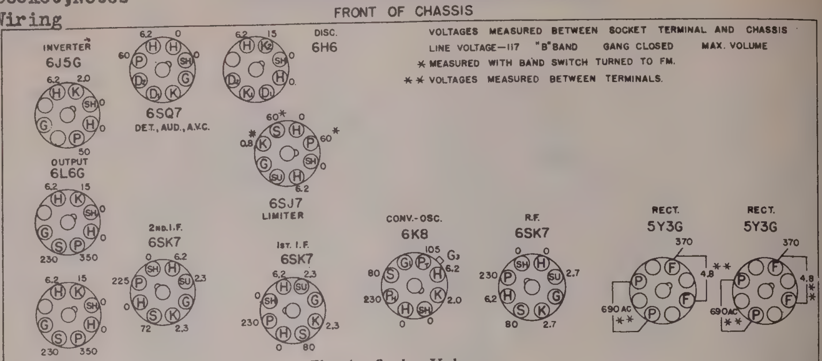

FRONT OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS
LINE VOLTAGE—117 "B" BAND GANG CLOSED MAX. VOLUME
* MEASURED WITH BAND SWITCH TURNED TO FM.
** VOLTAGES MEASURED BETWEEN TERMINALS.
INVERTER 6J5G
6SQ7 DET., AUD., A.V.C.
DISC. 6H6
6SJ7 LIMITER
OUTPUT 6L6G
6L6G OUTPUT
2ND. I.F. 6SK7
1ST. I.F. 6SK7
CONV.-OSC. 6K8
R.F. 6SK7
RECT. 5Y3G
RECT. 5Y3G

Fig. 4. Socket Voltages

GENERAL INFORMATION

The Model HM-136 is a combination frequency-modulation receiver and three-band radio using thirteen General Electric Pre-tested Tubes. Separate channels working into common tubes are employed for the detection and amplification of the frequency-modulated and amplitude-modulated R.F. and I.F. signals. An R.F. stage is employed in the frequency-modulated channel for increased sensitivity. Double interstage I.F. transformers are used with the frequency-modulated sections capacity-tuned and the amplitude-modulated sections inductively tuned. Other features of design include single-ended tubes in all stages except the converter-oscillator stage which uses a double section tube for increased stability, iron-core tuned oscillator coils for automatic station selection, noise limiter, discriminator, terminal board for conveniently connecting detector outputs to a public address system, "plug-in" type phono terminal, 10-inch curvilinear-type cone Dynapower speaker, and beam-power push-pull output.

ANTENNA

As a result of the high transmission frequencies the use of ordinary antennas for the reception of frequency-modulation signals is not satisfactory. General Electric builds a specially designed dipole antenna Model HT-9 for use with frequency-modulation receivers. For distances up to thirty miles from the transmitter a simple horizontal dipole with an over-all arm length of 10 feet 8 inches should give excellent results. The antenna should be located free of all obstructions and placed as a high as is practicable. A noticeable gain in signal strength will be obtained as antenna height is increased. Generally best results will be obtained if the dipole arms are horizontal and at right angles to the direction of the frequency-modulation station. The lead-in transmission line may be of any length up to 100 feet and should consist of low-loss antenna lead-in wire.

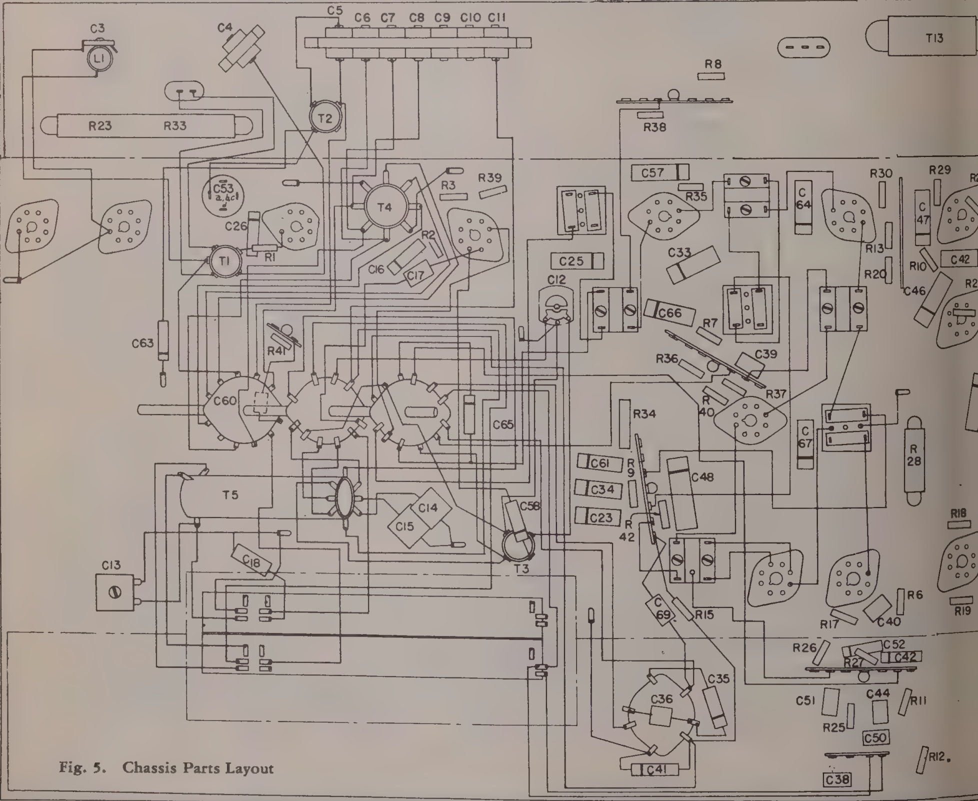


Fig. 5. Chassis Parts Layout

AMPLITUDE MODULATION

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band-switch Setting	Input Frequency	Tone Control Position	Point of Input*	Iron-core Trimmer	Comments
1 Band B	455 K.C. and 30 K.C. sweep	Bass	2nd I.F. 6SK7 Grid	3rd I.F. Sec. 3rd I.F. Pri.	Condenser gang at minimum capacity—Manual key depressed—vertical input to ground and junction of R-4 and R-12. Adjust iron core trimmers in order mentioned for a single curve of maximum amplitude. Since iron-core trimmers are at top and bottom of shield cans most effective alignment can be obtained by using two non-metallic screwdrivers simultaneously.
2 Band B	455 K.C. and 30 K.C. sweep	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	
3 Band B	455 K.C. and 30 K.C. sweep	Bass	Converter Grid	1st I.F. Sec. 1st I.F. Pri.	
4 Band B	455 K.C. and 30 K.C. sweep	Bass	Converter Grid	All I.F. Trimmers	

I.F. ALIGNMENT WITH OUTPUT METER

1 Band B	455 K.C. modulated	Bass	2nd I.F. 6SK7 Grid	3rd I.F. Sec. 3rd I.F. Pri.	Condenser gang at minimum capacity—Manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. Since iron-core trimmers are at top and bottom of shield cans most effective alignment can be obtained by using two non-metallic screwdrivers simultaneously.
2 Band B	455 K.C. modulated	Bass	1st I.F. 6SK7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	
3 Band B	455 K.C. modulated	Bass	Converter Grid	1st I.F. Sec. 1st I.F. Pri.	
4 Band B	455 K.C. modulated	Bass	Converter Grid	All I.F. Trimmers	

R. F. ALIGNMENT

1 Band B					Connect output meter across voice coil and depress manual key.
2 Band B	1500 K.C. modulated	Bass	Antenna Post**	Osc. (C-9) Ant. (C-6)	Tune in signal by adjusting C-9. Peak C-6 for maximum meter reading.
3 Band B	580 K.C. modulated	Bass	Antenna Post**	Osc. Padder (C-13)	Set dial pointer to 580 K.C. mark and align C-13 for maximum meter reading while rocking the gang condenser.
4 Band C	6 MC modulated	Bass	Antenna Post**	Osc. (C-10) Ant. (C-7)	Set pointer to 6 M.C. mark and align (C-10). Peak (C-7) for maximum output.
5 Band D	21 M.C. modulated	Bass	Antenna Post**	Osc. (C-11) Ant. (C-8)	Set pointer to 21 M.C. mark and align (C-11). Peak C-8 while rocking the gang condenser. The image of any signal on the D band should be 910 K.C. below input signal. Example: 21 M.C. image 20.09 M.C.

* Use "dummy" antenna consisting of .05 mfd. capacitor between signal generator and point of input.
* Use an I.R.E. "dummy" antenna as shown in Fig. 1 between the signal generator and the point of input.

tock No.	Description	List Price
*B-008	BOARD—Terminal board (2 lug)	$0.10
*B-049	BOARD—Antenna terminal board	.10
B-062	BOARD—Terminal board (6 lug)	.10
*B-093	BOARD—Terminal board (6 lug)	.10
B-094	BOARD—Terminal board (7 lug)	.10
B-172	BRACKET—Volume control mounting bracket	.05
B-173	BRACKET—Tuning drum support bracket	.20
B-183	BRACKET—Small removable support bracket for mounting tuning condenser	.05
B-1009	BOARD—Phono terminal board	.10
B-1016	BOARD—External amplifier terminal	.15
*C-006	CAPACITOR—.0015 mfd. 600 V. paper (C-35)	.25
*C-009	CAPACITOR—.001 mfd. 600 V. paper (C-65)	.25
*C-011	CAPACITOR—.002 mfd. 600 V. paper (C-58)	.25
*C-023	CAPACITOR—.005 mfd. 600 V. paper (C-63)	.25
*C-039	CAPACITOR—.01 mfd. 600 V. paper (C-43, 52, 68)	.25
*C-055	CAPACITOR—.003 mfd. 600 V. paper (C-41)	.25
*C-072	CAPACITOR—.05 mfd. 200 V. paper (C-16, 33, 57, 62)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-34, 42, 45, 64)	.30
*RC-096	CAPACITOR—0.1 mfd. 200 V. paper (C-61, 66, 67)	.30
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-25, 32)	.35
RC-147	CAPACITOR—.25 mfd. 400 V. paper (C-48)	.35
RC-191	CAPACITOR—.002 mfd. 1500 V. paper (C-46, 47)	.35
*RC-206	CAPACITOR—50 mmf. mica (C-17)	.35
RC-232	CAPACITOR—47 mmf. mica (C-37, 49, 50, 51, 70)	.25
RC-233	CAPACITOR—22 mmf. mica (C-39)	$0.25
*RC-235	CAPACITOR—100 mmf. mica (C-44, 69)	.25
*RC-242	CAPACITOR—150 mmf. mica (C-40, 60)	.25
RC-249	CAPACITOR—220 mmf. mica (C-38)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-36)	.30
RC-307	CAPACITOR—750 mmf. mica (C-18) ±5%	.40
*RC-347	CAPACITOR—1800 mmf. mica (C-14) ±5%	.35
RC-389	CAPACITOR—4300 mmf. mica (C-15) ±5%	.40
RC-676	CAPACITOR—B band padding capacitor (C-13)	.35
*RC-681	CAPACITOR—FM oscillator air trimmer (C-12)	.90
RC-863	CABLE—Power cable	.65

*Used on previous receivers.

(Prices subject to change without notice)

LOUD-SPEAKER

In order to realize the high fidelity inherent in a frequency-modulated system or present in a well-designed amplitude-modulated system, the audio amplifiers and loud-speaker must be capable of reproducing the signal as received. Conventional conical-type cone loud-speakers because of the sharp break at the cone throat tend to cut off the higher audio frequencies. The use of a curvilinear-type cone loud-speaker in the Model HM-136 eliminates this possible suppression of the higher audio tones and excellent frequency response from 30 to 10,000 cycles per second is obtainable.

To center the voice coil, loosen the two screws which clamp the speaker spider in position. These two screws are accessible from the rear of the speaker. Shift the spider around until the voice coil is centered, then tighten the screws in position.

Phonograph or Television Audio Connections

Each receiver is equipped with a phono terminal (pin jack) to allow the convenient connection of a record player or the detector output of a television converter. General Electric plug, Stock No. RP-145 fits the pin jack. When using a crystal type pick-up, a suitable load consisting of a 100,000 ohm resistor in series with a .01 mfd. capacitor should be connected across the pick-up leads.

Public Address System Connections

A terminal board is located on the back apron of the chassis permitting easy attachment of a public address system. This provision permits feeding programs from either type of transmission into an external amplifier and loud-speaker system. Three terminals are provided and are numbered 1, 2 and 3. To connect an external amplifier to his receiver remove the link connection between terminals No. 2 and No. 3 and reinsert between terminals No. 1 and No. 2. Connect the external amplifier between terminals No. 1 and No. 3, the ground side of the amplifier being connected to terminal No. 1. If the external amplifier input is not a high impedance type, an impedance matching network will have to be used to insure matching to the 2.0 megohm volume control.

Noise Limiter

The frequency-modulation noise limiter circuit which uses a 6SJ7 tube is essentially a fourth I.F. stage. The tube operates at low plate voltage (60 volts DC) so that plate current cut-off occurs with relatively small grid bias. A small cathode bias developed in R-40 establishes the operating point at the center of the linear portion of the grid-voltage plate-current characteristic. Normal signal input will swing the grid voltage considerably above and below the linear portion of the curve. Negative peaks of the signal voltage will be clipped off by tube cutoff. Positive peaks will be clipped off by grid bias limiting.

Since noise creates wiggles (variations) in the peaks of the carrier signal it can be eliminated by cutting off the carrier peaks. This function takes place in the noise limiter as described above providing, of course that the carrier signal is sufficiently strong to cause grid voltage swing above and below the cut-off points.

Discriminator

The discriminator circuit for a frequency-modulated signal input must secure the audio information by operating on frequency variations. Referring to the schematic diagram, Fig. 3, the frequency-modulated (FM) signal, after passing through the 6SJ7 limiter tube, is applied to the primary winding of the detector transformer (T-12). The secondary is a center tapped winding with the outer ends connected to the 6H6 detector plates as shown. Two 100,000 ohm resistors (R-25 and R-26) are connected in series across the 6H6 cathodes and it is across these resistors that the audio signal appears. The detector transformer (T-12) is tuned to the intermediate frequency (2.1 MC). An I.F. signal of 2.1 MC which is not modulated will swing the detector plates positive and negative an equal amount resulting in equal DC voltages appearing across diode resistors R-25 and R-26. Since these voltages are of opposite polarity the resultant voltage measured across the diode resistors will be zero. When the incoming I.F. signal is frequency modulated it will be swinging above and below the intermediate frequency of 2.1 MC by an amount proportional to the degree of modulation. As the modulated signal swings off the resonant frequency of 2.1 MC unequal voltages will be developed across resistors R-25 and R-26. The resultant voltage measured across both resistors will be equal to the difference between the voltage across R-25 and the voltage acr R-26. This resultant voltage will vary in magnitude direc as the degree of modulation. The number of tin per second the I.F. signal swings above and below t resonant point produces the audio signal. Hence, the volu of an audio signal is transmitted as the magnitude of t frequency swing of a carrier, and the frequency of an au signal is transmitted as the rate at which the carrier f quency is swung.

ALIGNMENT PROCEDURE

Frequency Modulation

I.F. Alignment

Due to the good stability of components and the wi band characteristics of the I.F. circuits, alignment sho be unnecessary under normal operating conditions. Sho I.F. alignment become necessary, it will require a catho ray oscilloscope and a 2.1 megacycle signal generator wi a superimposed ±200 KC sweep frequency. Many sig generators and mechanical frequency wobblers are availa wherein the above requirements are fulfilled. As for examp GE Model TMV-97-C oscillator used in conjunction wi the Frequency Modulator TMV-128-A will give a 200-3 KC sweep when operating on the 1500—3100 KC band the test oscillator. To obtain the proper test oscillator mi frequency (2.1 MC) the following procedure may be followe Set "wobbler" condenser for about mid-capacity. Tu broadcast receiver to 2.1 MC. Adjust test oscillator tuni until signal is heard at maximum strength in the broadca receiver. Connect the vertical plates of the oscillosco across resistor R-36. A 100,000 ohm resistor should be co nected in series with the high side of the oscilloscope. Usi a .05 mfd. capacitor in series with the high side of the te oscillator output, insert the oscillator sweep signal into t receiver circuit first at the control grid of the 2nd I.F. 6SK and align transformer trimmers T-11. The resultant cur should be sharp on either side and quite broad and flat the peak. Change the signal input to the 1st I.F. 6SK7 gr and align transformer trimmers T-10. The resultant cur should appear as the above stage only less broad at the pea Align transformer trimmers T-9 with the signal input at t converter grid for sharpness and a flat peak. If peak will n flatten retouch the grid trimmer of transformer T-10. Do n retouch any other trimmers.

Leave the input of the oscillator sweep signal at the co verter grid and connect the vertical oscilloscope plates acro the resistors R-25 and R-26. Align transformer T-12 for X-shaped crossover curve. Proper alignment of C-80 indicated when the curve crosses about midway in the ve tical plane. Proper alignment of C-79 is indicated when t sides of the curve near crossover are nearest to a straig line.

NOTE:—Keep signal input high enough so that noise limit is functioning. This point is indicated when an increase signal input no longer changes the size of the curve.

R.F. Alignment

Make sure the dial pointer coincides with the first divisi on the low frequency end of the dial scale when the ga condenser is completely closed.

1. Connect a 0–50 or 0–100 microammeter in series wi the low end of R-36. A high resistance 0–10 V., D.C. vo meter may be used instead of the microammeter. Conne the voltmeter across R-36 with a 100,000 ohm resistor series with the high side.
2. Apply an unmodulated signal in the region of 43 meg cycles to one of the antenna terminals using a 50-ohm res tor in series with the high side of the signal generator outp
3. Adjust pointer so it is set to the scale mark of t signal used and peak trimmers C-12, C-5 and C-4 progressive for maximum meter reading.

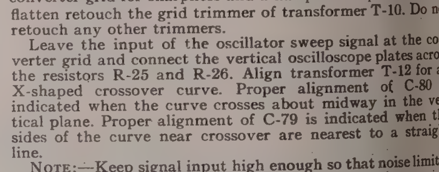


Fig. 1. Standard I.R.E. Dummy Antenna

GENERAL ELECTRIC CO.

Stock No.	Description	List Price
	(Pkg. 3)	.10
RC-1977	CLAMP—Tuning indicator clamp and thumb screw	.10
RC-1987	CLAMP—Ant-osc. coil clamp (Pkg. 2)	.05
RC-2001	CORE—Touch Tuning coil tuning core	.15
RC-5141	CAPACITOR—40 mfd. 25 V., 30 mfd. 450 V., 20 mfd. 450 V., 20 mfd. 400 V. dry electrolytic (C-53a, 53b, 53c, 53d)	2.70
RC-6519	CAPACITOR—FM antenna trimmer (C-4)	.15
RC-7015	CONDENSER—Tuning condenser (C-1, 2)	5.50
RC-8127	CABLE—Tuning drive cable assembly	.20
RC-8137	CABLE—Tuning indicator cable	.40
RC-8501	CARD—Station letter card	.25
RC-8502	CARD—Key "Off" tab card (Pkg. 10)	.10
RC-8503	CARD—Key "Manual" tab card (Pkg. 10)	.10
RC-8504	CARD—Key "Phono-Tele" tab card (Pkg. 10)	.10
RC-9021	CONE ASSEMBLY—10 inch speaker cone assembly	2.00
RD-120	DIAL—Main dial scale	3.25
RD-409	DRUM—Tuning condenser drive drum assembly	.30
RD-510	DIFFUSER—Large diffuser strip	.05
RD-511	DIFFUSER—Small diffuser strip (Pkg. 5)	$0.10
RE-062	ESCUTCHEON—Main dial escutcheon	2.25
RE-200	ESCUTCHEON BAND—Tuning escutcheon band	.20
RE-201	ESCUTCHEON BAND—Volume escutcheon band	.20
RF-015	FOOT—Rubber foot on chassis	.05
*RG-016	GRID CLIP—6K8 grid clip (Pkg. 5)	.10
RG-756	GEAR—Band switch miter gear	
RH-008	HAIRPIN COTTER—Tuning shaft hairpin cotter (Pkg. 10)	.05
RK-044	KNOB—Tone or band switch knob (Pkg. 2)	.40
RK-205	KEY—Feathertouch Tuning key (Pkg. 5)	.25
RL-093	COIL—B, C, D, band antenna coil (T-4)	
RL-603	COIL—Wave trap coil assembly (L-1, C-3)	.60
RL-2011	COIL—B, C, D, oscillator coil (T-5)	1.60
	assembly (L-2, 3, 4, 5, 6, 7, 8, 9)	2.35
RL-9513	COIL—Touch Tuning trimmer coil (Range: 1200-1550 KC) (Code—none) (L-2, 3)	.15
RL-9514	COIL—Touch Tuning trimmer coil (Range: 850-1400 KC) (Code—red) (L-4, 5, 6)	.15
RL-9515	COIL—Touch Tuning trimmer coil (Range: 540-900 KC) (Code—blue) (L-7, 8, 9)	.15
RM-504	MASK—Black felt dial scale mask	.10
RP-132	POINTER—Dial scale pointer	.25
RP-303	PULLEY—Drive cord pulley (Pkg. 2)	.10
*RQ-687	RESISTOR—15000 ohm 2 W. carbon (R-34)	.35
RQ-751	RESISTOR—180 ohm 3 W. carbon (R-28)	.30
*RQ-1215	RESISTOR—15 ohm ½ W. carbon (R-30) (Pkg. 5)	.70
RQ-1229	RESISTOR—56 ohm ½ W. carbon (R-29)	
*RQ-1243	RESISTOR—220 ohm ½ W. carbon (R-3, 19, 40) (Pkg. 5)	.70
*RQ-1247	RESISTOR—330 ohm ½ W. carbon (R-1, 7, 35) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohm ½ W. carbon (R-9, 23, 24) (Pkg. 5)	.70
*RQ-1275	RESISTOR—4700 ohm ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1277	RESISTOR—5600 ohm ½ W. carbon (R-38) (Pkg. 5)	.70
*RQ-1279	RESISTOR—6800 ohm ½ W. carbon (R-39) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohm ½ W. carbon (R-2, 4, 12, 43) (Pkg. 5)	.70
*RQ-1303	RESISTOR—68,000 ohm ½ W. carbon (R-20) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohm ½ W. carbon (R-25, 26) (Pkg. 5)	.70
*RQ-1311	RESISTOR—150,000 ohm ½ W. carbon (R-11) (Pkg. 5)	.70
*RQ-1313	RESISTOR—180,000 ohm ½ W. carbon (R-15) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohm ½ W. carbon (R-13, 21, 22, 27) (Pkg. 5)	.70
*RQ-1317	RESISTOR—270,000 ohm ½ W. carbon (R-18) (Pkg. 5)	.70
	36) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm ½ W. carbon (R-41, 44) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm ½ W. carbon (R-6, 37) (Pkg. 5)	.70
*RQ-1343	RESISTOR—3.3 megohm ½ W. carbon (R-14) (Pkg. 5)	$0.70
*RQ-1347	RESISTOR—4.7 megohm ½ W. carbon (R-17) (Pkg. 5)	.70
*RQ-1349	RESISTOR—5.6 megohm ½ W. carbon (R-10) (Pkg. 5)	.70
*RQ-1499	RESISTOR—47,000 ohm 1 W. carbon (R-42)	.20
RR-779	RESISTOR—4700 ohm 10 W., 3000 ohm 3.6 W. (R-32, 33)	.60
RS-236	SOCKET—Dial light socket assembly	.10
RS-252	SOCKET—Octal tube socket	.15
RS-253	SOCKET—Electrolytic mounting socket	.10
RS-463	SPRING—Drive cord tension spring (Pkg. 5)	.10
RS-464	SPRING—Dial control wheel spring (Pkg. 10)	.05
RS-925	SHAFT—Tuning drum shaft	.05
RS-931	SHAFT—Band switch extension shaft	.15
RS-1021	SPEAKER—10 inch P.M. speaker	10.25
RS-1801	SHIELD—Dial light white reflector shield	.10
RS-1802	SHIELD—Tuning indicator rubber shield	.10
RS-3040	SWITCH—Tone control switch (S-4)	.75
RS-3041	SWITCH—Band change switch (S-1, 2, 3)	1.65
RS-3042	SWITCH—Feathertouch Tuning switch (S-5, 6, 7, 8, 9)	4.00
RT-334	TRANSFORMER—1st I.F. transformer assembly (T-6)	2.00
RT-335	TRANSFORMER—2nd I.F. transformer assembly (T-7)	2.00
RT-336	TRANSFORMER—3rd I.F. transformer (T-8)	2.40
RT-472	TRANSFORMER—Output transformer (T-13)	3.15
RT-865	TRIMMER STRIP—Station selector trimmer strip (C-19, 20, 21, 22, 23, 24, 71, 72)	1.60
RT-869	TRIMMER STRIP—Antenna R.F. oscillator trimmers (C-5, 6, 7, 8, 9, 10, 11)	1.00
RT-954	TERMINAL—Speaker lead terminal (Pkg. 10)	.10
RT-1000	TRANSFORMER—50-60 cycle power transformer (T-14)	10.20
RT-2000	TRANSFORMER—FM antenna transformer (T-1)	.95
RT-2001	TRANSFORMER—FM oscillator transformer (T-3)	.85
RT-2002	TRANSFORMER—FM R.F. transformer (T-2)	.90
RT-2003	TRANSFORMER—FM 1st I.F. transformer (T-9)	.95
RT-2004	TRANSFORMER—FM 2nd I.F. transformer (T-10)	.95
RT-2005	TRANSFORMER—FM 3rd I.F. transformer (T-11)	.95
RT-2006	TRANSFORMER—4th I.F. Discrim. Transformer (T-12)	1.20
RV-075	VOLUME CONTROL—2.0 megohm volume control (R-16)	.70
RW-038	WINDOW—Station letter window (Pkg. 25)	.10
RW-113	WASHER—Felt washer for control shafts (Pkg. 25)	.10
RW-908	WHEEL—Tuning or volume wheel	.30
RX-062	ASSEMBLY—Speaker mounting assembly	.10

*Used on previous receivers.

(Prices subject to change without notice)

Model HM-136

Insist on Genuine Factory-tested Parts,
Available from Authorized Dealers

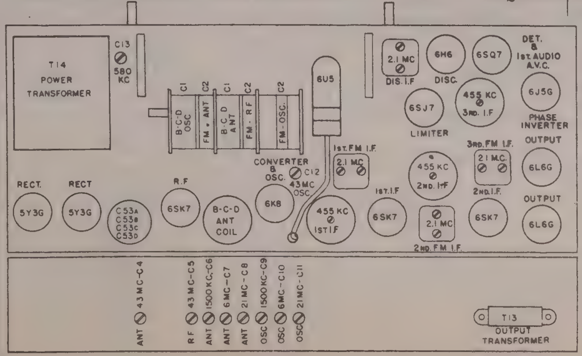
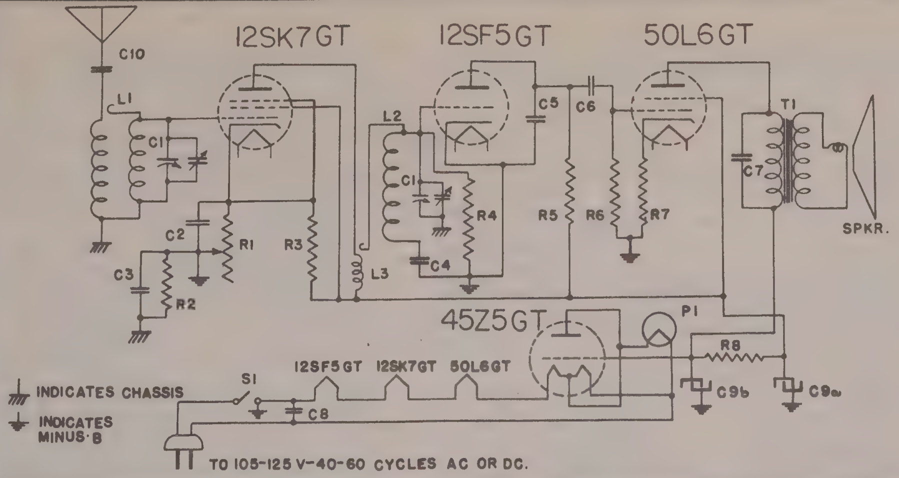


Fig. 2. Trimmer Location

MODEL H406U
Schematic,Voltage
Alignment,Trimmers

GENERAL ELECTRIC CO.



Symbol	Description	Symbol	Description	Symbol	Description
C-1	Tuning condenser	C-8	.02 mfd. paper capacitor	R-3	50,000 ohm carbon resistor
C-2	.02 mfd. paper capacitor	C-9a	16 mfd. dry electrolytic	R-4	5.6 megohms carbon resistor
C-3	0.1 mfd. paper capacitor	C-9b	16 mfd. dry electrolytic	R-5	3.0 megohms carbon resistor
C-4	.02 mfd. paper capacitor	C-10	.001 mfd. paper capacitor	R-6	1.0 megohms carbon resistor
C-5	100 mmf. mica capacitor	P-1	Dial lamp, Mazda No. 47	R-7	150 ohms carbon resistor
C-6	.01 mfd. paper capacitor	R-1	25,000 ohm volume control	R-8	2000 ohms carbon resistor
C-7	.02 mfd. paper capacitor	R-2	250,000 ohm carbon resistor		

Fig. 2. Schematic Diagram

Tubes

R.F. Amplifier	GE-12SK7GT
Detector-Audio	GE-12SF5GT
Power Output	GE-50L6GT
Rectifier	GE-45Z5GT

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
105–125 AC or DC	40–60	30

Tuning Frequency Range

Band "B" . . . . .540–1700 KC

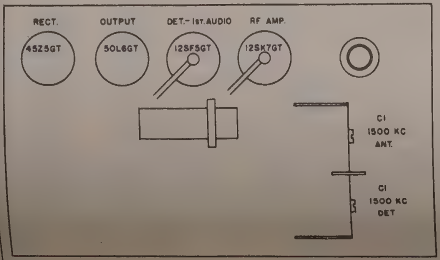


Fig. 1. Trimmer Location

VOLTAGE CHART

Tube No.	12SK7GT	12SF5GT	50L6GT	45Z5GT
Plate to -B Volts	10	17*	120	115 AC
Screen to -B Volts	110		120	
Cathode to -B Volts	0	0	7.5	130
Filament Volts	12.6	12.6	50	Entire filament ** 45

Voltage measured when volume control is set to maximum.

Line Voltage—115 AC. No signal input. On DC, voltages should read approximately 10 per cent lower.

*Measured on 250-volt scale—1000 ohms per voltmeter.

**Measured between socket terminal No. 2 and No. 7.

GENERAL INFORMATION

Model H-406U is a compact four-tube AC-DC tuned radio frequency receiver that tunes the broadcast band of frequencies. This model has the full approval of the Underwriters' Laboratories.

When operating from a DC source of power, it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT

Connect the high side of the signal generator through a 250 mmf. condenser to the antenna terminal. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

1. With gang condenser plates completely closed, the tuning pointer should be over the last mark on the dial.
2. Tune receiver to the 1500 KC point on the dial; then align trimmers on the gang condenser at 1500 KC for a maximum output meter reading.

Electrical Power Output

Undistorted	0.9 watts
Maximum	1.8 watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter	4 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

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GENERAL ELECTRIC CO.

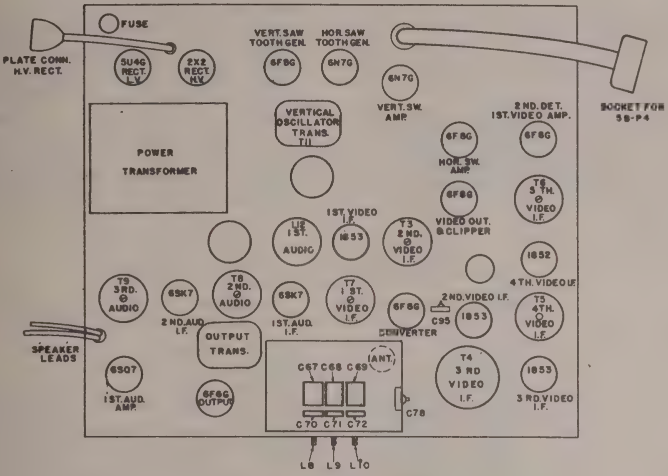

Fig. 8. Chassis Trimmer Location
Models HM-171 and HM-185

ANTENNA

In general, the television antenna should be of dipol type located as high as is practical and in an area re th horizon in the direction of the television transmitter ot o tructed by buildings or structures. A noticeable in s nal strength will be obtained as antenna height is eased Since television radiation reacts similarly to light es, r ection problems arise which often modify other- idea installation locations. Consideration must also be n noi sources within buildings, or ignition noises from cles adjacent streets. It is usually best to locate the le an nna on the side of the building away from the t th allowing the building to shield the antenna from ion n ses.

e dip e should be erected with arms parallel to the ground at ri t angles to the direction of the television station. oise reflection interference exist it may be better to t the ipole arms in the direction of the interference. oise i terference and poor signal strength may dictate use a reflector. A reflector will increase the signal gth preciably as well as increase the horizontal direc- y.

UTIONARY INSTRUCTIONS

trem high voltages (2500 volts or more) are used in opera n of this receiver; therefore, every precaution be ercised to insure safety to the service engineer to the ustomer.

e bac cover while in place, protects the user and should be moved except by a qualified television service eer.

The power-cord plug should not be inserted in a power supply outlet until a good, solid ground connection has been properly made to the receiver chassis.

For safety, the following operations must be performed with the power plug disconnected before working on the receiver with the back cover removed:

1. Locate the 879/2X2 high voltage rectifier tube socket.
2. Unsolder the lead (color-coded brown and yellow and measuring 3300 ohms to chassis) which is connected to the 879/2X2 tube socket.
3. Thoroughly insulate the exposed end of this lead.

All adjustments not accessible with the back cover in place can be made without energizing the high-voltage circuits.

Servicing of the high-voltage circuits can be satisfactorily performed with the power-cord removed from any power supply outlet. A resistance check of the circuit components will indicate any trouble existing. (HIGH VOLTAGES SHOULD NEVER BE MEASURED.)

The "picture tube" is highly evacuated and is consequently subject to a very great air pressure. If it is broken, glass fragments will be violently expelled. Handle with care, using safety goggles and gloves.

The large end of the "picture tube" particularly that part at the rim of the viewing surface—must not be struck, scratched, or subjected to more than moderate pressure. DO NOT FORCE THE SOCKET ONTO THE TUBE OR STRAIN ANY EXTERNAL CONNECTIONS. If it fails to slip into place smoothly, investigate and remove the cause of the trouble.

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST

Models HM-171 and HM-185

Parts Common to Both Radio and Television

Insist on Genuine Factory-tested Parts, Available from Authorized Dealers

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-009	BOARD—Terminal board (1 lug)	.15
*RB-058	BOARD—Terminal board (8 lug)	.10
*RB-060	BOARD—Antenna terminal board	.10
*RB-096	BOARD—Terminal board (3 lug)	.10
*RB-621	BEZEL—Molded indicator bezel	.20
*RC-006	CAPACITOR—.0015 mfd. 600 V. paper (C-42)	.25
*RC-009	CAPACITOR—.001 mfd. 600 V. paper (C-41, 52)	.30
*RC-011	CAPACITOR—.002 mfd. 600 V. paper (C-56)	.25
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-22)	.25
*RC-028	CAPACITOR—.006 mfd. 600 V. paper (C-26, 37)	.30
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-38, 62)	.25
*RC-048	CAPACITOR—.02 mfd. 600 V. paper (C-9, 13, 16, 18, 19, 24, 25, 29, 31, 34, 39, 45, 50)	.30
*RC-049	CAPACITOR—.004 mfd. 600 V. paper (C-35)	.35
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-2, 7, 11, 14, 17, 27)	.25
*RC-090	CAPACITOR—.04 mfd. 600 V. paper (C-73)	.30
*RC-096	CAPACITOR—0.1 mfd. 200 V. paper (C-30, 33)	.30
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-43, 44, 49, 53, 88, 93)	.35
RC-5139	CAPACITOR—10 mfd. 300 V., 10 mfd. 450 V., 10 mfd. 450 V., dry electrolytic (C-48, 61, 75)	$1.50
RC-5140	CAPACITOR—10 mfd. 450 V. dry electrolytic (C-74) (Also C-77 on HM-171)	.85
*RG-016	GRID CLIP—6F86 grid clip (Pkg. 5)	.10
RK-044	KNOB—Control knob (Pkg. 2)	.40
*RQ-525	RESISTOR—150,000 ohms 1 W. carbon (R-158)	.20
RQ-645	RESISTOR—680 ohms 2 W. carbon (R-134)	.20
*RQ-670	RESISTOR—3300 ohms 2 W. carbon (R-161) (Pkg. 5)	.70
*RQ-695	RESISTOR—39,000 ohms 2 W. carbon (R-127)	.20
RQ-774	RESISTOR—12,000 ohms 3 W. carbon (R-119)	.25
*RQ-1243	RESISTOR—220 ohms ½ W. carbon (R-105, 110, 114) (Pkg. 5)	.70
*RQ-1245	RESISTOR—270 ohms ½ W. carbon (R-129) (Pkg. 5)	.70
*RQ-1251	RESISTOR—470 ohms ½ W. carbon (R-148, 181) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms ½ W. carbon (R-102, 150, 152) (Pkg. 5)	.70
*RQ-1267	RESISTOR—2200 ohms ½ W. carbon (R-124, 130 on HM-171, 153, 182) (Pkg. 5)	.70
*RQ-1269	RESISTOR—2700 ohms ½ W. carbon (R-109) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3300 ohms ½ W. carbon (R-113) (Pkg. 5)	.70
*RQ-1273	RESISTOR—3900 ohms ½ W. carbon (R-117, 123, 190, 203) (Pkg. 5)	.70
*RQ-1283	RESISTOR—10,000 ohms ½ W. carbon (R-164) (Pkg. 5)	.70
*RQ-1285	RESISTOR—12,000 ohms ½ W. carbon (R-115) (Pkg. 5)	.70
*RQ-1289	RESISTOR—18,000 ohms ½ W. carbon (R-101, 195) (Pkg. 5)	.70

Stock No.	Description	List Price
*RC-132	CAPACITOR—0.1 mfd. 2000 V. paper (C-58)	$1.80
*RC-133	CAPACITOR—.06 mfd. 2000 V. paper (C-57)	1.60
RC-134	CAPACITOR—0.1 mfd. 1000 V. paper (C-65)	.30
RC-147	CAPACITOR—.25 mfd. 400 V. paper (C-47)	.20
*RC-157	CAPACITOR—0.5 mfd. 200 V. paper (C-63)	.40
RC-192	CAPACITOR—.003 mfd. 2000 V. paper (C-64, 66, 85, 86)	1.85
*RC-203	CAPACITOR—12 mmf. mica (C-15)	.35
*RC-220	CAPACITOR—6 mmf. mica (C-83)	.25
*RC-224	CAPACITOR—22 mmf. mica (C-4, 21)	.25
*RC-227	CAPACITOR—82 mmf. mica (C-79, 80)	.25
RC-232	CAPACITOR—47 mmf. mica (C-32, 95)	.25
*RC-235	CAPACITOR—100 mmf. mica (C-6, 46)	.25
RC-238	CAPACITOR—68 mmf. mica (C-54)	.10
*RC-242	CAPACITOR—150 mmf. mica (C-23)	.25
RC-246	CAPACITOR—180 mmf. mica (C-40)	.15
*RC-274	CAPACITOR—330 mmf. mica (C-5, 8, 87)	.30
*RC-293	CAPACITOR—470 mmf. mica (C-92)	.30
*RC-429	CAPACITOR—30 mfd. 500 V. wet electrolytic (C-59, 60)	1.35
*RC-698	CAPACITOR—R.F. padder (C-78)	.40
RC-1995	CLAMP—Ant. coil mounting clamp (Pkg. 5)	.10
RC-5138	CAPACITOR—20 mfd. 25 V., 10 mfd. 450 V., dry electrolytic (C-36, 77)	.90
*RQ-1335	RESISTOR—1.5 megohms ½ W. carbon (R-191) (Pkg. 5)	$0.70
*RQ-1339	RESISTOR—2.2 megohms ½ W. carbon (R-125, 149, 155, 166, 186) (Pkg. 5)	.70
*RQ-1341	RESISTOR—2.7 megohm ½ W. carbon (R-147) (Pkg. 5)	.70
*RQ-1349	RESISTOR—5.6 megohms ½ W. carbon (R-173, 174, 187, 188) (Pkg. 5)	.70
RQ-1420	RESISTOR—33 ohms 1 W. carbon (R-141)	.20
RQ-1460	RESISTOR—1200 ohms 1 W. carbon (R-122)	.20
*RQ-1461	RESISTOR—1500 ohms 1 W. carbon (R-176)	.20
*RQ-1471	RESISTOR—3300 ohms 1 W. carbon (R-154)	.20
*RQ-1475	RESISTOR—4700 ohms 1 W. carbon (R-107, 112, 116)	.20
RQ-1476	RESISTOR—5600 ohms 1 W. carbon (R-130 on HM-185, 197)	.20
*RQ-1485	RESISTOR—12,000 ohms 1 W. carbon (R-119)	.20
*RQ-1489	RESISTOR—18,000 ohms 1 W. carbon (R-178)	.20
*RQ-1499	RESISTOR—47,000 ohms 1 W. carbon (R-184, 199)	.20
*RS-179	SHIELD—6F8G tube shield	.15
RS-252	SOCKET—Octal tube socket	.15
RS-257	SOCKET—Electrolytic mounting socket	.05
RS-265	SOCKET—Light socket assembly	.15
RS-1011	SPEAKER—12-inch permanent magnet	4.80
RS-1803	SHIELD—6N7G tube shield and clip	.40
RT-471	TRANSFORMER—Output transformer (T-13)	1.70
RT-954	TERMINAL—Speaker lead comtact clip (Pkg. 10)	.10
*RW-101	WASHER—Felt washer for control shafts (Pkg. 10)	.05
RW-112	WASHER—Transformer shaft tension washer (Pkg. 10)	.10
RX-062	ASSEMBLY—Speaker mounting assembly	.10

* Used on previous receivers.

(Prices subject to change without notice)

REPLACEMENT PARTS LIST (Continued)

Stock No.	Description	List Price
RTC-5006	CONTROL—500,000 ohm tone control (R-132)	$0.65
RTC-5007	CONTROL—2.0 megohm variable control (R-143, 146, 159)	.75
RTC-5008	CONTROL—2.0 megohm volume control (R-126)	.75
RTC-5009	CONTROL—0.5 megohm width control (R-140)	.60
RTC-5010	CONTROL—3-20 mmf. tuning control (C-3)	1.30
RTC-6000	CARD—Television station tab No. 1 (Pkg. 10)	.05
RTC-6001	CARD—Television station tab No. 2 (Pkg. 10)	.05
RTC-6002	CARD—Television station tab No. 3 (Pkg. 10)	.05
RTC-7000	CABLE—Power cable with plugs	1.80
RTC-7001	CABLE—Picture tube cable and 11 prong socket	3.00
RTC-8000	CLAMP—Picture tube clamp (upper section)	.90
RTC-8001	CUSHION—Picture tube face cushion	1.30
RTE-100	ESCUTCHEON—Push button escutcheon	.80
RTF-100	FUSE HOLDER—Power line fuse holder	.65
RTG-100	GRID CLIP—Insulated 2 x 2 grid clip	2.00
RTG-201	GROMMET—Rubber grommet for insulating chassis hole from picture tube cable	.05
RTG-200	GROMMET—Rubber bumper on picture tube shield funnel (Pkg. 5)	.10
RTL-1000	COIL—R.F. coil (Band No. 1) (L-11)	.35
RTL-1001	COIL—R.F. coil (Band No. 2) (L-13)	.35
RTL-1002	COIL—R.F. coil (Band No. 3) (L-14)	.35
RTL-2000	COIL—Converter grid oscillator coil (T-2)	.30
RTL-2001	COIL—Converter plate oscillator coil (T-2)	.30
RTL-3000	COIL—Oscillator tuning coil (Band No. 1) (L-8)	.30
RTL-3001	COIL—Oscillator tuning coil (Band No. 2) (L-9)	.30
RTL-3002	COIL—Oscillator tuning coil (Band No. 3) (L-10)	.30
RTL-4000	CHOKE—Oscillator Plus B choke (L-1)	1.00
RTL-4001	CHOKE—1st Video choke (L-3)	.45
RTL-4002	CHOKE—Video diode choke (L-2)	.50
RTL-4003	CHOKE—Video output choke (L-6)	.50
RTL-5000	REACTOR—Plus B reactor (L-15)	1.60
RTM-1000	MASK—Picture tube mask	.35
*RQ-1293	RESISTOR—27,000 ohms ½ W. carbon (R-103) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms ½ W. carbon (R-165) (Pkg. 5)	.70
*RQ-1297	RESISTOR—39,000 ohms, ½ W. carbon (R-106) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms ½ W. carbon (R-192, 196) (Pkg. 5)	.70
*RQ-1301	RESISTOR—56,000 ohms ½ W. carbon (R-205) (Pkg. 5)	.70
*RQ-1303	RESISTOR—68,000 ohms ½ W. carbon (R-206) (Pkg. 5)	.70
*RQ-1305	RESISTOR—82,000 ohms ½ W. carbon (R-204) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms ½ W. carbon (R-111) (Pkg. 5)	.70
*RQ-1311	RESISTOR—150,000 ohms, ½ W. carbon (R-131, 137, 145) (Pkg. 5)	.70
*RQ-1313	RESISTOR—180,000 ohms ½ W. carbon (R-162) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms ½ W. carbon (R-104, 118, 128, 142, 171, 172) (Pkg. 5)	.70
*RQ-1317	RESISTOR—270,000 ohms ½ W. carbon (R-160) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohms ½ W. carbon (R-175) (Pkg. 5)	.70
*RQ-1321	RESISTOR—390,000 ohms ½ W. carbon (R-194) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms ½ W. carbon (R-139) (Pkg. 5)	.70
*RQ-1327	RESISTOR—680,000 ohms ½ W. carbon (R-156) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohms ½ W. carbon (R-120, 133, 135, 144, 151, 168, 179) (Pkg. 5)	.70

Stock No.	Description	List Price
RTQ-1000	RESISTOR—350 ohms 10 W. wire wound (R-177)	$1.00
RTQ-1001	RESISTOR—1100 ohms 16 W. wire wound (R-163 on HM-185)	1.40
RTQ-1002	RESISTOR—1300 ohms 16 W. wire wound (R-163 on HM-171)	1.40
RTS-100	SOCKET—Chassis power receptacle	1.00
RTS-101	SOCKET—2 x 2 tube socket (4 prong)	.95
RTS-300	SHAFT—Focus control insulated shaft	.90
RTS-301	SHAFT—Coil tuning core shaft	.15
RTS-500	SWITCH—Station selector switch (S-1)	2.80
RTS-700	STUD—4⅝-in. lg. stud for mounting R-163	.10
RTS-701	SETSCREW—Headless setscrew for focus control shaft assembly (Pkg. 5)	.10
RTT-0010	TRANSFORMER—Power transformer (T-12)	14.50
RTT-2000	TRANSFORMER—Antenna transformer (T-1)	1.00
RTT-3000	TRANSFORMER—1st Video I.F. transformer (T-7)	3.80
RTT-3500	TRANSFORMER—2nd Video I.F. transformer (T-3)	3.80
RTT-4000	TRANSFORMER—3rd Video I.F. transformer (T-4)	6.00
RTT-4500	TRANSFORMER—4th Video I.F. transformer (T-5)	3.80
RTT-5000	TRANSFORMER—5th Video I.F. transformer (T-6)	3.80
RTT-7000	TRANSFORMER—1st Audio I.F. transformer (L-12)	2.25
RTT-7500	TRANSFORMER—2nd Audio I.F. transformer (T-8)	3.80
RTT-8000	TRANSFORMER—3rd Audio I.F. transformer (T-9)	3.80
RTT-9000	TRANSFORMER—Vert. oscillator transformer (T-11)	2.80
RTW-100	WASHER—Picture tube rear support washer (rubber)	.80
RTW-500	WINDOW—Picture tube safety window (HM-185)	2.05
RTW-501	WINDOW—Celluloid station letter window (Pkg. 5)	.05
RTW-502	WINDOW—Picture tube safety window (HM-171)	1.60
RTX-1000	ASSEMBLY—Wave trap assembly (L-16, 17, 18, 19)	3.10
RTX-1003	ASSEMBLY—Wave trap assembly (L-20, C-94)	.80
	Parts Used in Television Only	
RTB-500	PUSH BUTTON—Station selector push button	.15
RTB-1000	BOARD—Focus control insulator mounting board	.80
RTB-1001	BOARD—Centering controls insulator mounting board	.40
RTB-1002	BOARD—I.F. terminal board (8-hole-square)	1.40
RTB-1500	BACK COVER—Cabinet back cover (HM-185)	.45
RTB-1501	BACK COVER—Cabinet back cover (HM-171)	.35
RTB-2000	BUSHING—Insulating bushing for mounting R-163	.05
RTB-2001	BUSHING—Station trimmer shaft bushing	.10
RTC-1000	TRIMMER STRIP—20-200 mmf. trimmers (C-70, 71,72)	.55
RTC-1001	TRIMMER STRIP—20-200 mmf. trimmers (C-67, 68, 69)	.55
RTC-5000	CONTROL—.25 megohm brightness control and power switch (R-157)	.80
RTC-5001	CONTROL—2.0 megohm centering control (R-169, 170)	.60
RTC-5002	CONTROL—2000 ohm tapered contrast control (R-108)	.60
RTC-5003	CONTROL—2.0 megohm focus control (R-167)	.60
RTC-5004	CONTROL—50,000 ohm horizontal speed control (R-138)	.60
RTC-5005	CONTROL—100,000 ohms hor. linearity control (R-189)	.60

(Prices subject to change without notice)

TELEVISION ALIGNMENT PROCEDURE

Th problem of aligning the several circuits in a television ecei is much more involved and requires more specialized quip ent than the alignment of conventional radio receiv- rs. rtunately, the use of stable components in carefully gin red circuits of wide-band characteristics reduces to a inin m the necessity for alignment under normal operating ondi ns. Should alignment become necessary the follow- g e ipment will be needed:

(A) For Video I.F. Alignment
- (1) Cathode ray oscilloscope
- (2) Wide-band sweep oscillator capable of sweeping from 7.5 to 15 MC.
- (3) Marker system either provided in sweep oscillator or from separate signal generator for locating 12.75 and 9.75 MC points.

(B) Sound I.F. Alignment
- (1) Cathode ray oscilloscope
- (2) Wide band sweep oscillator capable of sweeping from 7.75 to 8.75 MC.

(C) R.F. Alignment
- (1) Cathode ray oscilloscope
- (2) Wide-band sweep oscillator capable of sweeping the following bands.
  - (a) 44 to 50
  - (b) 50 to 56
  - (c) 66 to 72
  - (d) 78 to 84
  - (e) 84 to 90

VIDEO I. F. ALIGNMENT

	put eq.	Point of Input	Adjustments	Comments
				Connect vertical input cable of cathode ray oscilloscope across resistor R-43 of 6H6 video detector. See Fig. 5, arrow one.
	7.5 5MC Sw p	Control grid of 1853 (2nd video I.F.)		Connect low output tap of video I.F. sweep oscillator to control grid of 1853 (2nd video I.F.). See Fig. 5, arrow two. Connect ground lead to chassis. Turn contrast control (R-67) to about half of maximum or to a point which gives satisfactory vertical deflection without overloading. Set horizontal centering and gain controls on oscilloscope to give suitable horizontal deflection. Adjust sweep phase to give curve similar to Fig. 8, curve 3.

OTE: f sweep oscillator has marker points internally supplied, steps 3 and 4 may be omitted.

	Sa as in No. plus 12. MC	Same as in No. 2		Superimpose an accurately calibrated 12.75 MC signal in parallel with sweep signal. Signal will appear on sweep curve in oscilloscope as a wiggle, the center of which is a thin black line. With a pen or crayon mark this point on the screen of the oscilloscope. (NOTE: Hereafter the horizontal controls on the oscilloscope must not be touched.)
	Sa as in No. plus 9.7 MC	Same as in No. 2		Superimpose an accurately calibrated 9.75 MC signal in parallel with sweep signal. Mark screen at point where signal appears on curve as in No. 3 above.
	7.5- 5 MC Swe	Control grid of 1852 (4th video I.F.)	Iron cores of detector transformer T-9	Connect high tap of video I.F. sweep oscillator to control grid of 1852 (4th video I.F.) See Fig. 5, arrow five. (Do not touch horizontal controls of oscilloscope.) Turn sweep phase to give as near a single curve as possible. Adjust iron cores of T-9 until curve appears similar to Fig. 8, curve 1, with relatively flat top, 12.75 MC mark half-way down one side and 9.75 MC mark at corner of other side. These conditions plus maximum amplitude insure correct alignment.
	7.5- 5 MC Swe	Control grid of 1853 (3rd video I.F.)	Iron cores of 4th video transformer T-8.	Connect low tap of video I.F. sweep oscillator to control grid of 1853 (3rd video I.F.). See Fig. 5, arrow six. Adjust iron cores for maximum gain, flatness and proper centering between markers as described in step No. 5 and illustrated in Fig. 8, curve 2.
	7.5- 5 MC Swe	Control grid of 1853 (2nd video I.F.)	Iron cores of 3rd video transformer T-7.	Connect low tap to grid. See Fig. 5, arrow two. Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. Adjust series iron core for sharp cut-off on 9.75 MC side of curve. See Fig. 8, curve 3.
	7.5- 5 MC Swe	Control grid of 1852 (1st video I.F.)	Iron cores of 2nd video transformer T-6	Connect low tap to grid. See Fig. 5, arrow eight. Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. Adjust series iron core for sharp cut-off on 12.75 MC side of curve. See Fig. 8, curve 4.
	7.5- 5 MC Swe	Converter Grid, 6F8G	Iron cores of 1st video transformer T-11	Connect low tap to grid. Adjust iron cores for maximum gain flatness and proper centering.
).	14. 5 MC	Converter Grid, 6F8G	Series iron core of 2nd video transformer T-6	To check alignment of 14.25 MC trap proceed as follows: Connect low tap to grid. Reduce horizontal gain of oscilloscope to minimum. Adjust iron core for minimum line length.
1.	8.2 MC	Converter Grid, 6F8G	Series iron core of 3rd video transformer T-7	To check alignment of 8.25 MC trap proceed as follows: Connect low tap to grid. Reduce horizontal gain of oscilloscope to minimum. Adjust iron core for minimum line length.

R. F. ALIGNMENT

Signal Input	Point of Input	Adjustments	Comments
1.		Band width adjustment coupling condenser	Turn (C-2) in until tight, then open approximately $\frac{1}{16}$ of a turn.
2. 44 to 50 MC sweep	Antenna terminals	(L-10), (C-3), (C-8)	Depress band No. 1 push button. Set tuning control to mid-rotation. Adju L-10 until curve is centered between maximum horizontal sweep poin Adjust C-3 and C-8 for maximum amplitude. See Fig. 8, curve 5.
3. 50 to 56 MC sweep	Antenna terminals	(L-11), (C-4), (C-9)	Depress band No. 2 push button. Leave tuning control at mid-rotati point. Adjust L-11 for centering; C-4 and C-9 for maximum amplitude. S Fig. 8, curve 5.
4. 66 to 72 MC sweep	Antenna terminals	(L-12, (C-5), (C-10)	Depress band No. 3 push button. Adjust L-12 for centering; C-5 and C- for maximum amplitude. See Fig. 8, curve 5.
5. 78 to 84 MC sweep	Antenna terminals	(L-13) (C-83), (C-19)	Depress band No. 4 push button. Adjust L-13 for centering; C-83 and C- for maximum amplitude. See Fig. 8, curve 5.
6. 84 to 90 MC sweep	Antenna terminals	(L-14), (C-84), (C-20)	Depress band No. 5 push button. Adjust L-14 for centering; C-84 and C- for maximum amplitude. See Fig. 8, curve 5.

WAVE TRAP ALIGNMENT

Signal Input	Point of Input	Adjustments	Comments
1. 11.75 MC	Antenna terminals	Wave trap trimmer, C-88	Adjust for maximum dip in oscilloscope curve.

AUDIO I. F. ALIGNMENT

Input Freq.	Point of Input	Adjustments	Comments
1.			Connect vertical input cable of cathode ray oscilloscope between junction R-4 and C-29 and chassis. See Fig. 5, arrow ten.
2. 7.75 to 8.75 MC sweep	Control grid of 6B8	Iron cores of 4th audio I.F. transformer T-4	Align for maximum amplitude. See Fig. 8, curve 6.
3. 7.75 to 8.75	Control grid of 6SK7	Iron cores of 3rd audio I.F. transformer T-3	Align for maximum amplitude. See Fig. 8, curve 6.
4. 7.75 to 8.75	Converter grid of 6F8G	Iron cores of 2nd audio I.F. transformer T-2	Align for maximum amplitude. See Fig. 8, curve 7.

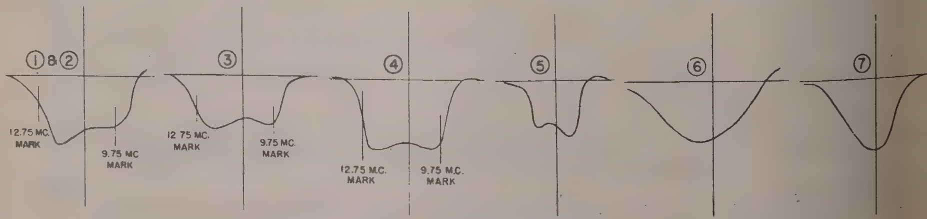

Fig. 8. Television Alignment Curves

GENERAL ELECTRIC CO.

MODELS HM225,HM226-7A
Parts List

Television Chassis Parts Common to Radio

Stock No.	Description	List Price
*R 008	BOARD—Terminal board (2 lug)	$0.10
*R 013	BOARD—Terminal board (2 lug)	.10
R 023	BOARD—Terminal board (4 lug)	.10
*R 058	BOARD—Terminal board (8 lug)	.10
*R 060	BOARD—Ant. gnd. terminal board	.10
*R 096	BOARD—Terminal board (3 lug)	.10
*R 621	BEZEL—Pilot light bezel	.20
R 4026	BOARD—Terminal board (2 lugs and 2 anchor lugs)	.05
R 007	CAPACITOR—.001 mfd. 1500 V. paper (C-42)	.15
*R 011	CAPACITOR—.002 mfd. 600 V. paper (C-60)	.25
*R 023	CAPACITOR—.005 mfd. 600 V. paper (C-12, 14, 21, 22, 23, 24, 26, 28, 31, 32, 35, 37, 38, 40, 41, 43, 45, 46, 79)	.25
*R 039	CAPACITOR—.01 mfd. 600 V. paper (C-74, 85, 86)	.25
*R 048	CAPACITOR—.02 mfd. 600 V. paper (C-34, 67, 69, 70)	.30
R 090	CAPACITOR—.04 mfd. 600 V. paper (C-56)	.30
*R 092	CAPACITOR—.05 mfd. 600 V. paper (C-29, 44, 49, 53, 59, 66)	.30
*R 096	CAPACITOR—0.1 mfd. 200 V. paper (C-25)	.30
*R 123	CAPACITOR—0.1 mfd. 400 V. paper (C-51, 57)	.35
*R 147	CAPACITOR—.25 mfd. 400 V. paper (C-87)	.20
*R 156	CAPACITOR—0.5 mfd. 100 V. paper (C-48, 71, 73)	.45
*R 202	CAPACITOR—4 mmf. mica L.P.F. (C-16)	.25
*R 226	CAPACITOR—10 mmf. mica (C-50)	.25
R 233	CAPACITOR—22 mmf. mica (C-52)	.25
R 241	CAPACITOR—33 mmf. mica L.P.F. (C-15, 36)	.20
*R 242	CAPACITOR—150 mmf. mica (C-27, 47)	.25
R 243	CAPACITOR—150 mmf. mica L.P.F. (C-18, 58)	.15
R 251	CAPACITOR—220 mmf. mica L.P.F. (C-63)	.10
R 269	CAPACITOR—330 mmf. mica L.P.F. (C-30, 82)	.20
R 293	CAPACITOR—470 mmf. mica (C-61)	.30
R 314	CAPACITOR—47 mmf. mica L.P.F. (C-1, 13)	.20
R 316	CAPACITOR—56 mmf. mica L.P.F. (C-33)	.10
R 318	CAPACITOR—82 mmf. mica L.P.F. (C-7, 11)	.15
*R 29	CAPACITOR—30 mfd. 450 V. wet electrolytic (C-64, 68, 75, 76, 80)	1.35
R 698	CAPACITOR—Coupling padder (C-2)	.40
R 1995	CLAMP—Ant. transformer clamp (Pkg. 5)	.10
R 0016	CONE ASSEMBLY—12 inch P.M. speaker cone assembly	2.20
*R 016	GRID CLIP—6F8G control grid clip (Pkg. 5)	.10
R 044	KNOB—Control knob and spring assembly (Pkg. 2)	.40
*R 59	CHOKE—Filter choke (L-25)	1.50
R 29	BOARD—Speaker plug terminal board (Pkg. 2)	.10
R 40	RESISTOR—240 ohms 2 W. carbon ±5% (R-71)	.25
*R 43	RESISTOR—270 ohms 2 W. carbon (R-35, 106)	.30
R 50	RESISTOR—820 ohms 2 W. carbon (R-50)	.15
*R 87	RESISTOR—15,000 ohms 2 W. carbon (R-46)	.35
R 94	RESISTOR—33,000 ohms 2 W. carbon (R-90, 104)	.15
*R 215	RESISTOR—15 ohms ½ W. carbon (R-29) (Pkg. 5)	.70
*R 241	RESISTOR—180 ohms ½ W. carbon (R-38, 108) (Pkg. 5)	.70
*R 247	RESISTOR—330 ohms ½ W. carbon (R-89) (Pkg. 5)	.70
*R 251	RESISTOR—470 ohms ½ W. carbon (R-40) (Pkg. 5)	.70

Stock No.	Description	List Price
*RQ-1259	RESISTOR—1000 ohms ½ W. carbon (R-1, 7, 56, 73) (Pkg. 5)	$0.70
*RQ-1263	RESISTOR—1500 ohms ½ W. carbon (R-19, 33) (Pkg. 5)	.70
*RQ-1267	RESISTOR—2200 ohms ½ W. carbon (R-2, 9, 15, 17, 20, 25, 31, 36, 37, 39) (Pkg. 5)	.70
*RQ-1269	RESISTOR—2700 ohms ½ W. carbon (R-21, 27) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3300 ohms ½ W. carbon (R-30, 43) (Pkg. 5)	.70
*RQ-1275	RESISTOR—4700 ohms ½ W. carbon (R-48) (Pkg. 5)	.70
*RQ-1279	RESISTOR—6800 ohms ½ W. carbon (R-32, 96) (Pkg. 5)	.70
*RQ-1283	RESISTOR—10,000 ohms ½ W. carbon (R-26, 42, 47, 58, 98, 107) (Pkg. 5)	.70
*RQ-1293	RESISTOR—27,000 ohms ½ W. carbon (R-5, 41) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms ½ W. carbon (R-4, 12, 28, 54) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms ½ W. carbon (R-8, 14, 102) (Pkg. 5)	.70
*RQ-1313	RESISTOR—180,000 ohms ½ W. carbon (R-13) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms ½ W. carbon (R-11, 44, 61, 62, 63, 64, 68, 78, 87) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms ½ W. carbon (R-49, 72, 92, 105) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm ½ W. carbon (R-6, 10, 34, 45, 55) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms ½ W. carbon (R-57, 95) (Pkg. 5)	.70
*RQ-1355	RESISTOR—10 megohms ½ W. carbon (R-94) (Pkg. 5)	.70
RQ-1457	RESISTOR—820 ohms 1 W. carbon (R-66)	.10
*RQ-1483	RESISTOR—10,000 ohms 1 W. carbon (R-3, 24, 74)	.20
*RQ-1491	RESISTOR—22,000 ohms 1 W. carbon (R-97)	.20
*RQ-1497	RESISTOR—39,000 ohms 1 W. carbon (R-93)	.20
RQ-1510	RESISTOR—100,000 ohms 1 W. carbon (R-103)	.10
RQ-1520	RESISTOR—470,000 ohms 1 W. carbon (R-80)	.10
RQ-1530	RESISTOR—2.2 megohms 1 W. carbon (R-22, 81, 82, 83, 84, 85, 86)	.10
*RS-217	SOCKET—879—2 X 2 tube socket (Pkg. 5)	.50
RS-252	SOCKET—Octal tube socket	.15
RS-257	SOCKET—Electrolytic mounting socket	.05
RS-267	SOCKET—Pilot light socket	.30
RS-1023	SPEAKER—12 inch P.M. Speaker	9.10
RT-954	TERMINAL—Speaker lead contact terminal (Pkg. 10)	.10
*RW-101	WASHER—Felt washer for control knob (Pkg. 10)	.05
RW-112	WASHER—I.F. tuning shaft tension washer (Pkg. 10)	.10
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
RX-063	ASSEMBLY—Electrolytic mounting assembly (washers and pal nuts)	.20

Television Chassis Parts Used in Television Only

Stock No.	Description	List Price
RT 500	KEY—Station selector key	$0.15
RT 1502	BACK COVER—Cardboard back cover for model HM-225	.85
RT 1503	BACK COVER—Cardboard back cover for model HM-226-7A	.95
RT 2001	BUSHING—R.F. coil tuning bushing	.10
RT 2500	BRACKET—Right R.F. unit support assembly	
RT 2501	BRACKET—Left R.F. unit support assembly	
RT 1002	TRIMMER STRIP—Front station selector trimmer strip (C-8, 9, 10, 19, 20)	.80
RT 1003	TRIMMER STRIP—Top station selector trimmer strip (C-3, 4, 5, 83, 84)	.85
RT 2000	CAPACITOR—.06 mfd. 4000 V. paper (C-77, 78)	2.80
RT 3000	CAPACITOR—20 mfd. 25 V. 40 mfd. 450 V. dry electrolytic (C-39, 72)	1.75
RT 3001	CAPACITOR—40 mfd. 25 V. dry electrolytic (C-62)	.60
RT 3002	CAPACITOR—10 mfd. 450 V., 5 mfd. 450 V., 20 mfd. 450 V. dry electrolytic (C-6, 54, 55, 65, 81)	1.80
RT 5005	CONTROL—100,000 ohms horizontal speed control (R-69)	.60
RT 5007	CONTROL—2.0 megohms vertical linearity or size control (R-53, 65)	.75
.RT 5009	CONTROL—500,000 ohms vertical speed control (R-79)	.60
RT 5011	CONTROL—10,000 ohms brightness or contrast control (R-52, 67)	.70
RT 5012	CONTROL—200 ohms 2 W. focus control (R-75)	1.00
RT 5013	CONTROL—1000 ohms horizontal linearity control (R-91)	.70
RT 5014	CONTROL—0.5 megohm volume or tone control (R-16, 23)	.60
RT 5015	CONTROL—Tuning control (C-17)	2.10
RT 025	CONTROL—1000 ohm horizontal size control (R-60)	.75
RTI 003	COIL—RF coil band No. 1 (L-5)	$0.30
RTI 004	COIL—RF coil band No. 2 (L-6)	.30
RTI 005	COIL—RF coil band No. 3 (L-7)	.30
RTI 006	COIL—RF coil band No. 4 (L-8)	.30
RTI 007	COIL—RF coil band No. 5 (L-9)	.30
RTI 002	COIL—Converter-oscillator plate coil (1½ turn) (T-15)	.30
RTI 003	COIL—Converter-oscillator grid coil (1 turn) (T-15)	.30
RTI 003	COIL—Oscillator tuning coil band No. 1 (L-10)	.30
RTI 004	COIL—Oscillator tuning coil band No. 2 (L-11)	.30
RTI 005	COIL—Oscillator tuning coil band No. 3 (L-12)	.30
RTI 006	COIL—Oscillator tuning coil band No. 4 (L-13)	.30
RTI 007	COIL—Oscillator tuning coil band No. 5 (L-14)	.30
RT 004	CHOKE—Video choke (L-19)	.75
RT 005	CHOKE—Video choke (L-22)	.75
RTI 006	CHOKE—Video cathode choke (L-18)	.95
RTI 007	CHOKE—Video diode choke (L-16, 17)	.75
RTI 500	COIL—Focusing coil (L-24)	5.10
RTI 000	YOKE—Deflection yoke (L-23)	12.00
RT 01	NUT—Pal nut for all controls (Pkg. 5)	.10
RT 01	PLUG—Female single slot plug on television chassis	.20
RT 02	PLUG—Male plug on deflection yoke and focus cable	.40
RT 003	RESISTOR—400 ohms damping (R-100)	1.00
RT 004	RESISTOR—400 ohms 17.9 W. wire wound (R-70)	.85

Stock No.	Description	List Price
RTQ-1005	RESISTOR—150 ohms 7.4 W. wire wound (R-18)	.55
RTQ-1006	RESISTOR—700 ohms 7.4 W. wire wound (R-77, 99)	.55
RTQ-1007	RESISTOR—1,500 ohms, 6 W.; 150 ohms, 9 W. wire wound (R-59, 101)	.85
RTQ-2010	RESISTOR—33 ohms 1 W. wire wound (R-88)	.40
RTR-001	RING—Picture tube support ring	.80
RTS-100	SOCKET—Power chassis power receptacle	1.00
RTS-102	SOCKET—Power fuse socket	
RTS-103	SOCKET—6 prong connector socket	.15
RTS-301	SHAFT—R.F. coil tuning core shaft	.15
RTS-501	SWITCH—Station selector switch	4.65
RTS-702	STUD—Focus coil adjustment stud	.15
RTS-703	SLEEVE—Picture tube rubber sleeve	.20
RTS-704	SCREW—Thumb screw for mounting picture tube bracket (Pkg. 2)	.10
RTC-6000	CARD—Station No. 1 tab card (Pkg. 10)	$0.05
RTC-6001	CARD—Station No. 2 tab card (Pkg. 10)	.05
RTC-6002	CARD—Station No. 3 tab card (Pkg. 10)	.05
RTC-6003	CARD—Station No. 4 tab card (Pkg. 10)	.05
RTC-6004	CARD—Station No. 5 tab card (Pkg. 10)	.05
RTC-6005	CARD—Station "Off" tab card (Pkg. 10)	.05
RTC-7000	CORD—Power cord assembly	1.80
RTC-7002	CABLE—Kinescope cable assembly on power chassis	1.25
RTC-7003	CABLE—Interconnecting power cable assembly (First hole from rear on right side of receiver chassis)	1.00
RTC-7004	CABLE—Interconnecting power cable assembly (Second hole from rear on right side of receiver chassis)	1.00
RTC-8002	CLAMP—Picture tube clamp	
RTC-8003	CLAMP—Deflection yoke clamp	.20
RTC-8004	CLAMP—Dry electrolytic mounting clamp (.06 mfd. 4,000 V.)	.20
RTC-8005	CUSHION—9-inch picture tube cushion	2.10
RTC-8006	CUSHION—12-inch picture tube cushion	2.40
RTE-101	ESCUTCHEON—Television station selector escutcheon	
RTG-101	GRID CLIP—6AL6G control grid clip	.35
RTG-102	GRID CAP—High voltage rectifier grid cap	2.00
RTG-202	GROMMET—Receiver chassis grommets (¾ inch dia. black)	.05
RTG-203	GROMMET—Power chassis grommet (1 inch dia.)	.05
RTG-300	GUIDE—Screwdriver guide on focus coil assembly	.05
RTI-001	INSULATOR—High voltage rectifier socket mounting board	.90
RTI-002	INSULATOR—Television station trimmer strip mounting insulator board	.05
RTI-003	INSULATOR—Stand off insulator	
RTS-705	SHIELD—Back cover tube projection shield for model HM-226-7A	$0.40
RTS-800	SPRING—Picture tube support adjustment spring (Pkg. 5)	.10
RTT-0220	TRANSFORMER—High voltage power transformer (T-14)	17.70
RTT-0221	TRANSFORMER—Low voltage power transformer (T-13)	29.95
RTT-2000	TRANSFORMER—Antenna transformer (T-1)	1.00

Parts list continued.

RTT-3001	TRANSFORMER—1st video I.F. transformer (T-11)	4.15
RTT-3501	TRANSFORMER—2nd video I.F. transformer (T-6)	6.70
RTT-4001	TRANSFORMER—3rd video I.F. transformer (T-7)	6.70
RTT-4501	TRANSFORMER—4th video I.F. transformer (T-8)	4.15
RTT-5001	TRANSFORMER—5th video I.F. transformer (T-9)	4.15
RTT-6500	TRANSFORMER—Horizontal output transformer (T-12)	15.40
RTT-6750	TRANSFORMER—Vertical output transformer (T-16)	6.00
RTT-7001	TRANSFORMER—1st audio I.F. transformer (T-2)	4.15
RTT-7501	TRANSFORMER—2nd audio I.F. transformer (T-3)	4.15
RTT-8001	TRANSFORMER—3rd audio I.F. transformer (T-4)	4.15
RTT-9000	TRANSFORMER—Vertical oscillator transformer (T-10)	2.80
RTT-9500	TRANSFORMER—Audio output transformer (T-5)	3.25
RTW-501	WINDOW—Station letter window (Pkg. 5)	.05
RTW-503	WINDOW—Safety glass window for Model HM-225	4.30
RTW-504	WINDOW—Safety glass window for Model HM-226-7A	3.50
RTX-1001	ASSEMBLY—Wave trap assembly (L-1, 2, 3, 4, C-1, 7, 11, 13)	
RTX-1003	ASSEMBLY—Wave trap assembly (L-15, C-88)	.80
RTX-2000	ASSEMBLY—Chassis mounting assembly	.20

* Used on previous radio receivers.

(Prices Subject to Change without Notice)

CAUTIONARY INSTRUCTIONS

All adjustments not accessible with the back cover in place can be made without energizing the high-voltage circuits.

Servicing of the high-voltage circuits can be satisfactorily performed with the power-cord plug removed from any power supply outlet. A resistance check of the circuit components will indicate any trouble existing. HIGH VOLTAGES SHOULD NEVER BE MEASURED.

The "picture tube" is highly evacuated and is consequently subject to a very great air pressure. If it is broken, glass fragments will be violently expelled. Handle with care, using safety goggles and gloves.

The large end of the "picture tube"—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure. DO NOT FORCE THE SOCKET ONTO THE TUBE OR STRAIN ANY EXTERNAL CONNECTIONS. If it fails to slip into place smoothly, investigate and remove the cause of the trouble.

Extremely high voltages (4000 volts or more) are used in the operation of this receiver; therefore, every precaution must be exercised to insure safety to the service engineer and to the customer.

The back cover, while in place, protects the user and should never be removed except by a qualified television service engineer.

The power-cord plug should not be inserted in a power supply outlet until a good, solid ground connection has been properly made to the receiver chassis.

For safety, the following operations must be performed with power plug disconnected before working on the receiver with the back cover removed:

1. Remove 879/2X2 tube from socket.
2. Detach top cap lead of 879/2X2 tube and insulate the contact end of this cap lead.
3. Ground the receiver chassis.

TELEVISION RECEIVER CIRCUITS

The television receiver circuits are divided into the following sections:

1. R.F. Unit
2. Converter-Oscillator and Amplifier
3. Audio Unit
4. Video Unit
5. Sync Pulse Clipper—Amplifier
6. Horizontal Oscillator—Output
7. Vertical Oscillator—Output
8. Low Voltage Rectifier
9. High Voltage Rectifier

R. F. Unit

This unit, comprising all circuits between the antenna terminal posts and the converter grid, consists of a high pass filter input, a series tuned antenna coil primary, a s capacity coupled secondary (C-2) and a video I.F. wave (C-88, L-15). The wave trap is broadly tuned at 11.75 to prevent I.F. interference. Any one of the five tuned cuits for each of the five television transmission bands ca connected into the secondary circuit by pressing the ap priate button. The secondary circuit trimmers when pro tuned give a broad, flat response curve.

Converter-Oscillator and Amplifier

A plate-tuned oscillator is used with vernier tuning mitted from the front control panel through trimmer (The resultant video I.F. signal of 12.75 M.C. and the a I.F. signal of 8.25 M.C. developed in the converter-oscil tube circuit is coupled through transformer T-11 to the amplifier tube.

Audio Unit

The audio unit is a conventional-type superhetero sound receiver with the I.F. stages tuned to 8.25 M.C. audio I.F. signal is taken off through the suppressor of 1st video I.F. tube.

Video Unit

This unit includes all the video I.F. amplifier stages video detector, two stages of video amplification and picture tube input. Three wave traps are provided in unit; one at T-6 for rejecting the audio I.F. of the adja television band, one at T-7 for rejecting the audio I.F. o band concerned, and one in the cathode circuit of the video, 6F8G, comprising L-18 and C-52, for removing 12.75 M.C. video I.F. from the detected signal ampl stages. A sensitivity control, known as contrast con (R-67), is provided in the AVC circuits of the 6H6 v detector for varying the grid bias on the 2nd and 3rd v I.F. tubes.

D.C. reinsertion (automatic background control) is acc plished in the 2nd video 6F6G tube circuit by using par the varying screen voltage developed across R-93 to con the picture tube grid voltage. A high impedance volt divider, R-94 and R-95, is used and the coupling conden C-38, is made small to prevent low frequency variation the plate supply from getting to the picture tube grid.

Sync-pulse Clipper—Amplifier

Sync-pulses are taken off the plate of the right sectio the 1st video and clipper tube, 6F8G. The video signals separated by tube cut-off since the plate voltage is only ab 10 volts. The sync-pulses are then amplified in the s amplifier tube and coupled through a high-pass filter to grid of the horizontal oscillator.

Horizontal Oscillator—Output

The horizontal oscillator is a multi-vibrator with sp controlled by varying the small positive grid voltage thro R-69. The horizontal pulses are passed through proper w shaping and amplifier circuits to the horizontal deflec coils of the picture tube. Horizontal linearity is adjustabl varying R-91. Horizontal sweep size is controlled by R-6 the cathode circuit of the 6AL6G. The degeneration resi R-22 and series circuit across the secondary of the 6A output transformer damp the output transient. Damp is adjustable through R-100.

Vertical Oscillator—Output

Vertical sync-pulses are separated from the horizo pulses in the vertical clipper right section of 6F8G and fed to the vertical oscillator. This oscillator is of the bloc type, transformer coupled. The generated sawtooth w across C-70 is shaped by the vertical linearity control, R The speed of the oscillator is controlled by R-79 and length of sweep (size) is adjustable through R-65. The ou is amplified and coupled to the vertical deflection coils o picture tube.

Low-voltage Rectifier

Two 5U4G rectifiers are necessary to supply plate cur which is over 300 ma. A combination of choke and resist filters is used so that the audio and oscillator plate sup will be free from video and sweep signals.

High-voltage Rectifier

The high voltage rectifier uses a resistance filter. The ble is connected across the filter input to reduce ripple. R is inserted in the plate lead for protection.

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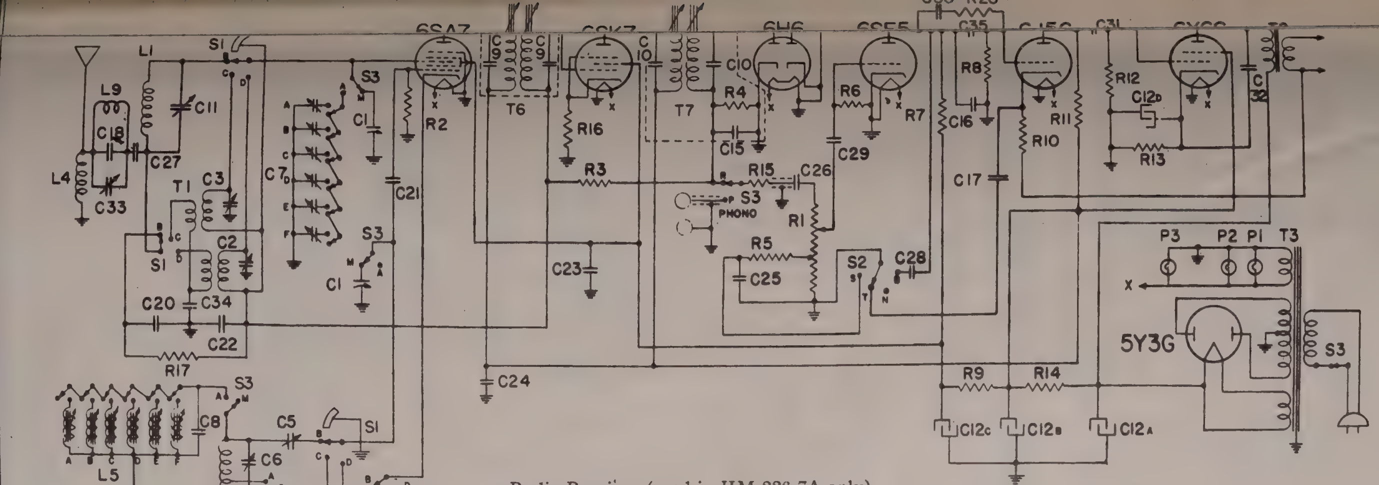
MODEL HM226-7A
Radio Receiver Schematic
Socket, Voltage, Trimmers



Radio Receiver (used in HM-226-7A only)
Band "B" .... 540–1600 K.C.
Band "C" .... 2.1–6.5 M.C.
Band "D" .... 6.25–22.5 M.C.

Fig. 12. Radio Schematic Diagram
(Model HM-226-7A only)

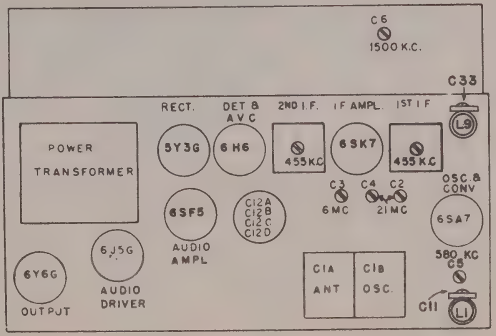
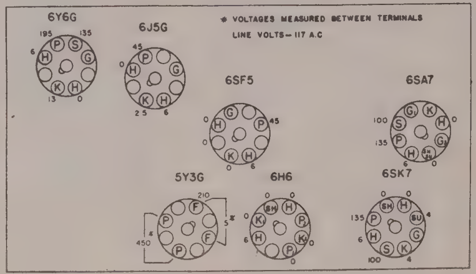


Fig. 11. Radio Chassis Trimmer Location
(Model HM-226-7A)

FRONT VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.
Band "B." No signal input. Max. volume.

Fig. 13. Radio Chassis Socket Voltages

Radio (used in HM-226-7A only)	
Converter-Oscillator	GE-6SA7
I.F. Amplifier	GE-6SK7
Detector and AVC	GE-6H6
1st Audio Amplifier	GE-6SF5
2nd Audio Amplifier	GE-6J5G
Audio Output	GE-6Y6G
Rectifier	GE-5Y3G
Dial Lamps	(3) Mazda No. 44

Loud-speaker—"Alnico" Magnetic Dynamic

Type of Cone	Curvilinear
Cone Diameter	12 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

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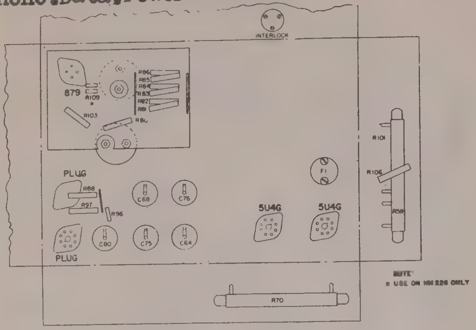

Fig. 10. Power Chassis Parts Layout

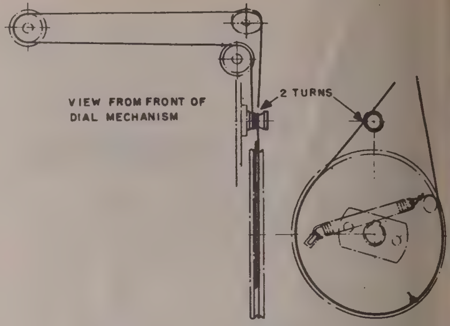

Fig. 14. Dial Drive Stringing Diagram

LOUD-SPEAKER

To center the voice coil, loosen the two screws which clamp the speaker spider in position. These two screws are available from the rear of the speaker. Shift the spider around until the voice coil is centered, then tighten the screws in position.

PHONOGRAPH CONNECTIONS

Model HM-226-7A radio receiver is equipped w a phono-terminal (pin jack) to allow the convenient conn ion of a record player. General Electric plug, Stock No. R .45, fits the pin jack.

Note—A suitable load consisting of a 100,000 ohm r stor in series with a .01 mfd. capacitor should be con ted across the pick-up leads when using a crystal-type u .

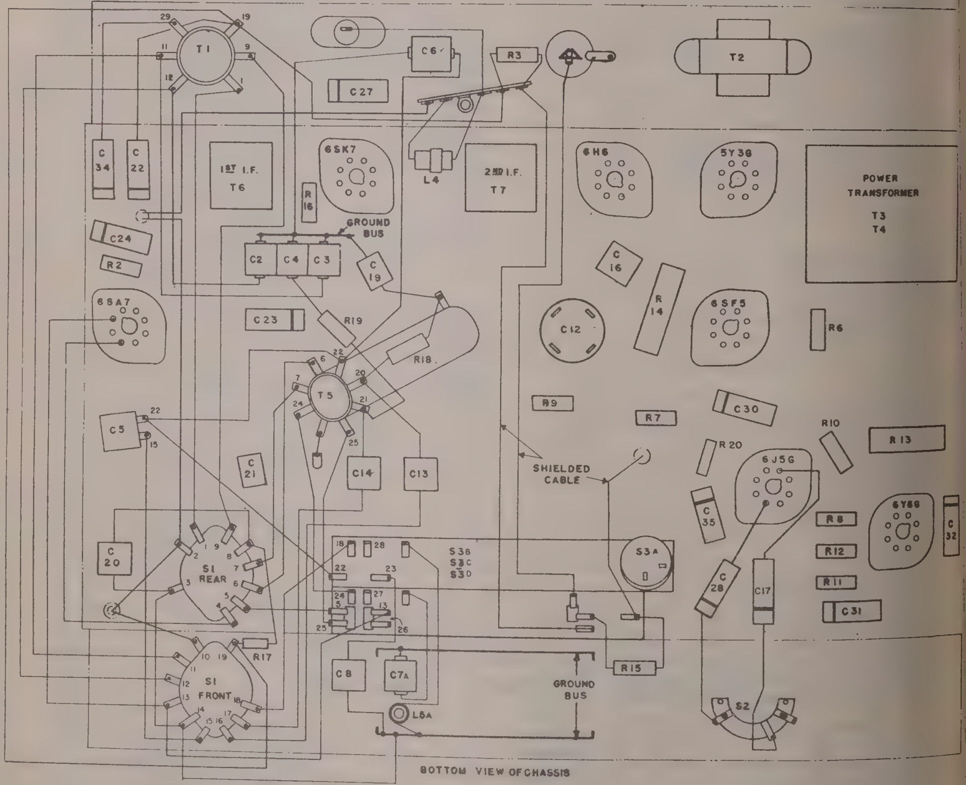

Fig. 15. Radio Chassis Parts Layout
(Model HM-226-7A only)

GENERAL ELECTRIC CO.

RADIO ALIGNMENT PROCEDURE (Model HM-226-7A only)

I. F. ALIGNMENT WITH OSCILLOSCOPE

and Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. 2nd I.F. Pri. (T-7)	Gang condenser plates closed—"Manual" key depressed—connect audio input of oscilloscope to chassis and to junction of R-3 and R-15. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude.
Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. 1st I.F. Pri. (T-6)	

I. F. ALIGNMENT WITH OUTPUT METER

and Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. 2nd I.F. Pri. (T-7)	Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. 1st I.F. Pri. (T-6)	

R. F. ALIGNMENT

and Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position.
Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-4) Ant. (C-2)	The image of any "D" band signal should be heard 910 K.C. below signal input when (C-4) is on proper peak. Example: 18 M.C. image, 17.09 M.C. Peak (C-2) while rocking the gang condenser.
Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Ant. (C-3)	Peak for maximum output with a low input signal.
Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-11)	Align (C-6) on 1500 K.C. and peak output with (C-11).
Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-5)	Align for maximum output with a low input signal, rocking gang condenser.
Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-11)	Retrim at 1500 K.C.

ADIO CHASSIS PARTS (Model HM-226-7A Radio)

(Prices Subject to Change without Notice).

*B-008	BOARD—Terminal board (2 lug)	$0.10
*B-009	BOARD—Terminal board (1 lug)	.15
*B-026	BOARD—Antenna terminal board	.10
*B-046	BOARD—Terminal board (5 lug)	.15
*B-096	BOARD—Terminal board (3 lug)	.10
B-098	BOARD—Ant. gnd. terminal board	.10
B-625	BUSHING—Tuning control shaft bushing	.10
B-1009	BOARD—Phono terminal board	.10
*C-009	CAPACITOR—.001 mfd. 600 V. paper (C-35)	.30
C-016	CAPACITOR—.002 mfd. 600 V. paper (C-28)	.25
*C-023	CAPACITOR—.005 mfd. 600 V. paper (C-26, 30)	.25
*C-039	CAPACITOR—.01 mfd. 600 V. paper (C-29)	.25
*C-048	CAPACITOR—.02 mfd. 600 V. paper (C-17, 25, 31)	.30
*C-060	CAPACITOR—.03 mfd. 600 V. paper (C-32)	.25
*C-092	CAPACITOR—.05 mfd. 600 V. paper (C-22, 23, 24, 34)	.30
*C-096	CAPACITOR—0.1 mfd. 200 V. paper (C-27)	.30
*C-206	CAPACITOR—50 mmf. wax treated mica (C-21)	.35
C-233	CAPACITOR—22 mmf. mica (C-19)	.25
*C-235	CAPACITOR—100 mmf. mica (C-15, 16)	.25
C-307	CAPACITOR—750 mmf. silvered mica (C-8)	.40
C-337	CAPACITOR—1,600 mmf. mica ±5% (C-18)	.25
C-358	CAPACITOR—2,000 mmf. mica ±5% (C-13)	.30
C-394	CAPACITOR—4,700 mmf. mica ±5% (C-20)	.40
C-396	CAPACITOR—5,600 mmf. mica ±5% (C-14)	.45
C-875	CABLE—Power cable	.40
C-1987	CLAMP—Oscillator and antenna coil clamp (Pkg. 2)	.05
C-1989	CUSHION—Condenser cushion (Pkg. 5)	.05
C-5130	CAPACITOR—40 mfd. 300 V.; 20 mfd. 300 V.; 20 mfd. 300 V.; 20 mfd. 25 V. dry electrolytic (C-12a, 12b, 12c, 12d)	2.10
C-6509	CAPACITOR—B band padder (C-5)	.35
C-6510	CAPACITOR—B band oscillator trimmer (C-6)	.20
C-6523	CAPACITOR—B band antenna trimmer (C-11)	.15
C-6524	CAPACITOR—Wave trap trimmer (C-33)	.20
C-7011	CONDENSER—Tuning condenser (C-1a, 1b)	2.15
C-8125	CABLE—Condenser drive cable assembly	.20
C-8141	CABLE—Power cable to radio (Power chassis end)	.60
C-8500	CARD—Station letter cards (1 set)	.20
C-8505	CARD—Key manual tab card (Pkg. 10)	.05
C-8507	CARD—Key off tab card (Pkg. 10)	.05
C-8512	CARD—Key phono tab card (Pkg. 10)	.05
D-135	DIAL—Radio dial	
D-407	DRUM—Condenser drive drum assembly	.40
E-204	ESCUTCHEON—Station key escutcheon	2.40
E-205	ESCUTCHEON—Tuning and volume escutcheon	
H-006	HAIRPIN COTTER—Tuning drive shaft hairpin cotter (Pkg. 10)	.10
S-3022	SWITCH—Station selector switch (S-3)	$7.60
S-3047	SWITCH—Tone control switch (S-2)	.40
S-3048	SWITCH—Band change switch (S-1)	1.00
T-0520	TRANSFORMER—60 cycle power transformer (T-3)	4.35
T-313	TRANSFORMER—1st I.F. transformer (T-6)	1.70
T-314	TRANSFORMER—2nd I.F. transformer (T-7)	1.90
T-462	TRANSFORMER—Output transformer (T-2)	1.40
RK-044	KNOB—Radio control knob (Pkg. 2)	$0.40
RK-204	KEY—Station key	.10
RL-083	COIL—C and D band antenna coil (T-1)	.85
RL-096	COIL—B band antenna coil (L-1)	
RL-287	COIL—Oscillator coil (T-5)	1.15
RL-345	CHOKE—Antenna choke (L-4)	.30
RL-606	COIL—Wave trap coil (L-9)	
RL-9510	COIL—Station selector coil assembly (L-5)	1.80
RM-501	MASK—Dial scale mask (Pkg. 10)	.05
RP-127	POINTER—Dial pointer assembly (Pkg. 5)	.25
*RP-303	PULLEY—Pulley and C clip (Pkg. 2)	.10
RQ-642	RESISTOR—220 ohms 2 W. carbon (R-13)	.20
RQ-670	RESISTOR—3,300 ohms 2 W. carbon (R-14)	.35
*RQ-1231	RESISTOR—68 ohms ½ W. carbon (R-19) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms ½ W. carbon (R-18) (Pkg. 5)	.70
*RQ-1251	RESISTOR—470 ohms ½ W. carbon (R-16) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3,300 ohms ½ W. carbon (R-10) (Pkg. 5)	.70
*RQ-1273	RESISTOR—3,900 ohms ½ W. carbon (R-9) (Pkg. 5)	.70
*RQ-1291	RESISTOR—22,000 ohms ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms ½ W. carbon (R-15, 17) (Pkg. 5)	.70
*RQ-1301	RESISTOR—56,000 ohms ½ W. carbon (R-5) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms ½ W. carbon (R-11) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms ½ W. carbon (R-7) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohms ½ W. carbon (R-12) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms ½ W. carbon (R-4, 20) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm ½ W. carbon (R-8) (Pkg. 5)	.70
RQ-1339	RESISTOR—2.2 megohms ½ W. carbon (R-3) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohms ¼ W. carbon (R-6) (Pkg. 5)	.70
*RS-236	SOCKET—Radio dial light socket	.10
RS-252	SOCKET—Octal tube socket	.15
RS-253	SOCKET—Electrolytic mounting socket	.10
RS-268	SOCKET—Bezel pilot lamp socket	.35
*RS-401	SPRING—Drive cord spring (Pkg. 2)	.20
RS-924	SHAFT—Tuning control shaft	.10
RT-862	TRIMMER STRIP—Station selector trimmer strip (C-7a, 7b, 7c, 7d, 7e, 7f)	$1.20
RT-863	TRIMMER STRIP—D and C antenna trimmers, D oscillator trimmer (C-2, 3, 4)	.45
*RT-952	TERMINAL—Speaker lead terminal (Pkg. 10)	.05
RV-067	VOLUME CONTROL—2 megohm volume control (R-1)	.65
*RW-101	WASHER—Knob felt washer (Pkg. 10)	.05
RW-908	WHEEL—Dial tuning volume wheel	.30

* Used on previous radio receivers.

MODEL H508
Schematic ,Socket
Trimmers ,Alignment

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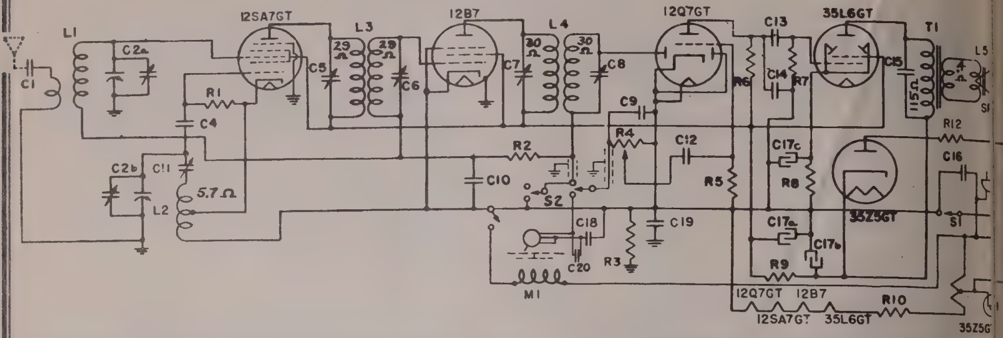

Symbol	Description	Symbol	Description	Symbol	Description
C-1	.002 mfd. paper capacitor	C-17b	40 mfd. 150 V. dry electrolytic	R-4	500,000 ohms volume control
C-2a	Antenna section tuning condenser	C-17c	20 mfd. 25 V. dry electrolytic	R-5	15 megohms carbon resistor
C-2b	Oscillator section tuning condenser	C-18	0.1 mfd. paper capacitor	R-6	470,000 ohms carbon resistor
C-4	47 mmf. mica capacitor	C-19	0.2 mfd. paper capacitor	R-7	470,000 ohms carbon resistor
C-9	470 mmf. mica capacitor	C-20	.001 mfd. paper capacitor	R-8	150 ohms carbon resistor
C-10	.05 mfd. paper capacitor	L-1	Beam-a-Scope	R-9	1200 ohms carbon resistor
C-11	B band padder	L-2	Oscillator coil	R-10	100 ohms wire wound resistor
C-12	.03 mfd. paper capacitor	L-3	1st I.F. transformer	R-12	15 ohms carbon resistor
C-13	.005 mfd. paper capacitor	L-4	2nd I.F. transformer	S-1	Power switch (on Volume Con)
C-14	330 mmf. mica capacitor	P-1	Dial Lamp Mazda No. 47	S-2	Radio-Phono switch
C-15	.01 mfd. paper capacitor	R-1	33,000 ohms carbon resistor	T-1	Output transformer
C-16	.05 mfd. paper capacitor	R-2	2.2 megohms carbon resistor		
C-17a	30 mfd. 150 V. dry electrolytic	R-3	470,000 ohms carbon resistor		

SERVICE DATA

Over-all Dimensions

Height—10⅛ inches. Width—15¼ inches. Depth—13½ inches.

Tubes

Converter-Oscillator	GE-12SA7GT
I. F. Amplifier	GE-12B7
Det., Aud, AVC	GE-12Q7GT
Power Output	GE-35L6GT
Rectifier	GE-35Z5GT
Dial Lamp	Mazda No. 47

Tuning Frequency Range . . . . 540–1600 KC

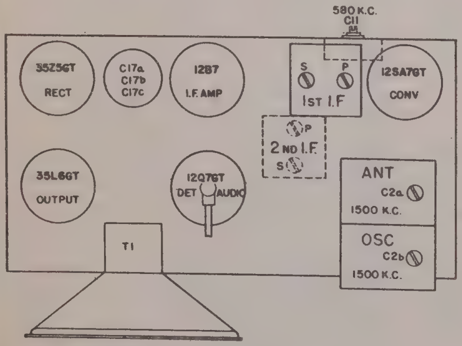

Fig. 2. Trimmer Location

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. . . . . .455 KC R.F. . . . . . . .1500 and 580 KC

The location of all trimmers is shown in Fig. 2.

Electrical Specifications

Rating	Power Supply (volts)	Frequency (cycles)	Power Consumption (watts)
A-6	115	60	55
A-5	115	50	55
C-2	115	25	55

Electrical Power Output (115-line volts)

Undistorted	1.2 watts
Maximum	2.0 watts

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter	4 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

I.F. Alignment

Connect an output meter across the voice coil. Turn volume control to maximum. Set test oscillator to 455 and keep the oscillator output as low as a readable me reading will permit.

Apply this signal to the grid of the 12B7 through a .05 m capacitor and align the 2nd I.F. transformer. Repeat the p cedure, applying the 455 KC signal to the control grid of 12SA7GT and aligning the 1st I.F. transformer. Do not rem grid leads from the tubes. Finish alignment by over-all adju ments.

R.F. Alignment

Apply a 1500 KC signal either through a standard I.R. dummy to the antenna terminal or through an additional lo connected to the generator output which can be magnetica coupled to the receiver Beam-a-Scope. Align (C-2b) at 15 KC and peak (C-2a) for maximum output. Change sig to 580 KC and tune receiver to signal. Peak (C-11) on t 580 KC signal by rocking the gang condenser. Retrim 1500 KC.

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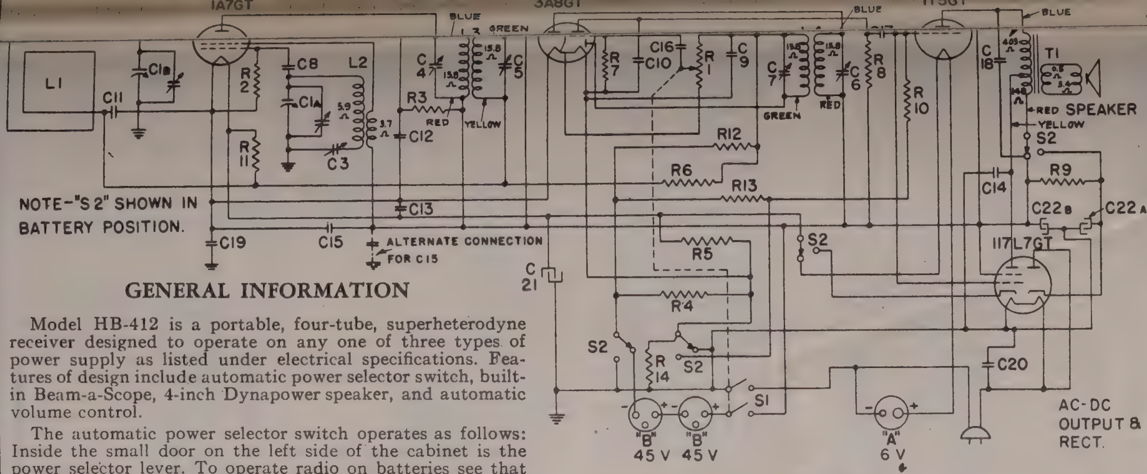

Fig. 3. Schematic Diagram

Model HB-412

Symbol	Description
C-1A	Oscillator section tuning condenser
C-1B	Antenna section tuning condenser
C-3	Oscillator padding capacitor
C-8	47 mmf. mica capacitor
C-9	220 mmf. mica capacitor
C-10	220 mmf. mica capacitor
C-11	.05 mfd. paper capacitor
C-12	0.1 mfd. paper capacitor
C-13	0.1 mfd. paper capacitor
C-14	220 mmf. mica capacitor
C-15	0.1 mfd. paper capacitor
C-16	.002 mfd. paper capacitor
C-17	.01 mfd. paper capacitor
C-18	.004 mfd. paper capacitor
C-19	0.2 mfd. paper capacitor
C-20	.01 mfd. line capacitor
C-21	100 mfd. 5 V. dry electrolytic
C-22A	40 mfd. 150 V. dry electrolytic
C-22B	20 mfd. 150 V. dry electrolytic
L-1	Beam-a-Scope
L-2	Oscillator coil
L-3	1st I.F. transformer
L-4	2nd I.F. transformer
R-1	1.0 megohm volume control
R-2	220,000 ohms carbon resistor
R-3	47,000 ohms carbon resistor
R-4	150 ohms carbon resistor
R-5	560 ohms carbon resistor
R-6	2.2 megohms carbon resistor
R-7	15 megohms carbon resistor
R-8	1.0 megohm carbon resistor
R-9	1800 ohms carbon resistor
R-10	470,000 ohms carbon resistor
R-11	3.9 megohms carbon resistor
R-12	680,000 ohms carbon resistor
R-13	1.5 megohms carbon resistor
R-14	27 ohms carbon resistor
S-1	Power switch (on volume control)
S-2	AC-DC or Battery switch
T-1	Output transformer

GENERAL INFORMATION

Model HB-412 is a portable, four-tube, superheterodyne receiver designed to operate on any one of three types of power supply as listed under electrical specifications. Features of design include automatic power selector switch, built-in Beam-a-Scope, 4-inch Dynapower speaker, and automatic volume control.

The automatic power selector switch operates as follows: Inside the small door on the left side of the cabinet is the power selector lever. To operate radio on batteries see that the prongs on the power cord plug are inserted in the lever holes and the plug pushed in until it wedges between the cabinet wall and the lever. Place the rest of the power cord in the compartment and close the door. To operate radio on an AC or DC power supply merely remove the power cord and plug from the compartment and insert in a convenience outlet.

Note: Do not press in on power selector lever while power cord is in convenience outlet.

When operating from a DC source of power, it is necessary to insert the power plug with the proper polarity; otherwise the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

When the receiver is operating on batteries it will perform as soon as it is turned on. However, when operating from an AC or DC power supply, sufficient time must be allowed for the tubes to become heated.

Audio power output is obtained from the 1T5GT on battery operation, and from the pentode section of the 117L7GT on AC or DC, 115-volt operation. The driving grids of the two tubes are in parallel. On battery operation the 117L7GT is dead due to no filament voltage, as is the case of the 1T5GT on AC-DC, 115-volt operation. A tapped primary output transformer is used to insure matching to the different load impedances of the two output tubes. If the receiver does not operate on low line voltage check 117L7GT for low plate current since its plate current energizes the 3A8GT and 1A7GT filaments; also check 1A7GT for low emission.

Precaution:

Model HB-412 when used on an AC power supply will have one side of the chassis connected directly to the line. In order to prevent injury to alignment equipment or shock to the servicemen, use an isolating transformer between the convenience outlet and the receiver power cord.

SERVICE DATA

Electrical Specifications

1. AC or DC Power Supply
   110–120 Volts, 25–60 cycles on AC, 25 watts
2. Battery Power Supply
   6-volt "A" supply, 90-volt "B" supply.

Recommended batteries for long life.
(a) "A" supply—Eveready No. 747 or equivalent
(b) "B" supply—two Eveready No. 482 or equivalent

Loud-speaker-"Alnico" Magnetic Dynamic

Outside Cone Diameter..................4 inches
Voice Coil Impedance (400 cycles). .....3.5 ohms

Tubes

Converter-Oscillator..................GE-1A7GT
I.F.—Det.—Aud.—AVC GE-3A8GT
Battery Power Output................GE-1T5GT
AC-DC Power Output—Rectifier........GE-117L7GT

Tuning Frequency Range. . .550–1600 KC

Intermediate Frequency. . . .455 KC

Maximum Power Output

Battery Operation.......275 milliwatts
AC or DC Operation.....2 watts

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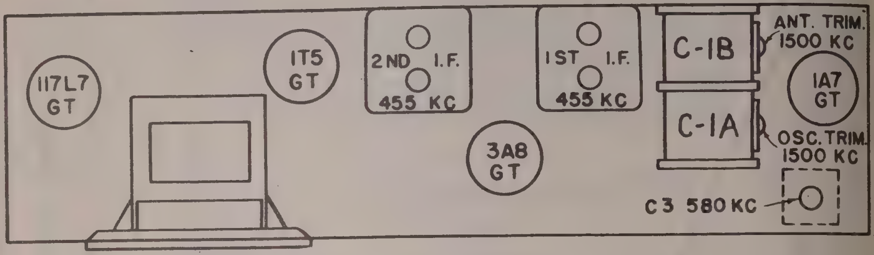


Fig. 1. Trimmer Location

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.	455 KC
R.F.	1500 and 580 KC

The location of all trimmers is shown in Fig. 1.

General Alignment Notes

This receiver must be removed from the carrying case in order to perform the alignment. Special care must be exercised to place the batteries, Beam-a-Scope and chassis in the same relative positions with respect to one another as these components occupied in the case; otherwise, alignment will not be satisfactory.

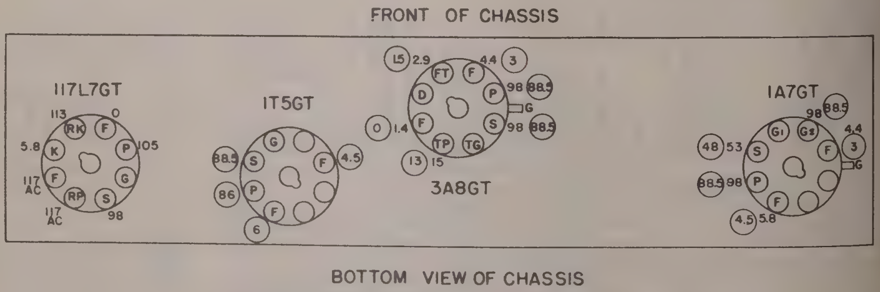
I.F. Alignment

With batteries, Beam-a-Scope and chassis in position for alignment as mentioned above, and using an isolating transformer if operating from an AC power source (refer to precaution under "General Information"), set up and align as follows: Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 KC and apply signal to the control grid of the 3A8GT tube through a .05 mfd. capacitor. Align the 2nd I.F. transformer trimmers. Next apply signal to the control grid of the 1A7GT through the same .05 mfd. capacitor and align the 1st I.F. transformer trimmers. Retouch the 2nd I.F. transformer trimmers while applying signal to the 1A7GT tube. Do not remove the grid leads from the tubes when applying the oscillator signal and keep the test oscillator output as low as a readable meter reading will permit.

R.F. Alignment

Place a one turn coupling loop not closer than six inches from the receiver Beam-a-Scope. Apply a 1500 KC signal to the coupling loop. Set pointer to 1500 KC and align the oscillator trimmer (C-1A). Peak (C-1B) for maximum output. Change test signal to 580 KC and with pointer in region of 580 KC peak (C-3) while rocking the gang condenser. Retrim at 1500 KC.

The Beam-a-Scope leads should be dressed the same as the components are mounted in the cabinet as during alignment.



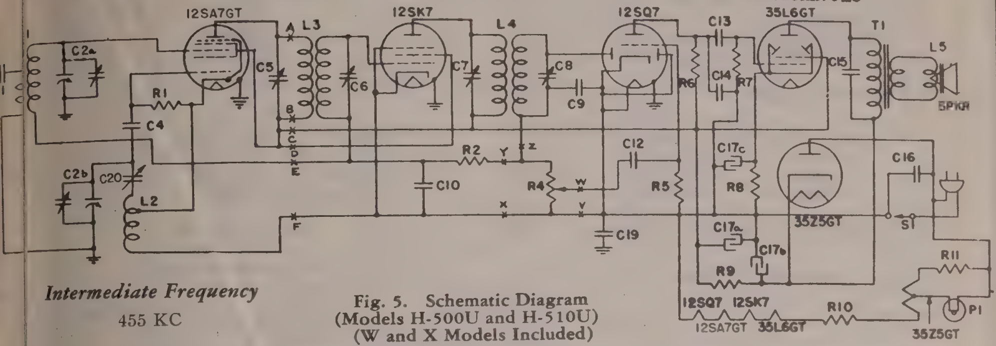
VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS.
VOLTAGE READINGS ENCIRCLED INDICATE VALUES OBTAINED WHEN OPERATING WITH A 6-VOLT "A" BATTERY AND A 90-VOLT "B" BATTERY.
REMAINING VOLTAGE READINGS OBTAINED WHEN OPERATING ON A 117-VOLT AC POWER SUPPLY.
READINGS GREATER THAN 50 OBTAINED ON 250-VOLT SCALE OF 1000 OHMS PER VOLT METER.

D- DIODE PLATE
F- FILAMENT
FT- FILAMENT TAP
G- CONTROL GRID
G1- OSCILLATOR GRID
G2- OSCILLATOR PLATE
K- CATHODE
P- PLATE
RK- RECTIFIER CATHODE
RP- RECTIFIER PLATE
S- SCREEN
TG- TRIODE GRID
TP- TRIODE PLATE

Fig. 2. Socket Voltages

GENERAL ELECTRIC CO.

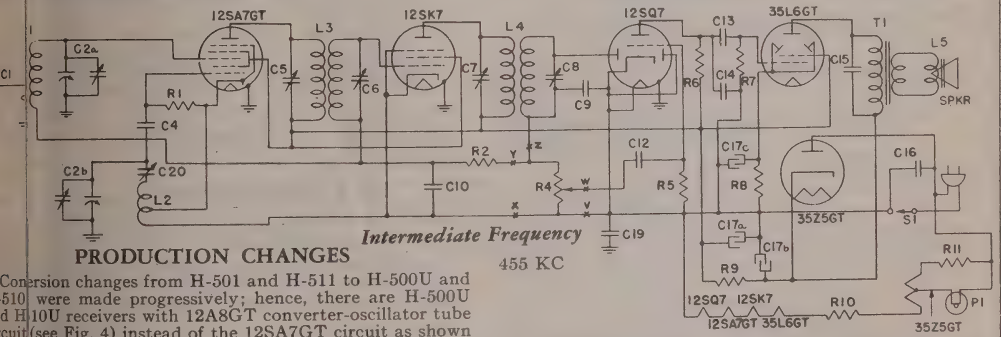
MODELS H500U,H510U
(W,X) Early,Late
Schematics,Changes
MODEL H520U (W,X)
Schematic



Intermediate Frequency
455 KC

Fig. 5. Schematic Diagram
(Models H-500U and H-510U)
(W and X Models Included)

Refer to Production Changes for circuits with 12A8GT tube and 2.0 megohm volume control. Lettered points indicate break-points for i ertion of circuits shown in Figs. 3 and 4.



Intermediate Frequency
455 KC

* Refer to Production Changes for circuits with 2.0 megohm volume control. Lettered points indicate break-points for insertion of circuit shown in Fig. 3.

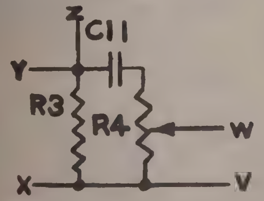
Fig. 6. Schematic Diagram
Model H-520U
(W and X Models Included)

PRODUCTION CHANGES

Con ersion changes from H-501 and H-511 to H-500U and
510 were made progressively; hence, there are H-500U
d H 10U receivers with 12A8GT converter-oscillator tube
cuit (see Fig. 4) instead of the 12SA7GT circuit as shown
the chematic diagram, Fig. 5. Insert the 12A8GT circuit
pla of the 12SA7GT circuit for those models having a
A8C tube. When ordering replacement parts for the
A8C circuit be sure to refer to the special replacement
rts t.

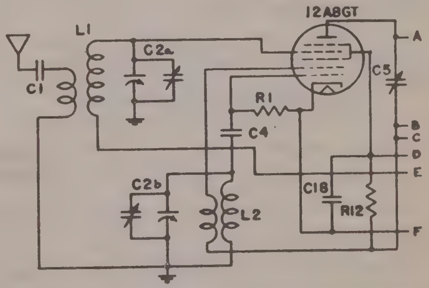
Sim rly there will be found receivers of Model H-500U,
510 and H-520U which have a 2.0 megohm volume control
cuit see Fig. 3). If such is the case insert the 2.0 megohm
lum control circuit in place of the 500,000 ohm volume
ntro circuit shown in the schematic diagram (Figs. 5 and
. W n ordering replacement parts for the 2.0 megohm
lum control circuit be sure to refer to the special replace-
ent rts list.

Cap itor (C-12) was .002 mfd. in all early production
ceiv s. It was later changed to .03 mfd. to improve per-
rma e.



Sym	Description
C-1	.002 mfd. paper capacitor
R-3	500,000 ohms carbon resistor
R-4	2 megohm volume control (RV-070)

Fig. 3. 2.0 Megohm Volume Control Circuit
(Refer to Production Changes)



Symbol	Description
C-1	.002 mfd. paper capacitor
C-2a	Antenna section tuning condenser } (RC-7013)
C-2b	Oscillator section tuning condenser } (RC-7013)
C-4	47 mmf. mica capacitor
C-18	.05 mfd. paper capacitor
L-1	Antenna coil (RL-085)
L-2	Oscillator coil (RL-290)
R-1	47,000 ohms carbon resistor
R-12	8200 ohms carbon resistor

Fig. 4. 12A8GT Converter-Oscillator Tube Circuit—Models
H-500U and H-510U
(Refer to Production Changes)

MODELS H500U,H510U(W,X)
MODEL H520U(W,X)
Gain,Voltage,Trimmers
Coils,Socket

GENERAL ELECTRIC CO.

Color Specifications

Model	Color and Material
H-500U, 510U, 520U	Oak—Plastic
H-500UW, 510UW, 520UW	Ivory—Plastic
H-500UX; 510UX, 520UX	Onyx—Plastic

Tuning Frequency Range

Model	H-500U, 510U (W and X Models Included)	H-520U (W and X Models Included)
Range	540–1800 KC	540–1600 KC

Electrical Power Output (115-line volts)

Undistorted	0.9
Maximum	1.8

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter	4 inches
Voice Coil Impedance (400 cycles)	3.5 ohms

Electrical Specifications

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
115 Volts AC or DC	25–60	30

Dial Lamp........Mazda No. 47

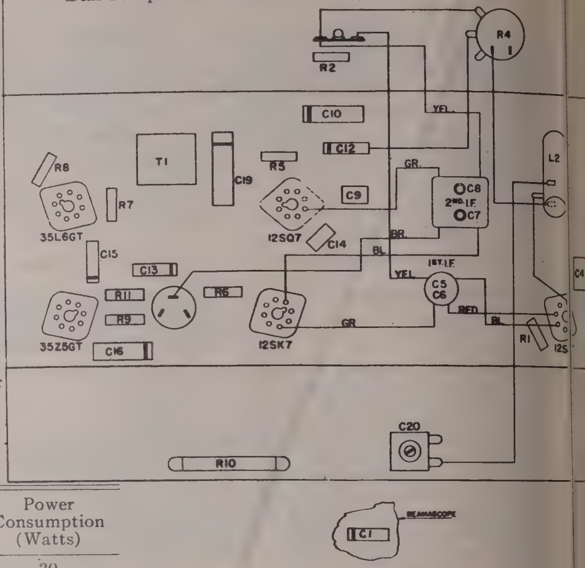


Fig. 7. Chassis Parts Layout

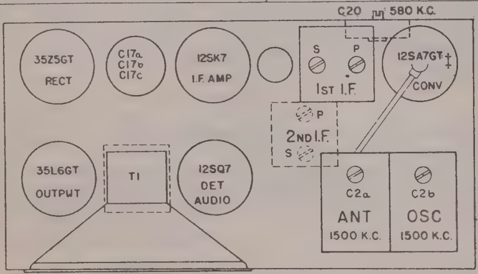


Fig. 1. Trimmer Location

‡ GE-12A8GT used on early production Model H-500U and H-510U.

COIL RESISTANCE CHART

Coil	Section	Resistance (Ohms)
Antenna Coil (H-500U, 510U)	Primary Secondary	7 26
Oscillator Coil (12SA7GT)	From C-20 to −B	5
Oscillator Coil (12A8GT)	Plate Section Grid Section	1.9 5.2
1st I.F. Transformer	Primary Secondary	29 29
2nd I.F. Transformer	Primary Secondary	30 30
Output Transformer	Primary Secondary	115 0.4

Special Service Information

The following information will be found very use servicing receivers if a vacuum tube voltmeter or s voltage measuring instrument is available.

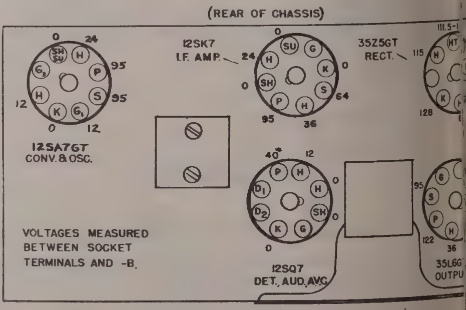
(1) Stage Gains — Gain

Antenna to 12SA7GT	3 to 4 at 100
12SA7GT to 12SK7 grid	42 at 455
12SK7 grid to 12SQ7 detector plate	70 at 455

(2) 0.1 volt, 400 cycle signal across volume contro give ½ watt speaker output.‡ (Volume turn maximum.)

(3) Average DC voltage developed across oscillato resistor (R-1)—12 volts.

‡ Variation of +10%, −20% permissible.



Bottom View of Chassis

Line volts—115. No signal input. When operated on a d-c power suppl ages are about 15% lower. Use a high resistance voltmeter.
* Measured on 500 volt scale of 1000 ohms per volt meter.

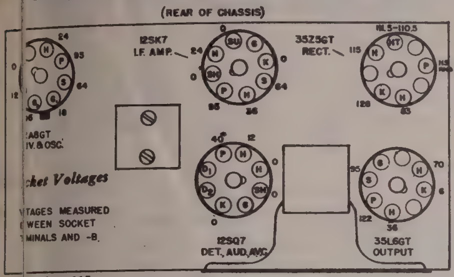
Fig. 2. Socket Voltages

olt ge,Socket,Chassis Wiring ai Parts List

GENERAL ELECTRIC CO.

MODELS H500,H501,H510,H511 H520,H521 (W and X)

-500, 501, 510, 511, 520, 521............Oak Plastic
-500W, 501W, 510W, 511W, 520W, 521W. Ivory Plastic
-500X, 501X, 510X, 511X, 520X, 521X. . Onyx Plastic



BOTTOM VIEW OF CHASSIS

L : volts—115.
N signal input.
W n operated on a DC power supply, voltages are about 15% lower.
U a high-resistance voltmeter.
* asured on 500-volt scale of 1000 ohms per volt meter.

D -Diode Plate	GT—Oscillator Plate	HT—Heater Tap	S—Screen
D -Diode Plate	G—Control Grid	K—Cathode	SU—Suppressor
G -Oscillator Grid	H—Heater	P—Plate	SH—Shell

ODEL	H-500, 501, 510, 511 (W and X Models Included)	H-520, 521 (W and X Models Included)
ange	540–1800 KC	540–1600 KC

ower Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
5 Volts AC or DC	25–60	30

lect cal Power Output (115-line volts)

ndis rted............................0.9
laxi m...........................1.8

uds aker "Alnico" Magnetic Dynamic

utsi Cone Diameter...........4 inches
oice oil Impedance (400 cycles) 3.5 ohms

PRODUCTION CHANGES

Capacitor (C-12) was .002 mfd. in all early production receivers. As production progressed this capacitor was changed to .03 mfd. to improve performance.

Sp ial Service Information

he following information will be found very useful in se icing of receivers if a vacuum tube voltmeter or similar vo age measuring instrument is available.

) Stage Gains

	Gain
Antenna to 12A8GT grid	5 to 5.5 at 1000 KC
12A8GT grid to 12SK7 grid	42 at 455 KC‡
12SK7 grid to 12SQ7 detector plate	60 at 455 KC‡

) 0.1 volt, 400 cycle signal across volume control will give ½ watt speaker output. (Volume control turned to maximum).

) Average DC voltage developed across oscillator grid leak..............................18 volt

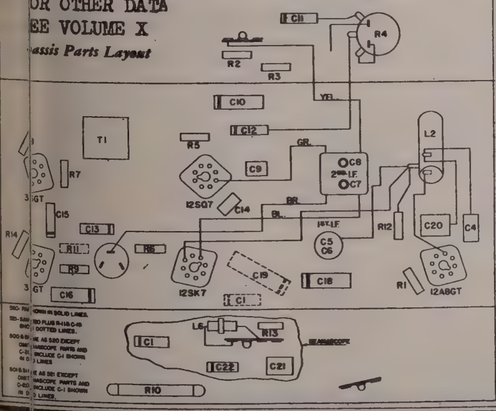
‡Variations of +10%, −20% permissible

lignment

recaution—If the signal generator is AC operated use an is ating transformer between the power supply and the radio r eiver power input. The use of an isolating capacitor is not r ommended as AC current through the capacitor will i roduce hum modulation and/or create the possibility of a b ned-out signal generator attenuator.

OR OTHER DATA
EE VOLUME X

assis Parts Layout


C11
R4
R2
R3
YEL.
C10
C12
T1
R5
GR.
C8
2ND I.F.
C7
L2
R7
C9
12SQ7
C14
BR.
BL.
GT
C15
C13
1ST I.F.
C5
C6
R12
C20
C4
R14
R11
R8
R9
C19
C18
R1
GT
C16
12SK7
C1
12A8GT
L6
R13
BEAMASCOPE
C1
C22
C21
R10
520 - PA OWN IN SOLID LINES.
521 - SAM 20 PLUS R-13 & C-19 SHO DOTTED LINES.
500 & 50 E AS 520 EXCEPT OMIT AMASCOPE PARTS AND C-20 INCLUDE C-1 SHOWN IN D LINES
501 & 51 E AS 521 EXCEPT OMIT AMASCOPE PARTS AND C-20 INCLUDE C-1 SHOWN IN D LINES.

Stock No.	Description	List Price
RL-291	COIL—Oscillator coil for Models H-520 and H-521 (W & X inc.) (L-2)	$0.50
RL-346	CHOKE—RF choke for Models H-520 and H-521 (W & X inc.) (L-6)	.30
RL-510	LOOP—Beam-a-Scope assembly for Models H-520 and H-521 (W & X inc.) (L-1)	.70
RL-937	LUG—Key pin binding lug (Pkg. 10)	.10
RP-134	PIN—Key pin for Models H-510, 511, 520, 521 (W & X inc.) (Pkg. 10)	.05
*RQ-1215	RESISTOR—15 ohms, ½ W. carbon (R-14) (Pkg. 5)	.70
*RQ-1283	RESISTOR—10,000 ohms, ½ W. carbon (R-13) Models H-520 and H-521 (W & X inc.) (Pkg. 5)	.70
RS-256	SOCKET—Electrolytic mounting socket for Models H-501, 511, 521 (W & X inc.)	.05
RS-257	SOCKET—Electrolytic mounting socket for Models H-500, 510, 520 (W & X inc.)	$0.05
RS-1016	SPEAKER—4-inch speaker for Models H-501, 511, 521 (W & X inc.) (L-5)	3.35
RS-1017	SPEAKER—4-inch speaker for Models H-500, 510, 520 (W & X inc.) (L-5)	3.25
RT-321	TRANSFORMER—1st IF transformer (L-3) for Models H-520 and H-521 (W & X inc.)	.95
RT-323	TRANSFORMER—1st IF transformer for Models H-500, H-501, H-510, H-511 (W & X inc.)	.90
RW-039	WINDOW—Celluloid station letter window for Models H-510, 511, 520, 521 (W & X inc.) (Pkg. 25)	.10
*RB-013	BOARD—Terminal board (2 lug) for Models H-500, 501, 510, 511 (W & X inc.)	.10
*RB-070	BOARD—Terminal board (3 lug) for Models H-520 and H-521 (W & X inc.)	.10
RB-179	BRACKET—Bracket for Beam-a-Scope frame for Models H-520 and H-521 (W & X inc.)	.10
RC-016	CAPACITOR—.002 mfd., 600 V. paper (C1, 11)	.25
*RC-060	CAPACITOR—.03 mfd., 600 V. paper (C-12)	.25
*RC-130	CAPACITOR—.2 mfd., 400 V. paper for Models H-501, 511, 521 (W & X inc.) (C-19)	.30
*RC-348	CAPACITOR—1600 mmf. mica for Models H-520, 521 (W & X inc.) (C-20)	.35
*RC-390	CAPACITOR—3900 mmf. mica for Models H-520 and H-521 (W & X inc.) (C-21)	.35
RC-1990	CLAMP—Antenna coil clamp for Models H-500, 501, 510, 511 (W & X inc.) (Pkg. 5)	.10
RC-7012	CONDENSER—Tuning condenser for Models H-510, 511, 520, 521 (W & X inc.) (C-2a, 2b)	4.00
RC-7013	CONDENSER—Tuning condenser for Models H-500, 501 (W & X inc.) (C-2a, 2b)	2.00
RC-8508	CARDS—Station letter cards for Models H-510, 511, 520, 521 (W & X inc.)	.30
RD-111	DIAL—Dial scale for Models H-500, 501, 510, 511 (W & X inc.)	.20
RD-112	DIAL—Dial scale for Models H-520 and H-521 (W & X inc.)	.20
RD-411	DRUM—Tuning condenser drive drum assembly for all models in ivory	.60
RD-414	DRUM—Tuning condenser drive drum assembly for all models in onyx	.60
RH-007	HANK—Antenna hank for Models H-500, 501, 510, 511 (W & X inc.)	.20
RK-048	KNOB—Control knob for all models in ivory	.15
RK-051	KNOB—Control knob for all models in brown	.15
RK-065	KNOB—Control knob for all models in onyx	.15
RK-206	KEY—Station selector key for Models H-510, 511, 520, 521, 510W, 511W, 520W, 521W (Pkg. 5)	.50
RK-208	KEY—Station selector key for Models H-510X, H-511X, H-520X, H-521X (Pkg. 5)	.70
RL-085	COIL—Antenna coil for Models H-500, 501, 510, 511 (W & X inc.) (L-1)	.50
RL-290	COIL—Oscillator coil for Models H-500, 501, 510, 511, (W & X inc.) (L-2)	.50

*Used on previous receivers

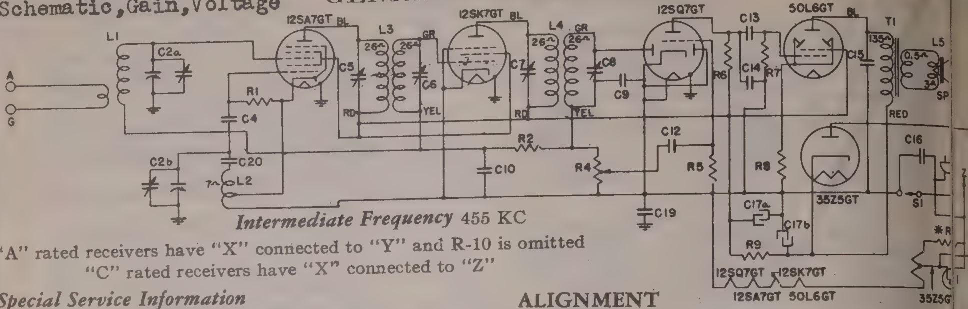
Prices subject to change without notice

(When ordering drums, knobs, or keys, specify color)

MODEL HJ514
Schematic,Gain,Voltage

GENERAL ELECTRIC CO.

Socket,Alignment,Tr



Intermediate Frequency 455 KC

"A" rated receivers have "X" connected to "Y" and R-10 is omitted

"C" rated receivers have "X" connected to "Z"

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains — Gain
- Antenna to 12SA7GT grid...3 to 3.5 at 1000 KC‡
- 12SA7GT grid to 12SK7GT grid....................50 at 455 KC ‡
- 12SK7GT grid to 12SQ7GT detector plate............50 at 455 KC ‡

Gains shown in the first two stages do not contain the conversion gain which amounts to 1.1 at 1000 KC.

(2) 0.15 volt, 400 cycle signal across the volume control will give ½ watt speaker output. (Volume control turned to maximum.)

(3) Average DC voltage developed across oscillator grid leak..................................15 volts

‡ Variations of +10%, −20% permissible.

The glass tubes used in the I.F. amplifier and 2nd detector stages are interchangeable with metal tubes.

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-179	BRACKET—Cabinet back chassis mounting bracket	.10
*RB-626	BUSHING—Tuning shaft bushing	.10
*RB-1015	BOARD—Terminal board (1 lug)	.10
RB-1102	BRACKET—Condenser mounting bracket	.10
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-13)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-15, 20)	.25
*RC-060	CAPACITOR—.03 mfd. 600 V. paper (C-12)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-10)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-16)	.30
*RC-130	CAPACITOR—0.2 mfd. 400 V. paper (C-19)	.30
*RC-232	CAPACITOR—47 mmf. mica (C-4)	.25
*RC-274	CAPACITOR—330 mmf. mica (C-14)	.30
*RC-293	CAPACITOR—470 mmf. mica (C-9)	.30
*RC-863	CORD—Power cord	.65
RC-5159	CAPACITOR—30 mfd. 150 V; 40 mfd. 150 V; dry electrolytic (C-17a, 17b)	.70
RC-7026	CONDENSER—Tuning condenser (C-2a, 2b)	2.05
RC-8160	CABLE—Tuning condenser drive cable	.10
*RC-9015	CONE ASSEMBLY—4-inch Dynapower speaker cone assembly	.80
RD-147	DIAL—Dial scale	
*RH-111	HAIRPIN COTTER—Tuning shaft retaining cotter (Pkg. 10)	.05
*RK-074	KNOB—Volume and tuning knobs (Pkg. 5)	.50
RL-525	BEAM-A-SCOPE—Cabinet back and Beam-a-Scope assembly (L-1)	.90
RL-2025	COIL—Oscillator coil (L-2)	.30
*RTN-001	NUT—Volume and tuning control pal nut (Pkg. 5)	.10
RP-173	POINTER—Dial pointer	.20
RQ-1214	RESISTOR—13 ohms, ¼-W. carbon ±5% (R-10) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms, ½-W. carbon (R-8) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½-W. carbon (R-6, 7) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 meg. ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 meg. ¼-W. carbon (R-5) (Pkg. 5)	.70
*RQ-1460	RESISTOR—1,200 ohms, 1-W. carbon (R-9) (Pkg. 5)	.70
*RS-238	SOCKET—Octal tube socket	.15
RS-278	SOCKET—Dial lamp socket assembly	.30
*RS-426	SPRING—Drive cable tension spring (Pkg. 5)	.10
RS-954	SPACER—Cardboard dial spacer (Pkg. 5)	.05
RS-1030	SPEAKER—4-inch Dynapower speaker (Complete with output transformer)	$3.25
RS-4002	SPRING—Dial scale retaining spring (Pkg. 3)	.05
RS-9000	SHAFT—Tuning control shaft	.10
RT-352	TRANSFORMER—1st I.F. transformer (L-3)	.70
RT-353	TRANSFORMER—2nd I.F. transformer (L-4)	.70
RT-482	TRANSFORMER—Output transformer (T-1)	.90
RT-955	TERMINAL—Antenna or ground terminal (Pkg. 5)	.10
RV-091	VOLUME CONTROL—0.5 megohm volume control (R-4)	.80
RW-046	WINDOW—Dial scale window	.15
RW-121	WASHER—Pointer felt washer (Pkg. 10)	.05

* Used on previous receivers—(Prices subject to change without notice).

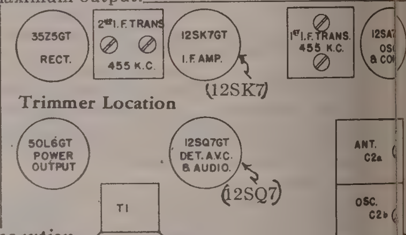
ALIGNMENT

I.F. Connect an output meter across the voice coil. volume control to maximum. Set test oscillator to and keep the oscillator output as low as a readab reading will permit.

Apply signal to the converter grid of the 12SA7GT a 0.05 mfd. capacitor and align progressively the tri the 2nd and 1st I.F. transformer cans. Do not remov lead from the 12SA7GT.

R.F. To insert the R.F. signal use either a standar dummy between the signal generator and the receiver post or a loop connected across the generator outp can be magnetically coupled to the receiver Beam When using an I.R.E. dummy antenna for R.F. al the ground lead from the signal generator to the ground post should be omitted.

With the gang condenser wide open, align oscilla mer (C-2b) to 1650 KC. Change generator signal to tune receiver to the signal and peak antenna trimm for maximum output.



Trimmer Location

Precaution

If the signal generator is AC operated use a transformer between the power supply and the rad power input.

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	P Cons (V
A	115—AC or DC	40–60	
C	115—AC or DC	25	

Electrical Power Output (*117-line volts*)

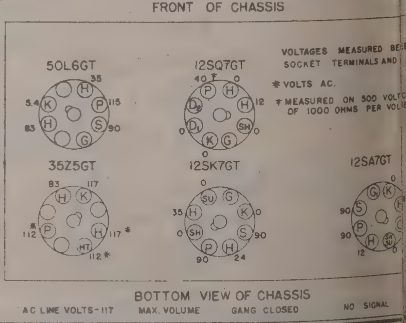
Undistorted..............................1.3

Maximum..............................1.9

Loud-speaker—"Alnico" Magnetic Dynami

Outside Cone Diameter..............4 i

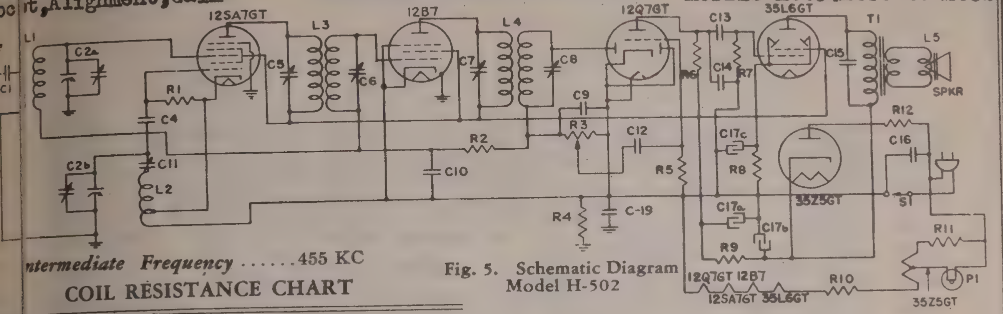
Voice Coil Impedance (400 cycles)......3.5



h atics,Voltage,Coils
c t,Alignment,Gain

GENERAL ELECTRIC CO.

MODEL H502
MODELS H503.H530 to H532



ntermediate Frequency ......455 KC

Fig. 5. Schematic Diagram
Model H-502

COIL RESISTANCE CHART

Coil	Section	Resistance
cill or Coil	Between C-11 and -B	5 ohms
t I. Transformer	Primary Secondary	29 ohms 29 ohms
d I. Transformer	Primary Secondary	30 ohms 30 ohms
utp Transformer	Primary Secondary	115 ohms 0.4 ohms

eci Service Information

Th ollowing data will be very useful to servicemen equiped w h vacuum tube voltmeters or similar voltage measuring stru ents.

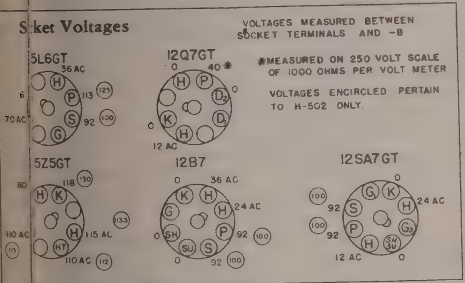
(1) Stage Gains	Gain
Antenna to Converter Grid	3 to 4 at 1000 KC
Converter Grid to 12B7 Grid	45 at 455 KC‡
12B7 Grid to 12Q7GT Grid	80 at 455 KC‡

(2) .1 volt, 400 cycle signal across volume control will ive ½ watt speaker output. ‡(Volume Control turned o Maximum).

(3) verage DC voltage developed across oscillator grid esistor (R-1)—12 volts.

V iations of +10%, −20%, permissible.

S ket Voltages



Lou peaker—"Alnico" Magnetic Dynamic

Ou ide Cone Diameter..........................4 inches
Vo e Coil Impedance (400 cycles)..............3.5 ohms

Model	Color	Material
H-502	Mahogany	Plastic
H-503	Walnut	Wood
H-530	Walnut	Wood
H-531	Maroon	Texti-leather over wood
H-532	Eggshell Gray	Texti-leather over wood

GENERAL INFORMATION

These Models are compact superheterodyne receivers using five General Electric Pre-tested Tubes. Operation is permitted on either a DC or AC source of power. Features of design include the new "Alnico" Dynapower speaker, single-ended tubes in the detector circuits, high-filament voltage tubes which eliminate line dropping resistors, and full approval of the Underwriters' Laboratories.

Model	Power Supply (Volts)	Frequency (Cycles on A-C)	Power Consumption (Watts)
H-502	115 Volts AC or DC	25–60	30
H-503, 530, 531, 532	115 Volts AC or DC	40–60	30

Electrical Power Output (*115-line volts*)

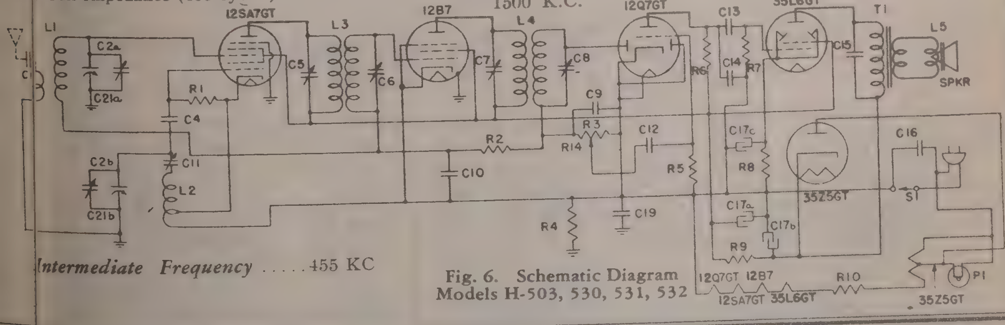
Undistorted...1.2 watts
Maximum...2.3 watts

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Turn the Volume Control to maximum. Set test oscillator to 455 K.C. and keep the oscillator output as low as a readable meter reading will permit.

Apply this signal to the grid of the 12B7 through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the 12SA7GT and aligning the 1st I.F. transformer. Do not remove grid leads from the tubes. Finish alignment by overall adjustments.

R.F. Apply a 1500 K.C. signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-scope. Align (C-2b) at 1500 K.C. and peak (C-2a) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-11) on the 580 K.C. signal by rocking the gang condenser. Retrim at 1500 K.C.



Intermediate Frequency .....455 KC

Fig. 6. Schematic Diagram
Models H-503, 530, 531, 532

MODEL H502
MODELS H503,H530 to H532

GENERAL ELECTRIC CO.

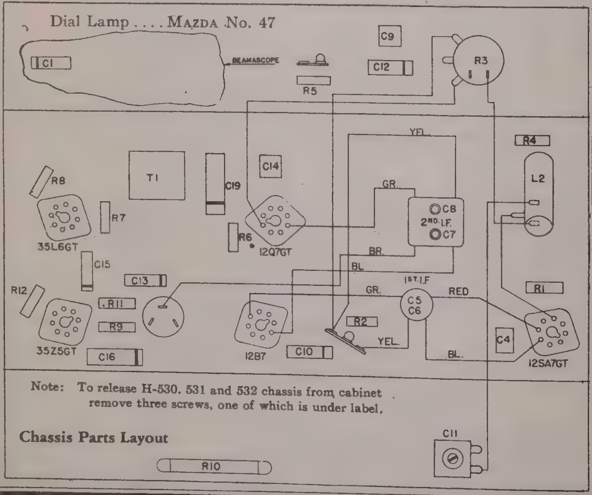
Chassis Wiring,Trimmers
Parts List

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-013	BOARD—Terminal board (2 lug)	.10
RB-179	BRACKET—Bracket for "Beam-a-Scope" frame	.10
RB-193	BRACKET—Pilot light bracket for Model H-502	.05
RB-194	BRACKET—Pilot lamp bracket for Model H-503	.05
RB-915	BACK COVER—Cabinet back cover for Model H-502	1.00
RB-927	BACK COVER—Cabinet back cover for Model H-503	.10
RB-928	BACK COVER—Cabinet back cover for Models H-530, 531, and 532	.10
*RC-011	CAPACITOR—.002 mfd. 600 V. paper (C-1)	.25
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-13)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-15)	.25
*RC-060	CAPACITOR—.03 mfd. 600 V. paper (C-12)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-10)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-16)	.30
*RC-130	CAPACITOR—0.2 mfd. 400 V. paper (C-19)	.30
*RC-216	CAPACITOR—47 mmf. mica (C-4)	.25
*RC-274	CAPACITOR—330 mmf. mica (C-14)	.30
*RC-294	CAPACITOR—470 mmf. mica (C-9)	.30
RC-676	CAPACITOR—B band padder (C-11)	.35
*RC-863	CORD—Power cord	.65
RC-5135	CAPACITOR—30 mfd. 150 V., 40 mfd. 150 V., 20 mfd. 25 V., dry electrolytic (C-17a, 17b, 17c)	1.15
RC-7019	CONDENSER—Tuning condenser for Models H-502 and 503 (C-2a, 2b)	2.05
RC-7020	CONDENSER—Tuning condenser for Models H-530, 531, and 532 (C-21a, 21b)	2.05
RC-9013	CONE ASSEMBLY—4-inch P.M. Cone Assembly for all models	.80
RD-140	DIAL—Dial scale for Models H-502 and 503	.20
RD-141	DIAL—Dial scale for Models H-530, 531, and 532	.45
RD-410	DRUM—Tuning condenser drive drum for Model H-502	.20
RD-416	DRUM—Tuning condenser drive drum for Model H-503	.35
*RG-016	GRID CLIP—Control grid clip (Pkg. 5)	.10
RK-051	KNOB—Control knob for Model H-502	.15
RK-057	KNOB—Control knob for Model H-503	$0.10
RK-071	KNOB—Control knob for Models H-530 and 532	.20

Symbol	Description	List Price
RK-072	KNOB—Control knob for Model H-531	.2
RL-518	LOOP—Beam-a-Scope assembly (L-1)	.8
RL-2018	COIL—Oscillator coil (L-2)	.4
RM-505	MASK—Drum dial felt masks for Model H-503	.0
*RQ-1215	RESISTOR—15 ohms ½ W. Carbon (R-12) (Pkg. 5)	.70
*RQ-1223	RESISTOR—33 ohms ½ W. Carbon (R-11) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms ½ W. Carbon (R-8) (Pkg. 5)	.70
*RQ-1261	RESISTOR—1200 ohms ½ W. Carbon (R-9) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms ½ W. Carbon (R-1) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms ½ W. Carbon (R-4, 6, 7) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms ½ W. Carbon (R-2) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohms ¼ W. Carbon (R-5) (Pkg. 5)	.70
RR-351	RESISTOR—100 ohms wire wound (R-10)	.20
*RS-238	SOCKET—Octal tube socket	.15
RS-256	SOCKET—Electrolytic mounting socket	.05
RS-258	SOCKET—Pilot lamp socket	.25
RS-263	SOCKET—12B7 tube socket	.15
RS-464	SPRING—Tuning drum spring (Pkg. 10)	.05
RS-1016	SPEAKER—4-inch P.M. speaker for Models H-503, 530, 531 and 532 (L-5)	3.35
RS-1026	SPEAKER—4-inch P.M. speaker for Model H-502 (L-5)	3.25
RT-322	TRANSFORMER—2nd I.F. transformer (L-4)	1.00
RT-343	TRANSFORMER—1st I.F. transformer (L-3)	.95
RT-465	TRANSFORMER—Output transformer for Models H-503, 530, 531 and 532 (T-1)	1.00
RT-476	TRANSFORMER—Output transformer for Model H-502 (T-1)	1.30
RV-080	VOLUME CONTROL—500,000 ohm volume control for Model H-502 (R-3)	.75
RV-081	VOLUME CONTROL—500,000 ohm volume control for Model H-503 (R-3)	.75
RV-082	VOLUME CONTROL—500,000 ohm volume control for Models H-530, 531 and 532 (R-14)	.75
RZ-170	CABINET—Brown Cabinet for Model H-502	2.95

* Used on previous receivers.
(Prices Subject to Change without Notice)

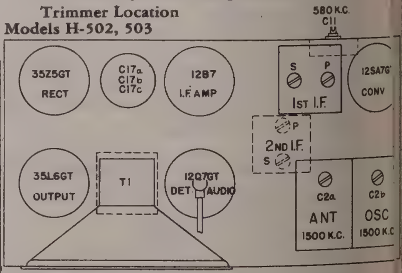
Dial Lamp .... MAZDA No. 47



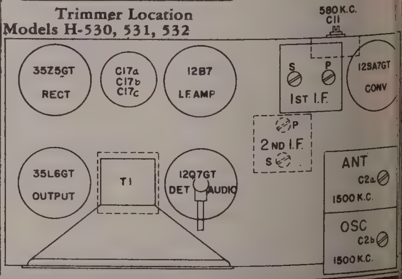
Note: To release H-530, 531 and 532 chassis from cabinet remove three screws, one of which is under label.

Chassis Parts Layout

Trimmer Location
Models H-502, 503



Trimmer Location
Models H-530, 531, 532



MODEL HB504
MODEL HB505
Schematics

GENERAL ELECTRIC CO.

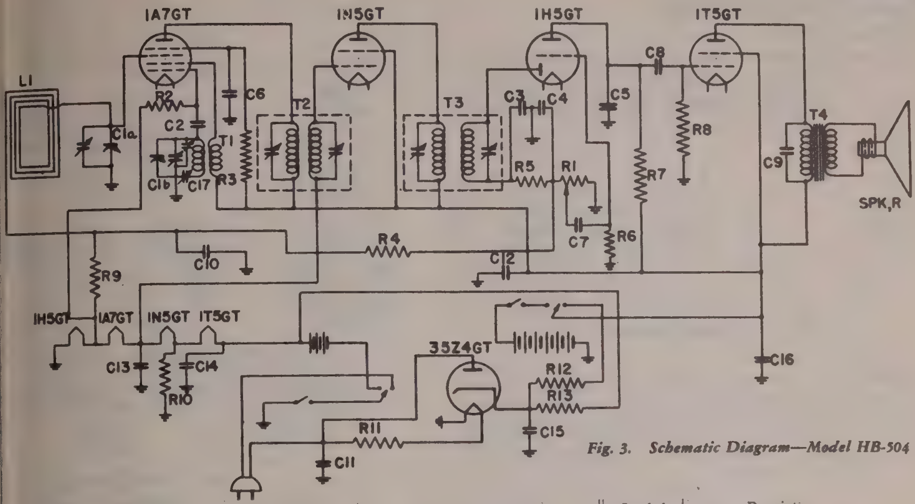


Fig. 3. Schematic Diagram—Model HB-504

bol	Description	Symbol	Description	Symbol	Description
C	Tuning Condenser	C-13	0.1 mfd., Paper Capacitor	R-7	1.0 megohms, Carbon Resistor
C	50 mmf. Mica Capacitor	C-14	100 mfd., 15 V. Dry Electrolytic	R-8	3.0 megohms, Carbon Resistor
C	100 mmf., Mica Capacitor	C-15	50 mfd., 150 V. Dry Electrolytic	R-9	3.0 megohms, Carbon Resistor
C	100 mmf., Mica Capacitor	C-16	20 mfd., 150 V. Dry Electrolytic	R-10	1000 ohms, Carbon Resistor
C	100 mmf., Mica Capacitor	C-17	600 KC, Padding Capacitor	R-11	600 ohms, Cord Dropping Resistor
C	.05 mfd., Paper Capacitor	L-1	Beam-a-scope	R-12	3000 ohms, Carbon Resistor
C	.001 mfd., Paper Capacitor	R-1	1.0 megohm, Volume Control	R-13	2500 ohms, Wire-wound Resistor
C	.004 mfd., Paper Capacitor	R-2	200,000 ohms, Carbon Resistor	T-1	Oscillator Coil
C	.002 mfd., Paper Capacitor	R-3	70,000 ohms, Carbon Resistor	T-2	1st I.F. Transformer
C	.05 mfd., Paper Capacitor	R-4	10 megohms, Carbon Resistor	T-3	2nd I.F. Transformer
C1	.05 mfd., Paper Capacitor	R-5	100,000 ohms, Carbon Resistor	T-4	Output Transformer
C2	0.1 mfd., Paper Capacitor	R-6	10 megohms, Carbon Resistor		

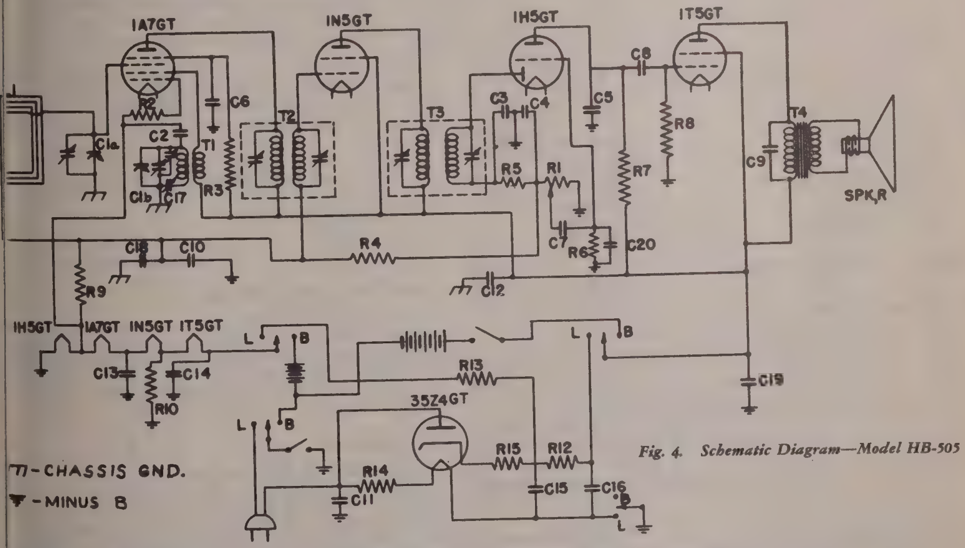


Fig. 4. Schematic Diagram—Model HB-505

mbol	Description	Symbol	Description	Symbol	Description
1	Tuning Condenser	C-14	100 mfd., 15 V. Dry Electrolytic	R-6	10 megohms, Carbon Resistor
2	50 mmf., Mica Capacitor	C-15	50 mfd., 150 V. Dry Electrolytic	R-7	1.0 megohm, Carbon Resistor
3	100 mmf., Mica Capacitor	C-16	20 mfd., 150 V. Dry Electrolytic	R-8	3.0 megohms, Carbon Resistor
4	100 mmf., Mica Capacitor	C-17	600 KC, Padding Capacitor	R-9	3.0 megohms, Carbon Resistor
5	100 mmf., Mica Capacitor	C-18	.25 mfd., Paper Capacitor	R-10	1000 ohms, Carbon Resistor
6	.05 mfd., Paper Capacitor	C-19	.05 mfd., Paper Capacitor	R-12	3000 ohms, Carbon Resistor
7	.001 mfd., Paper Capacitor	C-20	100 mmf., Mica Capacitor	R-13	2500 ohms, Wire-wound Resistor
8	.004 mfd., Paper Capacitor	L-1	Beam-a-scope	R-14	50 ohms, Carbon Resistor
9	.002 mfd., Paper Capacitor	R-1	1.0 megohm , Volume Control	R-15	50 ohms, Carbon Resistor
10	.05 mfd., Paper Capacitor	R-2	200,000 ohms, Carbon Resistor	T-1	Oscillator Coil
11	.05 mfd., Paper Capacitor	R-3	70,000 ohms, Carbon Resistor	T-2	1st I.F. Transformer
12	0.1 mfd., Paper Capacitor	R-4	10 megohms, Carbon Resistor	T-3	2nd I.F. Transformer
13	0.1 mfd., Paper Capacitor	R-5	100,000 ohms, Carbon Resistor	T-4	Output Transformer

MODEL HB504
MODEL HB505
Voltage, Socket, Trimmers
Alignment, Notes

GENERAL ELECTRIC CO.

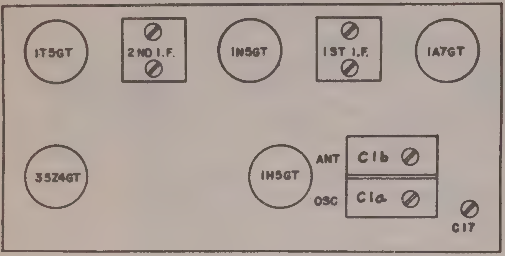


Fig. 1. Trimmer Location

Precaution: The Model HB-504 when used on an AC power supply will have one side of the chassis connected directly to the line. In order to prevent injury to the signal generator, if AC operated, or shock to the serviceman, use an isolating transformer between the convenience outlet and the receiver power cord.

Tubes

Converter and Oscillator	GE-1A7GT
I.F. Amplifier	GE-1N5GT
Det., Aud., AVC	GE-1H5GT
Power Output	GE-1T5GT
Rectifier	GE-35Z4GT

SERVICE DATA

Physical Dimensions

Models	HB-504 and HB-505
Height	9½ inches
Width	13¼ inches
Depth	6½ inches
Wt. with batteries	16¾ lbs

Tuning Control Drive Ratio.........................5:1

Electrical Specifications

1. AC or DC Power Supply
   105–125 Volts, 40–60 cycles on AC.
2. Battery Power Supply
   1.5 volt "A" supply, 90-volt "B" supply.
   Recommended batteries for 300-hour life:
   - (a) "A" supply—Eveready No. 718 or equivalent.
   - (b) "B" supply—Eveready No. 762 or equivalent.

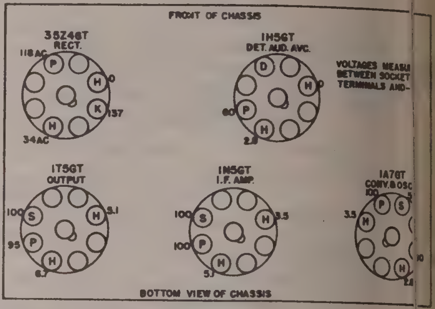
Tuning Frequency Range.................540–1600 KC

Intermediate Frequency..................455 KC

Maximum Power Output................175 milliwatts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter—5 inches.
Voice Coil Impedance (400) cycles 4.6 ohms.



Line volts—118. No signal input.
When operated on a DC power supply, voltages are about 15% wer
Voltages measured with a 20,000 ohms per volt meter.

D—Diode Plate	K—Cathode
G_1—Oscillator Grid	P—Plate
G_2—Oscillator Plate	S—Screen
H—Heater	

Fig. 2. Socket Voltages

GENERAL INFORMATION

The Models HB-504 and HB-505 are portable, five ibe superheterodyne receivers which are designed to opera on any one of three types of power supplies as listed under lectrical specifications. Features of design include auto tic power selector switch, built-in Beam-a-scope, 5-inch "Al co" magnet dynapower speaker and automatic volume cont .

The automatic power selector switch operates as fol ws When the door-cover at the side of the case is opened f the purpose of connecting the power cord to a convenience outlet, all batteries are automatically disconnected fron the circuit. When the power cord is replaced and the door-co r is closed the radio is automatically returned to battery eration.

When operating from a DC source of power, it is nece ry to insert the power plug with proper polarity; otherwis he receiver will fail to function. If any hum is noticed whe he receiver is used on AC, reverse the power plug in th receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 KC   Broadcast—1500 and 600 KC
The location of all trimmers is shown in Fig. 1.

General Alignment Notes

This receiver must be removed from the carrying cas in order to perform the alignment. Special care must be ercised to place the batteries, Beam-a-scope and chassis in he same relative positions with respect to one another as t se components occupied in the case, otherwise, alignment ll not be satisfactory.

I.F. Alignment

With batteries, Beam-a-scope and chassis in position r alignment as mentioned above, connect an output m r across the voice coil. Rotate the volume control to maxim . Set test oscillator to 455 KC and apply signal to the con l grid of the 1A7GT tube through a .05 mfd. capacitor. Do t remove the grid lead from the 1A7GT. Keep the test os lator output as low as a readable meter reading will perr . Adjust all I.F. trimmers for maximum output.

R.F. Alignment

Place a coupling loop six inches from the receiver Beam-scope. Apply a 1500 KC signal to the coupling loop. t pointer to 1500 KC and align the oscillator trimmer (C-1 . Peak (C-1b) for maximum output. Change test signal to 6 KC and with pointer in region of 600 KC peak (C-17) wh rocking the gang condenser.

GENERAL ELECTRIC CO.

MODELS H600,H601,H610,H611
MODELS H620,H621 (W,X)Final
Chassis Wiring,Gain,Voltage
Dial Drive,Socket

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

		Gain‡
(1)	Stage Gains.	
	Antenna to Converter Grid	2.7 at 1000 K.C.
	Converter Grid to 6SK7 Grid	28 at 455 K.C.
	6SK7 Grid to 6SQ7 Diode Plate	87 at 455 K.C.

‡Variations of +10%, −20% permissible.

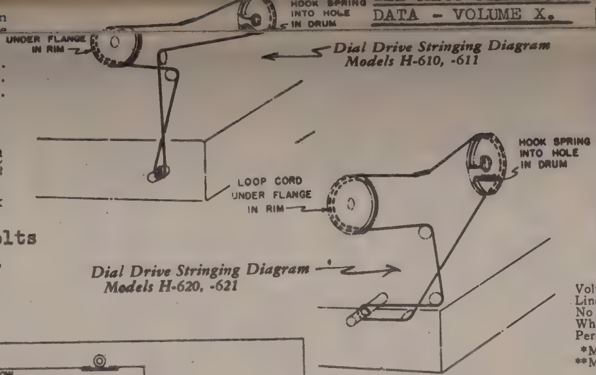
(2) Audio Gain.
.05 volts, 400 cycle signal across volume control with control set to maximum will give approximately ½ watt output at speaker.

(3) DC voltage developed across oscillator grid leak averages 13 volts.

Power Consumption is 55 watts at 115 volts AC or DC . AC frequency 25 - 60 cycles.

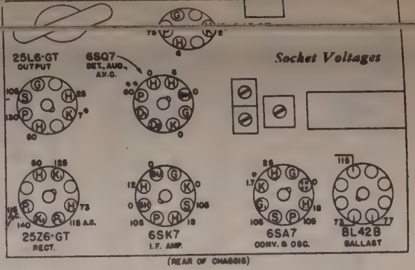
Power Output at 117 volts line:-
Undistorted....... 1.4 watt.
Maximum .... 2.5 watt.

DATA - VOLUME X.

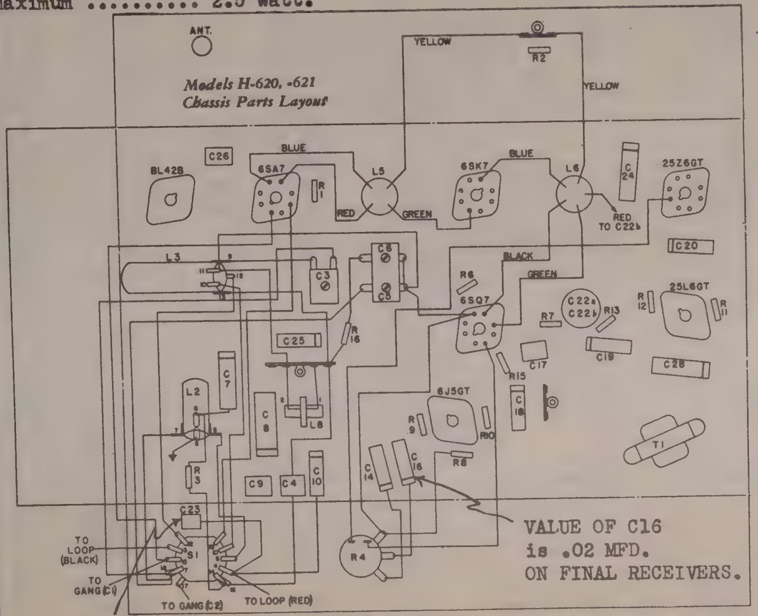

UNDER FLANGE IN RIM
HOOK SPRING INTO HOLE IN DRUM
LOOP CORD UNDER FLANGE IN RIM
HOOK SPRING INTO HOLE IN DRUM

Dial Drive Stringing Diagram Models H-610, -611

Dial Drive Stringing Diagram Models H-620, -621



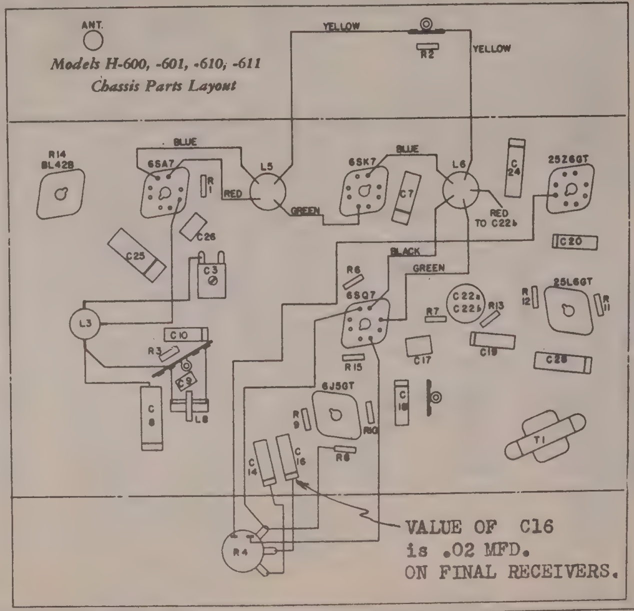
Voltages measured between socket terminal and −B.
Line Volts—115.
No signal input—Volume control at maximum.
When operated on DC power supply, voltages are about 15% lower.
Perform measurements with a high resistance voltmeter.
*Measured on 10 volt scale of a 20,000 ohms per volt meter.
**Measured on 50 volt scale of a 20,000 ohms per volt meter.



Models H-620, -621 Chassis Parts Layout

VALUE OF C16 is .02 MFD. ON FINAL RECEIVERS.

C23 is added between C10 and S1 in series with the ground with ground on final receivers.



Models H-600, -601, -610, -611 Chassis Parts Layout

VALUE OF C16 is .02 MFD. ON FINAL RECEIVERS.

MODELS H600U, H610U, H620U
H630U, H632U
MODELS H600UW, H610UW, H620UW
MODELS H600UX, H610UX, H620UX
Chassis Wiring, Trimmers
Dial Drive Data

GENERAL ELECTRIC CO.

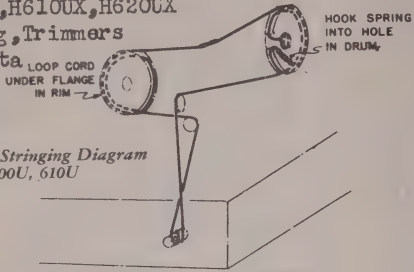


Fig. 4. *Dial Drive Stringing Diagram Models H-600U, 610U*

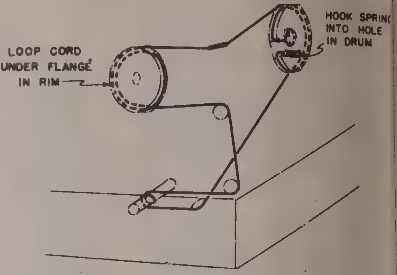


Fig. 5. Dial Drive Stringing Diagram Models H-620U, 630U, 632U

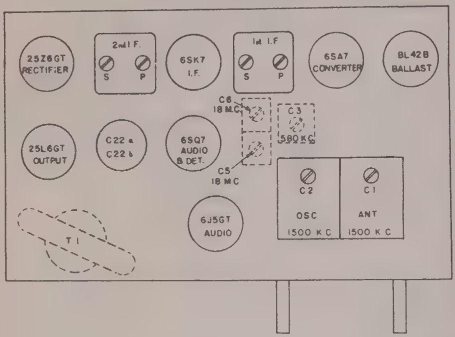


Fig. 2. Trimmer Location—Models H-620U, 630U, 632U

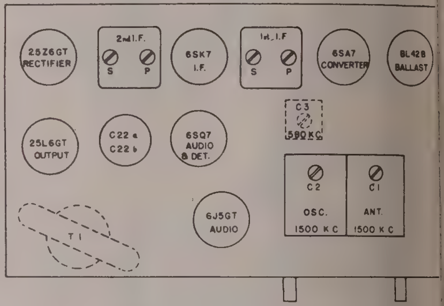
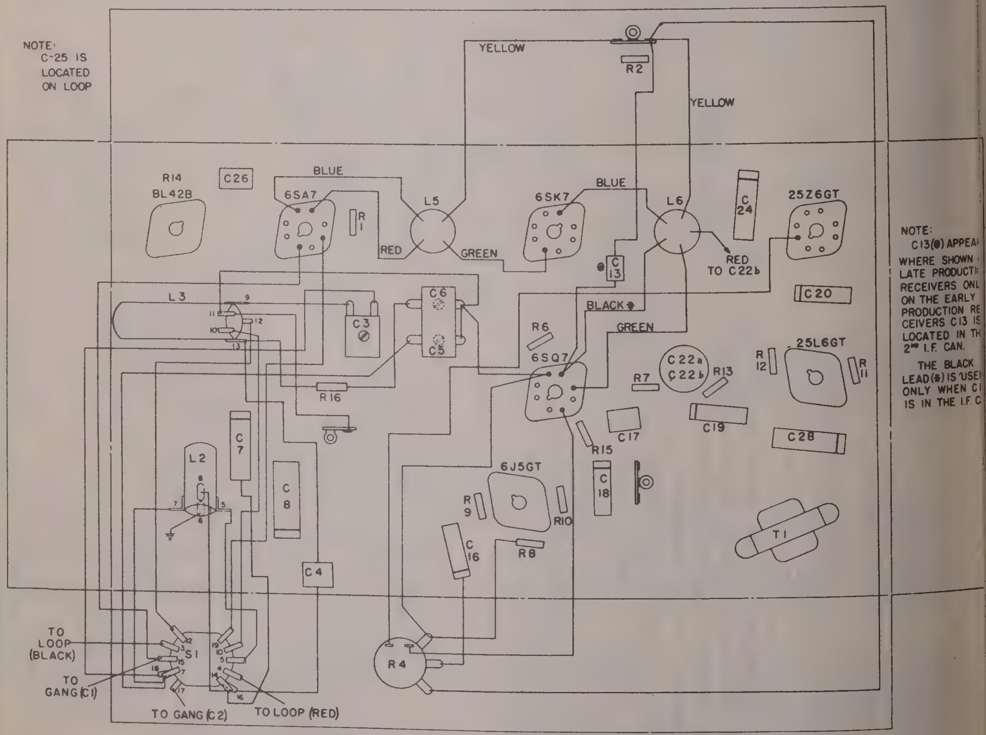


Fig. 1. Trimmer Location—Models H-600U, 610U

NOTE:
C-25 IS
LOCATED
ON LOOP



NOTE:
C13(●) APPEA
WHERE SHOWN
LATE PRODUCTI
RECEIVERS ONL
ON THE EARLY
PRODUCTION RE
CEIVERS C13 IS
LOCATED IN TH
2nd I.F. CAN.
THE BLACK
LEAD(*) IS USE
ONLY WHEN C1
IS IN THE I.F. C

Fig. 6. Chassis Parts Layout for Models H-620U, 630U and 632U
(Chassis Parts Layout for Models H-600U and 610U are the same as above except for band switch, "D" band coils and associated parts which are omitted.)

GENERAL ELECTRIC CO

MODELS H600U,H610U,H620U(W,X)
H630U,H632U
Schematics,Voltage,Changes

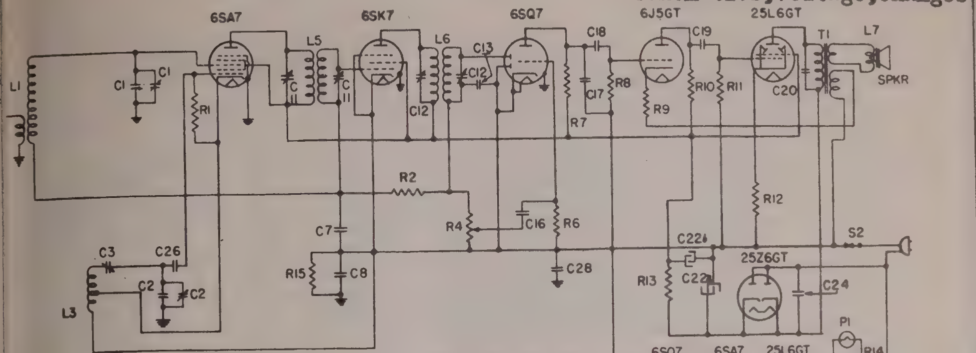


Fig. 7. Schematic Diagram
Models H-600U, 610U

SERVICE DATA

lor ecifications

Mod	Color	Material
H00U, 610U, 620U	Mottled brown	Plastic
H00UW, 610UW, 620UW	Ivory	Plastic
H00UX, 610UX, 620UX	Onyx	Plastic
H30U, 632U	Walnut	Wood

lectcal Specifications

Pver Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
11 AC or DC	25–60	55

unir Control Drive Ratio................4:1

Tung Frequency Range

Mcels	H-600U, 610U	H620U, 630U, 632U
Rage	550–1600 K.C.	550–1600 K.C. 5800–18000 K.C.

nteediate Frequency........................455 K.C.

Elecical Power Output (117 line volts)

hdistorted..................................1.4 watts
aximum....................................2.5 watts

oudpeaker—"Alnico" Magnetic Dynamic

Ctside Cone Diameter..........................5 inches
Vice Coil Impedance (400 cycles)............3.5 ohms

Tube

Cnverter and Oscillator.................GE-6SA7
I. Amplifier..................................GE-6SK7
lt., Aud., AVC..............................GE-6SQ7
2d Audio Amplifier........................GE-6J5GT
Iwer Output.................................GE-25L6GT
lctifier..GE-25Z6GT
Ial Lamp......................................MAZDA No. 44

PRODUCTION CHANGES

In changing from Models H-601, 611, 621, 631 and 633 to Models H-600U, 610U, 620U, 630U, and 632U several hundred receivers were built of the former type but labeled with the "U" series labels. These receivers can be identified by a 2.0 megohm volume control. Service information on receivers with 2.0 megohm volume controls will be found in Service Notes for Models H-600U, 610U, and 620U(EARLY), and in Service Notes for Models H-630U and 632U(EARLY).

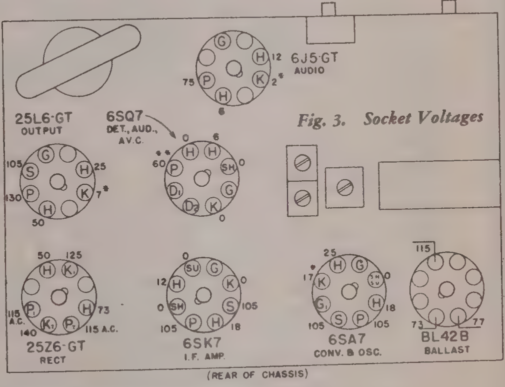


Fig. 3. Socket Voltages

Voltages measured between socket terminal and —B.
Line Volts—115.
No signal input—Volume control at maximum.
When operated on DC power supply, voltages are about 15% lower.
Perform measurements with a high resistance voltmeter.
*Measured on 10 volt scale of a 20,000 ohms per volt meter.
**Measured on 250 volt scale of a 20,000 ohms per volt meter.

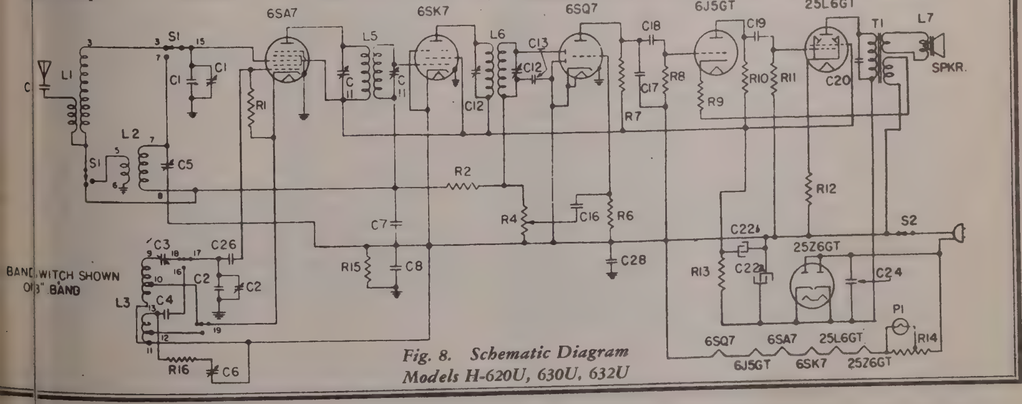


Fig. 8. Schematic Diagram
Models H-620U, 630U, 632U

MODELS H600U,H610U,H620U(W,X) H630U,H632U

GENERAL ELECTRIC CO.

Alignment,Gain,Coils,Parts

GENERAL INFORMATION

The above listed models are compact six-tube AC-DC superheterodyne receivers employing General Electric Pretested Tubes. Features of design include the built-in "Beam-a-Scope," 5-inch Dynapower speaker, single-ended tubes in the R.F. and I.F. circuits and automatic volume control.

Model H-610U (W & X inc.) also includes four "Feathertouch Tuning" keys.

Models H-620U (W & X inc.), H-630U and H-632U incorporate four "Feathertouch Tuning" keys and an additional frequency band permitting short-wave reception.

All models are fully approved by Underwriters' Laboratories. Model numbers ending in W or X indicate cabinet colors are in ivory or onyx respectively.

When operating from a DC source of power, it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F–455 K.C. R.F.—1500 and 580 K.C.

The location of trimmers for the above models are shown in their respective diagrams, Figs. 1 and 2.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the Volume Control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band on the two band receivers.

Set test oscillator to 455 K.C. and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Alignment

(1) *All models.*

Apply a 1500 K.C. signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 K.C. and peak (C-1) for maximum output. Change signal to 580 K.C. and tune receiver to signal. Peak (C-3) on the 580 K.C. signal by rocking the gang condenser. Retrim at 1500 K.C.

(2) *Models H-620U, 630U and 632U.*

Turn the band switch to "D" band after aligning on "B" band. Align (C-6) at 18 MC using an 18 M.C. signal. Peak (C-5) while rocking the gang condenser. The image of the 18 M.C. signal should be heard at approximately 17 M.C.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains.

	Gain‡
Antenna to Converter Grid	2.7 at 1000 K.C.
Converter Grid to 6SK7 Grid	28 at 455 K.C.
6SK7 Grid to 6SQ7 Diode Plate	87 at 455 K.C.

(2) Audio Gain.

.05 volts, 400 cycle signal across volume control with control set to maximum will give approximately ½ watt output at speaker.

(3) DC voltage developed across oscillator grid leak averages 13 volts.

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‡Variations of +10%, −20% permissible.

REPLACEMENT PARTS LIST

Models H-600U, 610U, 620U, 630U, and 632U

(W AND X MODELS INCLUDED)

Stock No.	Description	List Price
RA-313	CONDENSER ASSEMBLY—Tuning condenser and drive unit complete with pointer (Model H-610U)	$5.50
RA-314	CONDENSER ASSEMBLY—Tuning condenser and drive unit complete with pointer (Models H-620U, 630U, 632U)	5.70
*RB-013	BOARD—Terminal board (2 lug)	.10
*RB-041	BOARD—Terminal board (2 lug)	.10
RB-181	BRACKET—Dial scale-condenser support bracket assembly (Model H-600U)	.50
RB-182	BRACKET—Beam-a-Scope bracket	.10
RB-626	BUSHING—Tuning shaft bushing (Models H-600U, 610U)	.10
RB-918	BACK COVER—Plastic cabinet back cover for plastic models in brown	1.00
RB-919	BACK COVER—Plastic cabinet back cover for plastic models in ivory	1.60
RB-920	BACK COVER—Plastic cabinet back cover for plastic models in onyx	1.80
RB-921	BACK COVER—Cardboard cabinet back cover for Model H-630U	.15
RB-922	BACK COVER—Cardboard cabinet back cover for Model H-632U	.15
RB-1019	BOARD—5 inch speaker terminal board	.05
*RC-023	CAPACITOR—.005 mfd, 600 V. paper (C-18, 19)	.25
*RC-039	CAPACITOR—.01 mfd., 600 V. paper (C-20, 25)	.25
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-16)	.30
*RC-072	CAPACITOR—.05 mfd., 200 V paper (C-7)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-24)	.30
*RC-123	CAPACITOR—0.1 mfd., 400 V. paper (C-8, 28)	.35
*RC-216	CAPACITOR—47 mmf. mica (C-26)	.25
RC-293	CAPACITOR—470 mmf. mica (C-13, 17)	.30
*RC-390	CAPACITOR—3900 mmf. mica (C-4)	.35
*RC-676	CAPACITOR—"B" band padder (C-3) (Models H-620U, 630U, 632U)	.35
RC-747	CONDENSER—Tuning condenser (C-1, 2) (Model H-600U)	2.15
RC-748	CONDENSER—Tuning condenser (C-1, 2) (Model H-610U)	4.15
RC-749	CONDENSER—Tuning condenser (C-1, 2) (Models H-620U, 630U, 632U)	4.15
*RC-863	CORD—Power cord	.65
RC-1995	CLAMP—Coil clamp (Models H-620U, 630U, 632U) (Pkg. 5)	.10
RC-5136	CAPACITOR—50 mfd., 150 V.; 30 mfd., 150 V. dry electrolytic (C-22a, 22b)	1.15
RC-6515	CAPACITOR—"B" band padder (C-3) (Models H-600U, 610U)	.30
RC-6517	CAPACITOR—"D" band ant. and osc. trimmers (C-5, 6)	.30
RC-8130	CABLE—Tuning drive cable assembly (Models H-610U, 620U, 630U, 632U)	.15
RC-8131	CABLE—Tuning drive cable assembly (Model H-600U)	.15
RC-8508	CARD—Station letter card (Models H-610U, 620U, 630U, 632U)	.30
RC-9014	CONE ASSEMBLY—Speaker cone assembly. (all models)	.80
RD-114	DIAL—Dial scale (Models H-600U, 610U)	.15
RD-115	DIAL—Dial scale (Models H-620U, 630U, 632U)	.20
RG-302	GROMMET—Tuning shaft drive cord surface (Pkg. 10)	.10
RH-111	HAIRPIN COTTER—Tuning shaft hairpin cotter (Pkg. 10)	.05
RK-054	KNOB—Control knob for all models in brown (Pkg. 3)	.45
RK-055	KNOB—Control knob for all models in ivory, and Models H-630U, 632U (Pkg. 5)	$0.50
RK-066	KNOB—Control knob for all models in onyx (Pkg. 3)	.45
RK-209	KEY—Station selector key (Models H-610U, 610UW, 620U, 620UW, 630U, 632U)	.15
RK-211	KEY—Station selector key (Models H-610UX, 620UX)	.20
RL-098	COIL—"D" band antenna coil (L-2) (Models H-620U, 630U, 632U)	.65
RL-520	BEAM-A-SCOPE—Beam-a-Scope assembly (L-1)	.80
RL-937	LUG—Key pin binding lug (Pkg. 10)	.10
RL-2018	COIL—Oscillator coil (L-3) (Models H-600U, 610U)	.40
RL-2021	COIL—Oscillator coil (L-3) (Models H-620U, 630U, 632U)	.75
RP-134	PIN—Station selector key pin (Models H-610U, 620U, 630U, 632U (Pkg. 10)	.05
RP-141	POINTER—Dial scale pointer (Model H-600U) (Pkg. 5)	.50
RP-142	POINTER—Dial scale pointer (Model H-610U) (Pkg. 5)	.60
RP-143	POINTER—Dial scale pointer (Models H-620U, 630U, 632U) (Pkg. 5)	.60
RP-307	PULLEY—Condenser drive cord pulley (Models H-610U, 620U, 630U, 632U) (Pkg. 5)	.25
RP-308	PULLEY—½ inch drive cord idler pulley (Models H-610U, 620U, 630U, 632U) (Pkg. 5)	.10
RP-309	PULLEY—11/16 inch drive cord idler pulley (Models H-610U, 620U, 630U, 632U) (Pkg. 5)	.10
*RQ-1235	RESISTOR—100 ohms, ½ W. carbon (R-16) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms, ½ W. carbon (R-12) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½ W. carbon (R-13) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3300 ohms, ½ W. carbon (R-9) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½ W. carbon (R-1) (Pkg. 5)	.70
*RQ-1297	RESISTOR—39,000 ohms, ½ W. carbon (R-10) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½ W. carbon (R-7, 11, 15) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1365	RESISTOR—15 megohm, ¼ W. carbon (R-6) (Pkg. 5)	.70
RR-773	RESISTOR—Ballast resistor (BL-42-B) (R-14)	.40
RR-928	REFLECTOR—Dial scale reflector (Model H-600U)	.25
RR-929	REFLECTOR—Dial scale reflector (Model H-610U)	.30
RR-930	REFLECTOR—Dial scale reflector (Models H-620U, 630U, 632U)	.30
*RS-200	SOCKET—Octal tube socket (Pkg. 5)	.75
RS-256	SOCKET—Electrolytic mounting socket (Pkg. 5)	.25
*RS-261	SOCKET—Dial lamp socket assembly	.35
*RS-426	SPRING—Condenser drive cord spring (Pkg. 5)	.10
RS-510	SPACER—Station key spacer (Models H-610U, 620U, 630U, 632U) (Pkg. 10)	.10
RS-511	SLEEVE—Condenser bracket spacer sleeve (Pkg. 10)	.15
RS-927	SHAFT—Tuning shaft (Models H-600U, 610U)	$0.05
RS-929	SHAFT—Tuning shaft (Models H-620U, 630U, 632U)	.10
RS-1018	SPEAKER—5 inch P.M. speaker with bracket (all models except H-632U)	2.50
RS-1019	SPEAKER—5 inch P.M. speaker (Model H-632U)	3.40
RS-1809	SHIELD—Dial lamp shield for models in ivory and onyx (Pkg. 5)	.15
RS-3036	SWITCH—Band change switch	.60
RT-328	TRANSFORMER—1st I.F. transformer (L-5)	1.00
RT-329	TRANSFORMER—2nd I.F. transformer (L-6)	1.20
RT-469	TRANSFORMER—Output transformer (T-1)	1.25
RV-087	VOLUME CONTROL—500,000 ohm volume control)	.80
RW-039	WINDOW—Celluloid station letter window (All station key models) (Pkg. 25)	.10
*RW-101	WASHER—Control shaft felt washer (Pkg. 10)	.05
*RX-035	ASSEMBLY—Condenser mounting foot assembly (all station key models)	$0.15
RX-061	ASSEMBLY—Chassis mounting assembly (Models H-630U, 632U)	.10
RZ-158	CABINET—Plastic cabinet for Model H-600U	3.60
RZ-159	CABINET—Plastic cabinet for Model H-600UW	5.50
RZ-160	CABINET—Plastic cabinet for Model H-600UX	5.80
RZ-161	CABINET—Plastic cabinet for Model H-610U	3.60
RZ-162	CABINET—Plastic cabinet for Model H-610UW	5.50
RZ-163	CABINET—Plastic cabinet for Model H-610UX	5.80
RZ-164	CABINET—Plastic cabinet for Model H-620U	3.60
RZ-165	CABINET—Plastic cabinet for Model H-620UW	5.50
RZ-166	CABINET—Plastic cabinet for Model H-620UX	5.80

* Used on previous receivers.

Note: All parts listed above apply to models in ivory (W) and onyx (X) excepting cabinets, back covers, knobs, and keys. When ordering these items specify color as well as stock number.

(Prices Subject to Change without Notice)

COIL RESISTANCE CHART

Coil	Section	Resistance (Ohms)
"D" antenna coil	Primary	1.2
	Secondary	.04
"B" oscillator coil	C-3 to minus B	5
"D" oscillator coil	C-4 to minus B	1.2
1st I.F. transformer	Primary	32.4
	Secondary	32.4
2nd I.F. transformer	Primary	32.4
	Secondary	32.4
Output transformer	Primary	134
	Secondary	.4

GENERAL ELECTRIC CO.

MODEL HJ612
Schematic, Voltage, Socket
Trimmers, Gain, Alignment

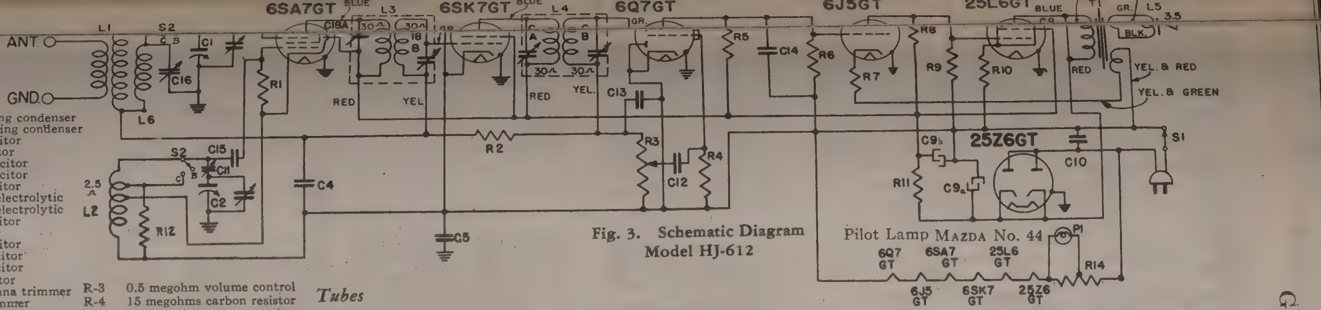


Fig. 3. Schematic Diagram
Model HJ-612

PARTS LIST

C-1	Antenna section tuning condenser
C-2	Oscillator section tuning condenser
C-4	.05 Mfd. paper capacitor
C-5	.2 Mfd. paper capacitor
C-6	.005 Mfd. paper capacitor
C-7	.005 Mfd. paper capacitor
C-8	.01 Mfd. paper capacitor
C-9a	50 Mfd., 150 V. dry electrolytic
C-9b	30 Mfd., 150 V. dry electrolytic
C-10	.05 Mfd. paper capacitor
C-11	300-675 Mmf. padder
C-12	.03 Mfd. paper capacitor
C-13	470 Mmf. mica capacitor
C-14	220 Mmf. mica capacitor
C-15	47 Mmf. mica capacitor
C-16	5-40 Mmf. "C" antenna trimmer
C-18a	50-135 Mmf. I.F. trimmer
C-18b	50-135 Mmf. I.F. trimmer
C-19a	50-135 Mmf. I.F. trimmer
C-19b	50-135 Mmf. I.F. trimmer
L-1	Beam-a-Scope
L-2	Oscillator coil
L-3	1st I.F. transformer
L-4	2nd I.F. transformer
L-6	"C" band antenna coil
P-1	Dial lamp, MAZDA No. 44
R-1	33,000 ohms carbon resistor
R-2	2.2 megohms carbon resistor
R-3	0.5 megohm volume control
R-4	15 megohms carbon resistor
R-5	470,000 ohms carbon resistor
R-6	1.0 megohms carbon resistor
R-7	3300 ohms carbon resistor
R-8	39,000 ohms carbon resistor
R-9	470,000 ohms carbon resistor
R-10	150 ohms carbon resistor
R-11	1000 ohms, 1 W. carbon resistor
R-12	4700 ohms carbon resistor
R-14	Ballast resistor BL-42-B
T-1	Output transformer

GENERAL INFORMATION

The Model HJ-612 is a compact 6-tube AC-DC superheterodyne receiver employing General Electric Pre-tested Tubes. Features of design include built-in Beam-a-Scope, airplane-type dial, broadcast and police-amateur-aircraft coverage, and automatic volume control.

When operating from a DC source of power it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Throw the band switch to "BC" (up).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. When using an I.R.E. dummy antenna for R.F. alignment do not connect a ground lead between the signal generator and the receiver. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-11) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Throw the band switch to "SW" band. Peak (C-16) on 2500 KC.

Tubes

Converter and Oscillator	GE-6SA7/6SA7GT
I.F. Amplifier	GE-6SK7GT
Det., Aud., AVC	GE-6Q7GT/6Q7G/6Q7
2nd Audio Amplifier	GE-6J5GT/6J5G
Power Output	GE-25L6GT
Rectifier	GE-25Z6GT/25Z6G

Power Supply Volts	Frequency (Cycles on AC)	Power Consumption (Watts)
115 AC or DC	25–60	50

Electrical Power Output (117 Line Volts)

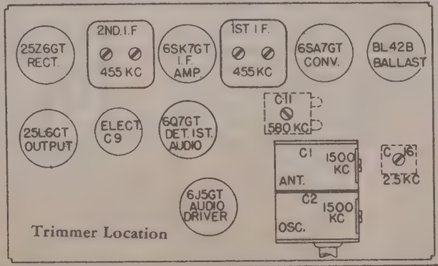
Undistorted	1.4 watts
Maximum	2.5 watts

Tuning Frequency Range

Band "B"	540–1620 KC
Band "C"	1550–3500 KC

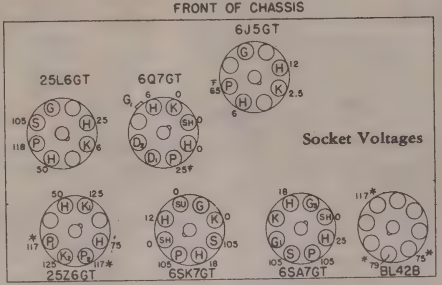
Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter	5 inches
Voice Coil Impedance (400 cycles)	3½ ohms



Trimmer Location

Intermediate Frequency..........455 KC



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND MINUS B
† MEASURED ON 250 VOLT SCALE OF 1000 OHMS PER VOLT METER
* VOLTS AC.
LINE VOLTS—117 A.C. GANG CLOSED MAX. VOLUME

SPECIAL SERVICE INFORMATION

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains

	Gain ‡
Antenna Post to Converter Grid	2.7 at 1000 KC
Converter Grid to 6SK7 Grid	28 at 455 KC
6SK7 Grid to 6Q7GT Diode Plate	87 at 455 KC

(2) Audio Gain
A 400-cycle signal of .05 volts across volume control will give approximately ½-watt speaker output. (Volume control turned to maximum.)

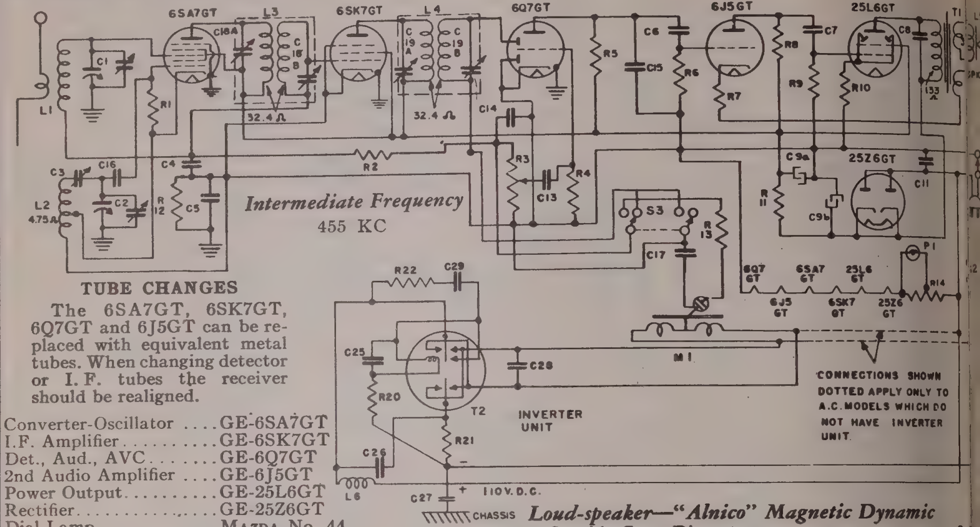
(3) DC voltage developed across oscillator grid resistor (R-1) averages 13 volts at 1000 KC.

‡Variation of +10%, −20% permissible. 1-40

MODELS HJ618AC,HJ618DC
Schematic,Voltage,Gain
Alignment,Trimmers,Socket

GENERAL ELECTRIC CO.

MODELS HJ624,J6
Alignment



Intermediate Frequency
455 KC

TUBE CHANGES

The 6SA7GT, 6SK7GT, 6Q7GT and 6J5GT can be replaced with equivalent metal tubes. When changing detector or I.F. tubes the receiver should be realigned.

Converter-Oscillator	GE-6SA7GT
I.F. Amplifier	GE-6SK7GT
Det., Aud., AVC	GE-6Q7GT
2nd Audio Amplifier	GE-6J5GT
Power Output	GE-25L6GT
Rectifier	GE-25Z6GT
Dial Lamp	MAZDA No. 44

GENERAL INFORMATION

Models HJ-618 AC and HJ-618 DC are compact, table-model, radio-phonograph combinations using six General Electric Pre-tested Tubes in a superheterodyne circuit. Model HJ-618 AC is designed to operate on a 60-cycle source of power as shown under electrical specifications. Model HJ-618 DC incorporates the same chassis and phonograph as the Model HJ-618 AC but includes in addition an inverter unit which will allow operation on a DC source of power.

Phonograph

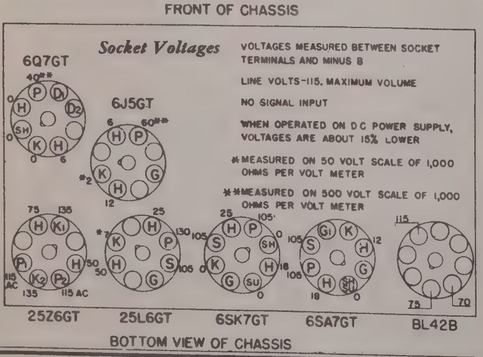
Type Pick-up	Crystal
Turntable Speed	78 R.P.M.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage Gains
Antenna Post to Converter Grid—4 at 1000 KC‡
Converter Grid to 6SK7GT Grid—30 at 455 KC‡
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC‡
(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.
(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

‡ Variations of + 10%, −20% permissible.



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND MINUS B

LINE VOLTS-115. MAXIMUM VOLUME

NO SIGNAL INPUT

WHEN OPERATED ON D C POWER SUPPLY, VOLTAGES ARE ABOUT 15% LOWER

*MEASURED ON 50 VOLT SCALE OF 1,000 OHMS PER VOLT METER

**MEASURED ON 500 VOLT SCALE OF 1,000 OHMS PER VOLT METER

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter	6.
Voice Coil Impedance (400 cycles)	3 o

NOTE—In no case should the magnet be removed fr assembled position without remagnetizing after repla

Model	Power Supply (Volts)	Frequency (Cycles on AC)	Pow Consu (Wa
HJ-618 AC HJ-618 DC	115 AC 115 DC	60	7 8

Electrical Power Output

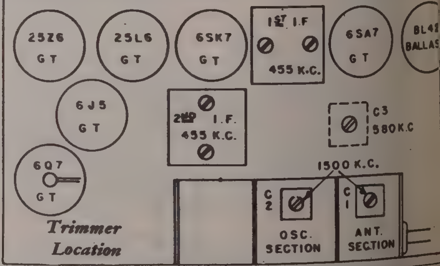
Undistorted	2.
Maximum	2.

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Tu volume control to maximum. Set test oscillator to 4 and keep the oscillator output as low as a readable mete ing will permit.

Apply signal to the grid of the 6SK7GT through a .0 capacitor and align the 2nd I.F. transformer. Repe procedure, applying the 455 KC signal to the contr of the 6SA7GT and aligning the 1st I.F. transformer. by over-all adjustments.

R.F. With gang condenser plates completely closed, se pointer to the first mark at the left end of the scale. A 1500 KC signal either through a standard I.R.E. d to the antenna terminal or through an additional loo nected to the generator output which can be magne coupled to the receiver Beam-a-Scope. Align (C-2) at KC and peak (C-1 on HJ-628) or (C-20 on HJ-624) for mum output. Peak (C-3) on 580 KC while rocking the condenser. Retrim at 1500 KC.



GENERAL ELECTRIC CO.

M DELS HJ-624 AND HJ-628

SERVICE DATA

ric *Specifications*

ode	Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Con-sumption (Watts)
-62		115 AC or DC	25–60	50
-62	A6	115–125	60	75
	A5	115–125	50	75
	C2	115–125	25	90

tric! Power Output

ndis rted....................2.0 watts
axir m....................2.5 watts

nog ph

ode HJ-628
ype ck-up....................Crystal
urnt le Speed....................78 R.P.M.

l-sp ker

e v ce coil is accurately and permanently centered e fa ory and should seldom give trouble. In case a voice eed centering it will be necessary to replace the entire and oice coil assembly.

OTE- n no case should the magnet be removed from the nble position without remagnetizing after replacing it.

DEL *HJ-618 AC and HJ-618 DC* *HJ-624 HJ-628*

H-639 AC AND H-639 DC

CHASSIS ASSEMBLY

ck o.	Description	List Price
08	OARD—Terminal board (2 lug)	$0.10
46	OARD—Terminal board (5 lug)	.15
86	RACKET—Volume control bracket	.10
23	APACITOR—.005 mfd. 600 V. paper (C-6, 7)	.25
39	APACITOR—.01 mfd. 600 V. paper (C-8)	.25
60	APACITOR—.03 mfd. 600 V. paper (C-13)	.25
72	APACITOR—.05 mfd. 200 V. paper (C-4)	.25
92	APACITOR—.05 mfd. 600 V. paper (C-11)	.30
23	APACITOR—0.1 mfd. 400 V. paper (C-17)	.35
30	APACITOR—0.2 mfd. 400 V. paper (C-5)	.30
16	APACITOR—47 mmf. mica (C-16)	.25
50	APACITOR—220 mmf. mica (C-15)	.25
93	APACITOR—470 mmf. mica (C-14)	.30
63	ORD—Power cord	.65
1995	LAMP—Oscillator coil clamp (Pkg. 5)	.10
5145	APACITOR—30 mfd. 150 V.; 50 mfd. 150 V., dry electrolytic (C-9a, 9b)	.75
3515	APACITOR—"B" band padder (C-3)	.30
3530	APACITOR—Antenna trimmer (Model HJ-624)	
9009	ONE ASSEMBLY—14-inch speaker cone assembly (Model HJ-628)	.95
9010	ONE ASSEMBLY—Speaker cone assembly (Model HJ-624.H-639AC.H639DC.	$0.90
9010	CONE ASSEMBLY—Speaker cone assembly *.Models HJ-618 AC and HJ-618 DC*	.90
068	SCUTCHEON—Dial scale escutcheon	.65
372	SCUTCHEON—Station letter escutcheon (Model HJ-628)	
016	RID CLIP—Tube control grid clip (Pkg. 5)	.10
516	OOP—Beam-a-Scope assembly (L-1) (Model HJ-628)	.90
523	OOP—Beam-a-Scope and cabinet back assembly (Model HJ-624)	
528	LOOP—Beam-a-Scope and cabinet back assembly (L-1) HJ-618AC.HJ-618DC	$1.00
2016	OIL—Oscillator coil (L-2)	.25
-102	EEDLE CUP—Phonograph needle cup	.10
1239	ESISTOR—150 ohms ½ W. carbon (R-10) (Pkg. 5)	.70
1271	ESISTOR—3300 ohms ½ W. carbon (R-7) (Pkg. 5)	.70
1295	ESISTOR—33,000 ohms ½ W. carbon (R-1) (Pkg. 5)	.70
1297	ESISTOR—39,000 ohms ½ W. carbon (R-8) (Pkg. 5)	.70
1307	ESISTOR—100,000 ohms ½ W. carbon (R-13) (Pkg. 5)	.70
1323	ESISTOR—470,000 ohms, ½ W. carbon (R-5, 9, 12) (Pkg. 5)	.70
1331	ESISTOR—1.0 megohm ½ W. carbon (R-6) (Pkg. 5)	.70
1339	ESISTOR—2.2 megohms ½ W. carbon (R-2) (Pkg. 5)	.70
1365	ESISTOR—15 megohms ¼ W. carbon (R-4) (Pkg. 5)	.70
1459	ESISTOR—1000 ohms 1 W. carbon (R-11)	.20
-773	ESISTOR—BL-42B ballast resistor (R-14)	.40
238	OCKET—Octal tube socket	$0.15
261	OCKET—Pilot lamp socket assembly	.20
1012	PEAKER—6½-inch Alnico magnet dynamic speaker	
-624	IJ-618AC,HJ618DC,H639AC,H-639DC	3.25

RS-1014	SPEAKER—14-inch Alnico magnet dynamic speaker (Model HJ-628)	6.00
RT-341	TRANSFORMER—1st I.F. transformer (L-3)	.80
RT-342	TRANSFORMER—2nd I.F. transformer (L-4)	.80
RT-475	TRANSFORMER—Output transformer (T-1)	1.00
RT-954	TERMINAL—Speaker contact terminal (Pkg. 10)	.10
RV-078	VOLUME CONTROL—0.5 megohm volume control (R-3)	.80
RX-062	ASSEMBLY—Speaker mounting assembly	10

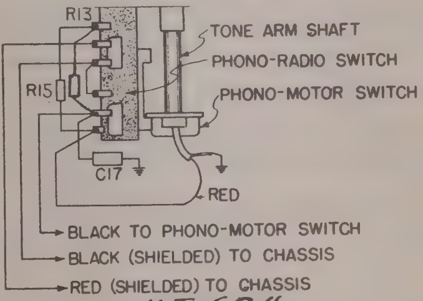
CONDENSER AND DIAL SCALE

RC-7017	CONDENSER—Tuning condenser and reflector assembly (C-1, 2)	5.80
RD-415	DRUM—Tuning or volume control drum	.20
RF-752	FASTENER—Dial and window snap fastener (Pkg. 25)	.10
RK-209	KEY—Feathertouch tuning key for extreme left station selector	.15
RK-214	KEY—Feathertouch tuning key for all station selectors except for one on left	.10
RL-937	BINDING LUG—Station pin binding lug (Pkg. 10)	.10
RP-154	PIN—Station key adjusting pin (Pkg. 10)	.10
RP-155	POINTER—Dial scale pointer	.15
RP-156	PLATE—Reflector plate	.10
RP-313	PULLEY—Wooden idler pulley	.05
RP-314	PULLEY—Pointer drive pulley and "C" washer	.15
RS-464	SPRING—Drum tension spring (Pkg. 10)	.05
RS-470	SPRING—Drive cord idler pulley tension spring	.05
RW-043	WINDOW—Dial scale window	.15

TONE ARM AND SWITCH ASSEMBLY
Except Model HJ-624

*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-17)	.35
RP-505	PICKUP—Crystal pickup and leads	5.40
*RQ-1307	RESISTOR—100,000 ohms ½ W. carbon (R-13) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms ½ W. carbon (R-15) (Pkg. 5)	.70
RS-472	SNAP RING—Tone arm spindle snap ring	.10
*RS-854	SCREW—Motor power switch set screw (Pkg. 10)	.25
RS-876	SCREW—Needle clamping screw	.25
RS-1810	SHIELD—Phono motor power switch shield	.15
RS-3051	SWITCH—Motor power switch and set screw assembly	.60
RS-3052	SWITCH—Phono switch, mounting plate and bushing assembly	2.15
RT-917	TONE ARM—Tone arm and pivot assembly	3.75

(contined)


R13
TONE ARM SHAFT
PHONO-RADIO SWITCH
PHONO-MOTOR SWITCH
R15
C17
RED
BLACK TO PHONO-MOTOR SWITCH
BLACK (SHIELDED) TO CHASSIS
RED (SHIELDED) TO CHASSIS

HJ-624

Fig. 3. Phono-Radio Switch Assembly

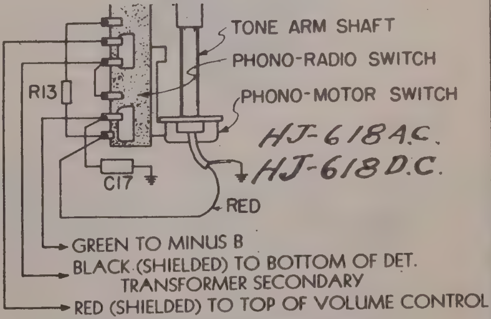

TONE ARM SHAFT
PHONO-RADIO SWITCH
R13
PHONO-MOTOR SWITCH
HJ-618A.C.
HJ-618D.C.
C17
RED
GREEN TO MINUS B
BLACK (SHIELDED) TO BOTTOM OF DET. TRANSFORMER SECONDARY
RED (SHIELDED) TO TOP OF VOLUME CONTROL

Fig. 3. Phono-Radio Switch Assembly

MODELS HJ618AC,HJ618DC
MODELS HJ624,HJ628
MODELS H639AC,H639DC
Turntable Parts

GENERAL ELECTRIC CO.

INVERTER ASSEMBLY
(Except Model HJ-624)

(continued)

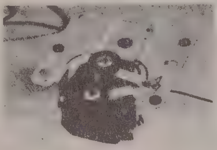
(Used only on special installations)

*RB-008	BOARD—Terminal board (2 lug)	.10
*RB-013	BOARD—Terminal board (2 lug)	.10
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-27)	.25
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-25, 29)	.35
RC-159	CAPACITOR—0.5 mfd. 200 V. paper (C-26)	.40
RC-5147	CAPACITOR—0.5 mfd. 200 V. line capacitor (C-28)	.45
RL-347	CHOKE—4 uh vibrator choke (L-6)	.30
*RQ-1243	RESISTOR—220 ohms ½ W. carbon (R-22) (Pkg. 5)	.70
RQ-1468	RESISTOR—2200 ohms 1 W. carbon (R-20)	.20
RR-781	RESISTOR—25 ohms 7.4 W. wire wound (R-21)	.20
RS-215	SOCKET—Vibrator socket (Pkg. 5)	.60
RV-203	VIBRATOR—Inverter unit vibrator (T-2)	5.50

MOTOR TURNTABLE ASSEMBLY

Model No. 1

(MODEL HJ-628)
MODELS HJ-618 AC, HJ-618 DC;
H-639 AC AND H-639 DC

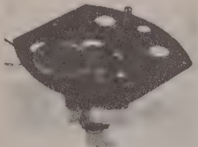


RB-187	BRACKET—Rubber-edged drive wheel bracket assembly	$0.20
RB-188	BRACKET—Rubber-edged idler wheel bracket assembly	.20
RB-627	BUSHING—Motor mounting rubber bushing (Pkg. 5)	.20
RC-5146	CAPACITOR—Pyranol capacitor Cat. 25F140	1.00
RH-112	HAIRPIN COTTER—Rubber-edged wheel locating hairpin cotter (Pkg. 10)	.10
RM-129	MOTOR—60-cycle phono motor only	4.50
RP-157	PLATE—Motor mounting plate and spindle bearing assembly	.90
RS-471	SPRING—Idler wheel bracket tension spring (Pkg. 5)	.30
RS-934	SPINDLE—Turntable spindle and snap ring	.30
RT-916	TURNTABLE—8-inch brown flocked turntable	1.60
RW-910	WHEEL—Rubber-edged wheel	.35

MOTOR TURNTABLE ASSEMBLY

Model No. 2

(MODEL HJ-628)
MODELS HJ-618 AC HJ-618 DC
H-639 AC AND H-639 DC



RM-133	MOTOR—60-cycle motor assembly complete	6.25
RP-165	PLATE—Main plate and turntable shaft bearing assembly	.90
RP-166	PLATE—Motor mounting plate	.30
RP-167	PLATE—Rubber-edged wheel movable plate and bearing assembly	.70
RP-316	PULLEY—60-cycle drive pulley and oil throw washer (Pkg. 2)	.25
RS-493	SPRING—Movable plate tension spring (Pkg. 2)	.10

RS-943	SPINDLE—Turntable spindle and cotter
RS-953	SPACERS—Rotor spacers between bearings (Pkg. 5)
RT-924	TURNTABLE—8-inch brown flocked turntable
RW-912	WHEEL—Rubber-edged wheel washer, oil felt and cott
RX-073	ASSEMBLY—Rotor bearing brackets, felts, bear assembly
RX-074	ASSEMBLY—Motor mounting bushing, washers a screws
RX-075	ASSEMBLY—Motor field and winding assembly
RX-076	ASSEMBLY—Movable-plate-guide spacer, washer scr assembly (Pkg. 5)
RX-077	ASSEMBLY—Propeller, cotter, washer assembly
RX-078	ASSEMBLY—Rotor assembly

MOTOR TURNTABLE ASSEMBLY
Model No. 3

HJ-618 AC AND HJ-618 DC
H-639 AC AND H-639 DC

RB-184	BRACKET—Turntable drive wheel bracket assembly
RB-185	BRACKET—Lower motor bearing bracket assembly complete
RF-502	FIELD—60-cycle field stator assembly complete
RF-503	FIELD—50-cycle field stator assembly complete
RF-504	FRAME—Upper motor frame assembly
RM-127	MOTOR—60-cycle motor assembly complete less turntable
RM-128	MOTOR—50-cycle motor assembly complete less turntable
RP-164	PLATE—Motor mounting plate and bearing assembly
RP-311	PULLEY—60-cycle motor pulley and setscrew
RP-312	PULLEY—50-cycle motor pulley and setscrew
RR-406	ROTOR—Rotor complete
RS-467	SPRING—Turntable drive tension spring
RS-875	SETSCREW—Motor pulley setscrew (Pkg. 12)
RS-932	SPINDLE—Turntable spindle and cotter
RT-923	TURNTABLE—8-inch brown flocked turntable
RW-909	WHEEL—Rubber-edged drive wheel
RX-065	ASSEMBLY—Turntable drive wheel bracket mounting washer, screw and nut assembly (Pkg. 5)
RX-066	ASSEMBLY—Lower bearing bracket screw and nut assembly (Pkg. 3)
RX-067	ASSEMBLY—Motor mounting screw, washer and grommet assembly (Pkg. 3)
RX-068	ASSEMBLY—Drive wheel oil retainer, cotter and thrust washer assembly (Pkg. 5)

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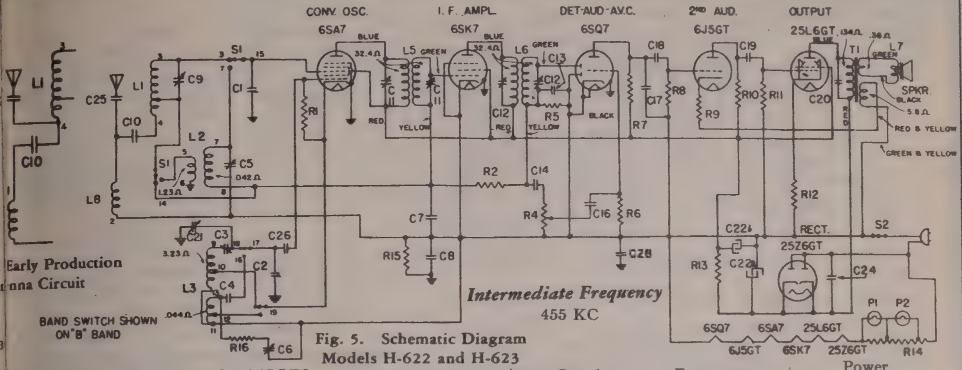
*Used on previous receivers.

(Prices subject to change without notic

NOTE:

When ordering motor-turntable assembly parts, refer to correct model list.

GENERAL ELECTRIC CO.



. 3. Early Production
A nna Circuit

Fig. 5. Schematic Diagram
Models H-622 and H-623

PRODUCTION CHANGES

S eral hundred early production Model H-622 receivers wer built with the antenna terminal connected as shown in Fig. . The remainder of these receivers were connected as sho in the schematic diagram, Fig. 5. The only difference bet en the two circuits is in the connection between the low side of C-25 capacitor and the antenna circuit. Early pro ction circuits had C-25 connected between L-1 and C-10. If h n is experienced when an outside antenna is used on thes early production models with Fig. 3 antenna circuit, reve e the power plug in the power supply outlet. Should this rocedure fail to attain the required results rewire C-25 into e circuit as shown in the schematic diagram, Fig. 5.

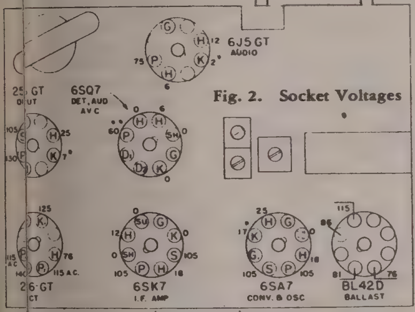


Fig. 2. Socket Voltages

*Me red on 10 volt scale of 20,000 ohms per volt meter.
**Me red on 250 volt scale of 20,000 ohms per volt meter.
Line ts—115.—No signal input.
Volu at maximum.
When erated on DC power supply, voltages are about 15 per cent lower.
All he r and ballast voltages are AC.

Power Supply Volts	Frequency (Cycles on AC)	Power Consumption (Watts)
115 AC or DC	25–60	50

Electrical Power Output (117 Line Volts)

Undistorted .... 1.4 watts
Maximum .... 2.5 watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter .... 6½ inches
Voice Coil Impedance (400 cycles) .... 3½ ohms

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage Gains

	Gain ‡
Antenna Post to Converter Grid	2.7 at 1000 KC
Converter Grid to 6SK7 Grid	28 at 455 KC
6SK7 Grid to 6SQ7 Diode Plate	87 at 455 KC

(2) Audio Gain
A 400 cycle signal of .05 volts across volume control will give approximately ½ watt speaker output. (Volume control turned to maximum.)

(3) DC voltage developed across oscillator grid resistor (R-1) averages 13 volts at 1000 KC.

‡Variation of +10%, −20% permissible.

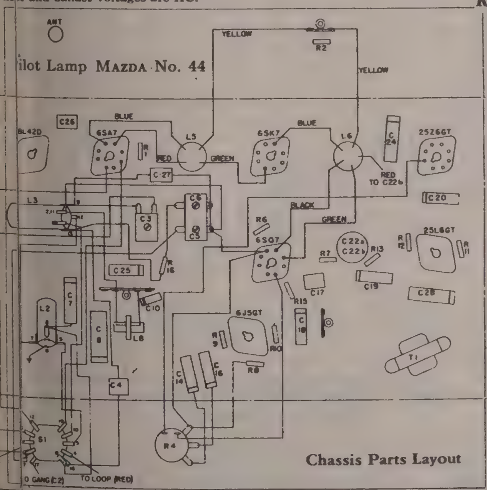
ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band (counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

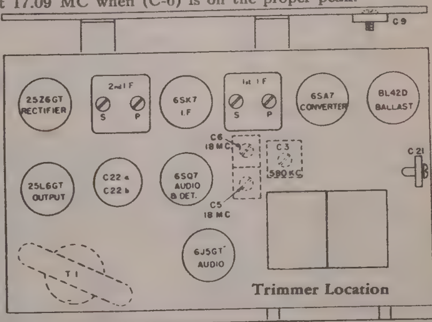
R.F. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-21) at 1500 KC and peak (C-9) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-3) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Turn the band switch to "D" band. Align (C-6) at 18 MC using an 18 MC signal. Peak (C-5) while rocking the gang condenser. The image of the 18 MC signal should be heard at 17.09 MC when (C-6) is on the proper peak.



Pilot Lamp Mazda No. 44

Chassis Parts Layout



Trimmer Location

MODELS HJ624,HJ628
Schematic,Voltage,Gain
Trimmers,Socket,
Changes

GENERAL ELECTRIC CO.

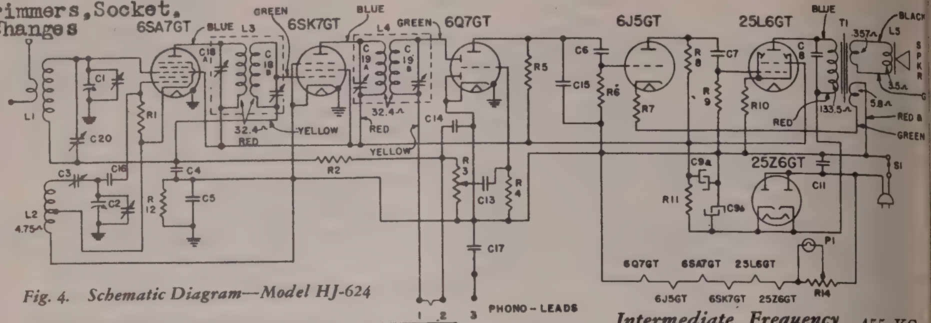


Fig. 4. Schematic Diagram—Model HJ-624

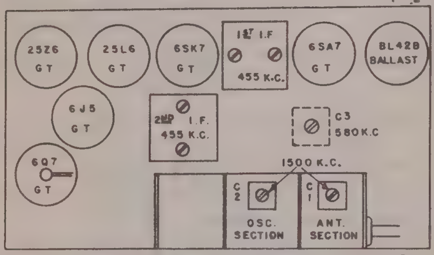
Intermediate Frequency 455 KC

Loud-speaker—"Alnico" Magnetic Dynamic

Model	HJ-624	HJ-628
Speaker Diameter	6.5 inches	14 inche
Voice Coil Impedance (400 cycles)		3.5 ohms

Tubes

Converter-Oscillator	GE-6S GT
I.F. Amplifier	GE-6S GT
Det., Aud., AVC	GE-6Q T
2nd Audio Amplifier	GE-6J5T
Power Output	GE-25L T
Rectifier	GE-25Z T
Dial Lamp	Mazda . 44



Note: On Model HJ-624 the antenna trimmer (C-1) on top the gang condenser is replaced with (C-20) located on the cabinet back cover.

Fig. 1. Trimmer Location

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains

Antenna Post to Converter Grid—4 at 1000 KC‡
Converter Grid to 6SK7GT Grid—30 at 455 KC‡
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC‡

(2) Audio Gains

.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½ watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

‡ Variations of +10%, −20% permissible

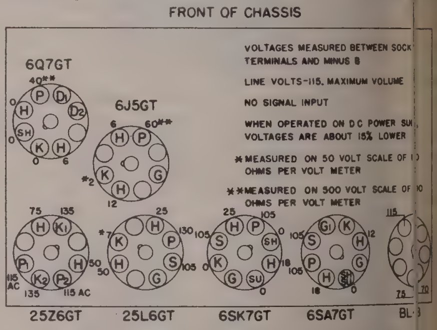
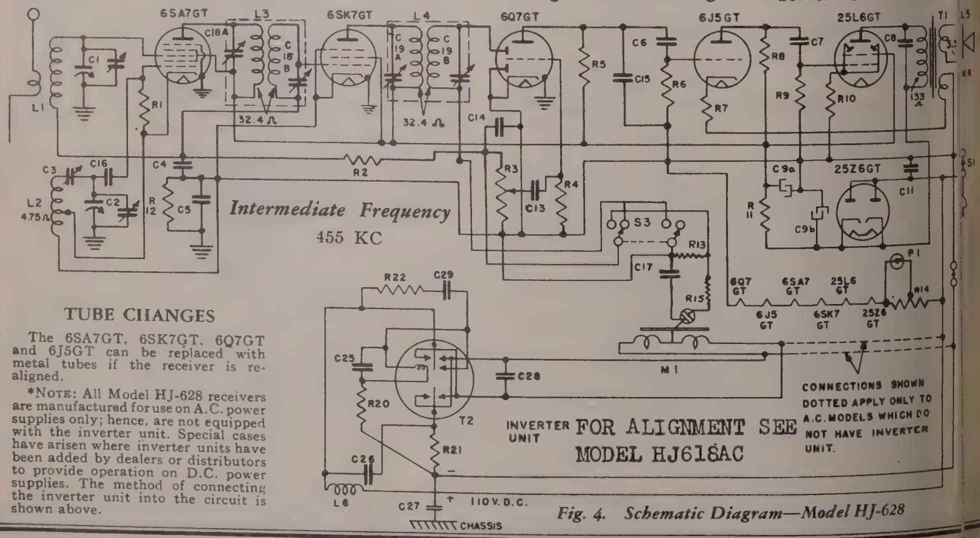

FRONT OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCK
TERMINALS AND MINUS B
LINE VOLTS-115. MAXIMUM VOLUME
NO SIGNAL INPUT
WHEN OPERATED ON D C POWER SU
VOLTAGES ARE ABOUT 15% LOWER
*MEASURED ON 50 VOLT SCALE OF
OHMS PER VOLT METER
**MEASURED ON 500 VOLT SCALE OF
OHMS PER VOLT METER
6Q7GT
6J5GT
25Z6GT
25L6GT
6SK7GT
6SA7GT
BL
40**
60**
115 AC
135
75
130
105
25
12
18
0
6
*2
*7
50
70
115

Fig. 2. Socket Voltages   BOTTOM VIEW OF CHASSIS



TUBE CHANGES

The 6SA7GT, 6SK7GT, 6Q7GT and 6J5GT can be replaced with metal tubes if the receiver is re-aligned.

*Note: All Model HJ-628 receivers are manufactured for use on A.C. power supplies only; hence, are not equipped with the inverter unit. Special cases have arisen where inverter units have been added by dealers or distributors to provide operation on D.C. power supplies. The method of connecting the inverter unit into the circuit is shown above.

Fig. 4. Schematic Diagram—Model HJ-628

GENERAL ELECTRIC CO.

MODEL H625 (Final)
MODELS H630 to H633 (Final)

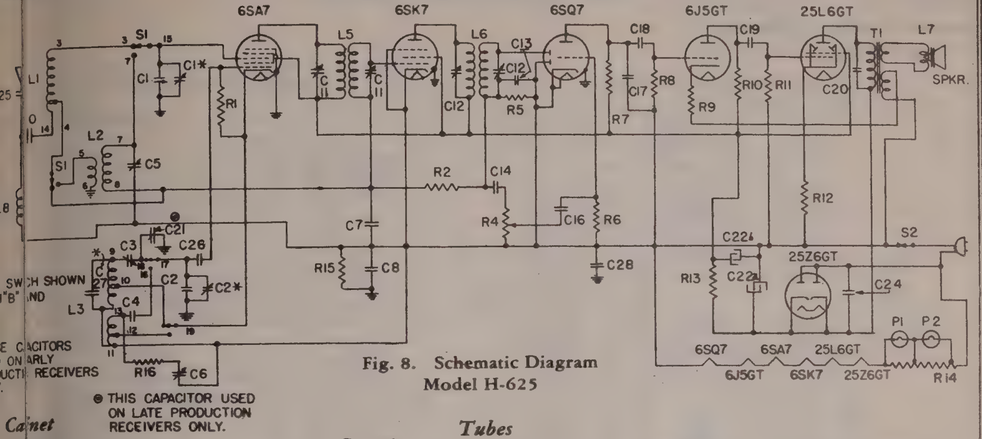


Fig. 8. Schematic Diagram
Model H-625

Ca inet

Mod H-625	Console
Mod s H-630, -631, -632, -633	Table Model

ng ntrol Drive Ratio....4:1

ric Specifications

wer upply V s	Frequency (Cycles on AC)	Power Consumption (Watts)
1 AC DC	25–60	50

Tubes

Converter and Oscillator	GE-6SA7
I.F. Amplifier	GE-6SK7
Det., Aud., AVC	GE-6SQ7
2nd Audio Amplifier	GE-6J5GT
Power Output	GE-25L6GT
Rectifier	GE-25Z6GT
Pilot Lamp	MAZDA No. 44

Electrical Power Output (117 Line Volts)

Undistorted	1.4 watts
Maximum	2.5 watts*

*Tests made on Model H-625 indicate that the sound output from this receiver is approximately equal to that of an AC receiver using a conventional wound-field loud-speaker rated at 5 watts.

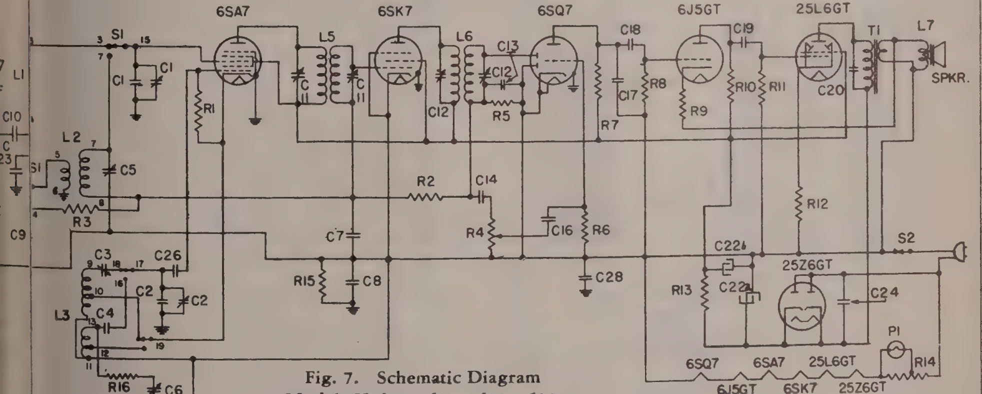
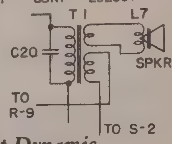


Fig. 7. Schematic Diagram
Models H-630, -631, -632, -633
Models H-630U, 632U (EARLY)



ON H-631 & H-633 RECEIVERS SUBSTITUTE THIS TRANSFORMER (T-1) FOR ONE SHOWN ABOVE

al S vice Information

fo wing data will be very useful to servicemen ped ith vacuum-tube voltmeters or similar voltage- uring nstruments.

St e Gains	Gain ‡
Ar nna Post to Converter Grid	2.7 at 1000 KC
Co verter Grid to 6SK7 Grid	28 at 455 KC
6S 7 Grid to 6SQ7 Diode Plate	87 at 455 KC

Au io Gain
A 0 cycle signal of .05 volts across volume control wi give approximately ½ watt speaker output. (Vol- um control turned to maximum.)

DC voltage developed across oscillator grid resistor (R) averages 13 volts at 1000 KC.

‡Va ations of +10%, −20% permissible.

Loud-speaker—"Alnico" Magnet Dynamic

Model	H-625	H-630, -631, -632, -633
Outside Cone Diameter—12 in.		5 in.
Voice Coil Impedance (400 cycles)		3½ ohms

Tuning Frequency Range

Band "B"	550–1600 KC
Band "D"	5800–18,000 KC

Intermediate Frequency....455 KC

MODEL H625
MODELS H630,H633(incl.)
H630U,H632U
Chassis Wiring,Voltage
Socket,Notes

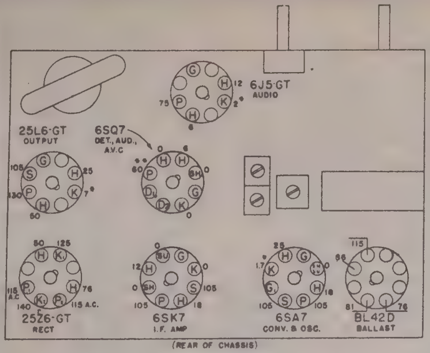
GENERAL ELECTRIC CO.

GENERAL INFORMATION

The Models H-625, H-630, H-631, H-632, and H-633 are compact six-tube AC-DC superheterodyne receivers employing General Electric Pre-tested Tubes. Features of design include built-in Beam-a-Scope, airplane-type dial, four Feathertouch Tuning keys, broadcast and short-wave coverage, and automatic volume control.

Models H-625, H-631, and H-633 are fully approved by Underwriters' Laboratories.

When operating from a DC source of power it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

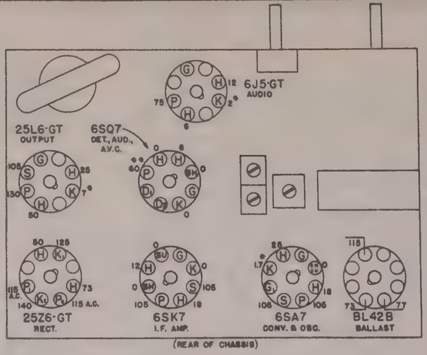


BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND -B

Fig. 4. Socket Voltages
Model H-625

*Measured on 10 volt scale of 20,000 ohms per volt meter.
**Measured on 250 volt scale of 20,000 ohms per volt meter.
Line Volts—115.—No signal input.
Volume at maximum.
When operated on DC power supply, voltages are about 15 per cent lower.
All heater and ballast voltages are A-C.



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND -B

Fig. 3. Socket Voltages
Models H-630, -631, -632, -633
Models H-630U and 632U (EARLY).

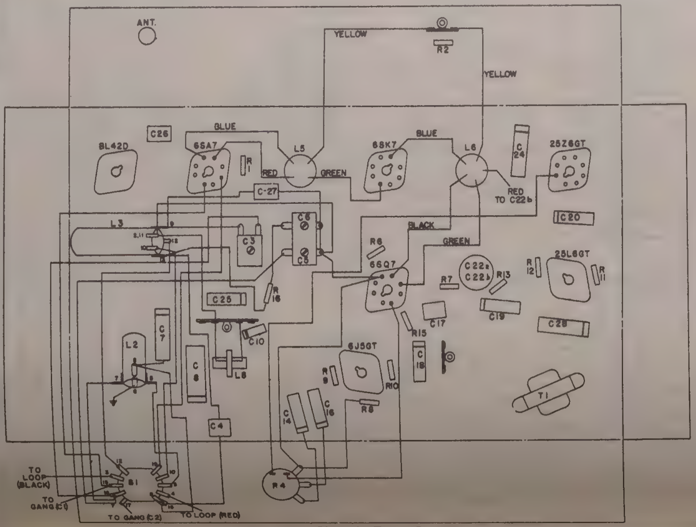
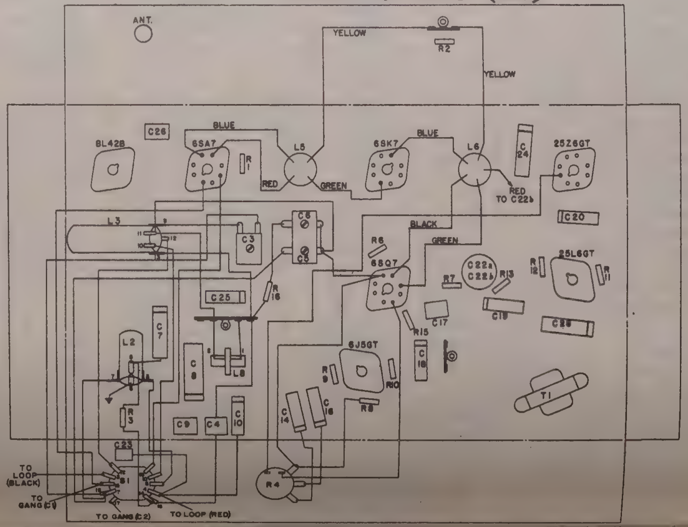


Fig. 6 Chassis Parts Layout



Models H-630, -631, -632, -633; *H-630U; H-632U (Early).*

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MODELS H625
MODELS H630 to H633
H630U,H632U
Alignment,Changes,Trimmers
Dial Drive Data,Parts

ALIGNMENT PROCEDURE

Alignment Frequencies

F.	455 KC
and "B"	1500 and 580 KC
and "D"	18,000 KC

The location of trimmers for the above models are shown in their respective diagrams, Figs. 1 and 2.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Alignment

(1) *Models H-630, -631, -632, -633* Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-3) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Turn the band switch to "D" band. Align (C-6) at 18 MC using an 18 MC signal. Peak (C-5) while rocking the gang condenser. The image of the 18 MC signal should be heard at 17.09 MC when (C-6) is on the proper peak.

(2) *Model H-625* The same alignment procedure as above may be followed for this model excepting that final R.F. alignment on "B" band should be made after the chassis and Beam-a-Scope are properly mounted in the cabinet and interconnected. The location of the Beam-a-Scope with respect to the chassis materially affects alignment.

NOTE.—A change exists in the "B" band trimmer arrangement on late production models. "B" band antenna trimmer (C-1) is eliminated. "B" band oscillator trimmer (C-2) is moved from the top of the gang condenser to the chassis deck and renumbered (C-21) (see Fig. 2). In aligning the late production Model H-625 apply 1500 KC signal as described for H-630. Set dial pointer to 1500 KC and align (C-21) for maximum output by rocking the gang condenser. Retune to 580 KC and peak (C-3) on 580 KC signal by rocking gang condenser. Repeat at 1500 KC.

Alignment on "D" band is the same as described for Model H-630.

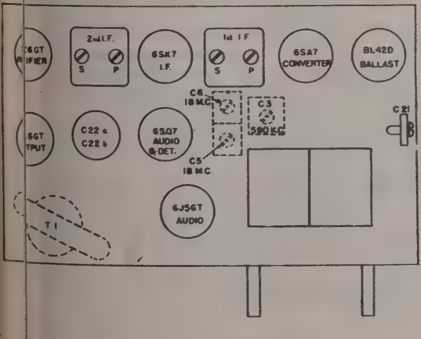
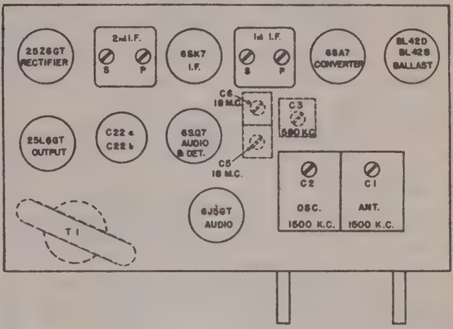


Fig. 2. Trimmer Location
(Late Production Model H-625)

PRODUCTION CHANGES

Late production models of the H-625 have certain trimmer and coil changes incorporated which should be noted when ordering replacement parts.

1. "B" band trimmers (C-1) and (C-2) on top of gang condenser are removed. (C-1) antenna trimmer is completely eliminated. (C-2) oscillator trimmer is renumbered (C-21) and mounted on chassis deck (see Fig. 2).
2. "D" band antenna coil changed from Stock No. RL-088 (Code—Red) to RL-098 (Code—Orange).



NOTE.—Models H-630, -631, -632, -633 use BL42B Ballast. Model H-625 uses BL42D Ballast.

Fig. 1. Trimmer Location
Models H-625 (Early), -630, -631, -632, -633

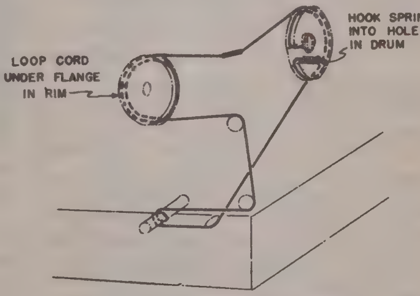


Fig. 9. Dial Drive Stringing Diagram

REPLACEMENT PARTS LIST

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
RA-314	CONDENSER ASSEMBLY—Tuning condenser and drive unit complete with pointer (Models H-630, -631, -632, -633)	$5.70
RA-315	CONDENSER ASSEMBLY—Tuning condenser and drive unit complete (Model H-625)	5.75
*RB-023	BOARD—Terminal board (4 lugs)	.10
RB-041	BOARD—Terminal board (2 lugs)	.10
RB-182	BRACKET—Beam-a-Scope bracket (Models H-630, -631, -632, -633)	.10
RB-921	BACK COVER—Cardboard cabinet back (Models H-630, -631)	.15
RB-922	BACK COVER—Cardboard cabinet back (Models H-632, -633)	.15
RB-924	BACK COVER—Cardboard cabinet back (Model H-625)	.30

MODEL H625
MODELS H630 to H633
H630U,H632U
Parts List

GENERAL ELECTRIC CO.

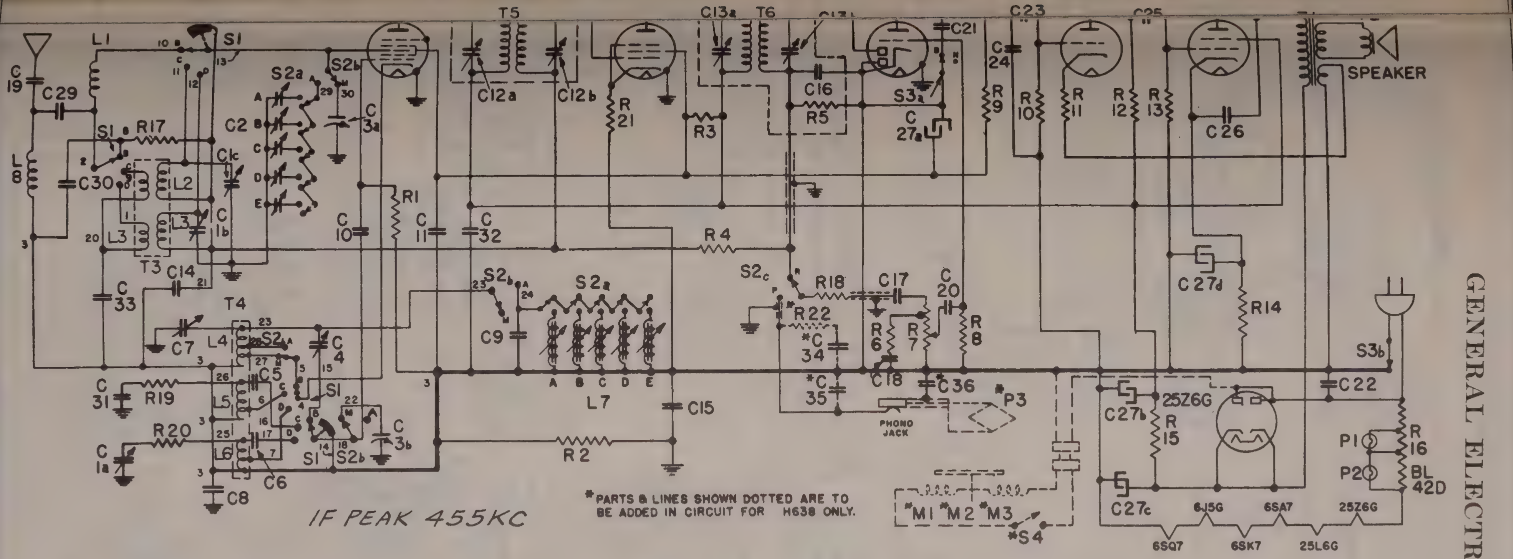
Stock No.	Description	List Price
RB-1018	BOARD—Antenna terminal board	.10
RB-1020	BOARD—Beam-a-Scope terminal board (Model H-625)	.10
*RC-011	CAPACITOR—.002 mfd. 600 V. paper (C-14)	.25
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-18, 19)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-10, 20, 25)	.25
*RC-048	CAPACITOR—.02 mfd. 600 V. paper (C-16)	.30
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-7, 24)	.30
*RC-123	CAPACITOR—0.1 mfd. 400 V. paper (C-8, 28)	.35
*RC-216	CAPACITOR—47 mmf. mica (C-26)	.25
*RC-220	CAPACITOR—6 mmf. mica (C-27 on Model H-625) (C-23 on remainder of Models)	.25
*RC-250	CAPACITOR—220 mmf. mica (C-17 on Model H-625)	.25
*RC-293	CAPACITOR—470 mmf. mica (C-13) (also C-17 on Models H-630, -631, -632, -633)	.30
*RC-390	CAPACITOR—3900 mmf. mica (C-4) (also C-9 on Models H-630, -631, -632, -633)	.35
*RC-645	CAPACITOR—"B" band osc. trimmer (C-21 on late Model H-625)	.15
*RC-676	CAPACITOR—"B" band padder (C-3 on Models H-630, -631, -632, and -633)	.35
RC-749	CONDENSER—Tuning condenser (C-1, 2)	4.15
*RC-863	CORD—Power cord	.65
RC-1995	CLAMP—Oscillator coil clamp (Pkg. 5)	.10
RC-5136	CAPACITOR—50 mfd. 150 V.; 30 mfd. 150 V.; dry electrolytic (C-22a, 22b)	1.15
RC-6516	CAPACITOR—"B" band padder (C-3 on Model H-625)	.30
RC-6517	CAPACITOR—"D" band ant. and osc. trimmers (C-5, 6)	$0.30
RC-8130	CABLE—Tuning drive cable assembly	.15
RC-8508	CARD—Station letter card (1 set)	.30
RD-115	DIAL—Dial scale (Models H-630, -631, -632, -633)	.20
RD-116	DIAL—Dial scale (Model H-625)	1.00
RG-302	GROMMET—Tuning shaft drive cord grommet (Pkg. 10)	.10
RK-055	KNOB—Light oak control knob (Pkg. 5)	.50
RK-074	KNOB—Light tan control knob (Model H-625) (Pkg. 5)	.50
RK-209	KEY—Light oak station selector key (Models H-630, -631, -632, -633)	.15
RK-210	KEY—Light oak station selector key (Model H-625)	.15
RK-215	KEY—Light tan station selector key (Model H-625)	.15
RL-088	COIL—"D" band antenna coil (Code—Red) (L-2)	.65
RL-098	COIL—"D" band antenna coil (Code—Orange) (L-2)	.65
RL-295	COIL—Oscillator coil (L-3 on Models H-630, -631, -632, -633)	.70
RL-296	COIL—Oscillator coil (L-3 on Model H-625)	.70
RL-346	CHOKE—Antenna choke (L-8)	.30
RL-511	BEAM-A-SCOPE—Beam-a-Scope antenna (L-1 on Models H-630, -631, -632, -633)	.70
RL-512	BEAM-A-SCOPE—Beam-a-Scope antenna (L-1 on Model H-625)	2.95
RL-937	LUG—Key pin binding lug (Pkg. 10)	.10
RM-503	MASK—Dial scale mask (Model H-625) (Pkg. 10)	.10
RN-200	NAMEPLATE—Dial scale metal nameplate (Model H-625)	.20
RP-134	PIN—Station selector key pin (Pkg. 10)	.05
RP-143	POINTER—Dial scale pointer (Models H-630, -631, -632, -633)	.60
RP-144	POINTER—Dial scale pointer (Model H-625) (Pkg. 5)	.25
RP-307	PULLEY—Condenser drive cord pulley (Pkg. 5)	.25
RP-308	PULLEY—½ inch drive cord idler pulley (Pkg. 5)	.10
RP-309	PULLEY—$\frac{1}{16}$ inch drive cord idler pulley (Pkg. 5)	.10

Stock No.	Description	
*RQ-1235	RESISTOR—100 ohms, ½ W. carbon (R-16) (Pkg. 5)	
*RQ-1239	RESISTOR—150 ohms, ½ W. carbon (R-12) (Pkg. 5)	
*RQ-1259	RESISTOR—1000 ohms, ½ W. carbon R-13) (Pkg. 5)	
*RQ-1271	RESISTOR—3300 ohms, ½ W. carbon (R-9) (Pkg. 5)	
*RQ-1295	RESISTOR—33,000 ohms, ½ W. carbon (R-1) (Pkg. 5)	
*RQ-1297	RESISTOR—39,000 ohms, ½ W. carbon (R-10) (Pkg. 5)	
*RQ-1323	RESISTOR—470,000 ohms, ½ W. carbon (R-3, 5, 7, 11, 15) (Pkg. 5)	
*RQ-1331	RESISTOR—1.0 megohm, ½ W. carbon (R-8) (Pkg. 5)	
*RQ-1339	RESISTOR—2.2 megohms, ½ W. carbon (R-2) (Pkg. 5)	
*RQ-1365	RESISTOR—15 megohms, ¼ W. carbon (R-6) (Pkg. 5)	
RR-772	RESISTOR—BL42D ballast resistor (R-14) (Model H-625)	
RR-773	RESISTOR—BL42B ballast resistor (R-14) (Models H-630, -631, -632, -633)	
RR-930	REFLECTOR—Dial scale reflector (Models H-630, -631, -632, -633)	
RR-941	REFLECTOR—Dial scale reflector (Model H-625)	
*RS-200	SOCKET—Octal tube socket (Pkg. 5)	
RS-256	SOCKET—Electrolytic mounting socket (Pkg. 5)	
RS-261	SOCKET—Pilot lamp socket	
*RS-426	SPRING—Condenser drive cord spring (Pkg. 5)	
RS-510	SPACER—Station key spacer (Pkg. 10)	
RS-511	SLEEVE—Condenser bracket spacer sleeve (Pkg. 10)	
RS-929	SHAFT—Tuning shaft	
RS-3036	SWITCH—Band change switch	
RT-328	TRANSFORMER—1st I.F. transformer (L-5)	$1.
RT-329	TRANSFORMER—2nd I.F. transformer (L-6)	1.
RT-468	TRANSFORMER—Output transformer (T-1) (Models H-630, -632)	
RT-469	TRANSFORMER—Output transformer (T-1) (Models H-625, -631, -633)	1.
*RT-952	TERMINAL—Loop lead contact terminal (Pkg. 10)	
RT-954	TERMINAL—Speaker lead terminal (Pkg. 10)	
RV-072	VOLUME CONTROL—2.0 megohm volume control (R-4)	
RW-039	WINDOW—Celluloid station letter window (Pkg. 25)	
*RW-101	WASHER—Control shaft felt washer (Pkg. 10)	
*RX-035	ASSEMBLY—Condenser mounting foot assembly	
RX-061	ASSEMBLY—Chassis mounting assembly	
	SPEAKER ASSEMBLY	
RB-1019	BOARD—5-inch speaker terminal board	
RC-9009	CONE ASSEMBLY—12-inch speaker cone assembly (Model H-625)	.9
RC-9014	CONE ASSEMBLY—5-inch speaker cone assembly (Model H-630, -631, -632, -633)	.8
RP-129	PLUG—Speaker plug (Model H-625) (Pkg. 2)	.1
RS-1011	SPEAKER—12-inch P.M. speaker (Model H-625)	4.8
RS-1018	SPEAKER—5-inch P.M. speaker (Models H-630, -631)	2.5
RS-1019	SPEAKER—5-inch P.M. speaker (Models H-632, -633)	3.4

*Used on previous receivers.

GENERAL ELECTRIC CO.

MODELS H634,H638,H640 Schematic,Socket,Trimmers



IF PEAK 455KC

*PARTS & LINES SHOWN DOTTED ARE TO BE ADDED IN CIRCUIT FOR H638 ONLY.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
C-1a	"D" band oscillator trimmer	C-22	.05 mfd. 250 V. A. C. moulded	M-1	60 cycle phono motor
C-1b	"D" band antenna trimmer		capacitor	M-2	50 cycle phono motor
C-1c	"C" band antenna trimmer	C-23	.005 mfd. paper capacitor	M-3	25 cycle phono motor
C-2a	7–65 mmf. station trimmer	C-24	100 mmf. mica capacitor	R-1	22,000 ohms, carbon resistor
C-2b	20–180 mmf. station trimmer	C-25	.02 mfd. paper capacitor	R-2	470,000 ohms, carbon resistor
C-2c	20–180 mmf. station trimmer	C-26	.01 mfd. paper capacitor	R-3	2200 ohms, carbon resistor
C-2d	100–490 mmf. station trimmer	C-27a	50 mfd. 150 V. dry electrolytic	R-4	2.2 megohms, carbon resistor
C-2e	100–490 mmf. station trimmer	C-27b	50 mfd. 150 V. dry electrolytic	R-5	470,000 ohms, carbon resistor
C-3	Tuning condenser	C-27c	50 mfd. 150 V. dry electrolytic	R-6	56,000 ohms, carbon resistor
C-4	"B" band oscillator padder	C-27d	20 mfd. 25 V. dry electrolytic	R-7	2 megohm volume control
C-5	2000 mmf. mica capacitor ±5%	C-29	0.1 mfd. paper capacitor	R-8	15 megohms, carbon resistor
C-6	5600 mmf. mica capacitor ±5%	C-30	4700 mmf. mica capacitor ±5%	R-9	220,000 ohms, carbon resistor
C-7	"B" band oscillator trimmer	C-31	22 mmf. mica capacitor	R-10	1 megohm, carbon resistor
C-8	0.1 mfd. paper capacitor	C-32	.05 mfd. paper capacitor	R-11	3300 ohms, carbon resistor
C-9	750 mmf. silvered mica cap	C-33	.05 mfd. paper capacitor	R-12	220,000 ohms, carbon resistor
	±5%	C-34	.01 mfd. paper capacitor	R-13	470,000 ohms, carbon resistor
C-10	47 mmf. mica capacitor	C-35	.002 mfd. paper capacitor	R-14	150 ohms, carbon resistor
C-11	.05 mfd. paper capacitor	C-36	0.1 mfd. paper capacitor	R-15	560 ohms, carbon resistor
C-14	.05 mfd. paper capacitor	L-1	Loop antenna	R-16	Ballast tube BL42D
C-15	0.1 mfd. paper capacitor	L-2	"C" band antenna coil	R-17	47,000 ohms, carbon resistor
C-16	100 mmf. mica capacitor	L-3	"D" band antenna coil	R-18	47,000 ohms, carbon resistor
C-17	.005 mfd. paper capacitor	L-4	"B" band oscillator coil	R-19	150 ohms, carbon resistor
C-18	.0072 mfd. paper capacitor	L-5	"C" band oscillator coil	R-20	68 ohms, carbon resistor
C-19	.005 mfd. paper capacitor	L-6	"D" band oscillator coil	R-21	390 ohms, carbon resistor
C-20	.01 mfd. paper capacitor	L-7	Station coil trimmers	R-22	100,000 ohms, carbon resistor
C-21	.0015 mfd. paper capacitor	L-8	Antenna choke	P-1, 2	Dial lamp, Mazda No. 44.

Fig. 3. Schematic Diagram

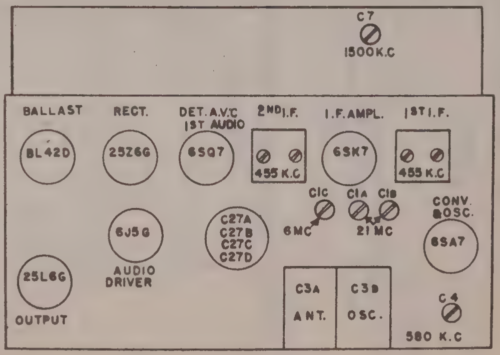
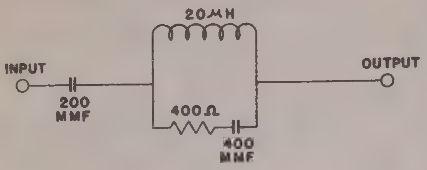


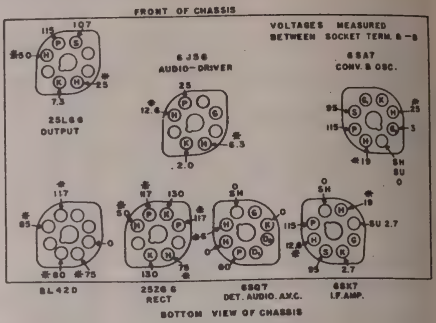
Fig. 2. Trimmer Location

MODELS H634,H638,H640
Chassis Wiring,Voltage

GENERAL ELECTRIC CO.

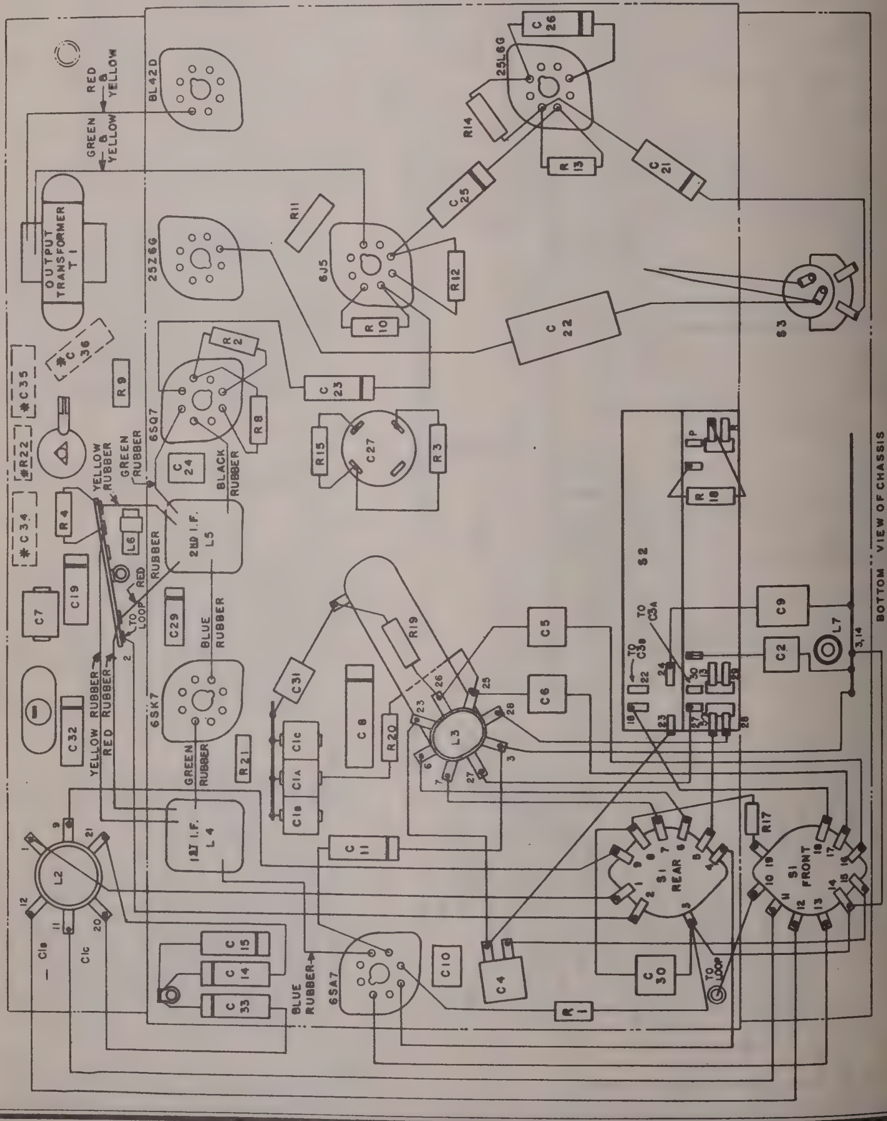
Fig. 7. I.R.E. Dummy Antenna





* Volts A.c.
Line Volts-117. No signal input. Max. volume. Gang closed. "B" band.
Volts measured on 20,000 ohms per volt-voltmeter.

Fig. 5. Socket Voltage



*C34-C35-C36-R22 TO BEADDED FOR H-638 PHONO-COMBINATION ONLY

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GENERAL ELECTRIC CO.

SPECIFICATIONS

sica Specifications

el.	H-634	H-638	H-640
ht.	10½ in.	12$\frac{11}{16}$ in.	10½ in.
th.	18 in.	19¾ in.	19⅝ in.
th.	9⅝ in.	13⅝ in.	9$\frac{9}{16}$ in.
ght icked.	22 lbs	37 lbs.	22 lbs

ing ontrol Drive Ratio..............10:1

tri l Specifications

ODE	RATING	POWER SUPPLY (VOLTS)	FRE-QUENCY (CYCLES ON AC)	POWER CON-SUMPTION (WATTS)
34 40		110–120 AC or DC	25–60	55
38	A6 A5 C2	115–125 AC 115–125 AC 115–125 AC	60 50 25	75 75 75

ing 'requency Range

and B"......................... 550–1600 K.C.
and C"......................... 2200–6500 K.C.
and D"......................... 6500–22000 K.C.

rm iate Frequency................455 K.C.

Electrical Power Output

Undistorted..........................1.75 watts
Maximum..............................2.7 watts

Tone Control.............................2-position

Loud-speaker—"Alnico" Magnet Dynamic

Model	H-634	H-638	H-640
Outside Cone Diameter	5-in.	6½ in.	6½ in.

Voice Coil
Impedance.....................3.5 ohms at 400 cycles

Phonograph

Model..........................H-638
Type Pick-up..................Crystal
Turntable Speed...............78 rpm.

Tubes

Converter and Oscillator	GE-6SA7
I.F. Amplifier	GE-6SK7
Det., Aud., AVC	GE-6SQ7
Audio Driver	GE-6J5G
Output	GE-25L6G
Rectifier	GE-25Z6G
Pilot Lamp	(2) Mazda No. 44

GENERAL INFORMATION

ode H-634, H-638 and H-640 employ three-band AC-rece ers of the superheterodyne type using six General tric 're-tested Tubes. Features of design include the -in 'Beam-a-Scope," the new "Alnico" dynapower ker, seven "Feathertouch Tuning" keys, a Visualux iro core oscillator trimmer coils for station keys and mat volume control.

ad tion to the above features, the Model H-638 incor-tes phonograph mechanism for reproducing recordings. ph cograph plays 10-inch or 12-inch records and is uall operated. A constant speed, self-starting, silent tric otor and high-quality crystal pick-up insure realistic odu ions.

Sys m

-1 is he Beam-a-Scope. On "B" band, L-1 operates as a ant nna. On "C" and "D" bands, the grid end of L-1 fect ely grounded preventing absorption spots due to res ance. T-3 is the "C" and "D" antenna transformer e T is the oscillator transformer for all bands. All sw ch and coil terminals are numbered in Fig. 3 and 4 t acilitate in locating common points.

he f lowing table shows the coils in use for various posi-s of e band and manual-automatic switch:

and-itch ition	Antenna Primary	Antenna Second-ary	Oscillator Grid	Oscillator Cathode	Remarks
anual ning d "B		L-1	L-4	Section 3 to 27 of L-4	C-3a and C-3b tuning condenser in circuit
mati ning d "B		L-1	L-4	Section 3 to 28 of L-4	C-2 and L-7 trimmers and coils in circuit
d "C	L-2	L-2	L-5	Section 3 to 6 of L-5	L-1 and L-4 effectively grounded through C-14 and C-4 respectively
d "D	L-3	L-3	L-6	Section 3 to 7 of L-6	L-1, L-2 secondary grounded through C-14. L-4, L-5 grounded through C-4 and C-5 respectively

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position without remagnetizing before replacing it.

Phonograph or Television Audio Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connection of record players or television audio channels. General Electric plug, Stock No. RP-145, fits the pin jack. The Model H-638 uses the plug connection from phonograph to radio and this plug may be readily removed to allow use of other record players, sound equipment or television sound converters.

Note—A suitable load consisting of a 100,000-ohm resistor and a .01 mfd. capacitor should be connected across the pick-up leads when using a crystal-type unit.

Alignment Procedure

The alignment procedure is given in table form
Use a standard I.R.E. "dummy" antenna, Fig. 7, in making all R.F. alignments. The relative position of the Beam-a-Scope with respect to the chassis materially affects R.F. alignment on "B" band; therefore, final R.F. alignment on "B" band should be made after the chassis and Beam-a-Scope are mounted in the cabinet.

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum-tube voltmeter or similar voltage-measuring instrument is available.

(1) Stage Gains
  (a) Antenna Post to Converter Grid
    Band "B"............3.5 to 4.0
    Band "C"............3.0 to 3.5
    Band "D"............1.3 to 3.0
  (b) Converter Grid to 6SK7 Grid....60 at 455 K.C.‡
  (c) 6SK7 Grid to 6SQ7 Det. Plate...35 at 455 K.C.‡
(2) A 400-cycle signal of .05 volts across the volume control will give ½ watt speaker output.‡ (Volume control turned to maximum.)
(3) Average DC voltage developed across oscillator grid resistor (R1).
    Band "B"...................6 to 8 volts
    Band "C"...................5 to 10 volts
    Band "D"...................2 to 5 volts

‡ Variations of +10%, −20% permissible.

ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid and Minus B	.05 mfd. or Larger	2nd I.F. Sec. (C-13b) 2nd I.F. Pri. (C-13a)	Gang condenser plates closed—"manual' key depressed—connect audio input of os cilloscope to minus B and to the junction o R-4 and R-18. Adjust trimmers in orde mentioned for a single symmetrical curve o maximum amplitude. The resultant curve i shown in Fig. 1.
2. Band "B"	455 K.C. Sweep	Converter Grid and Minus B	.05 mfd. or Larger	1st I.F. Sec. (C-12b) 1st I.F. Pri. (C-12a)	

I.F. Alignment with Output Meter

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid and Minus B	.05 mfd. or Larger	2nd I.F. Sec. (C-13b) 2nd I.F. Pri. (C-13a)	Gang condenser plates closed—connect out put meter across voice coil—keep input signa low and volume control on as far as possible Adjust all trimmers for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid and Minus B	.05 mfd. or Larger	1st I.F. Sec. (C-12b) 1st I.F. Pri. (C-12a)	

R. F. Alignment

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"					Close gang plates adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position
2. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-4)	Set dial pointer to 580 K.C. and tune in signal with (C-4)
3. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-7)	Peak trimmer for maximum output while rocking the gang condenser
4. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-4)	Retrim for maximum output with a low input signal rocking gang condenser
5. Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Ant. (C-1c)	Peak for maximum output with a low input signal
6. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-1a) Ant. (C-1b)	The image of any "D" band signal should be heard 910 K.C. below signal input when (C-1a) is on proper peak. Example: 15 M.C. image—14.09 M.C. Peak (C-1b) while rocking the gang condenser

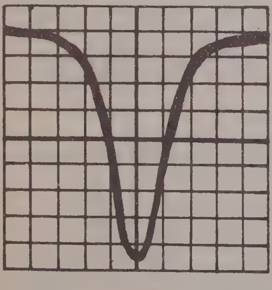


Fig. 1. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

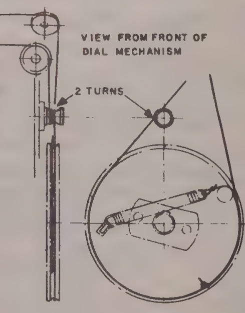


Fig. 6. Dial Drive Stringing Diagram

PHONOGRAPH MECHANISM (H-638)

The phonograph mechanism used in this receiver has be designed to be as simple as possible and give long and troubl free performance. Under normal operating conditions servi difficulties should be negligible. Occasionally, however, certa adjustments may be required.

Trip Mechanism

The trip mechanism is of simple design and consists of latch bar connected to the motor switch and a trip lever. Th latch is held closed by means of a spring between the latc bar and the trip lever. The motor switch is mechanicall connected to the latch bar so that when the trip mechanis is released, the motor switch is in the "Off" position. Be su this latch bar mechanism works freely without binding.

The trip is actuated by an adjustable arm on the trip leve When the eccentric groove in the record swings the tone ar back and forth, it pushes the latch out of engagement.

Crystal Pick-up

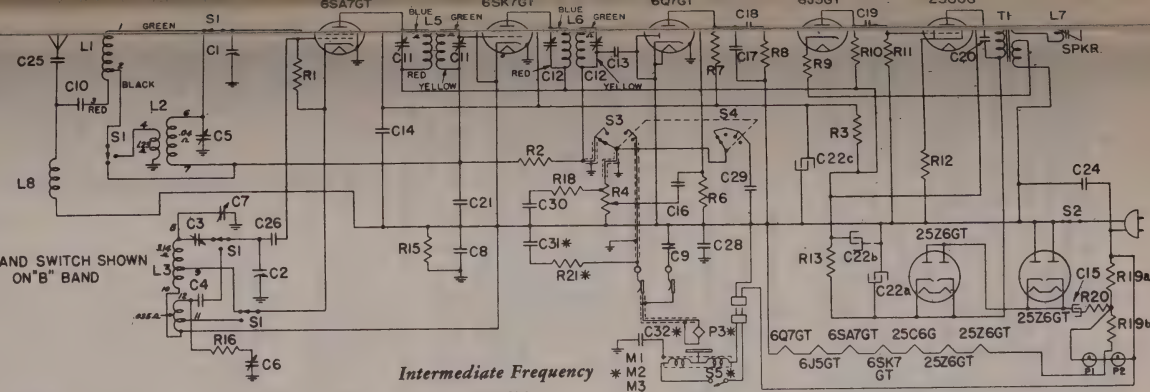
The crystal pick-up employs a crystal element which i coupled to a light needle chuck. The needle movement bend the crystal element thus generating voltage by the piezo electric effect. The voltage developed is dependent upon th needle movement amplitude and the load resistance.

The crystal cartridge is a factory-sealed unit and no adjust ments are provided. The cartridge is held in the tone arm b means of two screws. The pick-up and tone-arm assembl should require very little servicing and if treated with rea sonable care should perform its function without attentio for long periods of time.

Symbol	Description
C-2	Oscillator section tuning condenser
C-3	"B" band padding capacitor
C-4	3900 mmf. mica condenser ±5%
C-5	3-30 mmf. "D" antenna trimmer
C-6	3-20 mmf. "D" oscillator trimmer
C-7	3-20 mmf. "B" oscillator trimmer
C-8	0.1 mfd. paper capacitor
C-9	0.1 mfd. paper capacitor
C-10	.01 mfd. paper capacitor
C-13	220 mmf. mica capacitor
C-14	.05 mfd. paper capacitor
C-15	30 mfd. 250 V. dry electrolytic
C-16	.02 mfd. paper capacitor
C-17	220 mmf. mica capacitor
C-18	.005 mfd. paper capacitor
C-19	.03 mfd. paper capacitor
C-20	.01 mfd. paper capacitor
C-21	0.1 mfd. paper capacitor
C-22a	40 mfd. 250 V. electrolytic
C-22b	20 mfd. 250 V. electrolytic
C-22c	20 mfd. 250 V. electrolytic
C-24	.05 mfd. paper capacitor
C-25	.01 mfd. paper capacitor
C-26	47 mmf. mica capacitor
C-28	0.1 mfd. paper capacitor
C-29	.001 mfd. paper capacitor (used on H-736 only)
C-29	.002 mfd. paper capacitor (used on H-708 only)
C-30	.01 mfd. paper capacitor
C-31	.0072 mfd. paper capacitor
C-32	0.1 mfd. paper capacitor
L-1	Beam-a-Scope
L-2	"D" antenna coil
L-3	"B-D" oscillator coil
L-5	1st I.F. transformer
L-6	2nd I.F. transformer
L-8	1¼ mh. antenna choke
M-1	60-cycle phono motor
M-2	50-cycle phono motor
M-3	25-cycle phono motor
P-1, -2	Dial lamps, MAZDA No. 44
P-3	Crystal pick-up
R-1	33,000 ohms carbon resistor
R-2	2.2 megohms carbon resistor
R-3	3900 ohms carbon resistor
R-4	0.5 megohm volume control
R-6	15 megohms carbon resistor
R-7	470,000 ohms carbon resistor
R-8	1.0 megohms carbon resistor
R-9	3300 ohms carbon resistor
R-10	39,000 ohms carbon resistor
R-11	470,000 ohms carbon resistor
R-12	220 ohms 1 W. carbon resistor
R-13	3300 ohms 2 W. carbon resistor
R-15	470,000 ohms carbon resistor
R-16	27 ohms carbon resistor
R-18	33,000 ohms carbon resistor
R-19a	33 ohms, 3.5 W. wire wound
R-19b	20 ohms, 2.5 W. wire wound
R-20	22 ohms, 2 W. carbon resistor
R-21	100,000 ohms carbon resistor
S-1	Band switch
S-2	Power switch on volume control
S-3	Radio-Phono switch
S-4	Tone control
S-5	Motor power switch
T-1	Output transformer

Phonograph

Model H-708
Type . . . . Automatic Record Changer
Record Capacity
10-inch 8
12-inch 7
Type Pick-up . . . . Crystal
Turntable Speed . . . . 78 R.P.M.



Intermediate Frequency
455 KC

* Used on Model H-708 only.

Fig. 5. Schematic Diagram

AUTOMATIC RECORD CHANGER (H-708)

SEE (G69) PAGE 10-9.

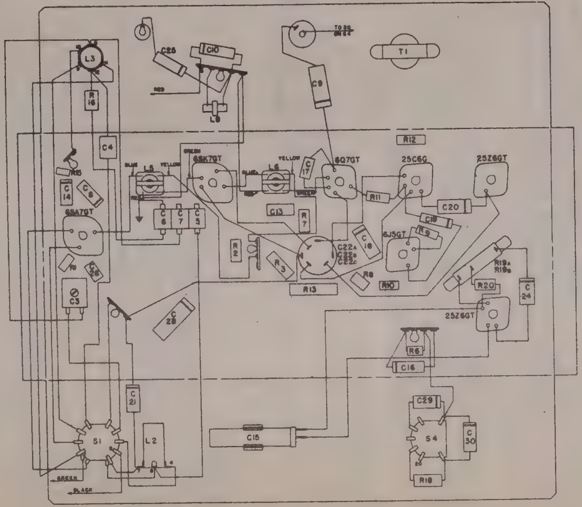


Fig. 4. Chassis Parts Layout

Electrical Specifications

Model	Rating	Power Supply (Volts)	Frequency (Cycles per second)	Power Consumption (Watts)
H-736		115	25–60	65
H-708	A6 A5 C2	115 115 115	60 50 25	90 90 90

Electrical Power Output

Undistorted . . . . 3.5 watts
Maximum . . . . 4.5 watts

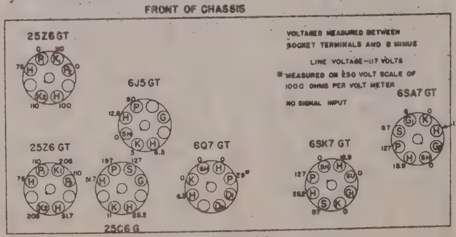


Fig. 2. Socket Voltages

GENERAL INFORMATION

Models H-736 and H-708 employ two-band AC receivers of the superheterodyne type using seven General Electric Pretested Tubes. Features of design include the voltage doubler rectifier circuit, 12-inch Dynapower speaker, built-in Beam-a-Scope, "plug-in" type terminal for connecting a record player or television sound channel, six mechanical type "Feather-touch Tuning" keys and beam power output.

Model H-708 also contains an automatic-record-changing phonograph mechanism. High-quality reproduction is assured with a crystal pick-up and constant-speed, self-starting, silent electric motor.

Voltage Doubler

The voltage doubler circuit used in Models H-736 and H-708 operates in the following manner; refer to Schematic Diagram Fig. 5. When the B minus side of the power line is positive the right-hand 25Z6GT rectifier will conduct charging up electrolytic capacitor (C-15) to near line voltage. On the reverse cycle when the B minus side of the power line is negative, the line voltage will add to the charge on (C-15) and will charge up electrolytic capacitor (C-22a) through the left-hand 25Z6GT rectifier to nearly twice line voltage. The series resistor (R-20) is inserted as a protective device for both rectifier tubes.

Phonograph or Television Sound Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connection of a record player or television sound channel. General Electric plug, Stock No. RP-145, fits the pin jack. The Model H-708 uses the plug connection from pick-up to radio and this plug may be readily removed to allow use of another record player or a television sound converter.

NOTE: When using a crystal pick-up other than the one supplied with the Model H-708, a suitable load consisting of a 47,000-ohm resistor in series with a .0072-mfd. capacitor should be connected across the pick-up leads.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.	455 KC
"B" Band	1500 and 580 KC
"D" Band	18,000 KC

The location of trimmers for the above models is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark on the left-hand end of the broadcast scale. Turn the band switch to "B" band (counterclockwise) and the tone control to "Radio-Bass" (extreme counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7GT tube through a .05 mfd. capacitor. Do not remove the 6SA7GT grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers (C-11 and C-12) for maximum meter reading.

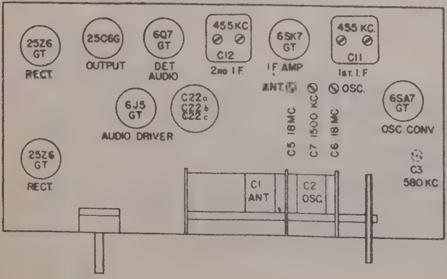


Fig. 1. Trimmer Location

R.F. Alignment

Apply R.F. signals through a standard I.R.E. du
antenna to the antenna post on the rear apron of the ch
The Beam-a-Scope must be connected for R.F. alignment
since its relative position with respect to the chassis mate
affects the alignment on "B" band, it is advisable to per
the alignment when the chassis and Beam-a-Scope are p
erly mounted in the cabinet.

Align (C-3) on 580 KC when gang condenser is turne
the 580 KC dial mark. Peak (C-7) on 1500 KC while roc
gang condenser. Repeak (C-3) on 580 KC while rocking
condenser.

Turn band switch to "D" band and turn gang condens
18 MC dial mark. Align (C-6) on 18 MC and peak (C-5)
rocking the gang condenser. The image of any "D"
signal should be heard 910 KC below the input signal
(C-6) is on the proper peak. Example: 18 MC image—1
MC.

Special Service Information

The following information will be found very usefu
servicing receivers if a vacuum-tube voltmeter or sim
voltage-measuring instrument is available:

(1) Stage Gains
  (a) Antenna Post to Converter Grid—1 1000 KC‡
  (b) Converter Grid to 6SK7 Grid—30 at 5 KC‡
  (c) 6SK7 Grid to 6Q7 Det. Plate—77 at 5 KC‡

(2) A 400-cycle signal of .06 volts across the volu control will give ½ watt speaker output.‡ (Vol turned to maximum.)

(3) Average DC voltage developed across oscillator g resistor (R-1)—6 volts.

‡ Variations of +10%, −20% permissible.

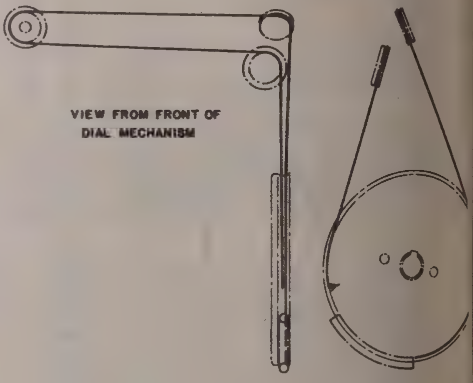


Fig. 3. Drive Cord Arrangement

Loud-speaker—"Alnico" Magnetic Dynamic

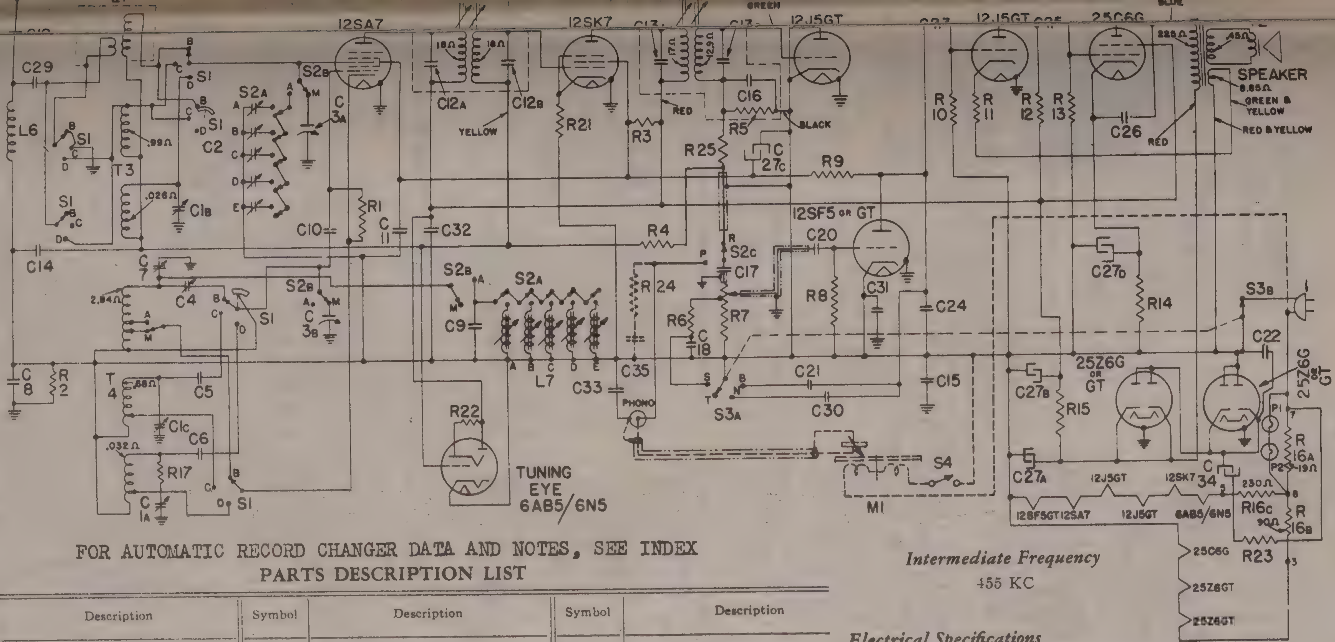
Outside Cone Diameter	12 inch
Voice Coil Impedance (400 cycles)	3.5 oh

The voice coil is accurately and permanently centered
the factory and should seldom give trouble. In case a voi
coil needs recentering, it will be necessary to replace th
entire cone and voice coil assembly.

NOTE: In no case should the magnet be removed from th
assembled position without remagnetizing after replacing it.

GENERAL ELECTRIC CO.

MODELS HJ905,HJ908,HJ908B
Schematic



FOR AUTOMATIC RECORD CHANGER DATA AND NOTES, SEE INDEX

PARTS DESCRIPTION LIST

Symbol	Description	Symbol	Description	Symbol	Description
C-1A	"D" band oscillator trimmer	C-22	.05 mfd. paper capacitor	R-8	4.7 megohms carbon resistor
C-1B	"D" band antenna trimmer	C-23	.005 mfd. paper capacitor	R-9	220,000 ohms carbon resistor
C-1C	"C" band oscillator trimmer	C-24	100 mmf. mica capacitor	R-10	1.0 megohm carbon resistor
C-2A	7-65 mmf. station selector trimmer	C-25	.02 mfd. paper capacitor	R-11	3300 ohms carbon resistor
C-2B	20-180 mmf. station selector trimmer	C-26	.01 mfd. paper capacitor	R-12	220,000 ohms carbon resistor
C-2C	20-180 mmf. station selector trimmer	C-27A	40 mfd. 250 V. dry electrolytic	R-13	330,000 ohms carbon resistor
C-2D	100-490 mmf. station selector trimmer	C-27B	20 mfd. 250 V. dry electrolytic	R-14	220 ohms 1 W. carbon resistor
C-2E	100-490 mmf. station selector trimmer	C-27C	20 mfd. 250 V. dry electrolytic	R-15	3300 ohms 3 W. carbon resistor
C-3A	Antenna section tuning condenser	C-27D	20 mfd. 25 V. dry electrolytic	R-16A	19 ohms ballast resistor
C-3B	Oscillator section tuning condenser	C-29	.01 mfd. paper capacitor	R-16B	90 ohms ballast resistor
C-4	300-675 mmf. "B" band padder	C-30	.001 mfd. 1000 V. paper capacitor	R-16C	230 ohms ballast resistor
C-5	2400 mmf mica capacitor ±5%	C-31	.01 mfd. paper capacitor	R-17	33 ohms carbon resistor
C-6	5600 mmf. mica capacitor ±5%	C-32	.05 mfd. paper capacitor	R-21	47 ohms carbon resistor
C-7	"B" band oscillator trimmer	C-33	0.1 mfd. paper capacitor	R-22	1.0 megohm carbon resistor
C-8	.08 mfd. paper capacitor	C-34	30 mfd. 250 V. dry electrolytic	R-23	30 ohms 4 W. wire resistor
C-9	750 mmf. silvered mica capacitor	C-35	.02 mfd. paper capacitor	R-24	100,000 ohms carbon resistor
C-10	47 mmf. mica capacitor	L-1	Beam-a-Scope	R-25	47,000 ohms carbon resistor
C-11	.05 mfd. paper capacitor	L-6	Antenna Choke	S-1	Band change switch
C-14	0.1 mfd. paper capacitor	P-1, 2	Dial lamp, MAZDA No. 44	S-2A	Station selector switch
C-15	0.1 mfd. paper capacitor	R-1	33,000 ohms carbon resistor	S-2B	Manual switch
C-16	100 mmf. mica capacitor	R-2	470,000 ohms carbon resistor	S-2C	Phono switch
C-17	.005 mfd. paper capacitor	R-3	3300 ohms 1 W. carbon resistor	S-3A	Tone switch
C-18	.0072 mfd. paper capacitor	R-4	2.2 megohms carbon resistor	S-3B	Power switch
C-19	.005 mfd. paper capacitor	R-5	470,000 ohms carbon resistor	S-4	Phono motor switch
C-20	.01 mfd. paper capacitor	R-6	56,000 ohms carbon resistor		
C-21	.0032 mfd. paper capacitor	R-7	2.0 megohms volume control		

Intermediate Frequency

455 KC

Electrical Specifications

Model	Rating	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
HJ-905		115	25-60	85
HJ-908	A6	110-125	60	95
	A5	110-125	50	95
	C2	110-125	25	110

Electrical Power Output

Undistorted..............................4.5 watts
Maximum..............................6 watts

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter....................12 inches
Voice Coil Impedance (400 cycles)..........3.5 ohms

ALIGNMENT PROCEDURE

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark on the left-hand end of the broadcast scale. Turn the band switch to "B" band (counterclockwise) and the tone control to "Normal."

Set test oscillator to 455 KC and apply signal to the control grid of the 12SA7 tube through a .05 mfd. capacitor. Do not remove the 12SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers (C-12 and C-13) for maximum meter reading.

R.F. Alignment

Apply R.F. signals through a standard I.R.E. dummy antenna to the antenna post on the rear apron of the chassis. The Beam-a-Scope must be connected for R.F. alignment and since its relative position with respect to the chassis materially affects the alignment on "B" band, it is advisable to perform the alignment when the chassis and Beam-a-Scope are properly mounted in the cabinet.

Align (C-4) on 580 KC when gang condenser is turned to the 580 KC dial mark. Peak (C-7) on 1500 KC while rocking gang condenser. Repeak (C-4) on 580 KC while rocking gang condenser.

Turn band switch to "D" band and turn gang condenser to 21 MC dial mark. Align (C-1A) on 21 MC and peak (C-1B) while rocking the gang condenser. The image of any "D" band signal should be heard 910 KC below the input signal when (C-1A) is on the proper peak. Example: 21 MC image —20.09 MC.

Turn band switch to "C" band and set pointer at 6 MC dial mark. Align (C-1C) on 6 MC while rocking the gang condenser.

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum-tube voltmeter or similar voltage-measuring instrument is available:

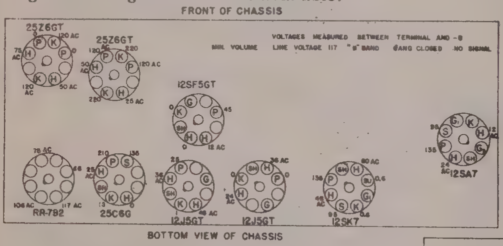

FRONT OF CHASSIS
VOLTAGES MEASURED BETWEEN TERMINAL AND -B
MIN. VOLUME LINE VOLTAGE 117 "B" BAND GANG CLOSED NO SIGNAL
25Z6GT
25Z6GT
12SF5GT
12SA7
RR-782
25C6G
12J5GT
12J5GT
12SK7
BOTTOM VIEW OF CHASSIS

Fig. 2. Socket Voltages

Tuning Frequency Range

Broadcast	550–1600 KC
Short-wave	2300–22,000 KC

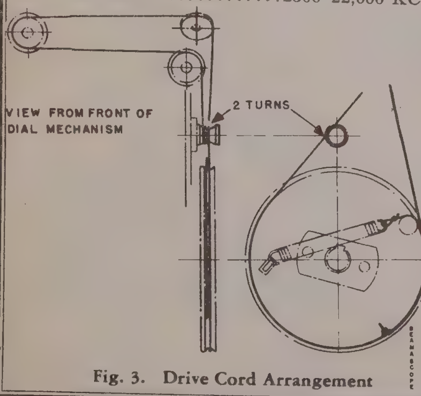


Fig. 3. Drive Cord Arrangement

(1) Stage Gains

- (a) Antenna Post to Converter Gri
  1000 KC‡
- (b) Converter Grid to 12SK7 Grid—
  KC‡
- (c) 12SK7 Grid to 12J5GT Det. Gri
  455 KC‡

(2) A 400-cycle signal of .04 volts across the control will give ½ watt speaker output.‡ turned to maximum.)

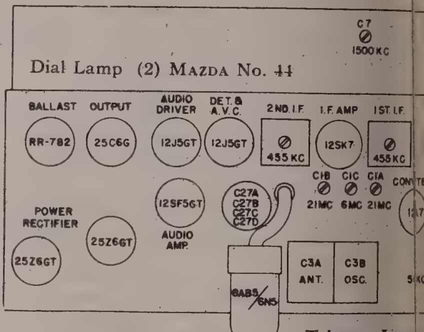
(3) DC voltage developed across oscillator grid (R-1)—11 volts at 1000 KC.

‡ Variations of +10%, −20% permissible.

Loud-speaker

The voice coil is accurately and permanently ce the factory and should seldom give trouble. In cas coil needs recentering, it will be necessary to rep entire cone and voice coil assembly.

NOTE: In no case should the magnet be removed assembled position without remagnetizing after repla



Trimmer Loca

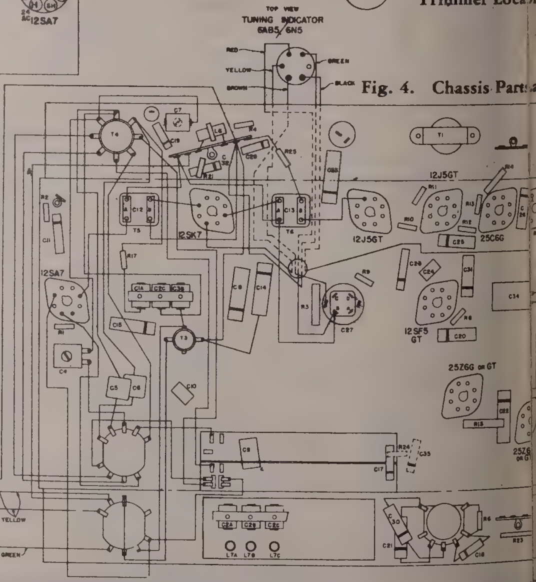


Fig. 4. Chassis Parts

Rating	Supply (Volts)	(Cycles per Second)	Consumption (Watts)
A6	115–125	60	30
A5	115–125	50	30

HM-21

Motor
Constant-speed, self-starting

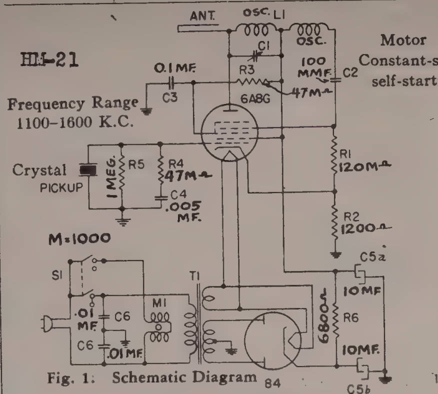


Fig. 1: Schematic Diagram 10-39

GENERAL INFORMATION

The Model HM-21 Wireless Record Player is a two-tube transmitter using a type 84 tube as a rectifier and a type 6A8G as an oscillator. Audio modulation is applied to the control grid of the 6A8G from a properly loaded crystal pickup circuit. The oscillator operates over a range of 1100–1600 kilocycles and the frequency is adjusted by the tuning trimmer (C-1). This trimmer is set to operate at approximately 1500 K.C. at the factory.

The turntable is driven at 78 revolutions per minute by a constant-speed, self-starting induction motor. The motor is properly lubricated at the factory for long operation and should not require attention under normal weather conditions.

The power control is a three-position switch. When this control is turned to the extreme counterclockwise position, all power is removed from the record player. When switched to the center position, power is applied to both the motor and the transmitter. When turned to the extreme clockwise position, power is still supplied to the transmitter but is removed from the motor. This last position provides a means of stopping turntable rotation without letting the tubes cool down from operating temperature.

To adjust the frequency of the oscillator turn the tuning trimmer which is accessible through a hole in the bottom cover near the power control knob. This is a screwdriver control. Clockwise rotation of the trimmer raises the frequency while counterclockwise rotation lowers the frequency. Since the electrical capacity of the hand may detune the transmitter somewhat if rested on the record player during adjustment, it is best to rest the record player on the edge of a table or bench with the tuning trimmer side of the record player just far enough out from the edge to allow screwdriver adjustment of the tuning trimmer.

MODELS HJ-905, HJ-908.

GENERAL INFORMATION

Models HJ-905 and HJ-908 employ three-band AC receivers of the superheterodyne type using nine General Electric Pre-tested Tubes. Features of design include the voltage doubler rectifier circuit, 14-inch Dynapower speaker, built-in *Super* Beam-a-scope, "plug-in" type terminal for connecting a record player or television sound channel, seven "Feathertouch Tuning" keys and beam power output.

Model HJ-908 also contains an automatic-record-changing phonograph mechanism. High-quality reproduction is assured with a crystal pick-up and constant-speed, self-starting, silent electric motor.

Model HJ-908B is the same as Model HJ-908 except in bleached mahogany cabinet.

Voltage Doubler

The voltage doubler circuit used in Models HJ-905 and HJ-908 operates in the following manner: refer to Schematic Diagram Fig. 5. When the B minus side of the power line is positive the right-hand 25Z6GT rectifier will conduct charging up electrolytic capacitor (C-34) to near line voltage. On the reverse cycle when the B minus side of the power line is negative the line voltage will add to the charge on (C-34) and will charge up electrolytic capacitor (C-27A) through the left-hand 25Z6GT rectifier to nearly twice line voltage. The series resistor (R-23) is inserted as a protective device for both rectifier tubes.

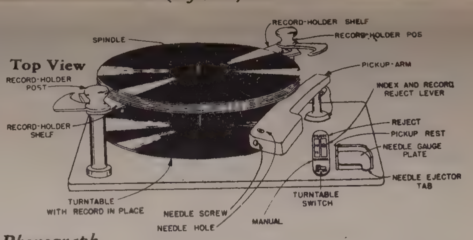
Phonograph or Television Sound Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connections of a record player or television sound channel. General Electric plug, Stock No. RP-145, fits the pin jack. The Model HJ-908 uses the plug connection from pick-up to radio and this plug may be readily removed to allow use of another record player or a television sound converter.

FEATHERTOUCH TUNING ADJUSTMENTS

When peaking the antenna trimmer of either of the first two left-hand station keys care must be exercised not to open the trimmer so far that tuning to the oscillator frequency results. If this occurs the tuning indicator shadow sector will vanish and a false indication will be given of tuning.

FOR OTHER AUTOMATIC
RECORD CHANGER DATA
SEE G69 VOL. X PAGE 9.

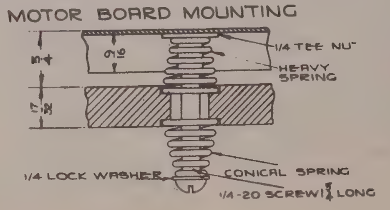


Phonograph

Model....................HJ-908
Type....................Automatic Record Changer
Record Capacity
10-inch...............8
12-inch...............7
Type Pick-up............Crystal
Turntable Speed..........78 R.P.M.

General Information

Model HJ-908 radio-phonograph combination is equipped with an automatic record changer. The turntable is driven through a friction drive wheel mounted on the turntable spindle. It is important that the drive motor spindle and rubber tires on the main driving wheel and idler pulley be kept clean and free from oil, grease, dirt or any foreign matter. Any quick-drying naphtha is satisfactory for cleaning these parts. The drive motor bearing is lubricated from an oil well filled and sealed at the factory. It should not require lubrication in the field. The turntable is not removable from the spindle without removing the tapered pin "24" which fastens the rubber-tired driving wheel to the spindle. Once the pin is removed, the driving wheel can be slipped off the spindle and the turntable and spindle assembly lifted upward from the motor board. Caution should be exercised not to bend the spindle. The spindle bearing should be oiled and the cup and ball thrust bearing oiled and checked for proper position.

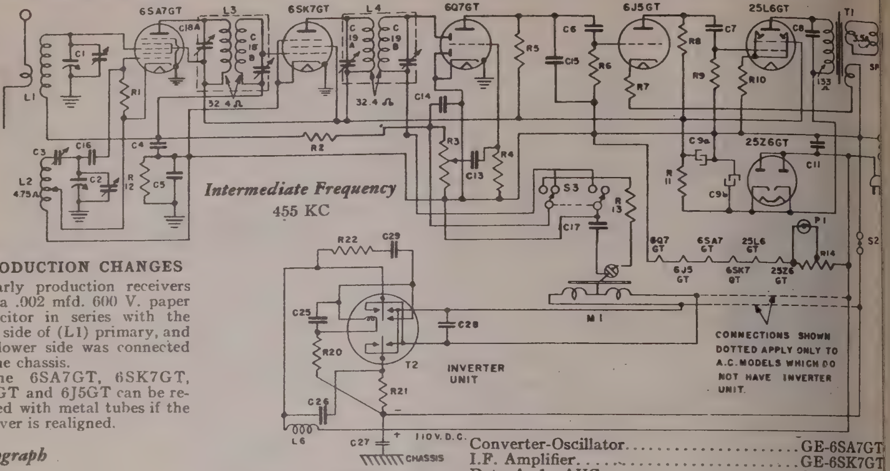


Mounting Details
of Automatic Record Changer

MODELS H639AC,H639DC
Schematic,Gain,Voltage

GENERAL ELECTRIC CO.

Socket,Alignment,Tri er
Phono.Sw.Assembly



Intermediate Frequency
455 KC

INVERTER UNIT

CONNECTIONS SHOWN DOTTED APPLY ONLY TO A.C. MODELS WHICH DO NOT HAVE INVERTER UNIT.

PRODUCTION CHANGES

Early production receivers had a .002 mfd. 600 V. paper capacitor in series with the high side of (L1) primary, and the lower side was connected to the chassis.

The 6SA7GT, 6SK7GT, 6Q7GT and 6J5GT can be replaced with metal tubes if the receiver is realigned.

Phonograph

Models	H-639 AC and H-639 DC
Type Pick-up	Crystal
Turntable Speed	78 R.P.M.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

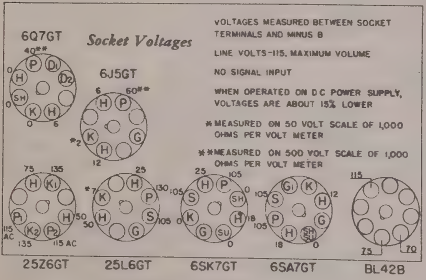
(1) Stage Gains
Antenna Post to Converter Grid—4 at 1000 KC‡
Converter Grid to 6SK7GT Grid—30 at 455 KC‡
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC‡

(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½ watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

‡ Variations of +10%, −20% permissible.

FRONT OF CHASSIS



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND MINUS B

LINE VOLTS-115. MAXIMUM VOLUME

NO SIGNAL INPUT

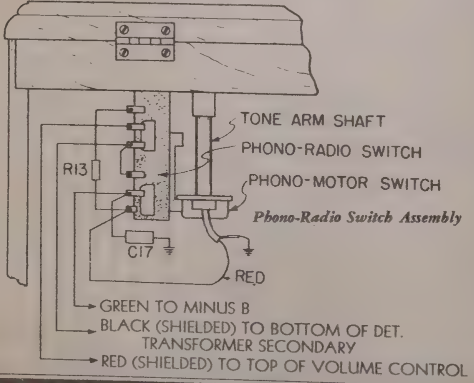
WHEN OPERATED ON DC POWER SUPPLY, VOLTAGES ARE ABOUT 15% LOWER

*MEASURED ON 50 VOLT SCALE OF 1,000 OHMS PER VOLT METER

**MEASURED ON 500 VOLT SCALE OF 1,000 OHMS PER VOLT METER

25Z6GT 25L6GT 6SK7GT 6SA7GT BL42B

BOTTOM VIEW OF CHASSIS


TONE ARM SHAFT
PHONO-RADIO SWITCH
PHONO-MOTOR SWITCH
R13
C17
RED
GREEN TO MINUS B
BLACK (SHIELDED) TO BOTTOM OF DET. TRANSFORMER SECONDARY
RED (SHIELDED) TO TOP OF VOLUME CONTROL

Phono-Radio Switch Assembly

Converter-Oscillator	GE-6SA7GT
I.F. Amplifier	GE-6SK7GT
Det., Aud., AVC	GE-6Q7GT
2nd Audio Amplifier	GE-6J5GT
Power Output	GE-25L6GT
Rectifier	GE-25Z6GT
Dial Lamp	Mazda No.

Model	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumptio (Watts)
H-639 AC	115 AC	60	75
H-639 DC	115 DC		85

Electrical Power Output

Undistorted	2.0 watt
Maximum	2.5 watt

Loudspeaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter	6.5 inche
Voice Coil Impedance (400 cycles)	3.5 ohm

The voice coil is accurately and permanently cente at the factory and should seldom give trouble. In case a vo coil needs recentering it will be necessary to replace the ent cone and voice coil assembly.

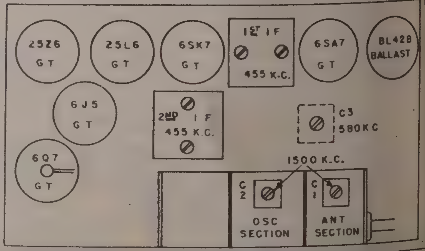
Note—In no case should the magnet be removed from t assembled position without remagnetizing after replacing i

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Turn volume control to maximum. Set test oscillator to 455 and keep the oscillator output as low as a readable meter rea ing will permit.

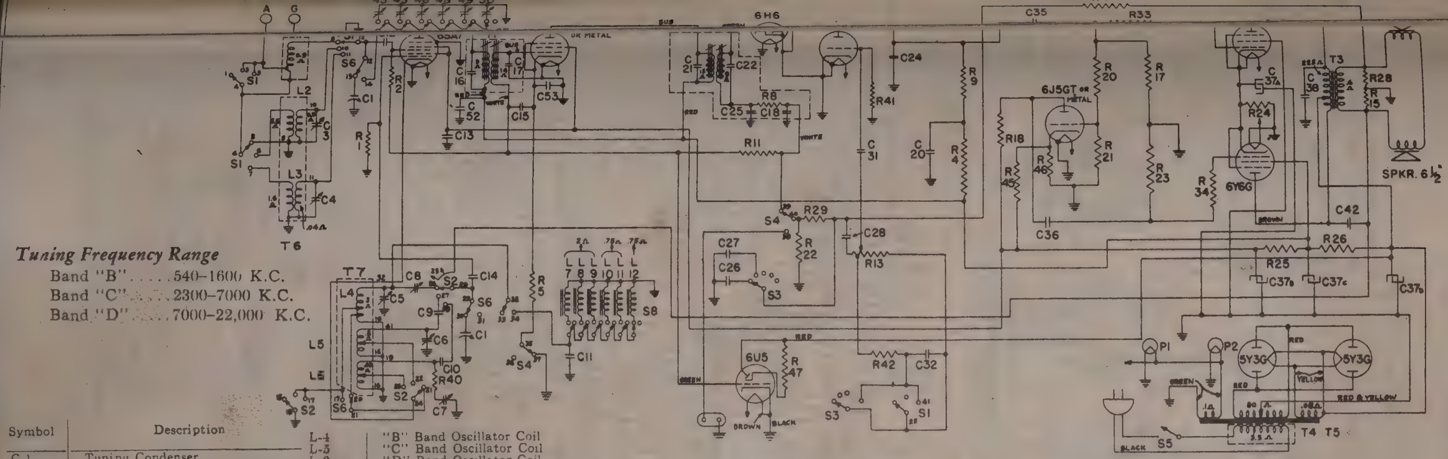
Apply signal to the grid of the 6SK7GT through a .05 m capacitor and align the 2nd I.F. transformer. Repeat t procedure, applying the 455 KC signal to the control g of the 6SA7GT and aligning the 1st I.F. transformer. Fin by over-all adjustments.

R.F. With gang condenser plates completely closed, set d pointer to the first mark at the left end of the scale. Appl 1500 KC signal either through a standard I.R.E. dum to the antenna terminal or through an additional loop c nected to the generator output which can be magnetica coupled to the receiver Beam-a-Scope. Align (C-2) at 15 KC and peak (C-1) for maximum output. Peak (C-3) on 5 KC while rocking the gang condenser. Retrim at 1500 KC



GENERAL ELECTRIC CO.

MODEL HJ1005
Schematic, Trimmers, Notes

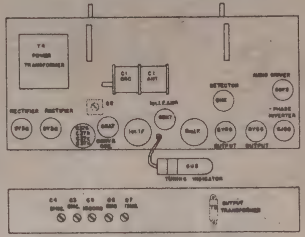


Tuning Frequency Range

Band "B" . . . . . 540–1600 K.C.
Band "C" . . . . . 2300–7000 K.C.
Band "D" . . . . . 7000–22,000 K.C.

Symbol	Description
C-1	Tuning Condenser
C-3	3–30 mmf. "C" Antenna Trimmer
C-4	3–30 mmf. "D" Antenna Trimmer
C-5	5–40 mmf. "B" Oscillator Trimmer
C-6	3–30 mmf. "C" Oscillator Trimmer
C-7	3–30 mmf. "D" Oscillator Trimmer
C-8	560 mmf. Padding Capacitor
C-9	1600 mmf. Mica Capacitor
C-10	4300 mmf. Mica Capacitor
C-11	750 mmf. Mica Capacitor
C-12	150 mmf. Mica Capacitor
C-13	0.1 mfd. Paper Capacitor
C-14	47 mmf. Mica Capacitor
C-15	0.1 mfd. Paper Capacitor
C-16	175 mmf. I.F. Capacitor
C-17	85 mmf. I.F. Capacitor
C-18	47 mmf. Mica Capacitor
C-20	25 mfd. Paper Capacitor
C-21	85 mmf. I.F. Capacitor
C-22	175 mmf. I.F. Capacitor
C-24	100 mmf. Mica Capacitor
C-25	47 mmf. Mica Capacitor
C-26	.0015 mfd. Paper Capacitor
C-27	470 mmf. Mica Capacitor
C-28	.01 mfd. Paper Capacitor
C-31	.01 mfd. Paper Capacitor
C-32	.003 mfd. Paper Capacitor
C-35	.05 mfd. Paper Capacitor
C-36	.05 mfd. Paper Capacitor
C-37A	20 mfd. 25 V. Dry Electrolytic
C-37B	20 mfd. 250 V. Dry Electrolytic
C-37C	20 mfd. 250 V. Dry Electrolytic
C-37D	40 mfd. 250 V. Dry Electrolytic
C-38	.02 mfd. 1000 V. Paper Capacitor
C-42	.01 mfd. 1000 V. Paper Capacitor
C-43	100–490 mmf. Station Trimmer
C-45	100–490 mmf. Station Trimmer
C-46	100–490 mmf. Station Trimmer
C-48	20–180 mmf. Station Trimmer
C-49	20–180 mmf. Station Trimmer
C-50	7–65 mmf. Station Trimmer
C-52	.25 mfd. Paper Capacitor
C-53	.08 mfd Paper Capacitor
L-1	Beam-a-Scope
L-2	"C" Band Antenna Coil
L-3	"D" Band Antenna Coil
L-4	"B" Band Oscillator Coil
L-5	"C" Band Oscillator Coil
L-6	"D" Band Oscillator Coil
L-7, 8, 9	Station Oscillator Coils (Code Blue)
L-10, 11	Station Oscillator Coils (Code Red)
L-12	Station Oscillator Coil (Code None)
P-1, 2	Dial Lamp, Mazda No. 44
R-1	22,000 ohms Carbon Resistor
R-2	1.0 megohm Carbon Resistor
R-4	47,000 ohms Carbon Resistor
R-5	330 ohms Carbon Resistor
R-8	47,000 ohms Carbon Resistor
R-9	220,000 ohms Carbon Resistor
R-11	2.2 megohms Carbon Resistor
R-13	2 megohms Volume Control
R-15	15 ohms Carbon Resistor
R-17	330,000 ohms Carbon Resistor
R-18	68,000 ohms Carbon Resistor
R-20	3.3 megohms Carbon Resistor
R-21	270,000 ohms Carbon Resistor
R-22	220,000 ohms Carbon Resistor
R-23	150,000 ohms Carbon Resistor
R-24	100 ohms 3.4 W. Wire Wound
R-25	2400 ohms 2 W. Carbon Resistor
R-26	2200 ohms 2.6 W. Wire Wound
R-28	150 ohms Carbon Resistor
R-29	47,000 ohms Carbon Resistor
R-33	1000 ohms Carbon Resistor
R-34	1000 ohms Carbon Resistor
R-40	33 ohms Carbon Resistor
R-41	4.7 megohms Carbon Resistor
R-42	100,000 ohms Carbon Resistor
R-44	4.7 megohms Carbon Resistor
R-45	15,000 ohms 1 W. Carbon Resistor
R-46	270 ohms Carbon Resistor
R-47	1.0 megohm Carbon Resistor
S-1, 2	Band Switch
S-3	Tone Switch
S-4	Phono Switch
S-5	Power Switch
S-6	Manual Switch
S-7, 8	Feathertouch Tuning Switch
T-1	1st I.F. Transformer
T-2	2nd I.F. Transformer
T-3	Output Transformer
T-4	50-60 cycle Power Transformer
T-5	25 cycle Power Transformer

Intermediate Frequency: . . . . 455 K.C.



Tubes

Converter and Oscillator	GE-6SA7
I.F. Amplifier	GE-6SK7/6SK7GT
Detector and AVC	GE-6H6
Audio Driver	GE-6SF5/6SF5GT
Phase Inverter	GE-6J5G/6J5GT/ 6J5
Power Output	(2) GE-6Y6G
Rectifier	(2) GE-5Y3G
Tuning Indicator	GE-6U5
Dial Lamp	(2) Mazda No. 44

GENERAL INFORMATION

The Model HJ-1005 is a three-band a-c operated receiver employing ten General Electric Pre-tested Tubes in a superheterodyne circuit. This receiver is equipped with nine "Feathertouch" Tuning Keys, six of which may be set up for favorite stations. The three remaining keys allow power control manual tuning and phonograph or television audio reception. The new *Super* Beam-a-scope, which is a highly efficient self-contained antenna circuit, is standard equipment on this model. Other features of design include: Dual Dynapower speakers, floodlighted station key finder, visualux dial, iron core I.F. transformers, automatic tone compensation, automatic volume control and push-pull output.

Electrical Specifications

Rating "A"—110–125 volts, 50–60 cycles, 125 watts
Rating "C"—110–125 volts, 25–60 cycles, 125 watts

Electrical Power Output

Undistorted . . . . 8.5 watts
Maximum . . . . 10 watts

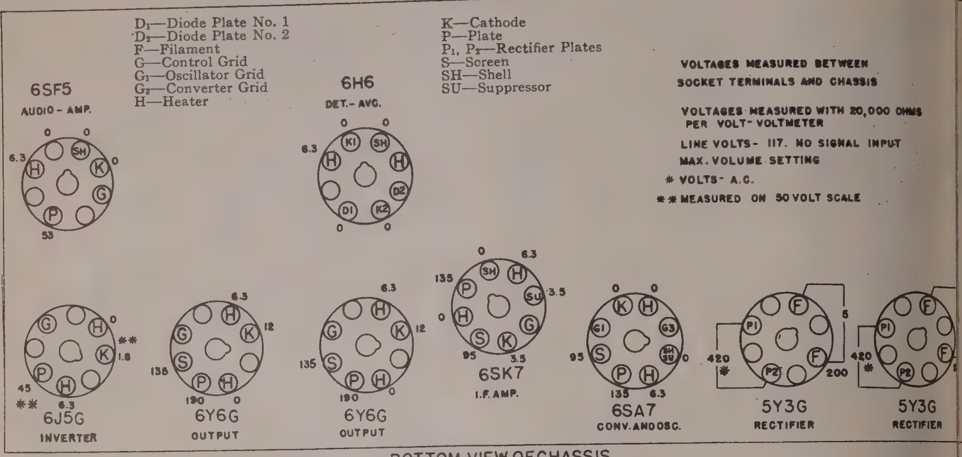
Loud-speakers—"Alnico" Magnetic Dynamic

Outside Cone Diameters . . . . 12-in. and 6½-in.
Voice Coil Impedances . . . . 3.5 ohms

MODEL HJ1005
Chassis Wiring, Voltage
Socket

GENERAL ELECTRIC CO.

FRONT OF CHASSIS



D_1—Diode Plate No. 1
D_2—Diode Plate No. 2
F—Filament
G—Control Grid
G_1—Oscillator Grid
G_3—Converter Grid
H—Heater

K—Cathode
P—Plate
P_1, P_2—Rectifier Plates
S—Screen
SH—Shell
SU—Suppressor

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

VOLTAGES MEASURED WITH 20,000 OHMS PER VOLT-VOLTMETER

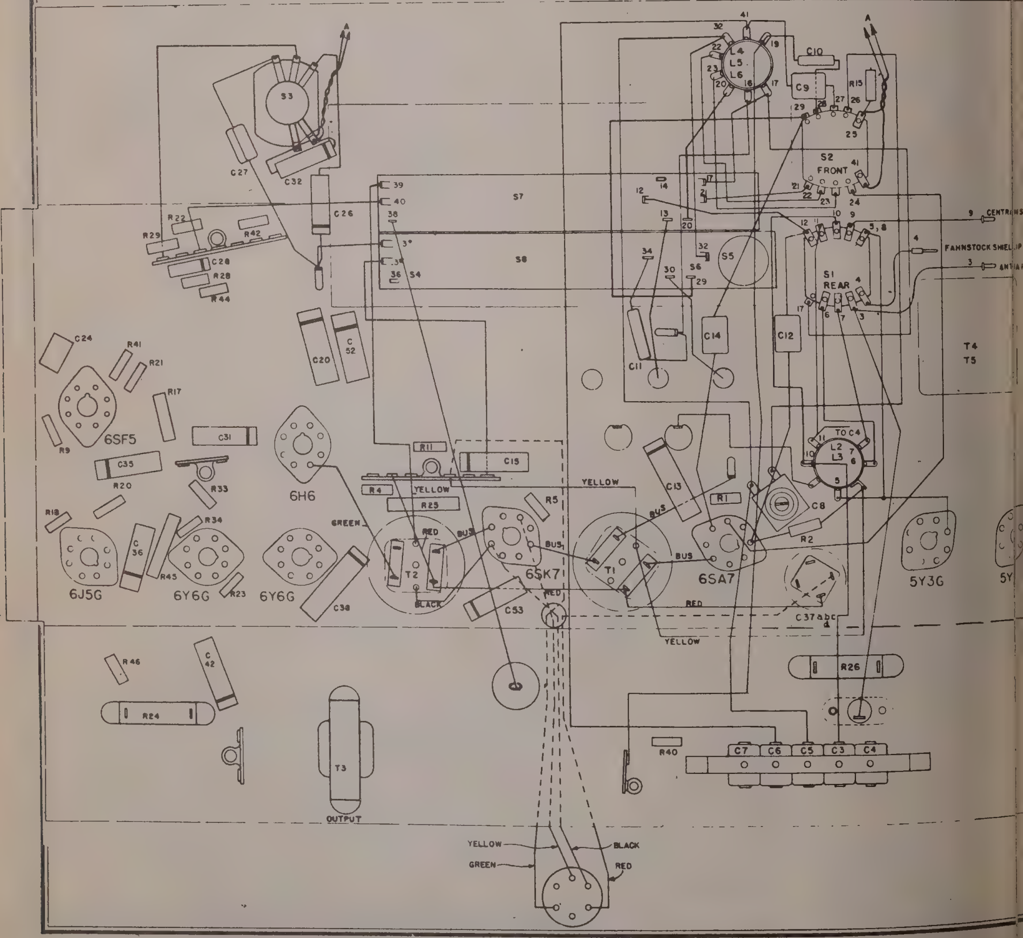
LINE VOLTS- 117. NO SIGNAL INPUT

MAX. VOLUME SETTING

* VOLTS- A.C.

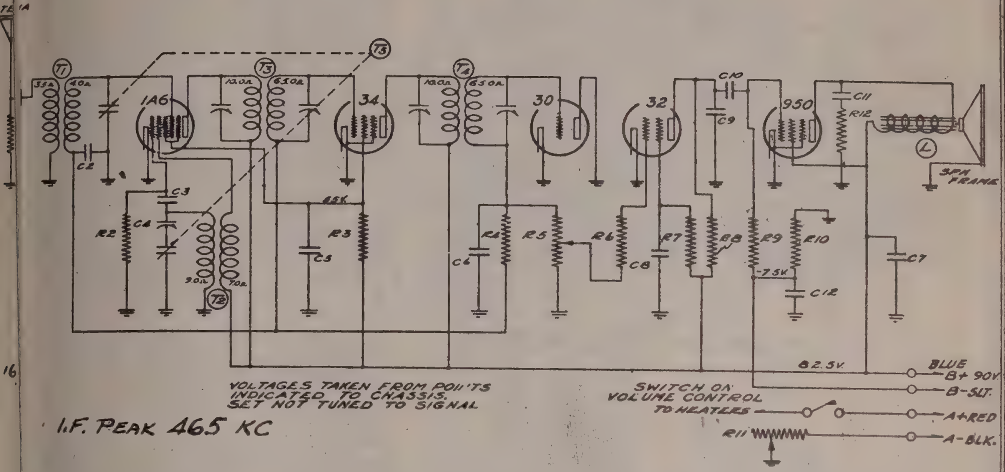
** MEASURED ON 50 VOLT SCALE

BOTTOM VIEW OF CHASSIS

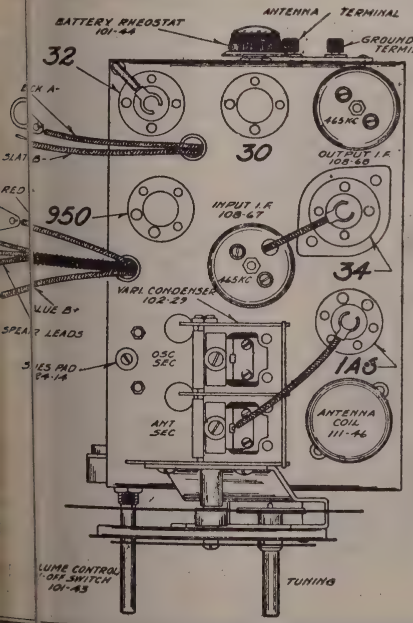


GOODYEAR TIRE & RUBBER CO., INC.

MODEL 522
Schematic, Voltage
Socket, Trimmers
Alignment



	Pa No.	Description
		RESISTORS
	13 17	10M Ohm-⅓ Watt - 20% - 20 Volt - Carbon
	13 52	50M Ohm-⅓ Watt - 20% - 10 Volt - Carbon
	13 7	10M Ohm-⅛ Watt - 20% - 20 Volt - Carbon
	13 8	2 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
	10 3	1 Meg Ohm Volume Control and Switch
	13 2	50M Ohm - ⅛ Watt - 20% 10 Volt - Carbon
	13 9	1 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
R8	130-9	200M Ohm - ⅛ Watt - 20% - 20 Volt - Carbon
R9	130-19	1 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
R10	130-93	450 Ohm - ⅛ Watt - 10% 10 Volt - Carbon
R11	101-44	4.75 Ohms - Rheostat
R12	130-52	50M Ohm - ⅓ Watt - 20% 10 Volt - Carbon
		CONDENSERS
C1	100-11	.01 x 400 Volt - 25%
C2	100-22	.05 x 200 Volt - 25%
C3	129-12	.00025 Mica - MT - 20%
C4	124-14	Series Pad
C5	100-9	.05 x 200 Volt - 25%
C6	129-5	.0001 Mica - MT - 20%
C7	100-6	.25 x 200 Volt
C8	100-9	.05 x 200 Volt - 25%
C9	129-2	.0005 Mica - MT - 20%
C10	100-11	.01 x 400 Volt - 25%
C11	100-11	.01 x 400 Volt - 25%
C12	119-22	10.0 Mfd. x 25 Volts - Working Voltage
		PARTS
T1	111-46	Antenna Coil
T2	110-36	Oscillator Coil
T3	108-67	Input I.F. Coil 465 K.C.
T4	108-68	Output I.F. Coil 465 K.C.
T5	102-29	Two Gang Condenser
L	114-19	Six Inch Magnetic Speaker



ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-67 and 108-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 950 output tube. Maximum deflection of the volt meter indicates resonance.

Use only enough signal to get a readily readable output.

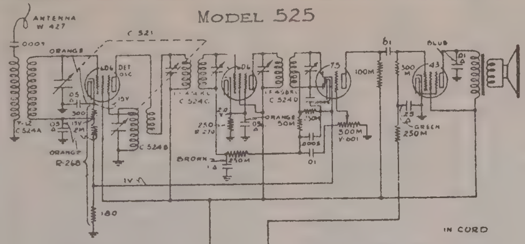
A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

1. Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.
   - (a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.
   - (b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.
   - (c) Re-set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.
   - (d) Check for sensitivity at 1400, 1000; 600 K.C. DO NOT **BEND PLATES.**

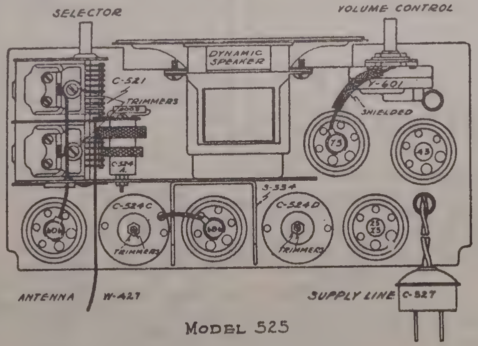
GOODYEAR TIRE & RUBBER CO., INC.

MODEL 525



IF PEAK 456 KC

DECIMALS ARE MICROFARADS
WHOLE NUMBERS ARE OHMS
NUMBERS PREFIXED BY LETTERS ARE PARTS.
VOLTAGES ARE FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL MEASURED ON A C.
⏚ CHASSIS GROUND
Δ CONDENSERS IN ONE UNIT C-526



MODEL 525

NOTE—CONNECTING CORD OF SET GETS WARM IN NORMAL OPERATION. DO NOT BECOME ALARMED.

Make sure that all tubes are pushed firmly in their proper sockets and that the clips are securely fasteneed to the caps on the tops of the tubes.

That the aerial is stretched out and that the connections to an outdoor antenna (if used) are good.

If necessary to change tubes or service chassis, **UNDER NO CIRCUMSTANCES REMOVE BACK OR CHASSIS WITHOUT FIRST REMOVING PLUG FROM LIGHT SOCKET.**

To remove chassis from cabinet, pull off knobs from front, remove back (held with screws to case). Remove four mounting screws, then chassis can be slipped out of case.

Should it be necessary, at any time, to rebalance this set the procedure is as follows. Attach a 456 kilocycle oscillator to the grid of the 6D6 tube in back of the variable condenser and adjust the trimming condensers of the I. F. transformers to maximum deflection on an output meter connected across the primary of the speaker input transformer. While adjusting these trimmers, the variable condenser should be at the maximum capacity position—at the extreme right of its rotation.

Next disconnect the antenna wire and connect an oscillator in series with a 75 mmf. condenser to the antenna coil. Rotate the condenser plates to the minimum capacity position—extreme left turn, and adjust the trimmer condenser of the rear section of the variable condenser to resonance. Align at 1400—1200—1000—800—600—530 kilocycles, bend slotted plates of variable condenser if necessary.

MODELS 685, 686 Runs 1 and 2.

TUBE COMPLEMENT

consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes. They are as follows:

1-Type 6L7 Pentagrid Mixer, First Detector.
1-Type 6C5 Oscillator.
1-Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
1-Type 6Q7 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1-Type 6F6 Pentode Output Amplifier.
1-Type 5Y3 or 5W4 High Vacuum Rectifier.
(Note: 5Y3 available in "Metal-Glass" only.)
1-Type 6G5 Cathode-Ray Tuning Indicator.
(Note: 6G5 available in all glass only)

The tube complement of the model 686 is as follows:

1-Type 6L7 Pentagrid Mixer, First Detector.
1-Type 6C5 Oscillator.
1-Type 6K7G Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
1-Type 6Q7G Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1-Type 6F6G Pentode Output Amplifier.
1-Type 5Y3 High Vacuum Rectifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screw driver.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS; (465 K.C.):

Part No. 108-73 Output I.F. Transformer.
Part No. 108-74 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles,
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-73) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer (No. 108-74) to resonance.
   (c) With oscillator still connected to 6L7, readjust output I.F. transformer (108-73) if necessary.

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly. Fig. 3.)
   (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
   (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

SHORT WAVE BAND ALIGNMENT:

5.2 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
   (b) Re-set external oscillator to 1800 kilocycles [illegible] check sensitivity.
   (c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

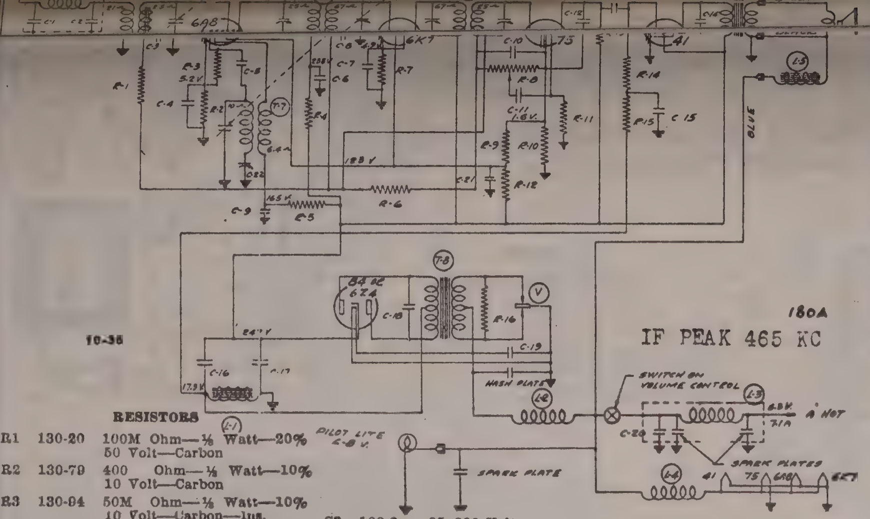
GOODYEAR TIRE & RUBBER CO., INC

MODEL 566
Schematic, Socket,
Alignment, Trimmers
Voltage, Notes

at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

ANTENNA CONNECTION:
The antenna is connected to the receiver by means of the antenna cable. The antenna wire is the single black wire projecting from the end of the cable. Splice this wire to the roof antenna lead and ground the pig-tail shielding as close to the corner post of the car as possible.

GENERATOR INTERFERENCE:
Remove the generator cutout mounting screw and fasten the condenser (148-1) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely. Connect the condenser lead to the battery terminal of the cutout The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated.



180A

IF PEAK 465 KC

RESISTORS

R1	130-20	100M Ohm—½ Watt—20% 50 Volt—Carbon
R2	130-79	400 Ohm—½ Watt—10% 10 Volt—Carbon
R3	130-94	50M Ohm—½ Watt—10% 10 Volt—Carbon—Ins.
R4	130-23	2M Ohm—½ Watt—20% 10 Volt—Carbon
R5	130-42	20M Ohm—½ Watt—20% 100 Volt—Carbon—Ins.
R6	130-68	1 Meg Ohm—½ Watt—10% 20 Volt—Carbon
R7	130-79	400 Ohm—½ Watt—10% 10 Volt—Carbon
R8	101-41	500M Ohm—Volume Control and Switch
R9	130-106	50M Ohm—½ Watt—10% 100 Volt—Carbon—Ins.
R10	130-101	600 Ohm—½ Watt—10% 10 Volt—Carbon—Ins.
R11	130-68	1 Meg Ohm—½ Watt—10% 20 Volt—Carbon
R12	130-95	12M Ohm—½ Watt—10% 100 Volt—Carbon
R13	130-3	500M Ohm—½ Watt—20% 100 Volt—Carbon
R14	130-5	300M Ohm—½ Watt—20% 10 Volt—Carbon
R15	130-45	250M Ohm—½ Watt—20% 20 Volt—Carbon—Ins.
R16	130-84	200 Ohm—½ Watt—20% 10 Volt—Carbon—Ins.

CONDENSERS

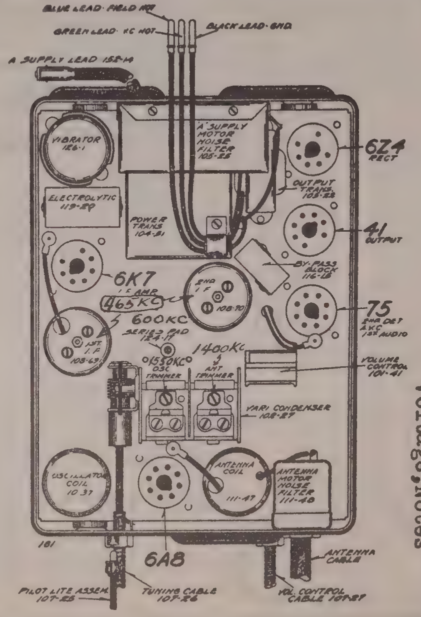
C1	129-3	.00002 Mica—"0"—20%
C2	129-49	.00009 Mica—"0"—5%
C3	100-9	.05x200 Volt
C4	100-6	.25x200 Volt
C5	129-21	.0002 Mica—"MT"—"0"—20%
C6	100-1	.1 x400 Volt 50%—10%
C7	100-33	.1 x200 Volt 50%—10%
C8	100-9	.05x200 Volt 25%—25%
C9	100-1-B	.1 x400 Volt 50%—10%
C10	129-12	.00025 Mica—"MT"—"0"—20%
C11	100-9	.05 x200 Volt 25%—25%
C12	129-5	.0001 Mica—"MT"—"0"—20%
C13	116-15	.05 x400 Volt
C14	116-15	.007x800 Volt
C15	100-33	.1x200 Volt 50%—10%
C16	119-20	8.0 Mfd. Electrolytic Condenser—350 Working Volts
C17	119-20	4.0 Mfd. Electrolytic Condenser—350 Working Volts
C18	100-36	.01x1400 Volt—10%
C19	100-35	.5 x 200 Volt 50%—10%
C20	100-35	.5 x 200 Volt 50%—10%
C21	100-33	.1 x 200 Volt 50%—10%
C22	124-17	Single Padder J-4-S

NOTE: C-13 and C-14 in one unit—part number 116-15.

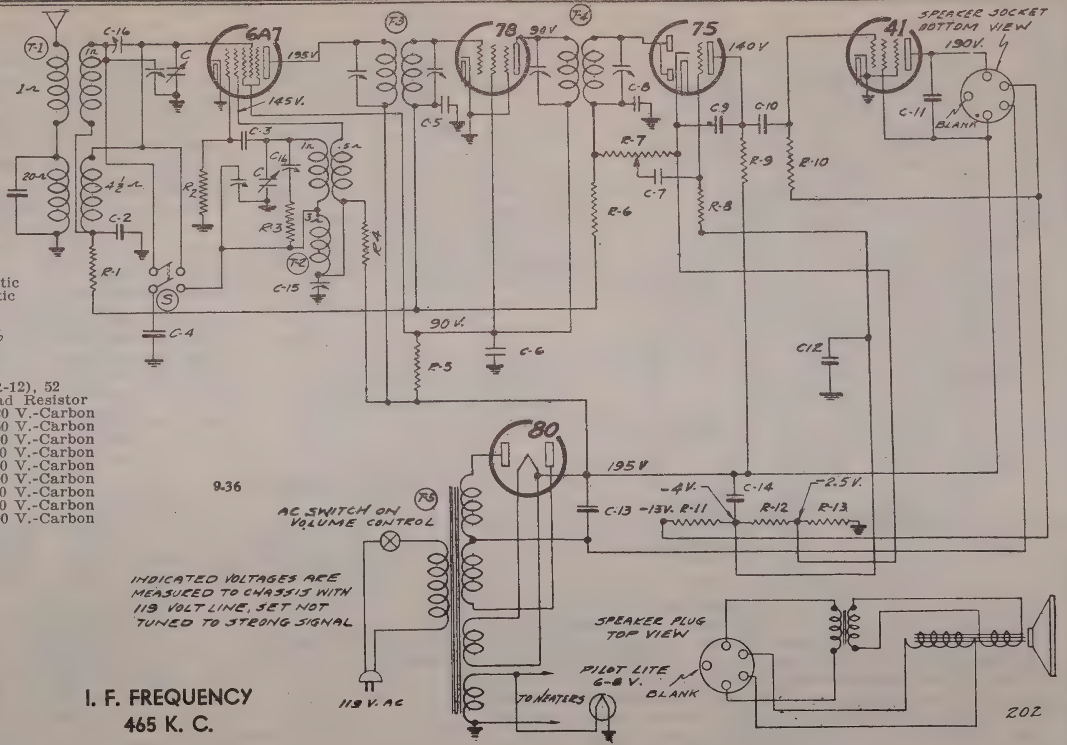
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

PARTS

T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	108-69	Input I.F. Coil—465 K.C.
T4	102-27	Two Gang Variable Condenser
T5	108-70	Output I.F. Coil—465 K.C.
T6	105-22	Output Transformer
T7	110-37	Oscillator Coil Assembly
T8	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-25	"A" Filter Assembly
L4	105-24	"A" Choke
L5	114-34	5¼" Speaker (Field resistance 4 ohms)
V		Vibrator



GOODYEAR TIRE & RUBBER CO., INC.



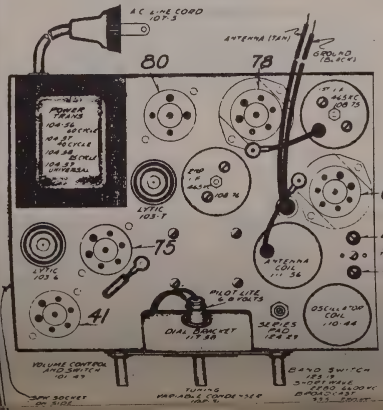
INDICATED VOLTAGES ARE MEASURED TO CHASSIS WITH 119 VOLT LINE, SET NOT TUNED TO STRONG SIGNAL

9-36

I. F. FREQUENCY
465 K. C.

LIST OF REPAIR PARTS
(Serial No. 6E248475 and up)

Part No.	Schematic Reference	Description
		CONDENSERS
100-6	C-12: C-6	.25 x200 Volt Tubular—Without Bracket
100-9	C-5	.05 x200 Volt Tubular
100-11	C-10: C-7	.01 x400 Volt Tubular
100-19	C-11	.006x600 Volt Tubular
100-26	C-2	.02 x400 Volt
103-6	C-13	8 Mfd. x 350 Volt Electrolytic
103-7	C-14	8 Mfd. x 300 Volt Electrolytic
129-5	C-9	.0001 Mica—Type O—20%
129-12	C-8	.00025 Mica—Type O—20%
129-61	C-4	.0017 Mica—Type W—2½%
129-62	C-3	.00003 Mica—Type O—10%
129-63	C-1	.0004 Mica—Type W—10%
		RESISTORS
106-26	R-11: R-12; R-13	220 Ohm (R-11), 33 Ohm (R-12), 52 Ohm (R-13), Metal Clad Resistor
130-12	R-2	50M Ohm-1/3 Watt-20%- 20 V.-Carbon
130-20	R-9	100M Ohm-1/3 Watt-20%- 50 V.-Carbon
130-22	R-4	5M Ohm-1/3 Watt-20%- 10 V.-Carbon
130-77	R-5	10M Ohm- 1 Watt-20%-100 V.-Carbon
130-100	R-10	150M Ohm-1/3 Watt-20%- 50 V.-Carbon
130-110	R-6	1 Meg Ohm-1/10 Wt.-10%-100 V.-Carbon
130-111	R-1	100M Ohm-1/10 Wt.-20%- 50 V.-Carbon
130-112	R-3	100 Ohm-1/10 Wt.-20%- 10 V.-Carbon
130-113	R-8	2 Meg Ohm-1/10 Wt.-20%-100 V.-Carbon



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII.

ALIGNMENT FREQUENCIES

IF:- 465 KC (I.F.) Dummy Adjust IF Trimmers.
S.W.Osc:- 6.6 MC (I.F.) Dummy Adjust S.W. Osc.
B.C. Osc:- 1720 KC (B.C.) Dummy .. B.C.Osc.
B.C. Ant. - 1550 KC (B.C.) [illegible]
600 KC .. .. Series Pad.

DUMMY ANTENNAS:

(I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

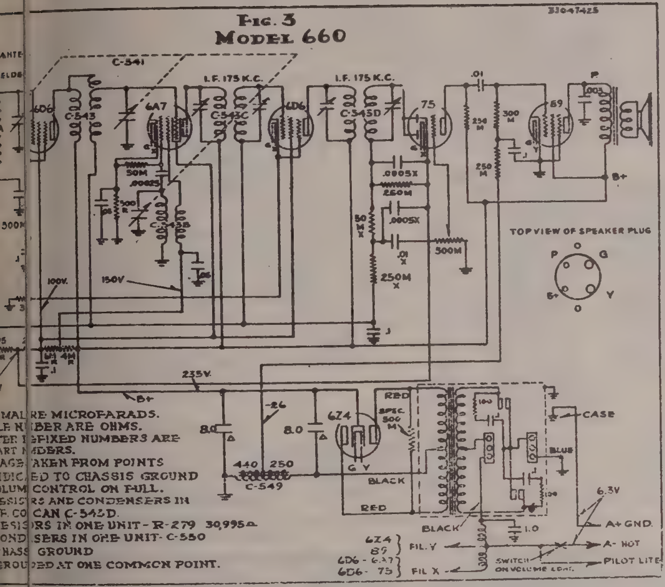
(Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

(Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 660
Schematic,Socket
Trimmers

Fig. 3
Model 660



SCHEMATIC CIRCUIT DIAGRAM

MODEL 660 AUTORADIO

PARTS LIST

Part No.	Description	List Price Each
A 660	Battery Cable—Plug Type	1.75
B 104	Cable Shaft Brackets	.35
B 660	Antenna Cable—Plug Type	.80
C 106	Shaft Couplings	.35
C 117	"A" Choke—Small	.25
C 118	"A" Choke—Large	.35
C 144	Dual .1-200 Volt Condenser	.35
C 152	.00025 Mica Condenser	.20
C 155	.0005 Mica Condenser	.20
C 522	.01-400 Volt Condensers	.25
C 531A	Dual .05 Condenser	.30
C 535	Dual .1—200 Volt Condenser	.35
C 541B	3 Gang Condenser	3.75
C 543	R.F. Coil	.80
C 543A	Antenna Coil	.80
C 543B	Oscillator Coil	.70
C 543C	Input I.F. Transformer	1.25
C 543D	Output I.F. Transformer with Parts	2.50
C 547	.1-200 Volt Condenser	.30
C 549	690 Ohm Choke	1.40
C 550	8-8 Mfd. Electrolytic Condenser	2.25
C 551	1 Mfd.—120 Volt Condenser	.35
C 553	.05-200 Volt Condenser	.25
C 554	.5 Mfd. Generator Condenser	.50
R 232A	Special 500M Ohm Resistor Identified with 2 Yellow Dots	.35
R 279	30,995 Ohm Resistor	.60
R 281	100 Ohm Resistor	.20
S 338	18" Volume Control Shaft	1.25
S 339	18" Selector Control Shaft	1.25
S 338S	Special 24" Volume Control Shaft	1.50
S 339S	Special 24" Selector Control Shaft	1.50
V 660	Complete "B" Unit—OAK	8.00
V 603	Volume Control	1.50
660	Remote Control Head Complete Less Shafts	5.00
	20 Ampere Fuses	.10
	Mounting Bolts	.10
	All carbon resistors	.20
	All sockets	.20
	Dynamic speakers	5.00

prices subject to change without notice

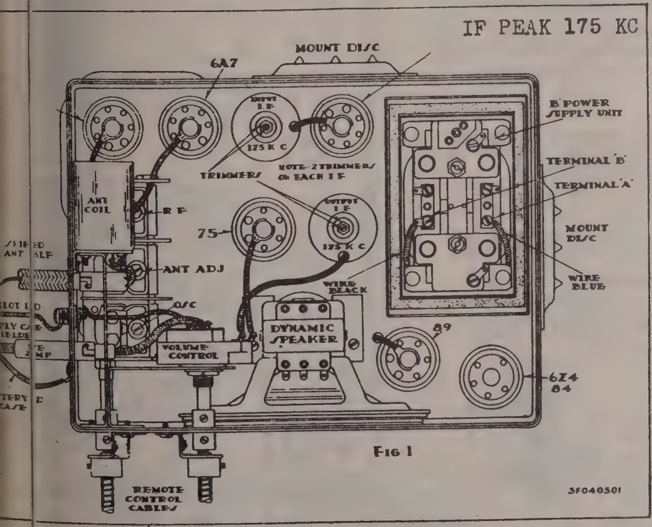


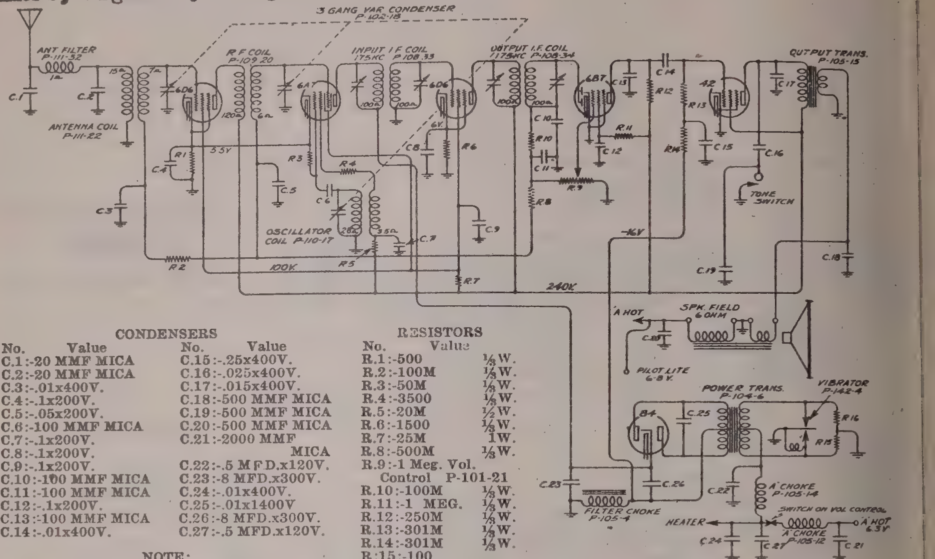
Fig 1

First Series Model 660 - Serial Numbers 3F04051 - 23J047424.
Vibrator Heads Only $4.00

MODEL 680
Schematic,Socket
Trimmers,Alignment,Voltage

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 680



CONDENSERS

No.	Value	No.	Value
C.1	:-20 MMF MICA	C.15	:-.25x400V.
C.2	:-20 MMF MICA	C.16	:-.025x400V.
C.3	:-.01x400V.	C.17	:-.015x400V.
C.4	:-.1x200V.	C.18	:-500 MMF MICA
C.5	:-.05x200V.	C.19	:-500 MMF MICA
C.6	:-100 MMF MICA	C.20	:-500 MMF MICA
C.7	:-.1x200V.	C.21	:-2000 MMF MICA
C.8	:-.1x200V.		
C.9	:-.1x200V.	C.22	:-.5 MFD.x120V.
C.10	:-100 MMF MICA	C.23	:-8 MFD.x300V.
C.11	:-100 MMF MICA	C.24	:-.01x400V.
C.12	:-.1x200V.	C.25	:-.01x1400V
C.13	:-100 MMF MICA	C.26	:-8 MFD.x300V.
C.14	:-.01x400V.	C.27	:-.5 MFD.x120V.

RESISTORS

No.	Value	
R.1	:-500	⅓W.
R.2	:-100M	⅓W.
R.3	:-50M	⅓W.
R.4	:-3500	⅓W.
R.5	:-20M	½W.
R.6	:-1500	⅓W.
R.7	:-25M	1W.
R.8	:-500M	⅓W.
R.9	:-1 Meg. Vol. Control P-101-21	
R.10	:-100M	⅓W.
R.11	:-1 MEG.	⅓W.
R.12	:-250M	⅓W.
R.13	:-301M	⅓W.
R.14	:-301M	⅓W.
R:15	:-100	
R.16	:-100	

NOTE:

C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.26 and C.23 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

Serial No. 60001 up.

IF PEAK 175 KC.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.

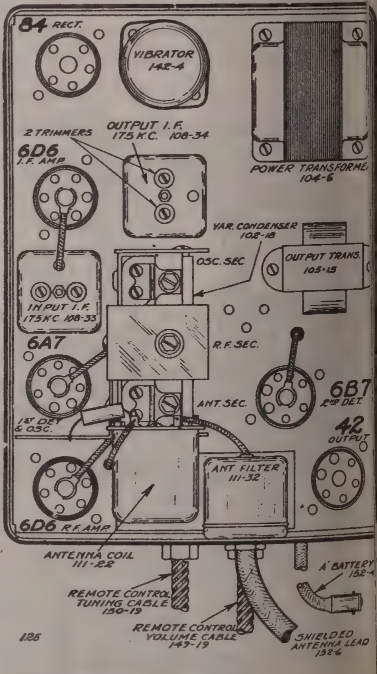
(a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

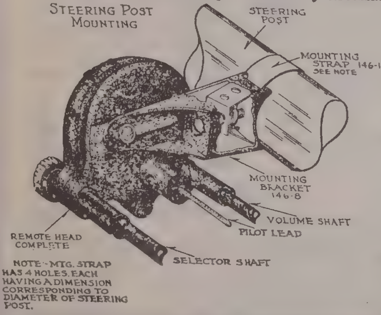
DUMMY ANTENNAS:

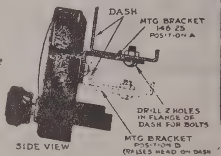
The dummy antennas referred to in the following instruction

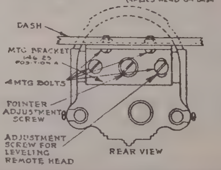
"I.F. Dummy" —A .1 mfd. condenser connected in with the test oscillator output lead.

"Broadcast Dummy"—A 200 mmfd. condenser connected in with the output lead of the test osci




STEERING POST MOUNTING
STEERING POST
MOUNTING STRAP 146-12 SEE NOTE
MOUNTING BRACKET 146-8
VOLUME SHAFT
PILOT LEAD
REMOTE HEAD COMPLETE
SELECTOR SHAFT
NOTE-MTG. STRAP HAS 4 HOLES, EACH HAVING A DIMENSION CORRESPONDING TO DIAMETER OF STEERING POST.

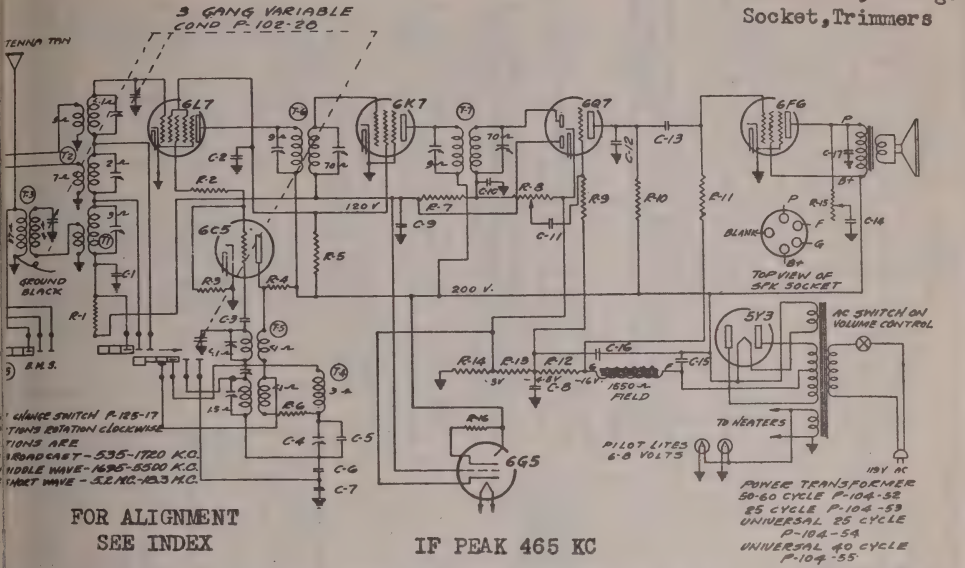

DASH
MTG BRACKET 146 25 POSITION A
DRILL 2 HOLES IN FLANGE OF DASH FOR BOLTS
MTG BRACKET POSITION B (RAISES HEAD ON DASH)
SIDE VIEW


DASH
MTG BRACKET 146 25 POSITION A
4 MTG BOLTS
POINTER ADJUSTMENT SCREW
ADJUSTMENT SCREW FOR LEVELING REMOTE HEAD
REAR VIEW

MODELS 685,686,
Runs 1,2

Schematic,Voltage
Socket,Trimmers

GOODYEAR TIRE & RUBBER CO., INC.

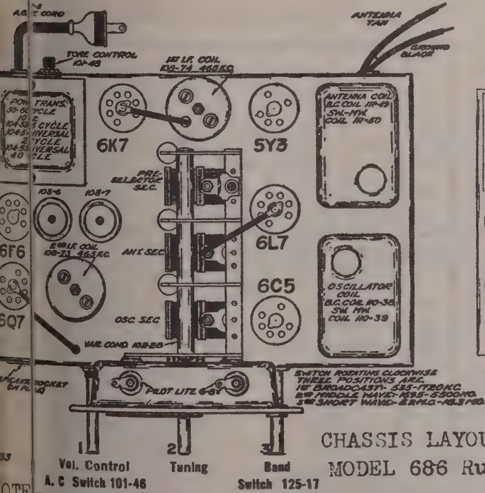


FOR ALIGNMENT
SEE INDEX

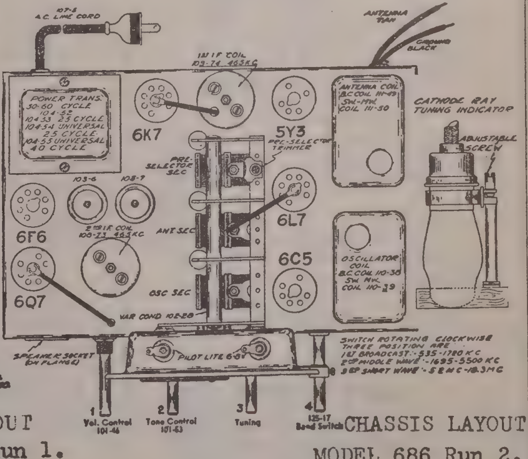
IF PEAK 465 KC

No.	'art No.	Description
		RESISTORS
1	30-20	100M Ohm—⅛ Watt—20% —50 Volt—Carbon
2	30-105	150 Ohm—⅛ Watt—20% —10 Volt—Carbon
3	30-12	50M Ohm—⅛ Watt—20% —10 Volt—Carbon
4	30-104	9M Ohm—1 Watt—20%—100 Volt—Carbon
5	30-104	9M Ohm—1 Watt—20%—100 Volt—Carbon
6	30-27	50 Ohm—⅛ Watt—20%—3 Volt—Carbon
7	30-19	1 Meg Ohm — ⅛ Watt—20%—100 Volt—Carbon
8	01-46	1 Meg Ohm—Volume Control
9	30-4	3 Meg Ohm — ⅛ Watt—20%—100 Volt—Carbon
10	30-103	100M Ohm—⅛ Watt—20% —50 Volt—Carbon
R11	130-102	500M Ohm—⅛ Watt—10% —50 Volt—Carbon
R12 R13 R14	106-26	220 Ohm 32 Ohm 52 Ohm
R15	101-53	50M Ohm—Tone Control
R16	130-110	1 Meg Ohm—1/10 Watt—10%—100 Volt—Carbon
		CONDENSERS
C1	100-22	.05 x 200 Volt—25%
C2	100-1	.1 x 400 Volt—25%
C3	129-39	.00005 Mica (MT—0)—20%
C4	124-28	Series Pad (80—225)
C5	129-56	.00055 Mica (MT—0)—10%
C6	129-55	.0034 Mica (MW—W)—2½%
C7	129-54	.003 Mica (MW—W)—2½%
C8	100-20	.1 x 200 Volt—25%
C9	100-22	.05 x 200 Volt—25%
C10	129-12	.00025 Mica (MT—0)—20%
C11	100-11	.01 x 400 Volt—25%
C12	129-2	.0005 Mica (MT—0)—20%
C13	100-11	.01 x 400 Volt—25%
C14	100-27	.025. x 600 Volt—25%
C15	103-6	8 Mfd. x 350 Volt Electrolytic
C16	103-7	8 Mfd. x 300 Volt Electrolytic
C17	100-25	.002 x 600 Volt—20%
		PARTS
T1	111-49	Broadcast Antenna Coil
T2	111-50	S.W.—M.W. Antenna Coil
T3	111-51	B.C.—Pre-Selector Coil Assem.
T4	110-38	B.C. Oscillator Coil
T5	110-39	S.W.—M.W Oscillator Coil
T6	108-74	Input I.F.—465 K.C.
T7	108-73	Output I.F.—465 K.C.
S	125-17	Band Switch

TUNING INDICATOR NOT
USED WITH SOME SETS

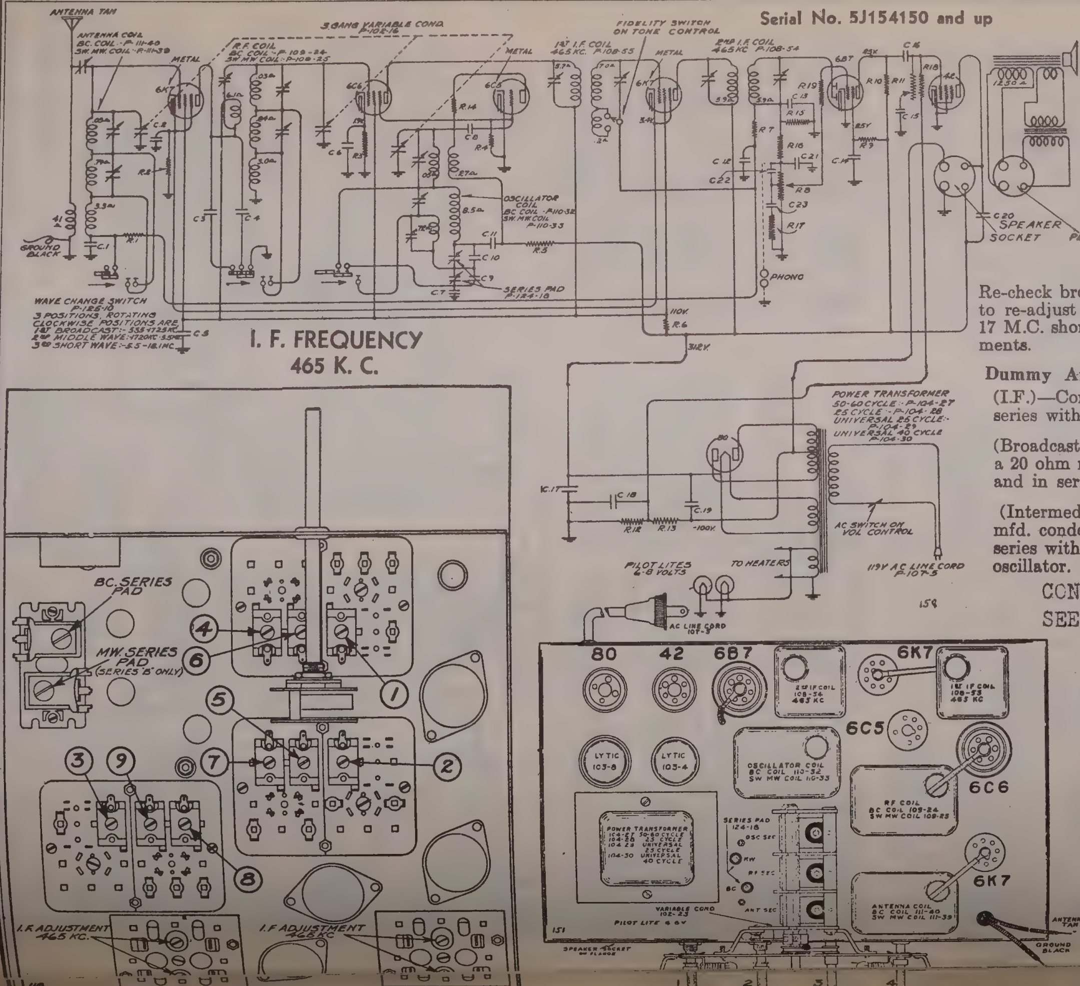

A.C. CORD
TONE CONTROL 101-48
1ST I.F. COIL 108-74 465KC
ANTENNA TAN
GROUND BLACK
POW. TRANS.
6K7
5Y3
ANTENNA COIL B.C. COIL 111-49 SW-MW COIL 111-50
PRE-SELECTOR SEC.
103-6
103-7
6F6
2ND I.F. COIL 108-73 465KC
ANT SEC
6L7
6C5
6Q7
OSC SEC
OSCILLATOR COIL B.C. COIL 110-38 SW. MW COIL 110-39
VAR COND 102-28
SPEAKER SOCKET ON FL
PILOT LITE 6-8
SWITCH ROTATING CLOCKWISE THREE POSITIONS ARE
1ST BROADCAST - 535-1720 KC
2ND MIDDLE WAVE - 1695-5500 KC
3RD SHORT WAVE - 5.2 MC-18.3 MC
1 Vol. Control A. C Switch 101-46
2 Tuning
3 Band Switch 125-17

CHASSIS LAYOUT
MODEL 686 Run 1.


107-5 A.C. LINE CORD
ANTENNA TAN
GROUND BLACK
1ST I.F COIL 108-74 465KC
POWER TRANS. 50-60 CYCLE 104-52 104-53 25 CYCLE 104-54 UNIVERSAL 25 CYCLE 104-55 UNIVERSAL 40 CYCLE
6K7
5Y3
PRE-SELECTOR TRIMMER
ANTENNA COIL B.C. COIL 111-49 SW-MW COIL 111-50
CATHODE RAY TUNING INDICATOR
ADJUSTABLE SCREW
PRE-SELECTOR SEC
103-6
103-7
6F6
2ND I.F. COIL 108-73 465KC
ANT SEC
6L7
6C5
6Q7
OSC SEC
OSCILLATOR COIL B.C. COIL 110-38 SW. MW. COIL 110-39
VAR COND 102-28
SPEAKER SOCKET (ON FLANGE)
PILOT LITE 6-8
SWITCH ROTATING CLOCKWISE THREE POSITION ARE
1ST BROADCAST - 535-1720 KC
2ND MIDDLE WAVE - 1695-5500 KC
3RD SHORT WAVE - 5.2 MC-18.3 MC
1 Vol. Control 101-46
2 Tone Control 101-53
3 Tuning
4 125-17 Band Switch

CHASSIS LAYOUT
MODEL 686 Run 2.

OTE-
Mod. 685 does not have tone control or tuning indicator and uses 2 metal and
fou glass tubes.



Serial No. 5J154150 and up

I. F. FREQUENCY
465 K. C.

ALIGNMENT FREQUENCIES

IF - 465 KC Four trimmers.
BC - BC Series Pad at 600 KC
Osc.(3),RF (2), Ant.(1)
at 1400 KC
SW -Osc.(8),RF(7),Ant.(6) at
17 MC.
INT.-MW Series Pad at 1800 KC
RF(5),Ant.(4),Osc.(9) at
5MC.

Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

Dummy Antennas

(I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

(Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

(Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

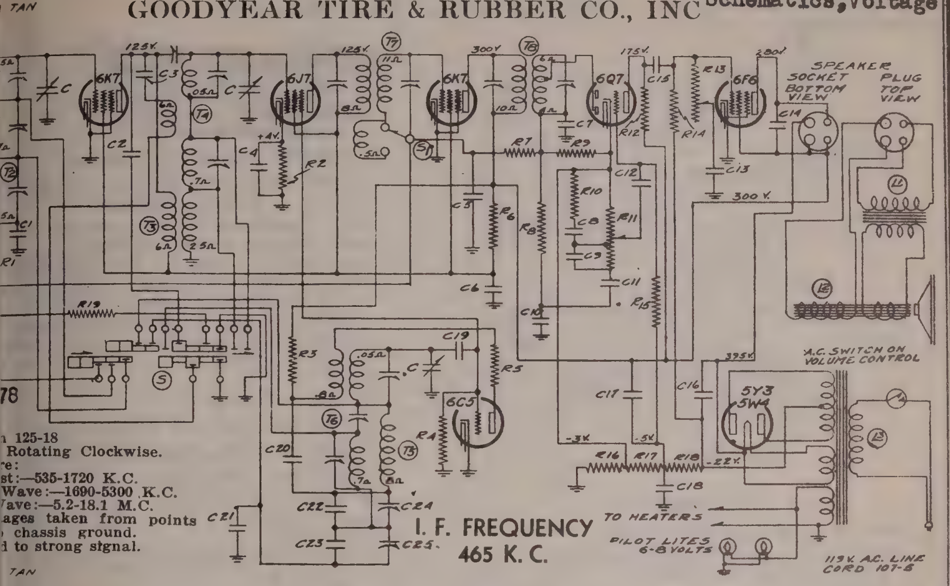
CONDENSERS

No.	Part No.	Value
C.1	100-9	.05x200 V.
C.2	100-6	.25x200 V.
C.3	129-22	.0014 Mica
C.4	129-21	.0002 Mica
C.5	100-24	.25x400 V.
C.6	100-20	.1x200 V.
C.7	129-29	.0038 Mica
C.8	129-31	.000025 M.
C.9	129-30	.0014 Mica
C.10	129-28	.00064 M.
C.11	100-13	.05x400 V.
C.12	100-9	.05x200 V.
C.13	129-47	.00004 M.
C.14	100-20	.1x200 V.
C.15	100-11	.01x400 V.
C.16	100-13	.05x400 V.
C.17	103-4	16 mfd. x350 V.
C.18	100-6	.25x200 V.
C.19	103-8	14 mfd. x400 V.
C.21	129-47	.00004 M.
C.22	129-21	.0002 Mica

RESISTORS

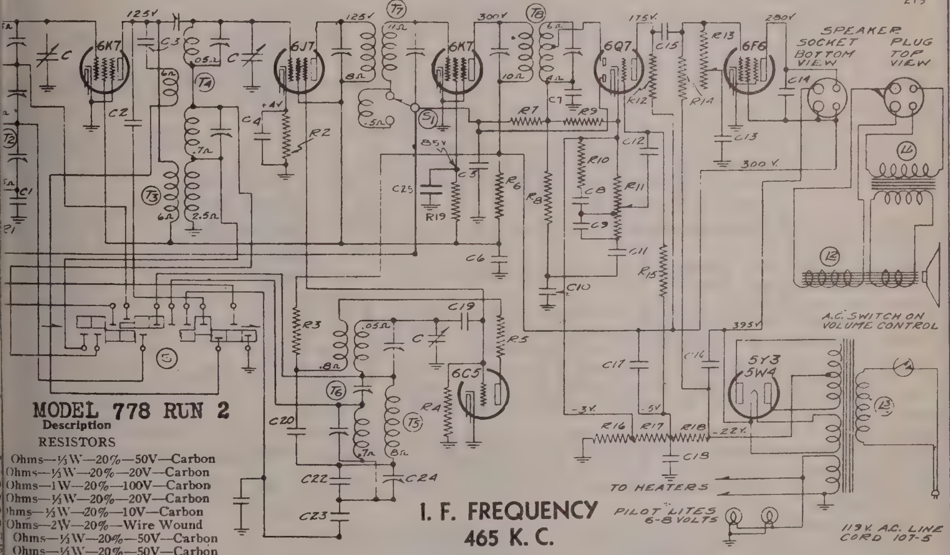
No.	Value	
R.1	100M	1/3 W.
R.2	180	1/3 W.
R.3	500	1/3 W.
R.4	50M	1/3 W.
R.12	250M	1/3 W.
R.13	750M	1/5 W.
R.14	100	1/3 W.
R.15	250M	1/3 W.
R.16	100M	1/3 W.
R.17	5000	1/3 W.
R.18	250M	1/3 W.
R.19	50M	1/3 W.
R.5	12M	1.0 W.
R.6	15M W.W.	2.0 W.
R.7	500M	1/5 W.
R.8	1 meg. Vol. Control P-101-37	
R.9	1 meg.	1/5 W.
R.10	250M	1/2 W.
R.11	300M	Tone

GOODYEAR TIRE & RUBBER CO., INC



1 125-18
Rotating Clockwise.
re:
st:—535-1720 K.C.
Wave:—1690-5300 K.C.
Vave:—5.2-18.1 M.C.
ages taken from points
chassis ground.
l to strong signal.

279



MODEL 778 RUN 2

Description

RESISTORS

Ohms—⅓W—20%—50V—Carbon
Ohms—⅓W—20%—20V—Carbon
Ohms—1W—20%—100V—Carbon
Ohms—⅓W—20%—20V—Carbon
hms—⅓W—20%—10V—Carbon
Ohms—2W—20%—Wire Wound
Ohms—⅓W—20%—50V—Carbon
Ohms—⅓W—20%—50V—Carbon
Ohms—⅓W—20%—10V—Carbon
gOhms—Vol. Con. with AC Switch
Ohms—⅓W—20%—50V—Carbon
Ohms—Tone Con. with Fid. Sw.
Ohms—⅓W—20%—100V—Carbon
gOhms—⅓W—20%—100V—Carbon
hms—10% Muter Resistor
hms—10% Muter Resistor
hms—10% Muter Resistor
R17, R18 in one unit—part 106-27.

CONDENSERS

ne section of three gang var. cond.
5—200 Volt—25%
003 Mica—MT—0—5%
0005 Mica—MT—0—20%
5—200. Volt—25%
5—200 Volt—25%
001 Mica—MT—0—20%
5—200 Volt—25%
005 Mica—MT—0—20%
0015 Mica—MT—0—20%
1—400 Volt—25%
2—400 Volt—25%
005—1000 Volt—20%
1—400 Volt—25%

C16	103-8	14 mfd.—400 Volt Electrolytic
C17	103-6	8 mfd.—350 Volt Electrolytic
C19	129-31	.000025 Mica—MT—0—15%
C20	100-13	.05—400 Volt—25%
C22	129-57	.0005 Mica—MT—0—5%

PARTS

T1	111-54	M.W. and S.W. Antenna Coil Assem.
T2	111-55	Broadcast Antenna Coil Assem.
T3	109-30	Broadcast R.F. Coil Assem.
T4	109-29	M.W. and S.W. R.F. Coil Assem.
T5	110-43	Broadcast Osc. Coil Assem.
T6	110-42	M.W. and S.W. Osc. Coil Assem.
T7	108-64	Input I.F. Coil—465 Kc.
T8	108-63	Output I.F. Coil—465 Kc.
L1	-	Output Transformer (on speaker)
L2	114-36	8" Speaker (Field Resis. 1250 Ohms)
L3	104-27	Power Transformer (50-60 Cycle)
S	125-18	Band Switch
S1	101-38	Fidelity Switch on Tone Control

PARTS RUN 1 ONLY

R7	130-3	500M ohms—1/3 Watt—20%—100 Volt—Carbon
R19	130-27	50 ohms—1/3 Watt—20%—Carbon

C6	100-24B	.25—400 Volt—20%
C11	100-9	.05—200 Volt—25%
C18	100-6B	.25—200 Volt—20%
C21	129-54	.003 Mica—MW—W—2½%
C22	129-57	.0005 Mica—MT—0—5%
C23	129-58	.0021 Mica—MW—W—5%
C24	124-18	Padder, 175 mmf. working capacity.
C25	124-18	Padder, 300 mmf. working capacity.

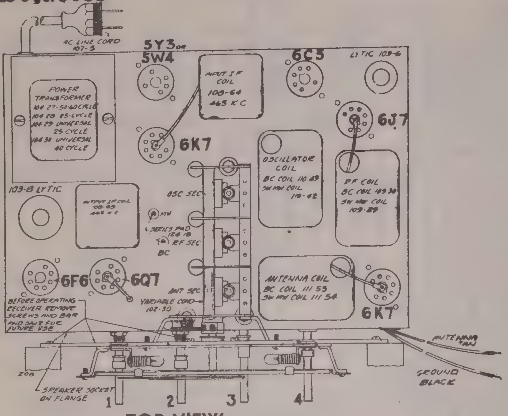
Note: C24, C25 in one unit—part No. 124-18.

PARTS RUN 2 ONLY

R7	130-38	2 megOhms—⅓W—20%—100V—Carbon
R19	130-76	30M Ohms—⅓W—20%—10V—Carbon
C6	100-41	.25—400 Volt—20%
C11	100-22	.05—200 Volt—25%
C18	100-46	.25—200 Volt—20%
C21	129-69	.0023 Mica—MW—W—2½%
C23	129-55	.0034 Mica—MW—W—2½%
C24	124-34	Padder, 200 mmf. working capacity
C25	100-11	.01 x 400 Volt—25%

MODEL 778, Runs 1,2
Alignment, Trimmers
Socket, Notes

GOODYEAR TIRE & RUBBER CO., INC.


AC LINE CORD 107-3
5Y3 or 5W4
INPUT I F COIL 108-64 465 K C
6C5
LYTIC 103-6
POWER TRANSFORMER 104 27-50-60 CYCLE 104 28 25-CYCLE 104 29 UNIVERSAL 25 CYCLE 104 30 UNIVERSAL 40 CYCLE
6J7
6K7
OSCILLATOR COIL BC COIL 110 43 SW MW COIL 110-42
RF COIL BC COIL 109 30 SW MW COIL 109-29
103-8 LYTIC
OUTPUT IF COIL 108-65 465 K C
OSC SEC
MW
SERIES PAD 124 18
RF SEC
BC
6F6
6Q7
ANT SEC
VARIABLE COND 102-30
ANTENNA COIL BC COIL 111 53 SW MW COIL 111 54
6K7
BEFORE OPERATING RECEIVER REMOVE SCREWS AND BAR AND SAVE FOR FUTURE USE
ANTENNA TAN
GROUND BLACK
208
SPEAKER SOCKET ON FLANGE
1
2
3
4

TOP VIEW

60 Cycle 75 Watt 105-115 V

1. Vol. Control A.C. Switch 101-47
2. Tone Control Fidelity SW 101-38
3. Tuning
4. Band switch 125-18

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VIII

Dummy Antennas

(I.F.)—Consists of a .1 mfd. condenser connected series with the external oscillator.

(Broadcast)—Consists of a 200 mmfd. condenser a 20 ohm resistor connected in series with each ot and in series with the external oscillator.

(Intermediate and Short Wave)—Consists of a mfd. condenser and a 400 ohm resistor connected series with each other and in series with the extern oscillator.

IF at 465 KC.

BC Series pad at 600 KC Run 1 (5) Run 2 (3). Osc.(4), RF (6), An (7) at 1400 KC.

SW Osc.(1),RF (8), Ant.(9) at 17M

INT. (RUN 1)

RF (10), Ant.(11), Osc.(2) at 1800 KC.

(RUN 2)

RF (10), Ant.(5), Osc.(2) at 5

DESCRIPTION

The tube complement of this chassis is as follows:

1—Type 6K7 Remote cut-off pentode R.F. amplifier
1—Type 6J7—pentode first detector.
1—Type 6C5 Oscillator
1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
1—Type 6Q7 duplex diode pentode second detector, A.V.C. and audio.
1—Type 6F6—pentode output amplifier.
1—Type 5Y3 or 5W4—high vacuum rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 127, 150, 225 and 260 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

SERVICE NOTES

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

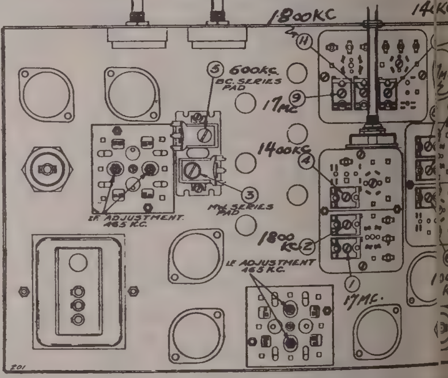
RUN 1 ONLY

NOTE: Chassis with serial numbers from 6C229300 to 6D242726 were equipped with a fuse in the primary circuit of the power transformer and supplied with a type 5Z4 rectifier tube.

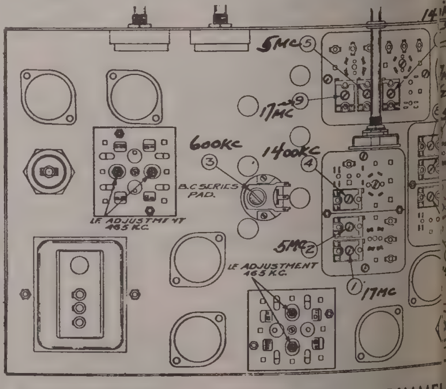
This fuse is made accessible for replacement by removing fuse cover located on back flange of chassis, replace only with a 2 ampere fuse. If replacement fuse blows out, check tubes, (particularly 5Z4 rectifier) circuit, repair or replace defective tubes or parts.

NEVER ATTEMPT TO REPLACE FUSE WITHOUT FIRST DISCONNECTING POWER.

NEVER REPLACE WITH FUSE OTHER THAN 2 AMPERE RATING.



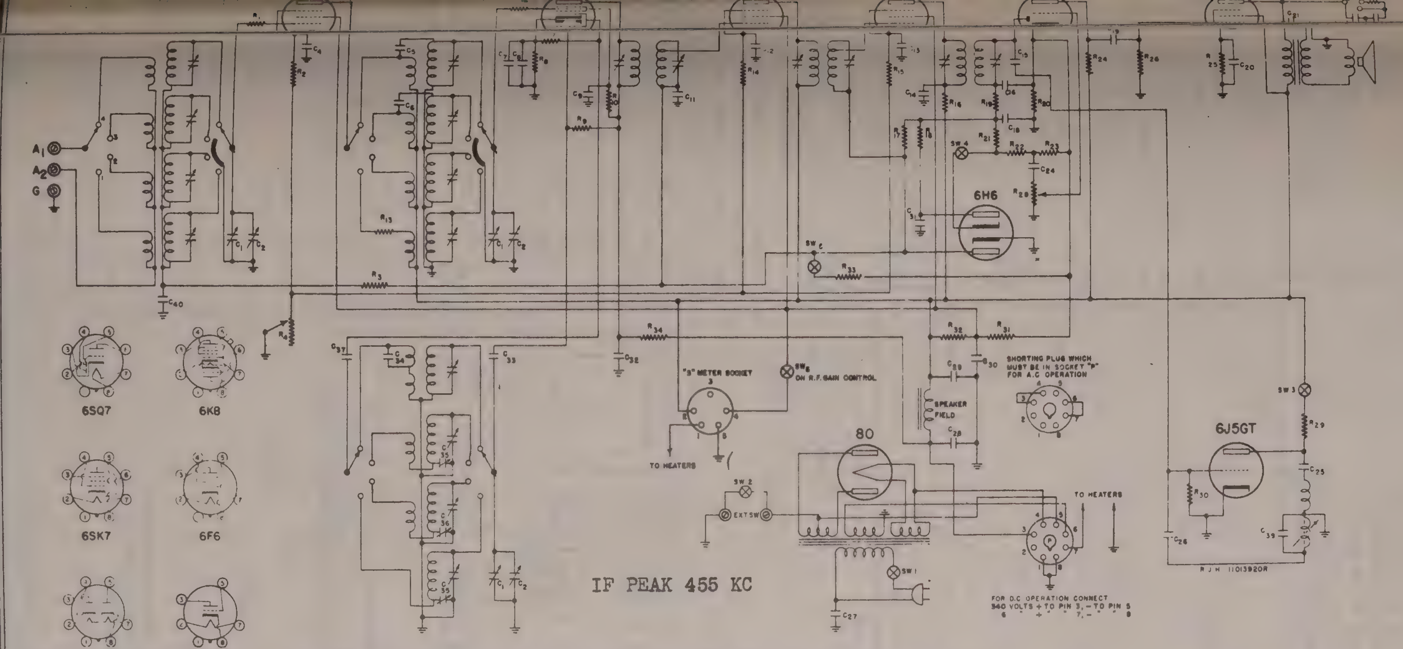
RUN 1 BOTTOM VIEW SHOWING TRIMME



RUN 2 BOTTOM VIEW SHOWING TRIMME

THE HALLICRAFTERS INC.

MODEL S20-R
Schematic, Notes



IF PEAK 455 KC

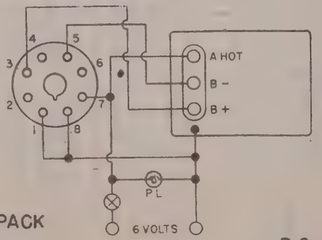
Unless otherwise specified the S20R Receiver operates on 100-125 volt 50-60 cycle current. A universal model is available on special order for operation on 110-250 volt, 25-60 cycle current.

SKY-CHAMPION MODEL - S20-R

TUBE LINE-UP

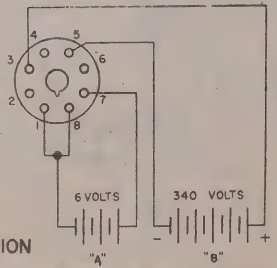
6SK7	R. F. Amplifier
6K8	1st Detector-Mixer H.F. Oscillator
6SK7	1st I.F. Amplifier
6SK7	2nd I.F. Amplifier
6SQ7	2nd Detector, A.V.C. 1st stage of audio
6F6G	2nd audio output stage
6H6	Automatic Noise Limiter
6J5GT	Beat Frequency Oscillator
80	Rectifier

The Model S20R Receiver draws 65 watts at 115 volts 60 cycle alternating current.



VIBRAPACK

BATTERIES



D C OPERATION

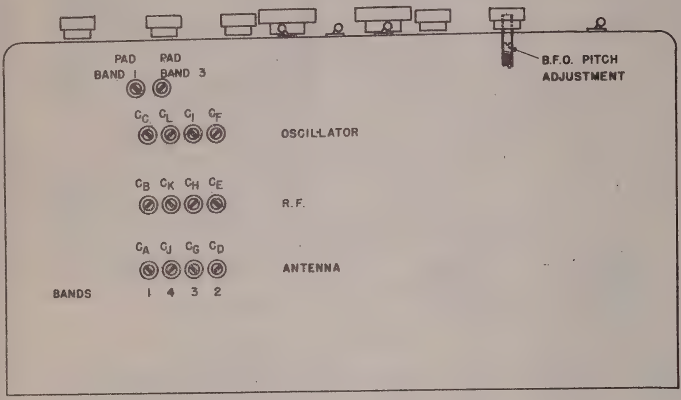
CONNECTIONS TO "PWR" SOCKET AFTER REMOVAL OF SHORTING PLUG

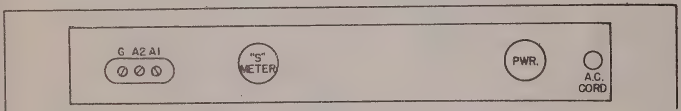
MODEL S20-R
Socket, Trimmers
Parts

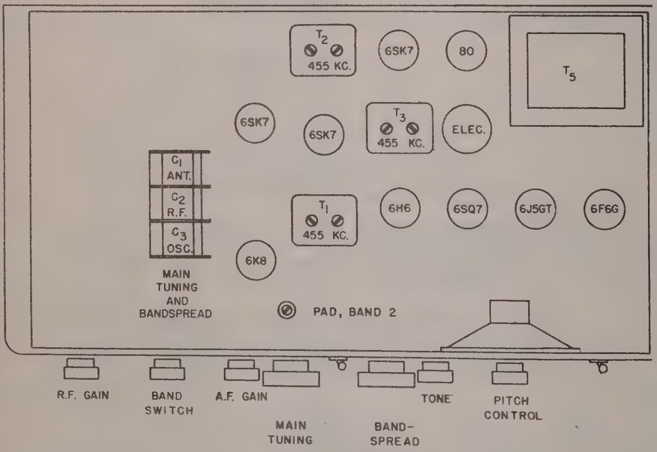
THE HALLICRAFTERS INC.

FREQUENCY RANGE

Band	Coverage
1	540 KC to 1,770 KC
2	1.72 MC to 5.4 MC
3	5.3 MC to 15.7 MC
4	15.2 MC to 44. MC







SWITCHES

SW1 – AC On-Off On Tone Control Switch
SW2 – Send Receive Switch
SW3 – BFO On-Off
SW4 – ANL On-Off
SW5 – AVC On-Off
SW6 – "S" Meter On R.F. Gain Control

RESISTORS

NO.	OHMS	WAT GE
1	30	1
2	200	
3	100,000	
4	10,000	R.F. ai
7	50,000	1
8	200	
9	20,000	
10	30,000	
12	3C	1
13	500	
14	1,000	
15	300	
16	1,000	
17	2,000,000	
18	1,000,000	
19	50,000	
20	100	1
21	100,000	
22	250,000	
23	250,000	
24	250,000	
25	500	
26	500,000	1/
27	5,000	
28	500,000	A.F. ai
29	15,000	1-1
30	50,000	1/
31	13,000	1-1
32	10,000	3
33	150	1/
34	10,000	1-1

CONDENSERS

NO.	CAPACITY		VOLTAGE	TYP
1	400	mmf	Main tuning	
2	27	"	Band Spread	
4	.05	mfd	200	
5	25	mmf		Cera
6	5	"		"
7	.002	mfd		Mic
8	.05	"	200	
9	.02	"	400	
11	.02	"	400	
12	.05	"	200	
13	.05	"	200	
14	.02	"	400	
15	2	mmf		Twisted a
16	50	"		Mic
18	50	"		"
19	.02	mfd	400	
20	10	"	25	Electro
21	.01	"	400	
22	.01	"	800	
23	.02	mfd	600	
24	.02	"	400	
25	.01	"	400	
26	100	mmf		Mic
27	.01	mfd	800	
28	30	"	450	Electro
29	10	"	400	"
30	.1	"	200	
31	.05	"	200	
32	10	"	450	Electro
33	100	mmf		Ceram
34	105	"		"
35	2400 and 450	"		Pad "
36	1400	"		Mic
37	.002	mfd		"
39	.0005	"		
40	.05	"	200	

THE HALLICRAFTERS INC.

MODEL S20-R
Alignment, Antenna Notes
MODEL SX-25
Antenna Notes

ANTENNA

The ky Champion has an antenna input circuit which will allow the use of either a doublet or Mar- cor (inverted "L") antenna. The approximate antenna input impedance of the S20R is 400 ohms.

A v y serviceable antenna will be the inverted "L", or Marconi type. This antenna should be ap- pro mately 75 feet long overall, including the lead-in to the set. Satisfactory operation of the Sky hampion is obtained throughout its tuning range with this type of antenna and because of that fac as well as its ease of construction it is highly recommended.

Wit the inverted "L" type of antenna A_2 must remain connected to G for best operation. While a gro d connection is usually not necessary it might prove to be helpful in reducing noise. A cold wat pipe or 6' foot rod driven in moist soil will be a very satisfactory ground when connected to the terminal on the receiver. Connections to a radiator or gas piping are not recommended.

Sho d a doublet antenna be used it is suggested that a transmission line of 400 ohms value of im- ped ce be constructed so that a most efficient transfer of energy is obtained. The commercially ava able all wave doublet antennas are usually provided with a coupling transformer which matches the ransmission line to the receiver. This transformer connects to the A_1 and A_2 terminals on the ant na strip. The half-wave length-doublet antenna cut for a particular frequency can be computed by e following formula.

$$\text{Len th in feet} = \frac{463}{\text{Frequency in megacycles}}$$

or for example, a half wave 20 meter or 14 megacycle antenna would be

$$\frac{463}{14} \text{ or 33.7 feet long overall}$$

Thi type of antenna is broken in the center with an insulator and has the transmission line con- nec d to each resulting quarter wave section at that point. This antenna is a very good per- for r, in a direction broadside to its length, only on the relatively narrow group of frequencies for hich it was cut. It does not function well on harmonic frequencies.

Whe using either type of doublet antennas the transmission line should be connected to A_1 and A_2 bin ng posts. The wire connecting the A_2 to ground or G can be left connected if the performance of t receiver is improved.

ALIGNMENT PROCEDURE

455 C, Intermediate-Frequency Alignment.
Hav the controls set as follows:
AF d RF gain controls for maximum volume.

B.F.O. switch in the "OFF" position.
Set band switch to #2 band.
Set main dial to 2 megacycles, band spread to zero.

Remo 6K8 grid cap and connect the hot side of your 455 KC generator to this tube. Connect the grou terminal of the signal generator to the chassis of the receiver. Now feed a 455 KC signal int he receiver. Adjust all I.F. transformer trimmers on T1, T2, T3, for maximum gain.

R. F. ALIGNMENT

Re-c nect the grid cap to the 6K8 tube. Connect the hot side of the generator to the A_1 antenna term al on the rear of the chassis through a 400 ohm resistor. Be sure a jumper is connected to A_2 a G. Leave signal generator ground connected to the chassis of the receiver.

The cation of the following trimmers and padders can be determined by referring to the top and bott chassis views. All pad adjustments are for the low frequency end of each band while the trim rs are for the high frequency ends.

In o er to get at the RF trimmers the guarantee card can be removed by placing a knife under the smal snap fasteners holding it in place. So that most satisfactory adjustment of the trimmers and padd s can be made, it is advisable to "Rock" the condenser gang across the signal being delivered by t generator until that particular circuit has been accurately peaked at all frequencies except 1400 C and 4 MC.

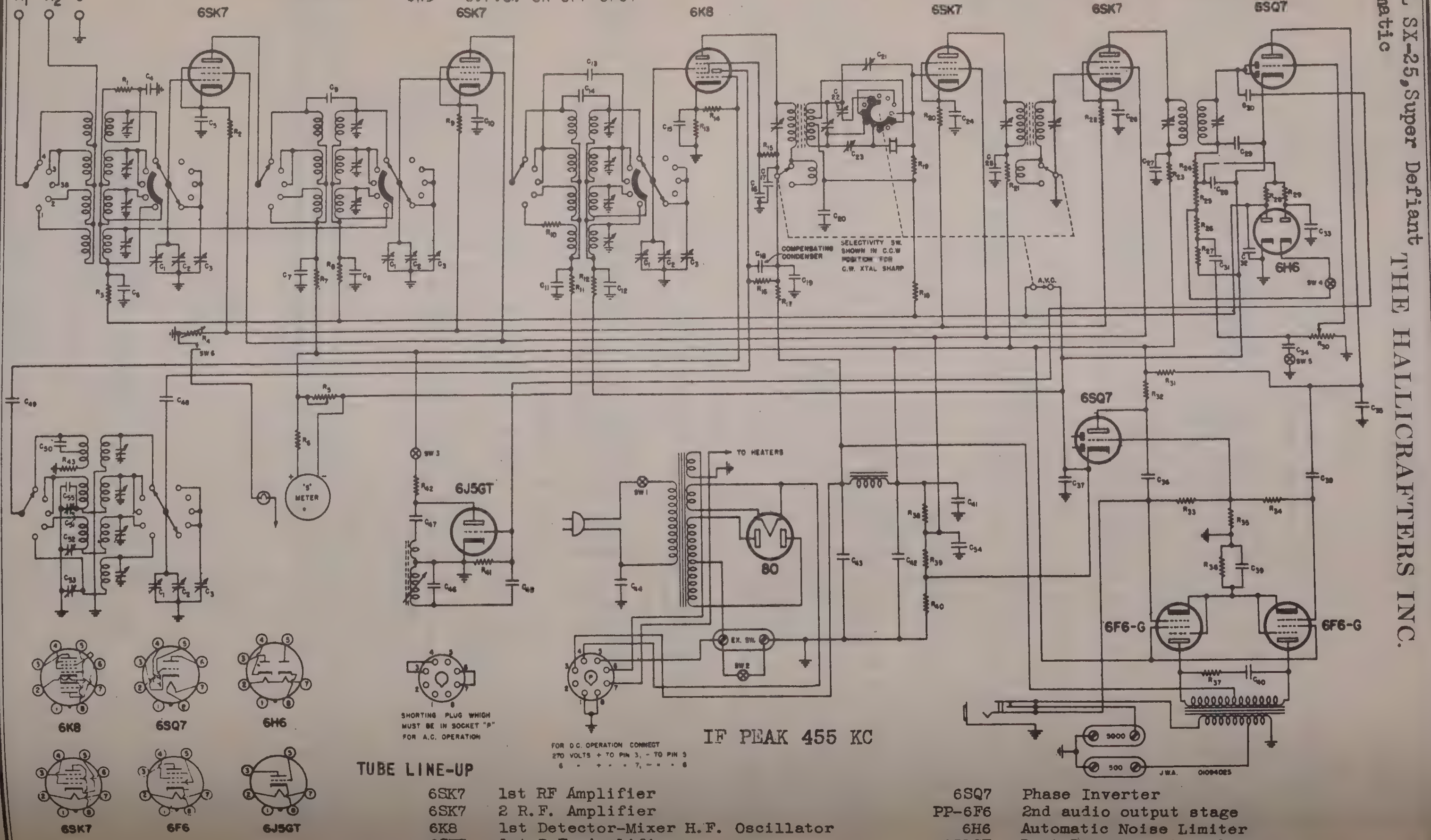
Bands	Trim at	Pad at
1	1400 KC Adjust C_A C_B C_C	600 KC Adjust Pad Band 1
2	4 MC Adjust C_D C_E C_F	2 MC Adjust Pad Band 2 (Top Chassis)
3	14 MC Adjust C_G C_H C_I	7 MC Adjust Pad Band 3
4	34 MC Adjust C_J C_K C_L	17 MC No pad on this Band

MODEL SX-25,Super Defiant
Schematic

THE HALLICRAFTERS INC.

SWITCHES

SW1 - AC ON-OFF on A.F. Gain Control
SW2 - Stand-by SPST
SW3 - B.F.O. ON-OFF SPST
SW4 - A.N.L. ON-OFF SPST
SW5 - High-Low Tone SPST
SW6 - "S" Meter on R.F. Gain Control.


A1
A2
G
6SK7
6SK7
6K8
6SK7
6SK7
6SQ7
6H6
SW 4
SW 5
SW 6
6SQ7
6F6-G
6F6-G
6J5GT
80
SW 1
SW 2
SW 3
EX. SW.
"S" METER
TO HEATERS
A.V.C.
COMPENSATING CONDENSER
SELECTIVITY SW. SHOWN IN C.C.W POSITION FOR C.W. XTAL SHARP
5000
500
J.W.A.
01094025
SHORTING PLUG WHICH MUST BE IN SOCKET "P" FOR A.C. OPERATION
FOR D.C. OPERATION CONNECT 270 VOLTS + TO PIN 3, - TO PIN 5 6 " + " " 7, - " " 6
6K8
6SQ7
6H6
6SK7
6F6
6J5GT

IF PEAK 455 KC

TUBE LINE-UP

6SK7	1st RF Amplifier
6SK7	2 R.F. Amplifier
6K8	1st Detector-Mixer H.F. Oscillator
6SK7	1st I.F. Amplifier
6SK7	2nd I.F. Amplifier
6SQ7	Phase Inverter
PP-6F6	2nd audio output stage
6H6	Automatic Noise Limiter
6J5GT	Beat Frequency Oscillator
80	Rectifier

SUPER DEFIANT MODEL SX25

THE HALLICRAFTERS INC.

FREQUENCY METER TUNING

MODEL SX-25, Super Defiant
Alignment, Trimmers, Parts
Frequency Meter Tuning

Aro d the outer edge of the main tuning dial the amateur bands for which "Frequency Meter Tuning" is ava able are marked with the red numerals; 10 - 20 - 40 and 80. Set the red line beneath these numera directly opposite the hair-line on the window and switch to the correct band. The band spread ca will indicate correct frequency within the limits of the accuracy of the setting and calibration.

The and spread dial of the SX25 Model is calibrated so that the operator may determine quite closely the Fre ency of the signal to which he is listening on the 10 to 80 meter amateur bands inclusive. The outer ge of this dial is marked off in 100 divisions for additional ease in logging and locating stations.

BAN 3B -- Special reference is called to this position of the Band Switch so that no confusion will be exp ienced. Band 3B is the same as Band 3 and is used in order to have the band spreading of the 40 met band accomplished through approximately the same number of degrees on the Band Spread Scale as ocup l by the other amateur bands for which calibration appears. When the Band Switch is placed in positio 3B another section of the band spread condenser is paralleled in the circuit. Band 3 main scale cali ration will read somewhat high when the Band Switch is set on 3B.

Not The accuracy of the main dial calibration will hold only if the BAND SPREAD condenser is set at min um capacity, or the position indicated by 100 on the Band Spread dial which has been approached by tur ng the Band Spread Knob in a clockwise direction, or to the right, as far as it will go.

CONDENSERS

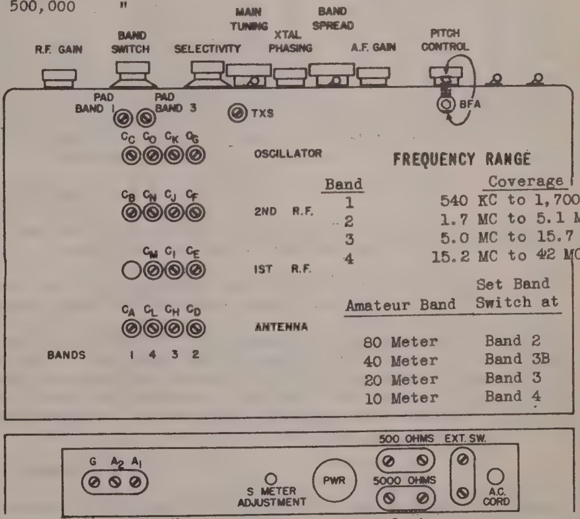
CAPACITY	VOLTAGE	TYPE
Ma Tuning Gang		
2 .Bd.Spr.Sec.		
5 " " "		
01 mfd	200	Paper
05 mfd	200	
05 mfd	200	Paper
02 mfd	400	Paper
05 mfd	200	Paper
3 mmfd		Ceramicon
05 mfd	200	Paper
02 mfd	400	Paper
05 mfd	200	Paper
mmfd		Ceramicon
35 mmfd		Ceramicon
05	200	
05 mfd	400	Paper
02 mfd	400	Paper
45 mmfd		Compensating
10 mfd	350	Electrolytic
05 mfd	200	Paper
25 mmfd		Phasing
5 to 18 mmfd "TXS"		Trimmer
5 to 18 mmfd		Trimmer
05 mfd	200	Paper
02 mfd	400	Paper
05 mfd	200	Paper
02 mfd	400	Paper
50 mmfd		Mica
0 mmfd		Mica
3 mmfd		Twisted Pair
.02 mfd	400	Paper
.02 mfd	400	Paper
.05 mfd	200	Paper
.002 mfd	1,600	Tubular Oil
20 mfd		Mica
.05 mfd	400	Paper
0 mfd	25	Electrolytic
.05 mfd	400	Paper
0 mfd	25	Electrolytic
.002 mfd	1,600	Tubular Oil
.1 mfd	400	Paper
0 mfd	350	Electrolytic
0 mfd	350	Electrolytic
.01 mfd	600	Paper
10 mmfd		Mica
50 mmfd		Mica
.02 mfd	400	Paper
15 mmfd		Ceramicon
.002 mfd		Mica
15 mmfd		Ceramicon
230 mmfd		Dual Pad
140 mmfd		Single Pad
40 mmfd		Dual Pad
.1 mfd	200	Paper
70 mmfd		Mica

RESISTORS

NO.	OHMS	WATTAGE
R1	100,000	1/3
2	400	"
3	100,000	"
4	10,000	R. F. Gain
5	500	S Meter
6	100	1/3
7	3,000	"
8	100,000	"
9	400	"
10	500	"
11	3,000	"
12	100,000	"
13	400	"
14	50,000	"
15	30,000	1
16	15,000	1
17	4,000	1
18	100,000	1/3
19	500,000	"
20	800	1/3
21	3,000	"
22	1,000	"
23	3,000	1/3
24	50,000	"
25	250,000	"
26	100,000	"
27	250,000	"
28	2,000,000	"
29	1,000,000	"
30	500,000	A.F. Gain
31	250,000	1/3
32	250,000	1/3
33	250,000	"
34	250,000	"
35	200,000	"
36	250	1
37	20,000	1
38	15,000	1
39	15,000	1
40	150	1/3
41	50,000	"
42	20,000	1
43	8	1/3

ANTENNA

SEE ANTENNA DATA
FOR MODEL S20-R



FREQUENCY RANGE

Band	Coverage
1	540 KC to 1,700 KC
2	1.7 MC to 5.1 MC
3	5.0 MC to 15.7 MC
4	15.2 MC to 42 MC

Amateur Band	Set Band Switch at
80 Meter	Band 2
40 Meter	Band 3B
20 Meter	Band 3
10 Meter	Band 4

Bands	Trim at	Pad at
1	1500 KC Adjust C_A C_B C_C	600 KC Adjust Pad Band 1
2	14 MC Adjust C_H C_I C_J C_K	6 MC Adjust Pad Band 3
3	4 MC Adjust C_D C_E C_F C_G	1.8 MC Adjust Pad Band 2 (Top Chassis)
4	30 MC Adjust C_L C_M C_N C_O	18 MC No pad on this Band

MODEL SX-25 Super Defiant
Alignment Procedure,Notes

THE HALLICRAFTERS INC.

"S" METER

When the R.F. gain control is advanced until a switch is heard to operate, a light will appear behin translucent scale of the meter itself. Only when this light is on will the meter indicate in "S" u When so adjusted the meter can be used as a resonance indicator. With the R.F. gain control backe from maximum the meter is still in the circuit but will not indicate carrier level accurately. O rear apron of the chassis is the "S" meter adjustment screw. To set the "S" meter, disconnect antenna and have the R.F. Gain Control on full and the selectivity switch in the "I.F. SHARP A.V.C. position. Now, adjust this knurled knob until the meter reads zero. Reconnecting the antenna and t in a station will show its relative carrier intensity.

The 500 and 5000 ohm terminals are for connections to a loud speaker or other load of those impe values. The matching SX25 speaker should be connected to the 5000 ohm strip. When headphones are pl into the phone jack the 5000 ohm speaker connection is automatically disconnected.

The "EXT. SWITCH" terminal strip is for external switch provisions should the receiver be controlled remote switch or relay. The SEND-REC switch on the panel must be in the Send Position when an exte relay is used for stand-by operation.

Unless otherwise specified the SX25 Receiver operates on 100-125 volt 50-60 cycle current. A unive model is available on special order for operation on 110-250 volt, 25-60 cycle current.

ALIGNMENT PROCEDURE

455 KC, Intermediate-Frequency Alignment.
Have the controls set as follows:
AF and RF gain controls for maximum volume.
B.F.O. switch in the "ON" position.

Set band switch to #2 band.
Set main dial to 2 megacycles, band spread t
Selectivity switch in "AVC OFF" xtal phone po

Remove the 6K8 tube grid cap. Connect a 1 megohm resistor between grid cap and grid of 6K8 tube. connect the hot side of the signal generator to the grid of the 6K8 tube through a .1 MFD conden Connect the ground terminal of the signal generator to the chassis of the receiver. Remove modula from generator and feed a 455 KC signal into the receiver and set the pitch control to give a beat of approximately 1000 cycles. Adjust all I.F. transformer trimmers for maximum gain with the excep of the secondary trimmer on transformer T1. Identified on top chassis view as T1S. In adjusting trimmer it will be noted that the output reaches a maximum goes through a dip and then back to max again. Wobbulate the IF frequency and align to the dip between the two maximum points. A distinct ch in the crystal note sounding like an apparent broadening of the crystal action will be noted when correct adjustment has been reached. At this point in the alignment it is necessary to make an adj ment on the phasing control as follows: Tune the signal generator so that its signal will go thr zero beat and then to the other side of zero beat until a signal of approximately 5000 cycles is hear the speaker or headphones. Now carefully adjust the "PHASING CONTROL" until this signal is reduce volume to a minimum. Reset the signal generator to its original frequency and recheck the adjustmen T1S. Now repeak carefully the other trimmers on I.F. transformers for maximum gain. Place the se tivity switch in the "CW. XTAL" position leaving all controls on the receiver as previously adjus Again wobbulate the frequency of the signal generator carefully through the very narrow range of crystal peak. Adjust small trimmer through hole in the bottom plate marked "TXS" until the sharp cry peak reaches maximum output. At this point the crystal is extremely sharp and maximum output is possi If this setting gives too sharp crystal filter action this "TXS" trimmer can be adjusted counter-cl wise for broader crystal response to suit the operator.

B.F.O. ADJUSTMENT

In the center of the "PITCH CONTROL" shaft, after the knob has been removed, you will find a reces screw for adjustment of the Beat Frequency Oscillator.

Before rotating this screw with a suitable screw-driver loosen the set screw on this shaft. This screw can be reached through a hole in the bottom plate directly under the B.F.O. Assembly marked "BF

Now tune in a signal on the receiver with the BFO off. Exact resonance can be determined with the c trols so adjusted that the "S" meter will indicate. After you have assured yourself that you have signal properly tuned in place the selectivity switch in anyone of the three "AVC OFF" positions. T the BFO switch to the "ON" position. You now can adjust the screw in the center of the pitch cont shaft until a beat note is heard. Tighten the set screw through the bottom plate, replace the knob the BFO adjustment is completed.

R. F. ALIGNMENT

Re-connect the grid cap to the 6K8 tube. Connect the hot side of the generator to the A_1 antenna termi on the rear of the chassis. Be sure a jumper is connected to A_2 and G. Leave signal generator gro connected to the chassis of the receiver.

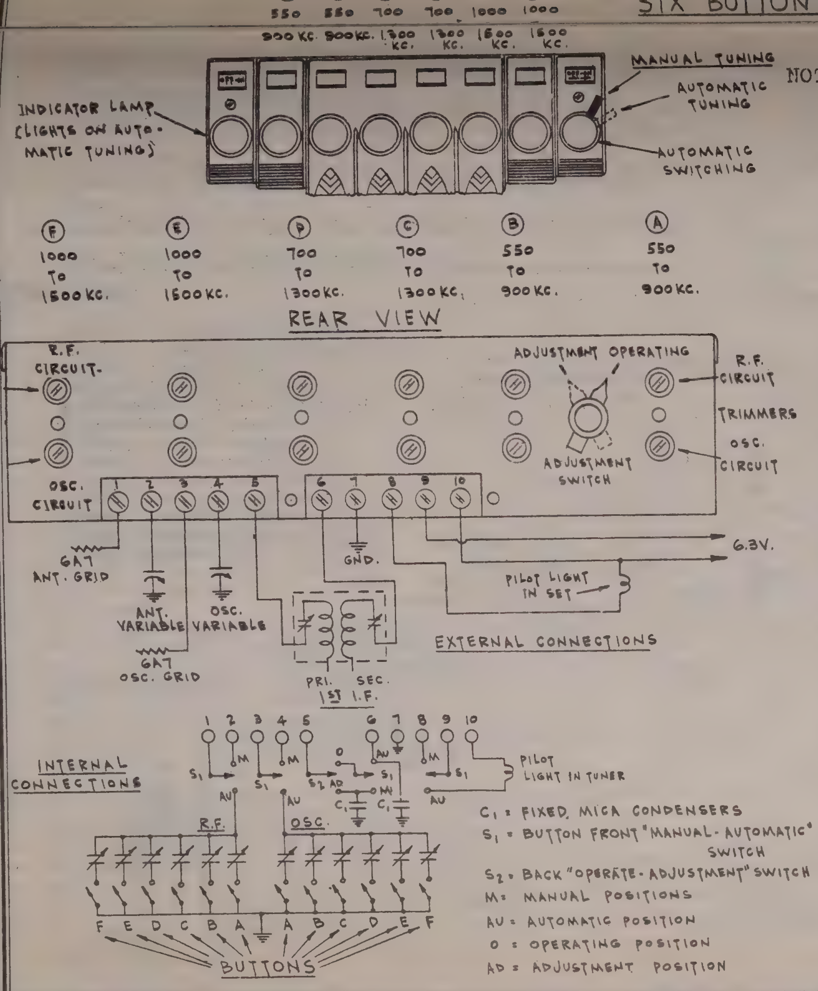
The location of the following trimmers and padders can be determined by referring to the top and bot chassis views. All pad adjustments are for the low frequency end of each band while the trimmers are the high frequency ends.

In order to get at the RF trimmers the guarantee card can be removed by placing a knife under the sm snap fasteners holding it in place. So that most satisfactory adjustment of the trimmers and padders be made, it is advisable to "Rock" the condenser gang across the signal being delivered by the genera until that particular circuit has been accurately peaked.

HALSON RADIO & TELEVISION INC.

MODEL 6-Button Automatic Tuner-Data

SIX BUTTON AUTOMATIC TUNER



NOTE:-THE ADJUSTMENT SWITCH AND I.F. CONNECTIONS WERE ELIMINATED FROM THIS CIRCUIT, THEREFORE, OMIT ANYTHING PRETAINING TO THEM.

This push button assembly is for convenience and rapidity in the selection of favorite stations. Use preferably on strong local stations of good quality or the major networks. It in no way affects the operation of the normal manual tuning control, located below the dial which is used as heretofore, but is rather an adjunct for convenience.

CHOOSING THE STATIONS FOR AUTOMATIC TUNING Before any adjustment, select the six stations desired. Check their frequency and choose them so that two are from the low frequency end of the broadcast band, two are from the middle frequency and two are of the higher frequencies. Note that all trimmers in the back are marked with the range they cover. Be sure that each set of trimmers is used for only a station within its range.

In most cases this should accommodate the six most popular stations. Occasionally three stations might be desired in one frequency group. Since there are only two buttons available, the least important station will have to be tuned in by the manual control. The chosen stations should be lined up on the buttons in the order of their frequency with the lowest frequency on the left hand side, the next higher frequency to the right of it and so on until the highest frequency station is on the furthest right hand button.

Remove the two small wood screws and take off the front escutcheon. Insert in the order chosen and in the correct windows, the station call letters desired behind the little celluloid windows.

ADJUSTMENT FOR A PARTICULAR BUTTON Each button is wired up to a particular trimmer set in the back. The back adjustment is approximately directly behind its button. For example,- the last button nearest one end of the cabinet is adjusted by the last trimmer nearest that same end of the cabinet. Again, the third button from one end of the cabinet is adjusted by the third set of trimmer screws from that same end.

METHOD OF STATION ADJUSTMENT Having picked the station desired, the button for it and the trimmer screws behind the button, the next step is adjustment of the trimmers to actually receive the desired station. Turn back the switch to ADJUSTMENT position. Tune in manually the desired station and leave there. Turn the front automatic button switch to right or automatic position (left button will light up). Turn bottom screw of trimmer (oscillator) until desired station is heard. Switch back and forth between manual and automatic positions for easy identification of the desired station. Turn volume control up.

CAUTION - It is usually necessary at the beginning to arbitrarily screw top or RF trimmer in fairly tight to right. Sometimes a loud " puttering " or oscillation will be heard as lower, oscillator, screw is turned. When this occurs, tighten up (turn right, clockwise) the upper RF trimmer and then continue adjusting the oscillator until desired station is heard. The actual receiving of the station will always first have to be accomplished by the oscillator trimmer.

After the station is heard, tune upper trimmer for maximum response.

Repeat both trimmer adjustments for greater accuracy.

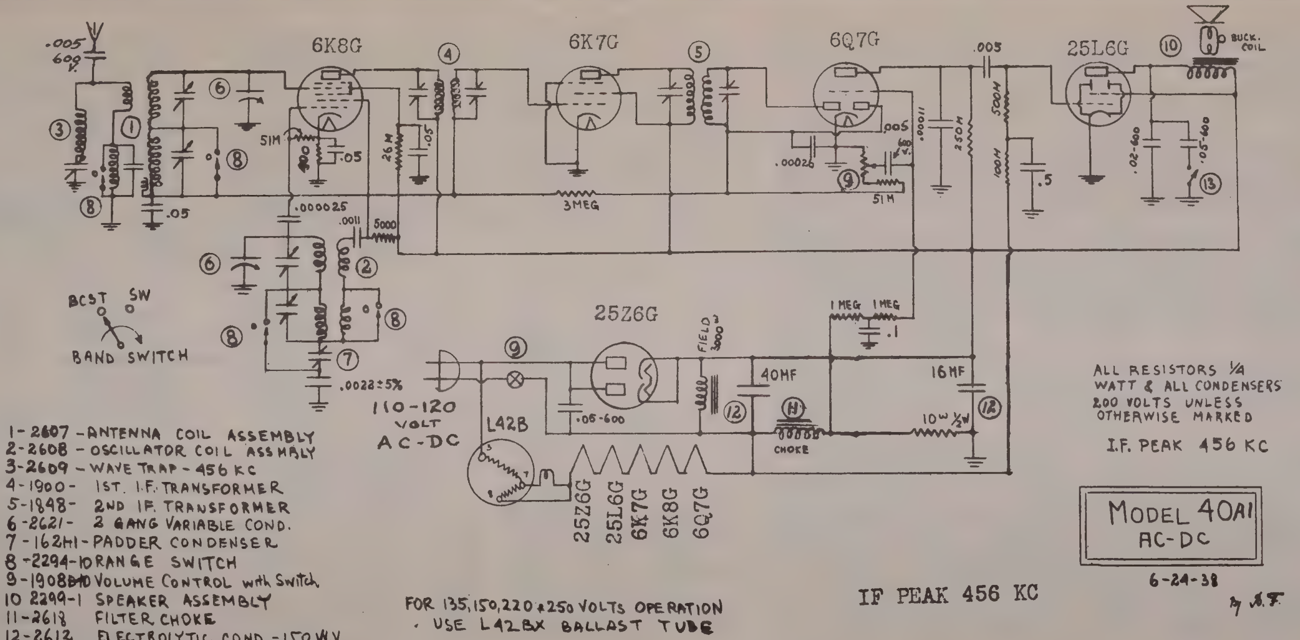
Continue to the next button and adjust its bottom and top trimmers behind it.

After all trimmers have been adjusted, turn back switch to OPERATION position and leave there in that position henceforth.

The receiver is now ready for use. The front button switch will instantly permit use of either automatic or manual tuning without any interaction or dependence of one upon the other

MODEL 40A1
Schematic, Socket
Alignment, Trimmers

HALSON RADIO & TELEVISION INC.



ALL RESISTORS ¼ WATT & ALL CONDENSERS 200 VOLTS UNLESS OTHERWISE MARKED

I.F. PEAK 456 KC

MODEL 40A1
AC-DC

6-24-38

by A.F.

1-2607 - ANTENNA COIL ASSEMBLY
2-2608 - OSCILLATOR COIL ASSMBLY
3-2609 - WAVE TRAP - 456 KC
4-1900 - 1ST. I.F. TRANSFORMER
5-1848 - 2ND I.F. TRANSFORMER
6-2621 - 2 GANG VARIABLE COND.
7-162H1 - PADDER CONDENSER
8-2294-10 RANGE SWITCH
9-1908B10 VOLUME CONTROL with Switch
10 2299-1 SPEAKER ASSEMBLY
11-2618 FILTER CHOKE
12-2612 ELECTROLYTIC COND - 150 W.V.
13-2622 TONE CONTROL SWITCH

FOR 135, 150, 220 & 250 VOLTS OPERATION
. USE L42BX BALLAST TUBE

IF PEAK 456 KC

ALIGNMENT PROCEDURE -

(1) Set service oscillator to 456 KC and connect the output lead to the top grid of 6A7. Adjust the I.F. trimmers for maximum response.

(2) Connect oscillator set at 456 KC to the antenna lead through a .0002 MFD condenser band switch in the broadcast position, and adjust the wave trap for minimum response.

(3) Set oscillator for 22 MC, band switch in the short wave position, dial pointer set for 22 MC calibration, and adjust the short wave oscillator trimmer until the signal is heard.

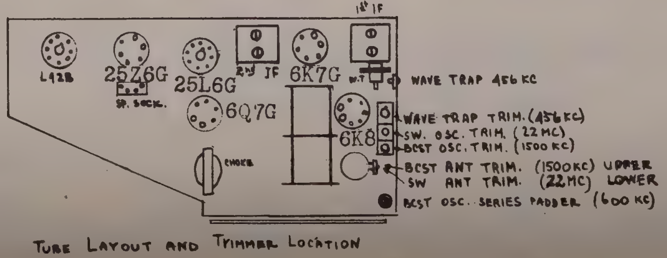
(4) Turn the band switch to the broadcast position, set dial to 1500 KC calibration and feed a 1500 KC signal from the oscillator through the antenna. Adjust the broadcast oscillator trimmer until the signal is heard, then adjust the broadcast antenna trimmer for maximum response.

(5) Set the test oscillator to 600 KC and adjust the broadcast osc. series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.

(6) Repeat procedure numbers 4 and 5 for greater accuracy.

(7) Turn the set to the S.W. Band, set the test oscillator to 22 MC

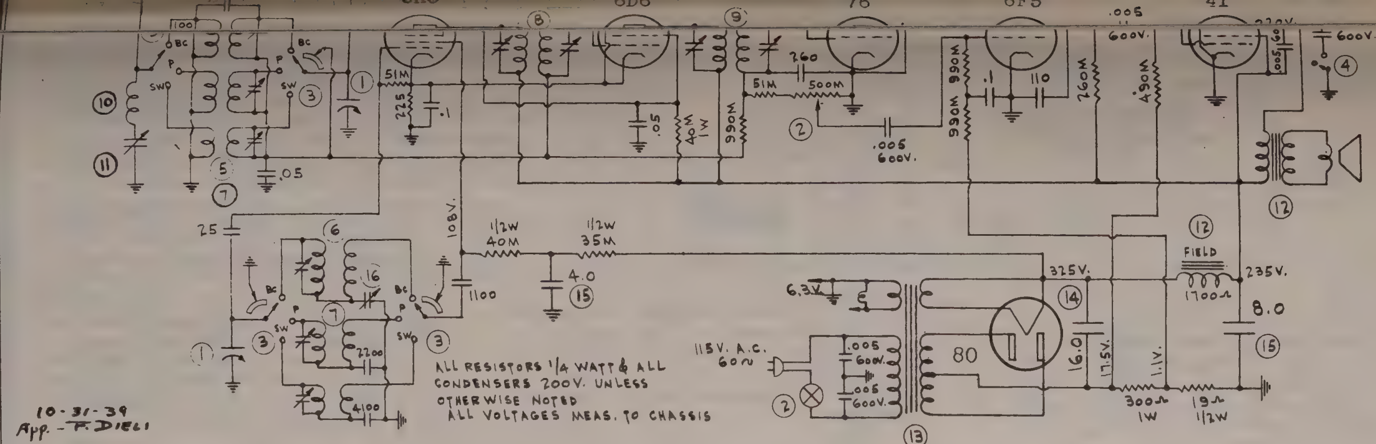
tubes not in their proper sockets, shorted serial defective plug or wiring loose in socket.



TUBE LAYOUT AND TRIMMER LOCATION

HALSON RADIO & TELEVISION INC.

MODEL 40B2X
Schematic, Socket
Alignment, Trimmers



ALL RESISTORS 1/4 WATT & ALL CONDENSERS 200V. UNLESS OTHERWISE NOTED
ALL VOLTAGES MEAS. TO CHASSIS

10-31-39
App. - F. Dieli

1 = 2468 - VARIABLE CONDENSER 495 MMFD.
2 = 1508E - VOLUME CONTROL & SWITCH
3 = 2345A - RANGE SWITCH
4 = 1439C - TONE CONTROL SWITCH
5 = 2488 - ANTENNA COIL ASSEMBLY
6 = 2489 - OSCILLATOR " "
7 = 2490 - ANT.-OSC. " " (POLICE BAND)
8 = 1900L - I.F. TRANSFORMER - 1ST - 456 K.C.
9 = 1848P - " " - 2ND - "
10 = 2297-1 - WAVE TRAP COIL - 456 KC.
11 = 2337-1 - " " TRIMMER
12 = 2272-1 - SPEAKER ASSEMBLY
13 = 2311 - POWER TRANSFORMER - 115V. - 60~
14 = 2353 - ELECT. COND. (WET) 16 MFD. 450V.
15 = 2308-2 - " " 8-4 MFD. 350V.
16 = 1621-1 PADDER COND. 200-685 MMFD.

ALIGNMENT PROCEDURE

(1) Set service oscillator to 456 kc and connect the output lead to the top grid of 6A7. Adjust trimmers for maximum response.

(2) Connect oscillator set at 456 kc to the antenna lead through a .0002 mfd. condenser; variable condenser closed, and adjust wave trap trimmer for minimum response. Band switch to be in broadcast position.

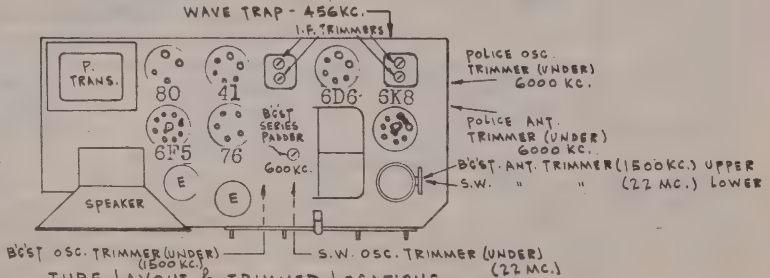
(3) Turn band selector to the short wave band, set the test oscillator to 22 mc and connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 22 mc and adjust short wave oscillator trimmer until signal is heard. Then adjust short wave antenna trimmer for maximum response.

(4) Turn band selector to police band, set test oscillator to 6000 kc, connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 6000 kc and adjust police oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.

(5) Turn band selector to broadcast band, set test oscillator to 1500 kc, connect to antenna lead through a .0002 mfd. condenser. Set dial at 1500 kc and adjust broadcast oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.

(6) With band selector in broadcast position, set test oscillator to 600 kc and adjust broadcast oscillator series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.

(7) Repeat procedures 5 and 6 for greater accuracy.

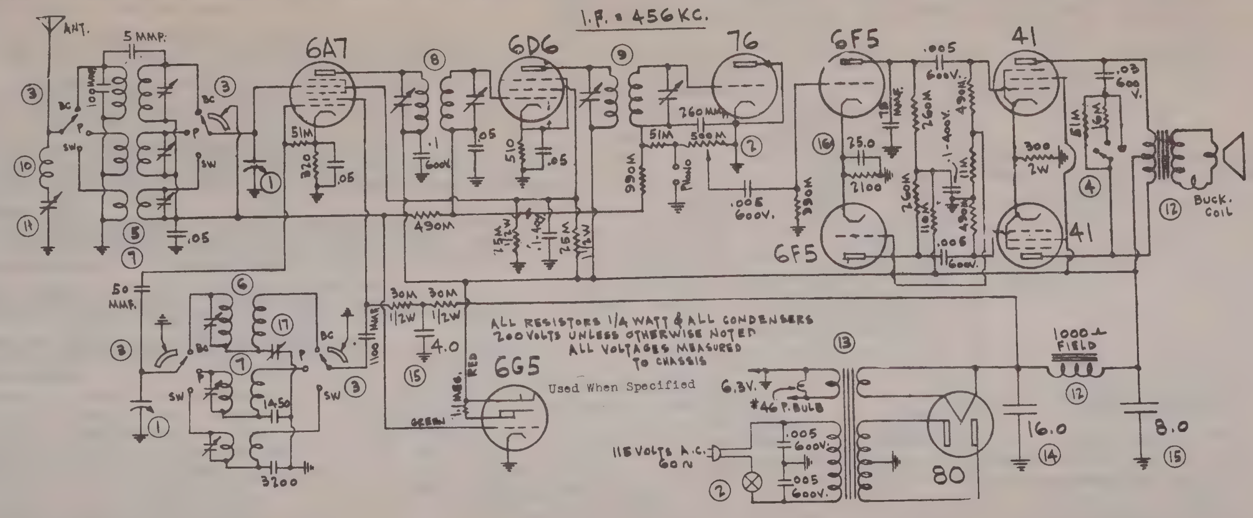

WAVE TRAP - 456KC.
I.F. TRIMMERS
P. TRANS.
80
41
6D6
6K8
6F5
76
B'C'ST SERIES PADDER
600KC.
SPEAKER
E
E
POLICE OSC. TRIMMER (UNDER) 6000 KC.
POLICE ANT. TRIMMER (UNDER) 6000 KC.
B'C'ST. ANT. TRIMMER (1500KC.) UPPER
S.W. " " (22 MC.) LOWER
B'C'ST OSC. TRIMMER (UNDER) (1500 KC.)
S.W. OSC. TRIMMER (UNDER) (22 MC.)

TUBE LAYOUT & TRIMMER LOCATIONS

MINOR REASONS FOR FAILURE TO FUNCTION - Defective tubes, grid caps off, volume control not fully turned on, tubes not in their proper sockets, shorted antenna, defective plug or wiring loose in socket.

MODEL 40C3X
Schematic, Socket
Alignment, Trimmers

HALSON RADIO & TELEVISION INC.



1 = 2290-3 - VARIABLE CONDENSER - 495 MMFD.
2 = 1808D-3 - VOLUME CONTROL & SWITCH
3 = 2345 - RANGE SWITCH
4 = 2346 - TONE CONTROL SWITCH
5 = 2347 - ANTENNA COIL ASSEMBLY
6 = 2348 - OSCILLATOR " "
7 = 2349 - ANT.-OSC. " " (POLICE BAND)
8 = 2382-1 - I.F. TRANSFORMER - 1ST - 456 KC.
9 = 1848L - " " - 2ND - " "
10 = 2297-1 - WAVE TRAP COIL - 456 KC.
11 = 2337-1 - " " TRIMMER
12 = 2356-20 - SPEAKER ASSEMBLY
13 = 2352-1 - POWER TRANSFORMER - 115V. - 60 ~
14 = 2353 - ELECT. COND. (WET) 16 MFD - 450V.
15 = 2308-2 - " " 8-4 MFD. - 350V.
16 = 2369 - " " 25 MFD. - 15V.
17 = 1621-1 - PADDER COND. 200-685 MMFD.

ALIGNMENT PROCEDURE

(1) Set service oscillator to 456 kc and connect the output lead to the top grid of 6A7. Adjust trimmers for maximum response.

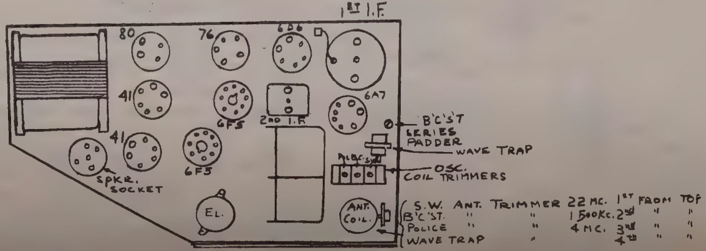
(2) Connect oscillator set at 456 kc to the antenna lead through a .0002 mfd. condenser; variable condenser closed, and adjust wave trap trimmer for minimum response. Band switch to be in broadcast position.

(3) Turn band selector to the short wave band, set the test oscillator to 22 mc and connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 22 mc and adjust short wave oscillator trimmer until signal is heard. Then adjust short wave antenna trimmer for maximum response.

(4) Turn band selector to police band, set test oscillator to 6000 kc, connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 6000 kc and adjust police oscillator trimmer until signal is heard. Then adjust police antenna trimmer for maximum response.

(5) Turn band selector to broadcast band, set test oscillator to 1500 kc, connect to antenna lead through a .0002 mfd. condenser. Set dial at 1500 kc and adjust broadcast oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.

(6) With band selector in broadcast position, set test oscillator to 600 kc and adjust broadcast oscillator series padder for maximum response by simultaneously



TUBE LAYOUT & TRIMMER LOCATION

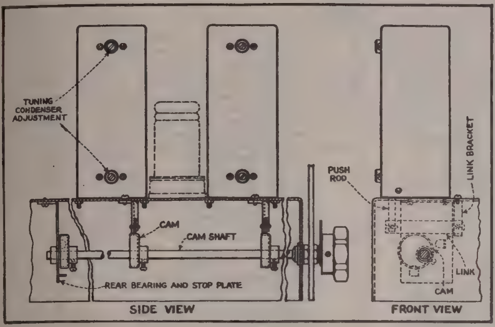
F.J.D 9-7-39

defective plug or wiring loose in socket.

HAMMARLUND MFG. CO., INC.

MODEL 200 Series
Assembly,Selectivity Curves

-Bandwidth
which varies
y an per-
operator to
he receiver
qual ob-
with mini-
terference.



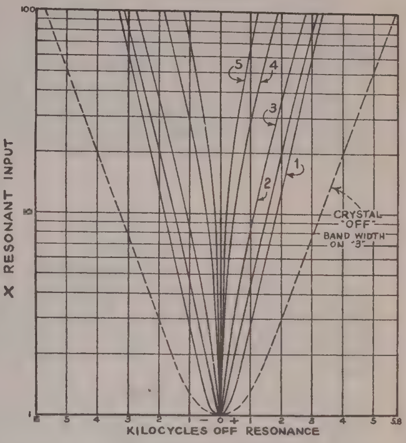
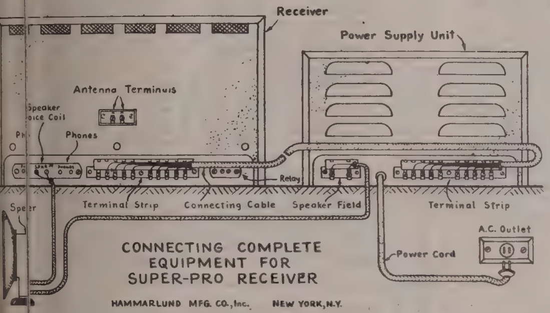
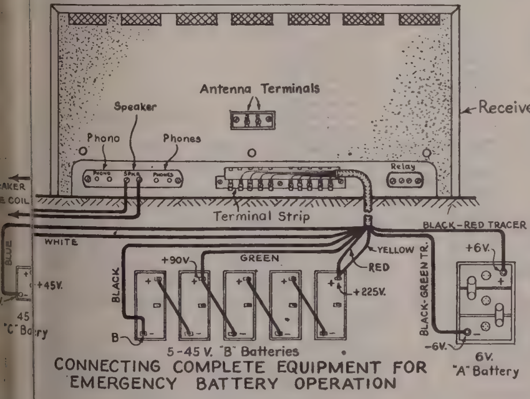


FIG. 6—Variable crystal filter selectivity curves showing five positions of the control switch. Positions 1, 2 and 3 are intended for voice reception. Position 1 is broad enough to permit reception of music. Positions 4 and 5 are for single signal code reception.



The two drawings on this page show the proper method of connecting the receiver, r supply, and speaker together. The drawing above shows a standard installation, the diagram below indicates receiver connections when batteries furnish the r. Protective covers are furnished for all important terminal strips and they d always be in place.



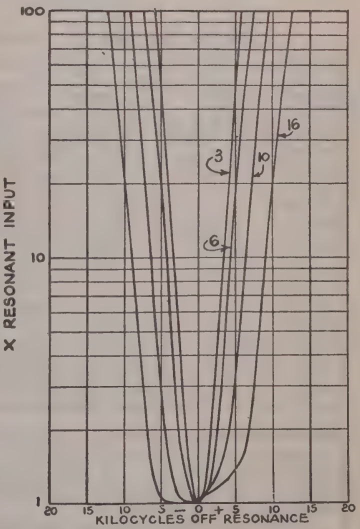
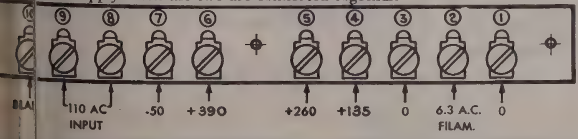


FIG. 5—I.F. curves taken at four positions of the band width control. The actual selectivity of the I.F. amplifier is continuously variable between curves 3 and 16. Particular attention should be paid to the sharp cut-off which greatly reduces back-ground interference.

Drawing below provides voltage readings at the various terminals on either the ver or power supply when the two are connected together.



HAMMARLUND MFG. CO., INC.

ANTENNA REQUIREMENTS

The input of the Series 200 "Super-Pro" is approximately 112 ohms. This means that for best results, the antenna should be coupled to the receiver by means of a low impedance transmission line. The doublet type antenna produces best results. Any well-known low impedance lead-in cable can be used with satisfaction. The use of low impedance lead-ins provides less chance for the lead-in itself to pick up extraneous noises. The low impedance lead-in, together with the electrostatic shield built into the antenna coil of the receiver, reduces noise to a minimum. It must be remembered that every antenna has a period of resonance and works best at that frequency. When erecting a doublet antenna, it is advisable to arrange its physical dimensions so that it will resonate in the band of frequencies where most sensitivity is desired. Care taken in designing and erecting an antenna will pay for itself many times in superior results.

DESIGN

The general design of the new "Super-Pro" embraces over five years of extensive research and experimentation. Individual components in the majority of cases have been specially designed for this receiver. The tuning inductors contained in the tuning unit are individually wound on low-loss forms. There are 20 in this group. Each coil has its own form and is mounted on an Isolantite base. This base also accommodates the variable trimming capacitor. All oscillator trimmers are of the air dielectric type and add considerably to the overall stability of the receiver. High stability mica trimmers are employed in the R.F. circuits.

The band change switch is especially designed for the "Super-Pro" and is unlike any other switch used for this purpose. The cam-operated knives contact stationary fingers and complete the circuit. Thus, no moving part carries current to cause noise or stray coupling. All contacts are silver-plated and will provide years of reliable service. The contacts are designed and placed so that the capacity between them is reduced to a negligible amount. This eliminates frequency drift due to change in dielectric constant during temperature rise. The I.F. transformers in the "Super-Pro" are designed particularly for this receiver. Each coil is wound on an Isolantite form and the coupling between them is mechanically variable to provide control of selectivity. Air dielectric trimmers are employed for maximum stability. Each grid coil in the I.F. unit is tapped near the low potential end so that changes in tubes will not affect the alignment of the receiver. This method also permits the use of a large number of stages operating at relatively low gain in order to obtain a maximum degree of selectivity without instability that might exist with a small number of stages operating at maximum gain.

SUPER-PRO MODELS AND PRICES

Code	Type	Tuning Range	Speaker	List Price
SP-210-X	Crystal	15–560 Meters	Jensen 10″ Dynamic	$465.00
SPR-210-X	Crystal Rack	15–560 Meters	Jensen 10″ Dynamic	482.50
SP-220-X	Crystal	15–560 Meters	Jensen 12″ High Fidelity	490.00
SPR-220-X	Crystal Rack	15–560 Meters	Jensen 12″ High Fidelity	507.50
SP-210-SX	Crystal	7½–240 Meters	Jensen 10″ Dynamic	465.00
SPR-210-SX	Crystal Rack	7½–240 Meters	Jensen 10″ Dynamic	482.50
SP-220-SX	Crystal	7½–240 Meters	Jensen 12″ High Fidelity	490.00
SPR-220-SX	Crystal Rack	7½–240 Meters	Jensen 12″ High Fidelity	507.50
SP-210-LX	Crystal	*15–2000 Meters	Jensen 10″ Dynamic	465.00
SPR-210-LX	Crystal Rack	*15–2000 Meters	Jensen 10″ Dynamic	482.50
SP-220-LX	Crystal	*15–2000 Meters	Jensen 12″ High Fidelity	490.00
SPR-220-LX	Crystal Rack	*15–2000 Meters	Jensen 12″ High Fidelity	507.50
PSC-10	Speaker cabinet finished to match receiver			8.50

Above prices cover 110-115-125 volt, 50 to 60 cycle models with tubes, crystal, and speaker. Receiver and power supply enclosed in wrinkle finished table type metal cabinets. Special models for 50-60 cycles with universal type power supply tapped for 115, 125, 140, 230, and 250 volts, also available at no increase in price. Twenty-five cycle models, $20.00 additional.

* In this model, the 1000 to 2000 meter band is substituted for the 60 to 120 meter band.

Receiver in cabinet measures 21½″ wide, 15¼″ deep, and 12¼″ high. Power supply in cabinet measures 13″ wide, 7½″ deep, and 8½″ high. Rack models fit standard 19″ relay racks. Shipping weight approximately 110 pounds.

(Prices subject to change without notice)

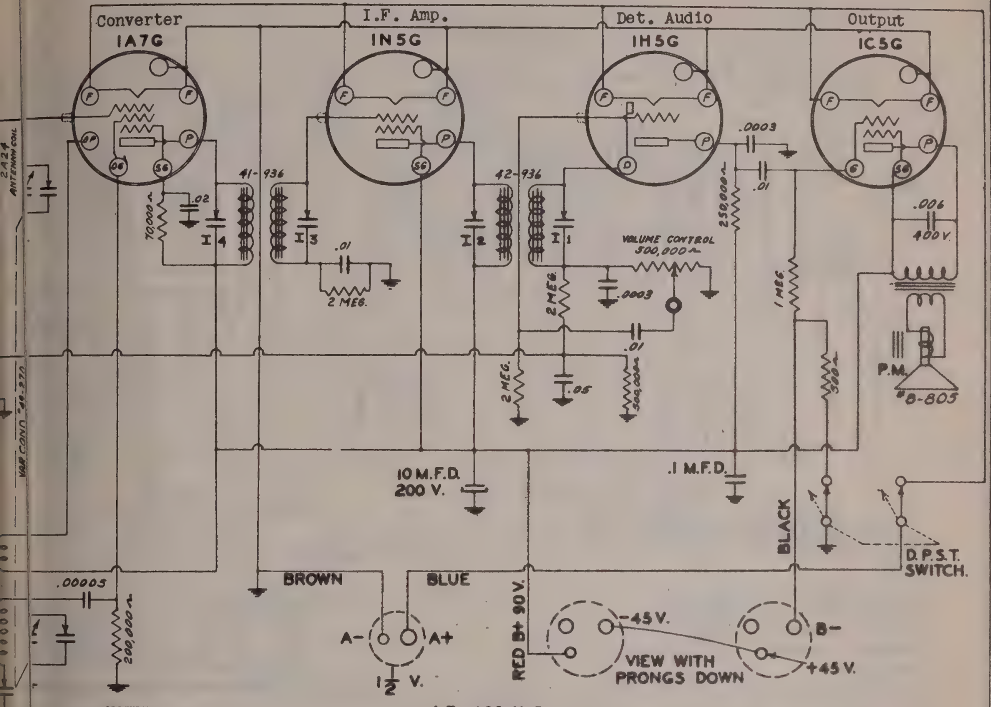
"SUPER-PRO" MODEL SP-200-SX PARTS LIST

(This parts list should be used to identify parts shown in the illustrations)

Schematic Designation	DESCRIPTION — RECEIVER PARTS	Pa N
A1	Antenna Input Coil Assembly 10.0 to 20.0 m.c.	SA-
A2	Antenna Output Coil Assembly 10.0 to 20.0 m.c.	SA-1
B1	Antenna Input Coil Assembly 5.0 to 10.0 m.c.	SA-4
B2	Antenna Output Coil Assembly 5.0 to 10.0 m.c.	SA-1
C1	Antenna Input Coil Assembly 20.0 to 40.0 m.c.	SA-4
C2	Antenna Output Coil Assembly 20.0 to 40.0 m.c.	SA-1
D1	Antenna Input Coil Assembly 2.5 to 5.0 m.c.	SA-4
D2	Antenna Output Coil Assembly 2.5 to 5.0 m.c.	SA-1
E1	Antenna Input Coil Assembly 1250 to 2500 k.c.	SA-4
E2	Antenna Output Coil Assembly 1250 to 2500 k.c.	SA-1
F	1st R.F. Coil Assembly 10.0 to 20.0 m.c.	SA-1
G	1st R.F. Coil Assembly 5.0 to 10.0 m.c.	SA-1
H	1st R.F. Coil Assembly 20.0 to 40.0 m.c.	SA-1
J	1st R.F. Coil Assembly 2.5 to 5.0 m.c.	SA-1
K	1st R.F. Coil Assembly 1250 to 1160 k.c.	SA-1
L	2nd R.F. Coil Assembly 10.0 to 20.0 m.c.	SA-1
M	2nd R.F. Coil Assembly 5.0 to 10.0 m.c.	SA-1
N	2nd R.F. Coil Assembly 20.0 to 40.0 m.c.	SA-1
P	2nd R.F. Coil Assembly 2.5 to 5.0 m.c.	SA-1
R	2nd R.F. Coil Assembly 1250 to 2500 k.c.	SA-1
S	High Frequency Osc. Coil Assembly 10.0 to 20.0 m.c.	SA-1
T	High Frequency Osc. Coil Assembly 5.0 to 10.0 m.c.	SA-1
W	High Frequency Osc. Coil Assembly 20.0 to 40.0 m. c.	SA-1
X	High Frequency Osc. Coil Assembly 2.5 to 5.0 m.c.	SA-1
Y	High Frequency Osc. Coil Assembly 1250 to 2500 k.c.	SA-1
T-1	Crystal filter assembly (465 kc.)	SA-1
T-2, T-3	1st and 2nd, I.F. Transformer Coil Assembly	SA-1
T-4	Detector plate coil assembly	SA-1
T-5	Beat oscillator coil assembly	SA-1
T-6	A.V.C. Plate coil assembly	SA-1
T-7	Push-Pull Input Transformer	482
T-8	Push-Pull Output Transformer	482
1	Antenna terminal strip	384
2-12-22-106-	Capacitor Fixed Mica type 600 mmf.	6073
28	Capacitor Fixed Silver type 95 mmf.	6195
34	Capacitor Fixed Silver type 50 mmf.	6074
77	Capacitor Fixed Mica type 50 mmf.	619
9-19-69	Capacitor Fixed Tubular type .02 mf. 500 V.	617
4-14-24	Capacitor Fixed Tubular type .01 mf. 500 V.	6175
7-17-30-36-43-46-48-51-56-58-61-63-73-85-92	Capacitor Fixed Tubular type .05 mf. 500 V.	6174
40-101-102	Capacitor Fixed Tubular type .25 mf. 400 V.	382
88	Capacitor Dry Electrolytic 40 mf. 150 V.	6171
80	Resistor 4 ohms wire wound 5 watt	4921
89	Resistor 750 ohms wire wound 10 watt	3836
96	Resistor 300 ohms metallized ½ watt	6169
98	Resistor 1,700 ohms metallized ½ watt	4947
10-20-44-6-47-49-57-59-16	Resistor 2,000 ohms metallized ½ watt	6160
99	Resistor 3,000 ohms metallized 1 watt	3809
86	Resistor 5,000 ohms metallized ½ watt	4814
5-15-25-50-60	Resistor 10,000 ohms metallized ½ watt	6165
37	Resistor 12,000 ohms metallized 2 watt	4840
29	Resistor 25,000 ohms metallized 2 watt	3999
35-26-66-84	Resistor 50,000 ohms metallized ½ watt	6075
64-72-93	Resistor 50,000 ohms metallized 1 watt	6166
65	Resistor 75,000 ohms metallized ½ watt	4914
78	Resistor 250,000 ohms metallized ½ watt	4912
3-13-23-70-74-83	Resistor 500,000 ohms metallized ½ watt	6076
53	Resistor 2,000,000 ohms metallized ½ watt	4920
8-18-45	Tube socket 6K7	4922
55-62-91	Tube socket 6SK7	4923
76-95	Tube socket 6H6	6111
79	Tube socket 6N7	4924
81	Tube socket 6SJ7	4925
71	Tube socket 6C5	4926
75-87-90	Tube socket 6F6	6108
27	Tube socket 6L7	4927
42	Tube socket 6J7	4928
32-33	Dial lamps 6.3 volt .15 amp.	3920
38	Meter lamp 6.3 volt .15 amp. Bayonet type	6036
94	Tuning meter	4903
100	Off-on Switch	2983
52-103	AVC-MANUAL and SPEAKER-PHONES Switch	2990
41	CW-MOD Switch	4915
31	Send-Receive Switch	4917
67	Limiter switch	4916
54	Sensitivity control 50,000 ohm	4918
68	Audio Gain Control 250,000 ohm	4919
39	Relay terminal strip	4904
104	Phono-Speaker-Phones terminal strip	4905
105	Connecting terminal strip	3838
110	Meter adjusting potentiometer 1,000 W wire wound	4932
1	Power transformer 110 volts 60 cycle A.C.	4801
2	Filter choke	2981
3	A.C. input Cord and Plug	3900
4	Fuse Block for 2A. fuse	3859
5	Line Voltage Adjusting Strip	3858
6	Speaker Field Terminal Strip	3840
7	Connecting Terminal Strip	3838
8-9-10	Filter Condenser 16 mfd. electrolytic 450 volts	3832
11	Filter Condenser 8-8-8 mfd. electrolytic 450 volts	3834
12	Resistor 18,000 ohms (2 taps)	3997
13	Resistor 18,000 ohms (1 tap)	4946
14	Tube socket 80	4807
15	Tube socket 5Z3	3828
16	1 mf. paper filter condenser	4945

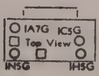
HOWARD RADIO CO.

MODEL 12B
Schematic,Notes



NOTES

I.F. 465 K.C.



HOWARD RADIO CO.		
MODEL 12-B		
10-27-39.	DWG. NO. D64-715	
DWN. BY.	CHKD. BY.	APPVD. BY.
R.B.M.		

Wh adjusting this pad, move the unin hand back and forth and adjust adde until the peak of greatest in- ensi is obtained.

POWER SUPPLY 90 V. "B" - 1½ V. "A" "B" drain - 10 mils.
"A" drain - 250 mils.

EAKE = Permanent Magnet SIZE = 5"
V.C.IMP. (400CPS) = 4 Ohms
FIELD = P M

POWER OUTPUT - (MAX.) = 360MW upo 180mw

SERVICE NOTES

It is necessary that the IN5G tube be shielded. See that the shield is firmly in place around the bottom portion of the tube.

The intermediate frequency of this receiver is 465 KC.

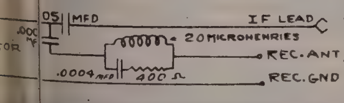
The trimmers and padding condenser adjustments are accessible through bottom of cabinet.

Color code of battery leads:- Red B+90; Black B-; Brown A-; Blue A + 1½ V.

Ea h step of the alignment should be r eated in the original order for eater accuracy. Keep output from ignal Generator low. The I.F. trim rs are reached through the two holes n the top of each I.F. can.

See hat the tuning hand is set xactl on the last line above 540 hen t condenser is at maximum capac- ty.

The ollowing dummy antenna circuit s rec mended, since it is adaptable or a frequency range. The grid cap hould emain in place during alignment.

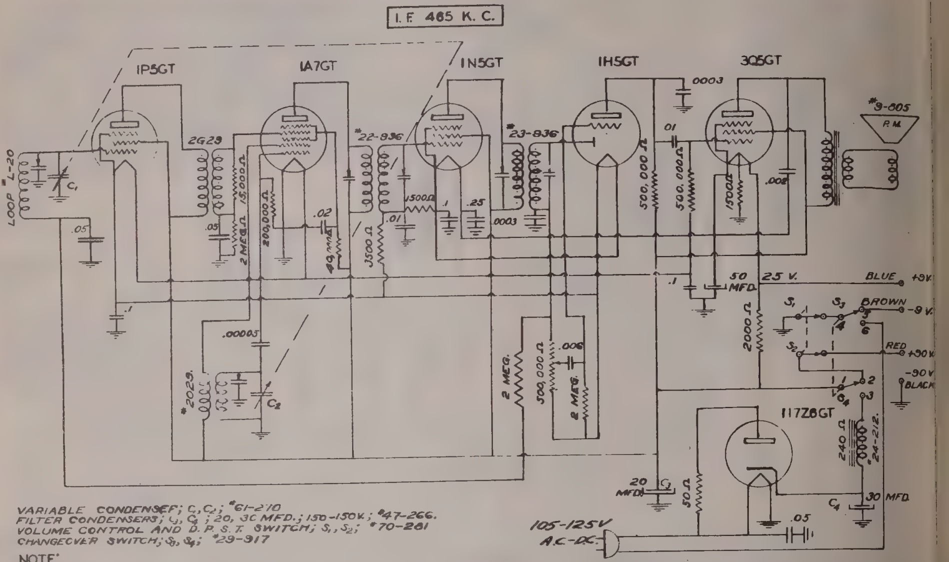


RECOMMEND BATTERY KITS

	EVEREADY	BURGESS	For greater economy use two "A" cells in PARALLEL. Connect plus to plus and minus to minus.
1½ V. "A" 1 Required	740	20-F	
45 V. "B" 2 Required	749	D60	
Combination "A" and "B" Single Unit.	746	17GD60	Use Adaptor

MODEL 14ACB
MODEL 700
Schematics

HOWARD RADIO CO.

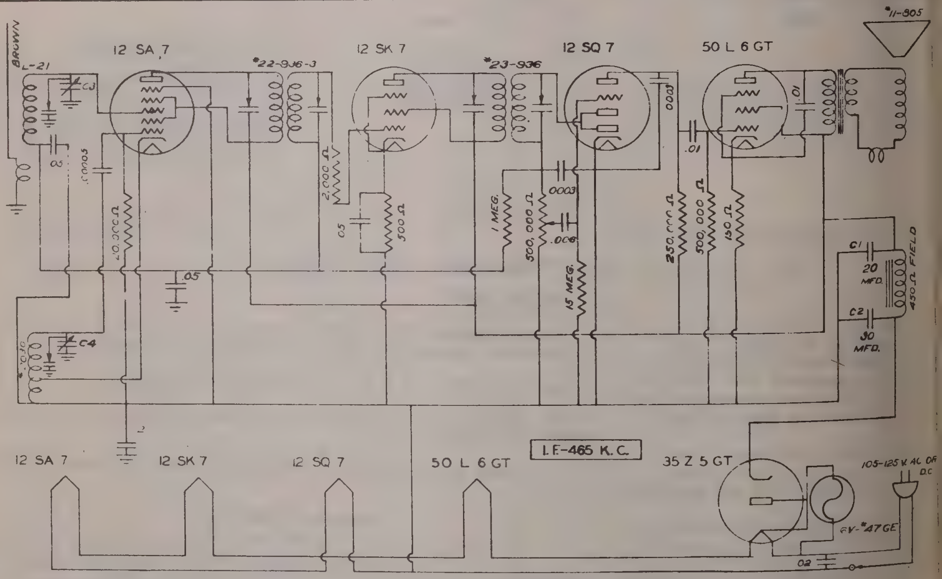


VARIABLE CONDENSEF; C1, C2; *61-270
FILTER CONDENSERS; C3, C4; 20, 30 MFD.; 150-150V.; *47-266.
VOLUME CONTROL AND D. P. S. T. SWITCH; S1, S2; *70-281
CHANGEOVER SWITCH; S3, S4; *29-917

NOTE:

SWITCH SHOWN IN POSITION FOR BATTERY OPERATION. FOR A. C. OR D. C. OPERATION, SWITCH CONNECTS TERMINAL 4 TO 6 AND 1 TO 3.

MODEL 14ACB		
DWG. NO. D77-715		3-29-40
DWN. BY	CHKD. BY	APPVD. BY
NVJ		

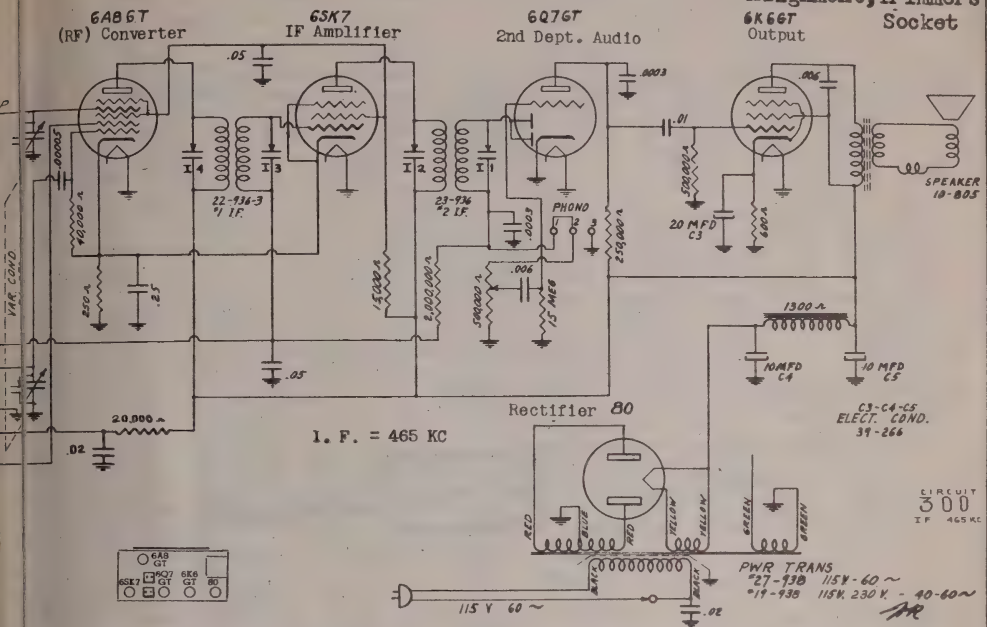


C1, C2—20-30 MFD 150-150V. *47-266.
C3, C4—VARIABLE CONDENSER *62-270.
VOLUME CONTROL AND SWITCH *69-281.

MODEL 700	
D76-715	3-26-40

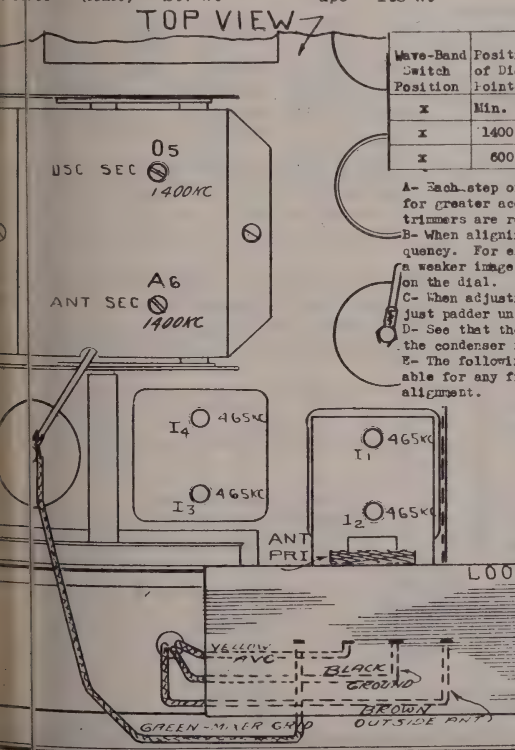
HOWARD RADIO CO.

MODEL 300
Schematic, Voltage
Alignment, Trimmers
Socket



R SUPPLY - (Standard Models) = AC 105-120 V. 60 Cycles
UMPTION 50 WATTS
R OUTPUT - (MAX.) = 2.7 W. upo = 1.5 W.

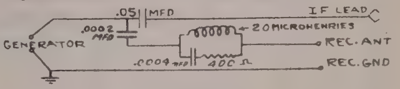
SPEAKER = Electrodynamic SIZE = 5"
V.C.IMP. (400CPS) = 4 Ohms
FIELD = 1300 Ohms



ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
x	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
x	1400 KC	1400 KC	Brown lead	D	O_5 A_6	Osc. & Ant.
x	600 KC	600 KC	Brown lead		CUT PLATE	OSC. SECTIO

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



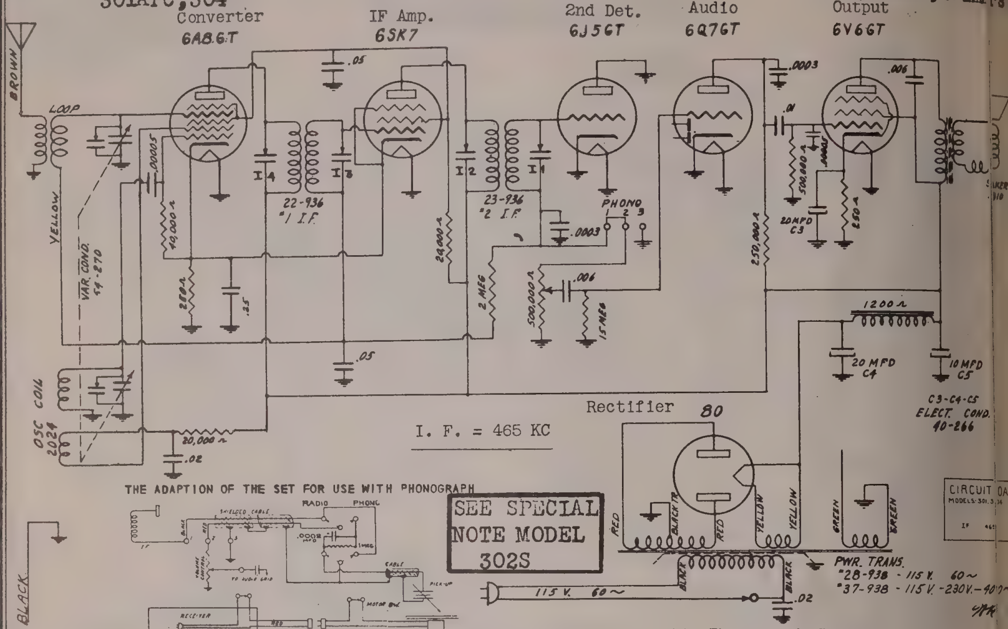
SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier = 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6A8 GT	Mixer	4.5	105	195 OP195
6SK7	IF	4.5	105	195
6Q7 GT	Det.	x	x	60
6K6 GT	Output	16	195	185

MODELS 300A,301,303
301APC,304

HOWARD RADIO CO.

Schematic,Volte
Alignment,Trimrs



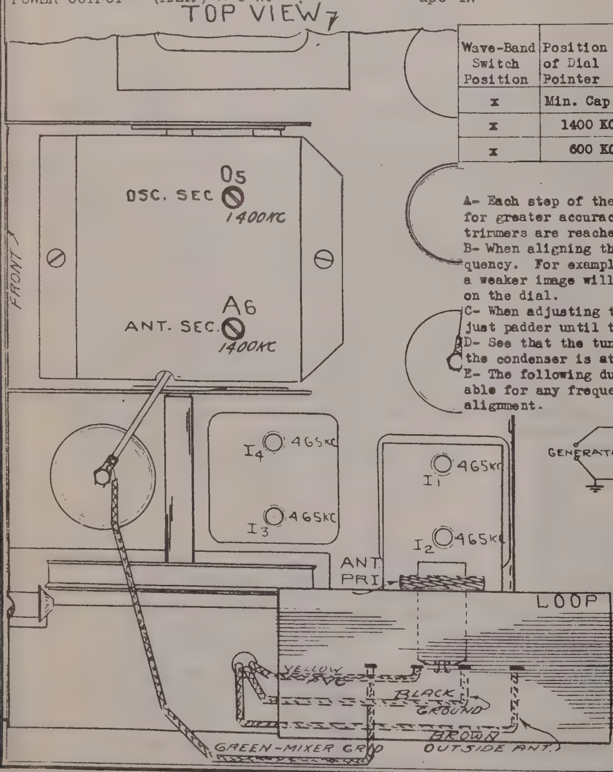
THE ADAPTION OF THE SET FOR USE WITH PHONOGRAPH

SEE SPECIAL
NOTE MODEL
302S

Automatic Phonograph Combination, 303 and 4,
employing Chassis type 300 A

POWER SUPPLY - (Standard Models) = 105 to 120 V. 60 Cycle.
CONSUMPTION 60 WATTS + 30 W.APC.
POWER OUTPUT - (MAX.) = 6 W. upo 4w

SPEAKER = Electro-dynamic SIZE = 12"
V.C. IMP. (400 CPS) = 6 Ohms FIELD = 1200



ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Functio
x	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
x	1400 KC	1400 KC	Brown lead	D	O_5 A_6	Osc.,
x	600 KC	600 KC	Brown lead		CUT PLATE	OSC. SE

NOTES

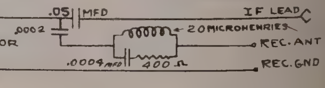
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F trimmers are reached through the two holes on the top of each I.F. can

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, th a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained

D- See that the tuning hand is set exactly on the last line above 540 w the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adap able for any frequency range. The grid cap should remain in place duri alignment.



SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at -117
High voltage reading off rectifier = 330 V.
Drop across speaker field = 90 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Mixer	4	112	235 OR150
6SK7	IF	4	112	235
6J5 gt	Det.	x	x	x
6Q7 gt	Audio	x	x	38
6V6 gt	Output	11	240	230

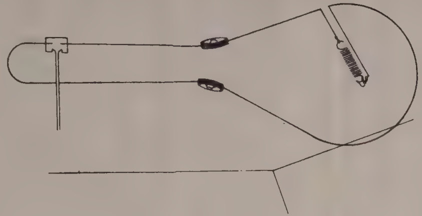
HOWARD RADIO CO.

MODEL 300 Series
MODEL 500 Series
Dial and Tuner Data

Dial Mechanism
300 Series

THE TUNING CONTROL

To provide smooth push button tuning with a minimum amount of effort the tuning shaft has a spring return which disengages the rubber friction drive from the large drive pulley after the tuning knob has been held down while tuning the set manually. There is no adjustment required on this mechanism.



THE ABOVE DIAGRAM SHOWS THE EXACT DRIVE CORD ARRANGEMENT IN CASE A REPLACEMENT IS REQUIRED. THE LAYOUT IS SHOWN WITH THE VARIABLE CONDENSER ALL THE WAY IN AT MAXIMUM CAPACITY AND THE TUNING HAND AT THE LAST LINE ABOVE 550.

The drive string running from one pulley across the dial plate to the other pulley may be slightly higher at its point of mounting to the tuning hand, this will maintain a slight downward pull on the hand to avoid wobble. Another cause of wobble would be caused by crimping the lugs of hand around the string in such a manner that the string would be out of line.

A slight amount of petroleum jelly along the top edge of the dial will provide a smoother travel of the hand. Arrange the long section of the hand straight and with sufficient clearance from the dial plate face to avoid scratching the numerals.

THE STRING TENSION of the drive string is maintained by the coil spring mounted on the large drive pulley. Too much tension will cause an extra load in tuning. Lack of tension will naturally cause backlash.

See that dial light sockets do not touch top edge of tuning hand as it moves across dial plate.

Since the pull against the large pulley is quite great, see that the set screws in the pulley hub to the condenser shaft are tight to avoid slipping.

THE PUSH BUTTONS must extend straight outward. If a chassis is removed, see that the push-button screw shanks are not bent so as to bind against the openings in the cabinet panel.

500 Series Dial Mechanism

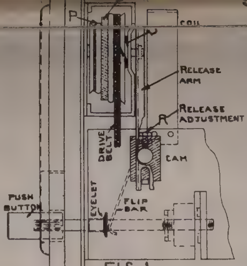


FIG. 1

FIG. 1 SHOWS THE DIAL DRIVE MECHANISM IN UAL TUNING. THE CORK ASSEMBLY C IS FRICTIONED AGAINST THE FACE OF STRING PULLEY P, DUE TO PRESSURE OF COIL SPRING S. THE PUSH BUTTON IS NOT PRESSED IN, LEAVING A SMALL GAP BETWEEN THE BRASS EYELET AND THE FLIP BAR.

FIG. 2. SHOWS THE PUSH BUTTON ON ITS WAY IN, AT THE VERY START OF WHICH THE EYELET MOVES THE FLIP BAR, CAUSING THE RELEASE ARM TO OVERCOME THE COIL SPRING TENSION AND DRAW THE CORK CLUTCH AWAY FROM THE STRING PULLEY FACE, POINT G. ALL OF THIS ACTION TAKES PLACE BEFORE THE PUSH BUTTON SCREW STARTS TO ACTUATE THE VARIABLE CONDENSER.

THE OBJECT OF THE ABOVE MECHANISM OF COURSE IS TO ELIMINATE THE PRESSURE THAT OTHERWISE WOULD BE REQUIRED IF THE MANUAL TUNING CONTROL HAD TO BE SPUN AROUND WHEN USING THE PUSH BUTTONS.

THE SCREW ADJUSTMENT R, FIG. 1, WILL PROVIDE THE PROPER AMOUNT OF CLUTCH RELEASE CLEARANCE AT G, FIG. 2.

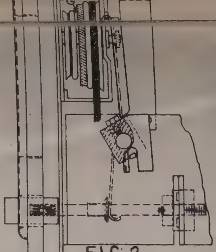


FIG. 2

LACK OF SMOOTHNESS in dial operation may be due to:
- Too much tension on dial string.
- Incorrect adjustment with release action causing drag. (See adjustment R).
- Fly wheel will rub on cabinet shelf if the rubber cushion is not in place beneath chassis.
- See that dial light sockets do not touch top edge of tuning hand as it moves across dial plate.
- Do not adjust the belt to a greater tension than is necessary.
- Slipping of the dial mechanism may be due to any of the above items or lack of sufficient cork friction which in turn may be due to weakness in tension spring S (Fig. 1) or a tight bearing at this point.

SETTING-UP THE PUSH BUTTONS
300 Series 500 Series

1. Leave the set turned on at least 15 minutes before making settings.
2. Decide upon the six stations that you want to tune in automatically.

It is preferable to set the lower frequency stations, starting with the button on the right.

3. Tune the station with the regular tuning knob, making certain the station is EXACTLY IN TUNE, then with the fingers loosen the push button with a twist to the left of about one-half turn, now push the button ALL THE WAY IN.
4. Carefully release button and tighten it with a twist to the right.
5. Repeat above procedure for the other five buttons for five other stations and insert station letter tab in position for each button.

THE PUSH BUTTONS WILL ONLY OPERATE CORRECTLY WHEN THEY ARE OPERATED WITH A FIRM, QUICK THRUST, KEEPING FINGER ON BUTTON UNTIL DIAL POINTER COMES TO A STOP.

THE STRING TENSION of the drive cord is maintained by the coil spring on the large drive pulley FIG. 4.

THE PUSH BUTTONS must extend straight outward, before a chassis is mounted in the cabinet, see that the push-button screw shanks are not bent so as to bind against the escutcheon holes.

THE DRIVE BELT tension is very easily obtained between the tuning shaft and the pulley by raising or lowering the frame when the two screws B, B (Fig. 3) are loosened. Do not get the belt too tight. The belt runs directly on the tuning shaft, the rubber grommet on the shaft is merely acting as a guide.

TO REPLACE THE DRIVE BELT (1) remove screws B, B and D, D from frame, permitting frame to be disassembled (2) loosen set screws holding lead fly wheel on tuning shaft. This will allow tuning shaft to be pulled out to loop the belt in place.

THE REPLACEMENT OF THE CORK clutch is also accomplished by removing screws B, B and D, D.

THE TUNING HAND should be set to the end calibration line above 550 KC when the condenser is at maximum capacity.

The drive string running from one pulley across the dial plate to the other pulley will be higher at the point of mounting on the tuning hand, this will maintain a slight downward pull on the tuning hand which will prevent wobble. Another cause of wobble would be in crimping the lugs around the string causing the string to be out of line.

A slight amount of petroleum jelly along the top edge of the dial plate is beneficial. Arrange the long section of the hand so it will not scratch the dial numbers.

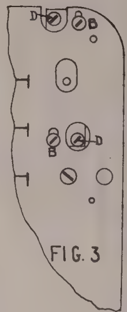


FIG. 3

(Four stations for Series 300)

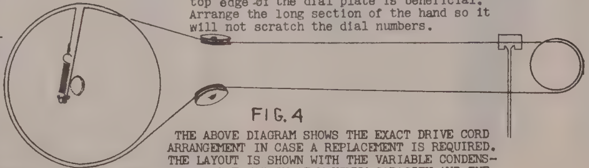


FIG. 4

THE ABOVE DIAGRAM SHOWS THE EXACT DRIVE CORD ARRANGEMENT IN CASE A REPLACEMENT IS REQUIRED. THE LAYOUT IS SHOWN WITH THE VARIABLE CONDENSER ALL THE WAY IN AT MAXIMUM CAPACITY AND THE TUNING HAND AT THE LAST LINE ABOVE 550.

*(Four stations for 300 Series)

MODEL 301APC MODEL 518APC
MODEL 302APC MODEL 520APC
MODEL 308APC MODEL 580APC

HOWARD RADIO CO.

Automatic Phono

INSTALLATION AND OPERATING INSTRUCTIONS
AUTOMATIC PHONOGRAPH COMBINATION

INSTALLATION

PREPARING FOR OPERATION - Remove the bracket "A" securing the pickup and needle mechanism. This bracket is shown in place in Figure 1. It is held to the motorboard by means of a screw "B". Remove the screw, lift off the bracket and replace screw in motorboard to cover hole. Then remove red bolts "C" and "D" which hold the motorboard secure during shipment. These are also shown in Figure 1. When these bolts are removed it will allow the wood strips to be taken out. "E" and "F".

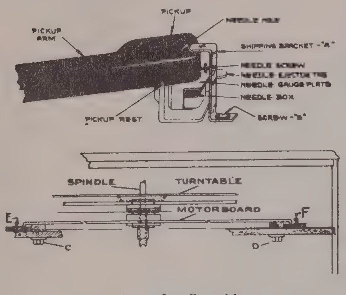


Figure 1 - Unpacking

The two record holder posts (See Figure 6) are covered with paper held in place by rubber bands as is also the pickup. Remove these paper coverings.

THE SCREWS THAT HOLD THE RADIO CHASSIS ARE LOOSENED JUST ENOUGH TO ALLOW THE WOOD STRIPS (USED IN SHIPMENT) TO BE REMOVED. CAUTION: ONLY A SMALL AMOUNT OF TURNING OF THE WING SCREWS IS NECESSARY. IF THEY ARE TOO LOOSE THE CHASSIS WILL DROP OUT OF POSITION AND THE PUSH BUTTONS WILL NOT OPERATE PROPERLY.

LOCATION: The instrument should be located near an electric outlet and on a level surface. The cabinet should not be located near a source of heat such as a radiator or register. If the cabinet is placed parallel to a wall, at least an inch space should exist between the back of the cabinet and the wall, for best tone quality. The instrument must be installed in a level position for proper operation of the phonograph.

POWER SUPPLY: Unless otherwise specified on the chassis and on the power transformer, the standard receiver is to be operated from an alternating current only - (105 to 120 Volts, 60 cycle).

SPEED REGULATION: There are no adjustments on the Phonograph Motor for speed regulation since the design of the motor is for a constant speed, similar to an electric clock. Be certain that the power line frequency is the same as specified on the motor frame, the standard models being 60 cycle.

PHONOGRAPH INSTRUCTIONS

CAUTIONS - 1. NEVER USE FORCE TO START OR·STOP THE MOTION OF ANY PART OF THE RECORD-CHANGING MECHANISM OR PICKUP ARM.

2. THE USE OF RECORDS WHICH HAVE BECOME WARPED OR DAMAGED THROUGH IMPROPER CARE MAY CAUSE THE MECHANISM TO JAM AND DAMAGE TH INSTRUMENT. IN ADDITION, RECORDS WHICH HAVE BECOME WARPED WILL SLIDE ON ONE ANOTHER WHEN PLAYING, RESULTING IN UNSATISFACTOR REPRODUCTION.

3. THIS INSTRUMENT IS NOT RECOMMENDED FOR PLAYING 10-INCH AND 12-INCH RECORDS IN MIXED SEQUENCE. IF THE USER DESIRES THI SERVICE HE MUST BE POSITIVE THAT ALL RECORDS ARE PERFECTLY FLAT AND FREE FROM WARP. THE INDEX AND RECORD REJECT LEVER MUST BE SE AT "10" AND AFTER PLAYING THE LAST SELECTION THE PICKUP WILL COME DOWN IN POSITION FOR A 10-INCH RECORD AND REPEAT THE PLAYING O THIS LAST RECORD ON A 10-INCH DIAMETER UNLESS THE TURNTABLE SWITCH IS TURNED OFF. ANY JAMMING OF THE MECHANISM UNDER THESE CONDI TIONS INDICATES THAT THE RECORDS USED ARE NOT PERFECTLY FLAT OR THAT THEIR EDGES ARE NOT SUFFICIENTLY SMOOTH TO PERMIT NORMA OPERATION OF THE SEPARATORS IN DROPPING EACH RECORD IN SEQUENCE ONTO THE TURNTABLE.

4. DO NOT LEAVE RECORDS ON THE RECORD HOLDER POSTS, AS THEY ARE LIABLE TO WARP. KEEP YOUR RECORDS IN A RECORD FILE (ALBUM O CABINET) WHEN NOT IN USE. IF ANY RECORDS SHOULD BECOME WARPED, PLACE THEM ON A FLAT SURFACE WITH A FLAT HEAVY ARTICLE, SUCH AS LARGE BOOK, ON TOP AND LEAVE THEM IN THIS POSITION FOR A FEW DAYS.

ONLY LOAD YOUR RECORDS ON THE RECORD HOLDER SHELVES AFTER THE PICKUP IS IN ITS REST POSITION AND THE TURNTABLE STOPPED WIT TURNTABLE SWITCH AT "OFF".

TURNTABLE SWITCH: The Turntable Switch is a toggle type located in the front of the index plate on the motorboard (See Figur 6). It is used to start and stop the motor.

INDEX LEVER: The Index Lever moves in a small arc in the slot in the index plate. (See Figure 6). The plate is labeled fo four positions of the lever - "Manual" "12", "10" and "Reject". If a single record is to be played the automatic record-changin feature will not be used and the Index Lever should be set to the "Manual" position.

If either 10 or 12-inch records are to be played automatically the index lever must be moved to the position indicating the siz records that are to be played. If 10-inch records are to be played, or 10 and 12 inch mixed, the Index Lever must be set at "10" and if 12-inch records are to be played, the lever must be set at "12". To reject a record being played, or to start the record-changing cycle in case the record just played does not have the standard eccentric or spiral changing groove simply push the leve to the "REJECT" position and let go. The pickup will raise up and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the leve should be returned to the "12" position after rejecting a record. Keep the lever in its "MANUAL" position when not actually playing records automatically.

Before operating the phonograph, either automatically or manually, be sure that the Pickup Arm is down at playing level and ca be easily moved by hand. If not, the Index Lever will be in "10" or "12" and an "eject cycle" must be completed to bring the ar down. To do this, turn the Power switch on the radio panel to "ON" position, then throw the turntable switch "ON". The turntabl will start to revolve and the cycle of motion of the pickup Arm will be resumed. When the Pickup Arm comes down, turn off th turntable switch.

TO OPERATE THE PHONOGRAPH: To play records, set the radio Power switch to the "ON" position. With the Index Lever at Manua and the pickup resting on the support over the needle gauge plate, arm in groove, loosen the needle screw and drop a needle, poin first, through the needle hole in the pickup. (See Figures 1 and 6). The needle will be stopped in the right position by th needle gauge plate. Press gently on top of pickup to seat it squarely on the gauge plate. Then tighten the needle screw wit your fingers.

Lift the Record Holder shelves, Figure 6, with the fingers underneath and revolve to clear the record circle, also push back the lever sticking up adjacent to the rear record holder post. You now have clear access to the turntable. Place the first recor upon the turntable with the spindle protruding through the center of the record.

Swing the shelves back into position down in place and load up. For automatic operation seven 10-inch records or six 12-inc records may be stacked on the record holder shelves.

It is not recommended to mix 10 and 12 inch records for automatic operation. Records should never be stacked higher than th spindle.

STEP BY STEP PROCEDURE FOR OPERATING PHONOGRAPH

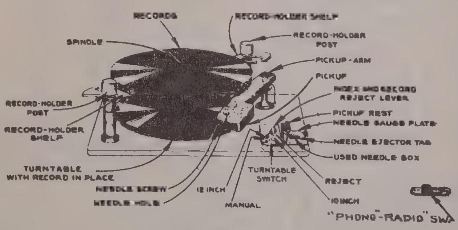


Figure 6

A. TO PLAY 10" OR 12" RECORDS INDIVIDUALLY:
   1. Move Index Lever to "Manual" position. See Figure 6.
   2. Make sure the pickup arm is resting in its groove wit pickup over used needle box. See Figures 1 and 6.
   3. Lift the record holder shelves and swing outwards. See Figure 6.
   4. Push back the vertical lever near the rear record holde post.
   5. Place single record on turntable.
   6. Turn power on at receiver, and switch to "Phono" position.
   7. Turn on turntable switch. See Figure 6. The turntable will start revolving. Wait till it has reached its normal speed.
   8. Lift pickup arm and carefully place needle in first groove of record,
   9. Adjust "Volume" and "Tone" as for radio. The same controls are used.

The phonograph will not shut off until the turntable switch (Figure 6) or the Receiver switch is turned off.

To repeat the selection on records with the center changing groove, set index lever to the 10" or 12" position depending upon which size record is being played.

210A
utton Adapter
tic

HOWARD RADIO CO.

MODEL 301APC MODEL 518APC
MODEL 302APC MODEL 520APC
MODEL 308APC MODEL 580APC

Automatic Phono.Data

TO PLAY 10" OR 12" RECORDS SO THAT RECORDS WILL CHANGE AUTOMATICALLY AFTER EACH SELECTION.
Move index lever to "Manual" position. Fig. 6.
Make sure the pickup arm is resting in groove with pickup over reject needle cup. Figs. 1 and 6.
Place first record on turntable as for individual playing.
Swing the record holder shelves inward into place down on their posts and extending over the turntable. Fig. 6.
Stack any amount up to seven 10-inch records on the record holder shelves.
Turn power on at receiver, and switch to "Phono" position.
Turn on turntable switch. Fig. 6.
With index lever still in the "Manual" position lift pickup arm and lower to first groove of record.
Move index lever to 10 or 12 inch position depending on the size records being played.
Adjust volume and tone as for radio.

ords with the center changing groove will change automatically at the end of each selection until the end of the last record ached. The last record will repeat itself until the Turntable Switch or Power-Tone control is turned off. To bring down er record at any time during playing of series, push the index lever, (Fig. 6) to "Reject" and let go. Bring back to "12" u are playing 12-inch records.

TION: DO NOT STOP THE TURNTABLE WITH TURNTABLE SWITCH OR POWER-TONE KNOB UNTIL THE PICKUP IS DOWN AT THE END OF A CYCLE.

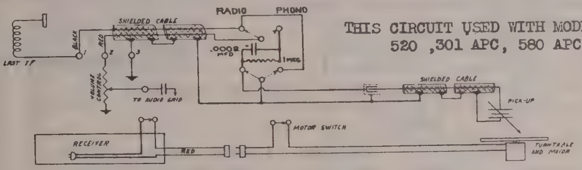
CHANGE NEEDLE: To change needle, place the pickup over the Needle Gauge Plate, with the pickup Arm resting in the support e, loosen the Needle Screw, press down the Needle Ejector Tab to drop the needle into the Used Needle Box (Figs. 1 and 6). the gauge plate to return to its normal position. Drop a new needle point first, into the needle holc, press gently on p to seat it squarely on gauge plate and tighten the needle screw with your fingers.

DLES: Good needles are essential to best reproduction. It is advisable to use medium-tone needles and these may be purchasom your Retail Store. Do not reinsert a used needle in the pickup. Change your needles frequently, worn needles distort duction and may damage the records. A rack for holding needle books will be found at the back of the compartment under the To enply used needles from the needle box, lift the pickup and move to left out of the way, then tilt up used needle box at and lift out of its hole in the motorboard. Press the ejector tab to open the lid; to replace, slide the lug on the back its groove in the motor board and press the box into plate.

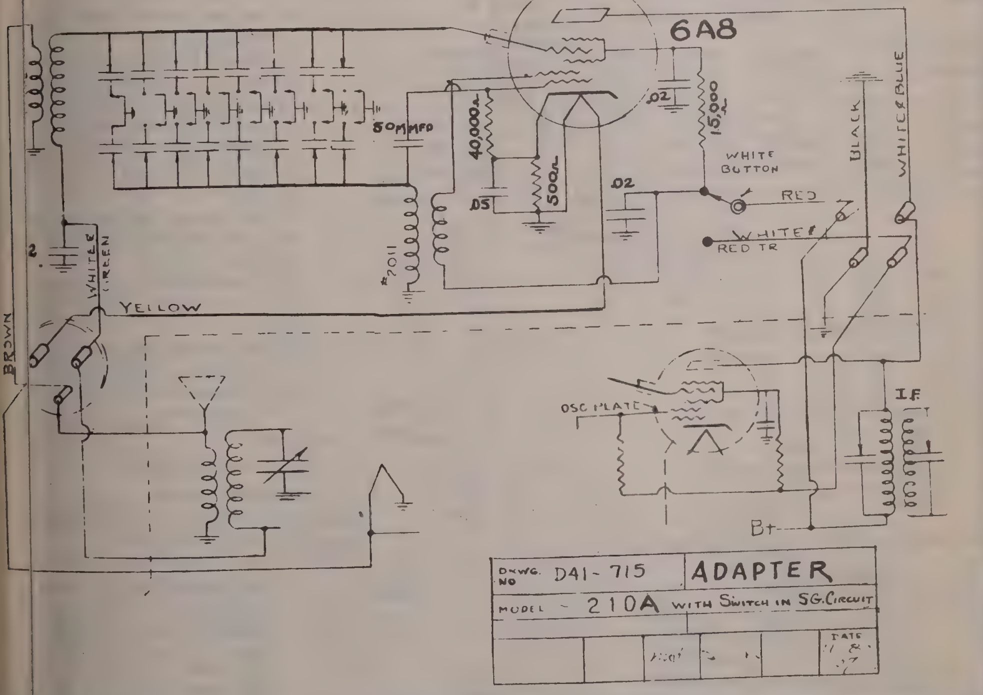
ORDS: Handle your phonograph records carefully. It is advisable to purchase your records from The Retail Store where you ave them played over on an instrument of this type. Keep your records in a record album or lay them flat when not in use. leave them on the Record-Holder shelves. Electrically transcribed records are best. Worn or poorly transcribed records rein distortion. Records with the eccentric or spiral center groove are necessary for automatic operation, either change or t.

RICATION: Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gear of record posts. ht machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various s on underside of motorboard.
ly a few drops of light machine oil to the motor spindle bearing. The oil hole has a screw plug. Do not allow oil or grease me in contact with rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

FOR SERVICE REFERENCE THE FUNDAMENTAL RADIO-PHONOGRAPH ELECTRICAL CIRCUIT IS SHOWN BELOW.

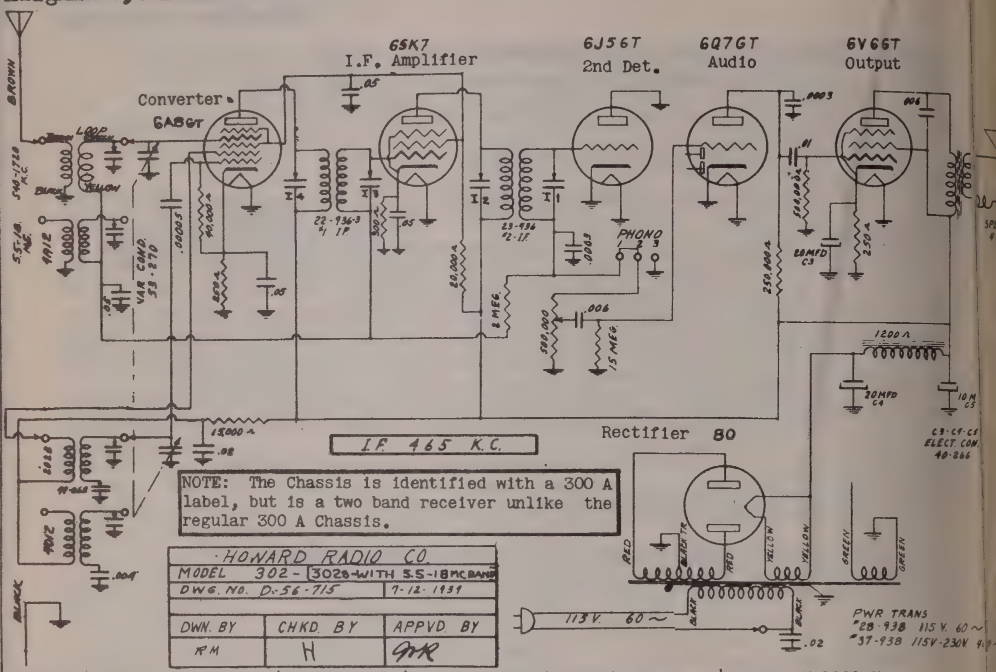


THIS CIRCUIT USED WITH MODELS:
520 ,301 APC, 580 APC



MODELS 302S,302APC
Schematic,Voltage
Alignment,Trimmers

HOWARD RADIO CO.



I.F. 465 K.C.

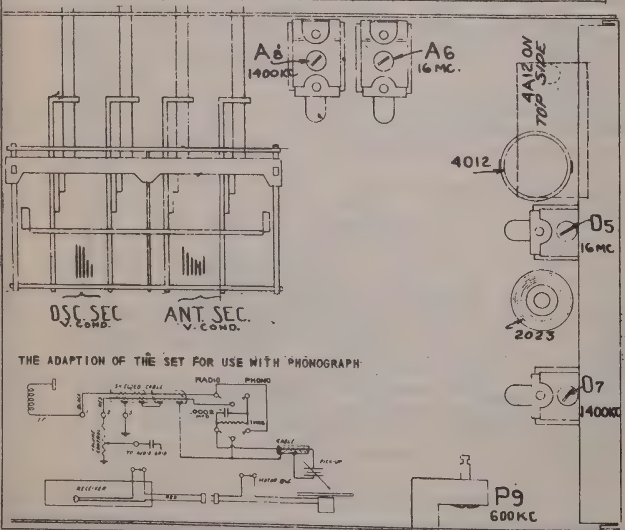
NOTE: The Chassis is identified with a 300 A label, but is a two band receiver unlike the regular 300 A Chassis.

HOWARD RADIO CO.		
MODEL 302- 302S-WITH 5.5-18MC BAND		
DWG. NO. D-56-715	7-12-1939	
DWN. BY	CHKD. BY	APPVD. BY
RM	H	

SPEAKER = Electro-dynamic | SIZE = 8" | V.C.IMP. (400CPS) = Ohms | FIELD = 1200 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle CONSUMPTION 60 WATTS
POWER OUTPUT- (MAX.) = 6 W. upo 4 W.

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_7 A_8	Osc. Ant.
BC	600 KC	600 KC	Brown lead	C	P_9	Osc. Pad.



NOTES

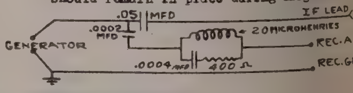
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



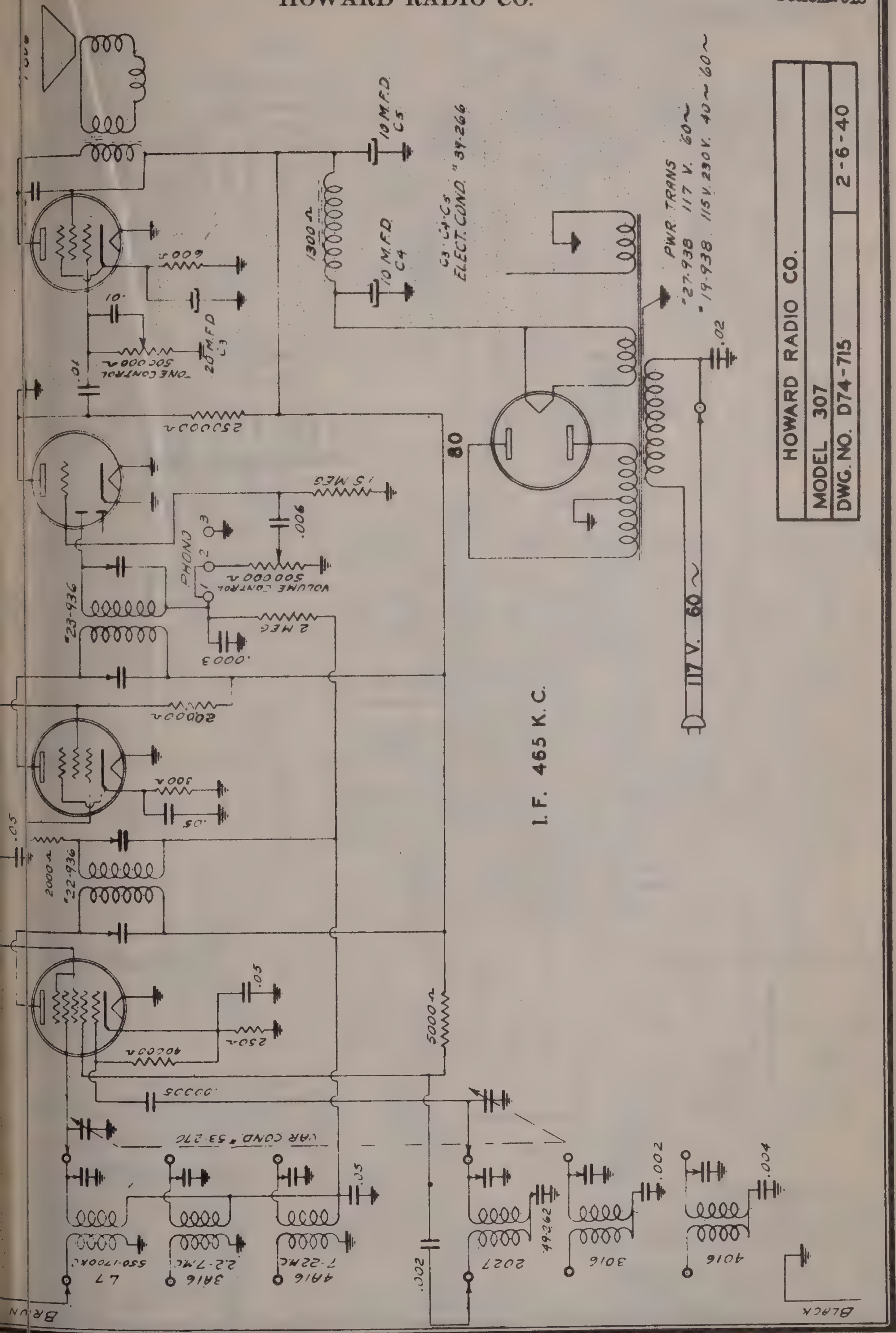
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at -1
High voltage reading off rectifier = 330V.
Drop across speaker field = 90 V.
Voltage taken with 1.000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Mixer	4	112	235 OR150
6SK7	IF.	4	112	235
6J5 gt	Det.	x	x	x
6Q7 gt	Audio	x	x	38
6V6 gt	Output	11	240	230

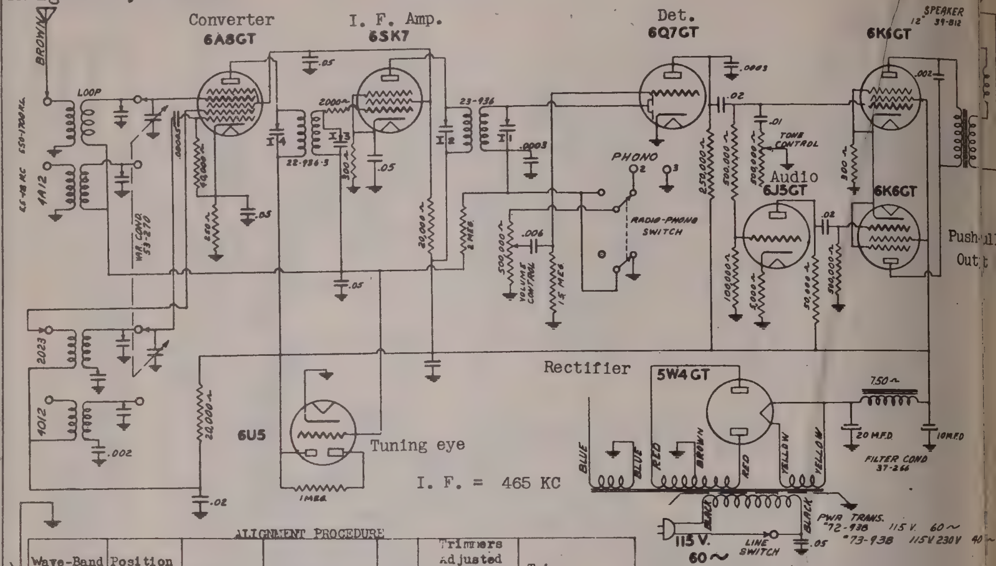
MODEL 307
Schematic

HOWARD RADIO CO.



MODELS 308APC,308C,308TT
Schematic,Voltage
Alignment,Trimmers

HOWARD RADIO CO.



POWER SUPPLY - (Standard Models) =
105-120 V. 60 Cl

CONSUMPTION 70 WATTS + 30APC
POWER OUTPUT - (MAX.) = 7.5 W. upo 5

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	16 MC	16 MC	Brown lead	B,D	O_5 A_6	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O_7 A_8	Osc. Ant.
BC	600 KC	600 KC	Brown lead	C	P_9	Osc. Pad.

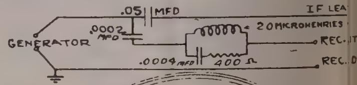
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

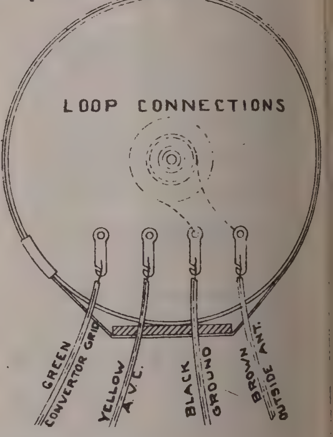
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

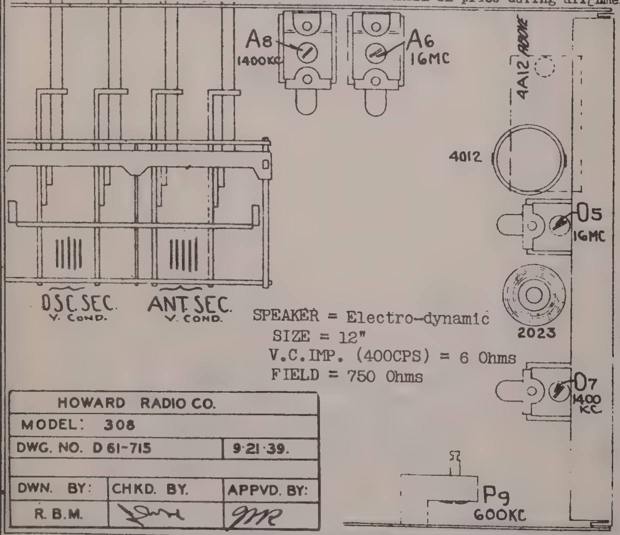
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.







SPEAKER = Electro-dynamic
SIZE = 12"
V.C.IMP. (400CPS) = 6 Ohms
FIELD = 750 Ohms

HOWARD RADIO CO.
MODEL: 308
DWG. NO. D 61-715 9-21-39.
DWN. BY: CHKD. BY. APPVD. BY:
R. B. M. JMR

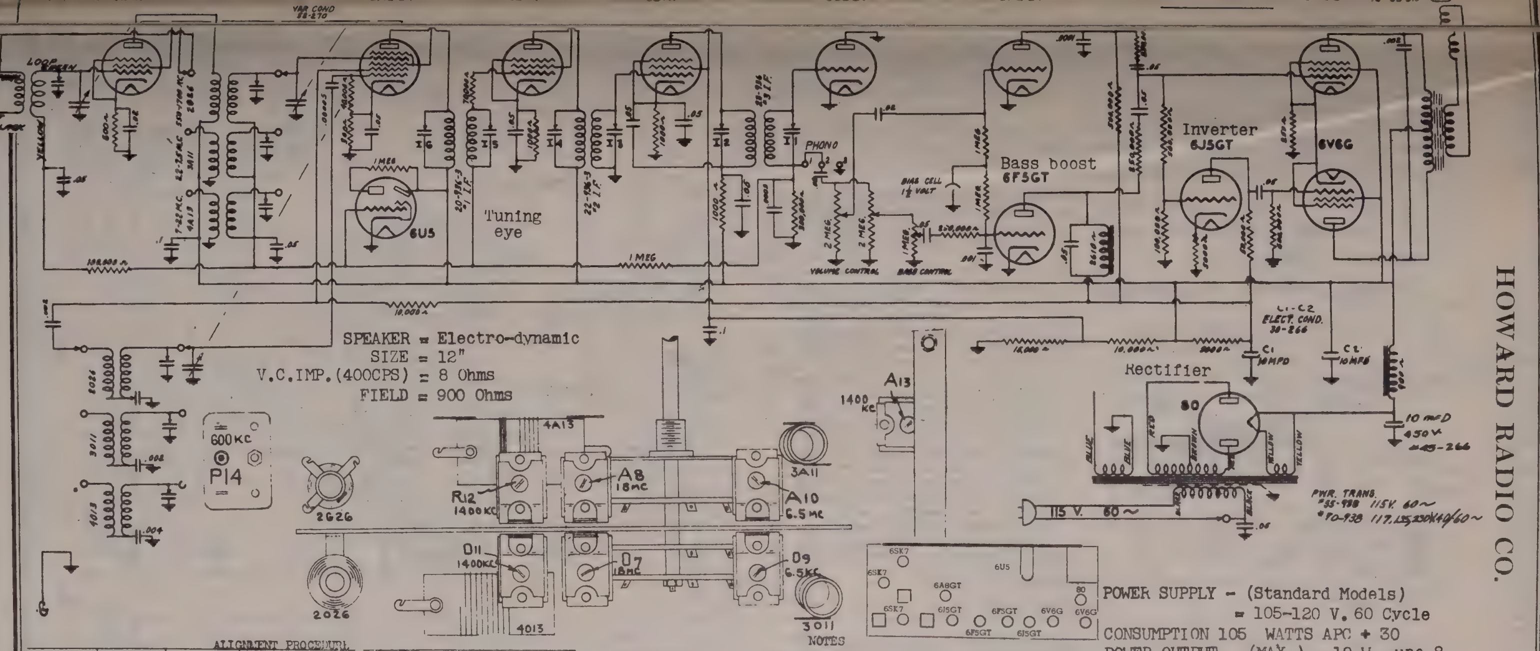
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 11
High voltage reading off rectifier = 315 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6A8 gt	Mixer	4	105	230 OR 105
6SK7	IF	3	105	235
6Q7 gt	Det.	x	x	70
6J5 gt,	Inverter	7	x	150
6K6 gt	Output	18	240	230
6K6 gt	"	18	240	230

HOWARD RADIO CO.

MODELS 518,518S,518APC
Schematic,Voltage,Socket Alignment,Trimmers



SPEAKER = Electro-dynamic
SIZE = 12"
V.C.IMP.(400CPS) = 8 Ohms
FIELD = 900 Ohms

POWER SUPPLY - (Standard Models)
= 105-120 V. 60 Cycle
CONSUMPTION 105 WATTS APC + 30
POWER OUTPUT - (MAX.) = 12 W. upo 8

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	I_5 I_6 IF
SW	18 MC	18 MC	Ant. Post	B,D	O_7 A_8	Osc., Ant.
PB	6.5 MC	6.5 MC	Ant. Post		O_9 A_{10}	Osc., Ant.
BC	1400 KC	1400 KC	Ant. Post		O_{11} R_{12} A_{13}	Osc. RF,Ant.
BC	600 KC	600 KC	Ant. Post	C	P_{14}	Osc. Pad.

NOTES

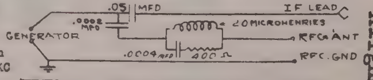
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

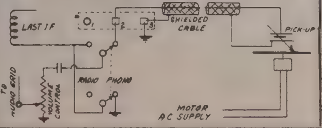
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



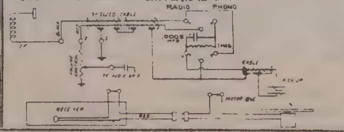
MODEL: 518		
DWG. NO. C-59-715		8-3-39
DWN. BY	CHKD. BY	APPVD. BY
R.B.M.	H	

THE ADAPTION OF THE SET FOR USE WITH PHONOGRAPH

APC MODELS - BUILT-IN SWITCH



REGULAR MODELS - EXTERNAL SW.

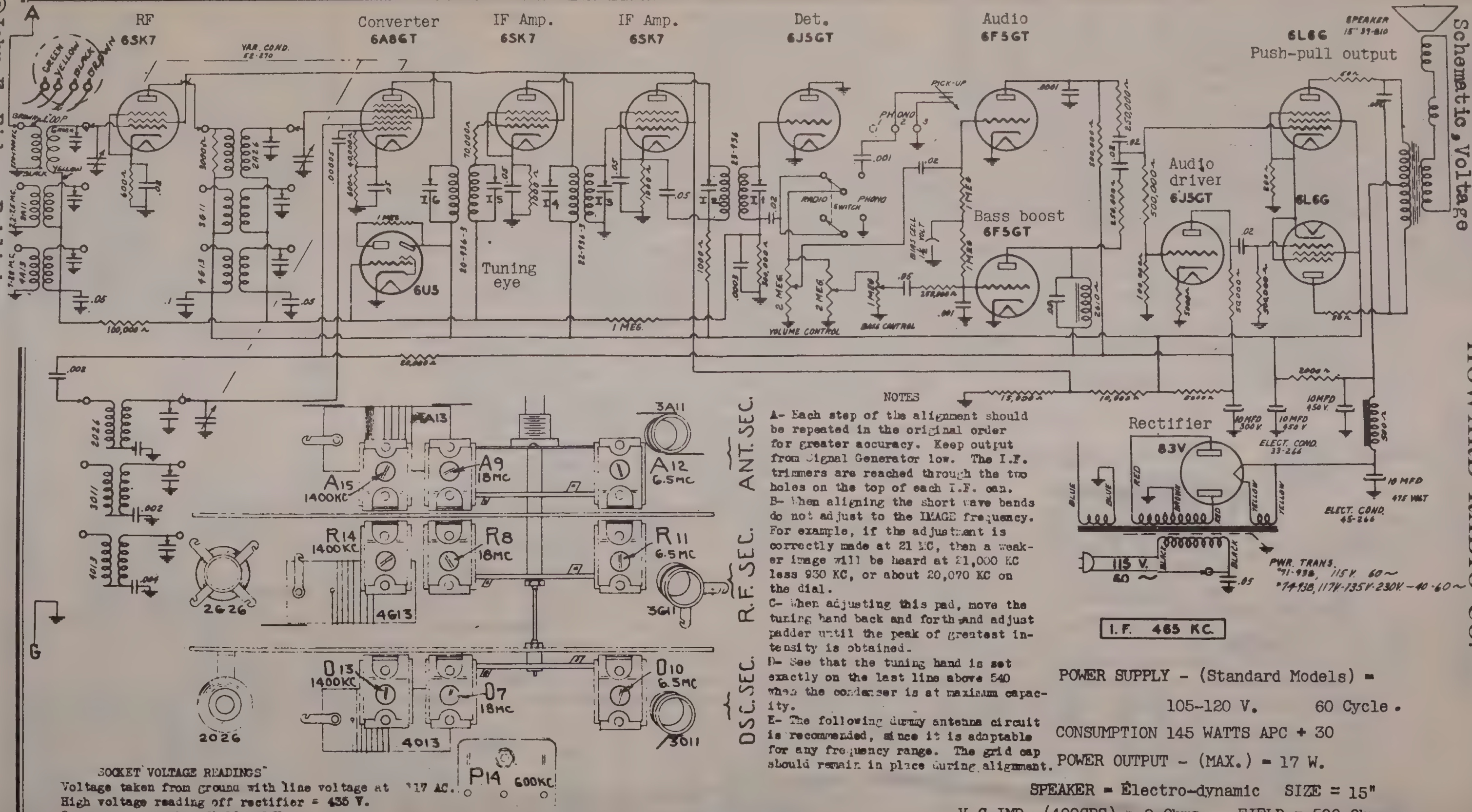


SOCKET VOLTAGE READINGS
Voltage taken from ground
with line voltage at = 117 AC.
High voltage reading off
rectifier - 340 V.
Drop across speaker field - 95 V.
Voltage taken with 1,000 Ohm
per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE	TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6SK7 gt	RF.	8	100	245	6F5 gt	Audio	x	x	65
6A8 gt	Mixer	4	100	245 OP135	6F5 gt	Bass B.	x	x	200
6SK7	1st IF	5	100	245	6J5 gt	Inverter	6	x	120
6SK7	2nd IF	5	100	240	6V6 g	Output	16½	245	235
6J5 gt	Det.	x	x	x	6V6 g	"	16½	245	235

MODEL 520APC
Schematic, Voltage

HOWARD RADIO CO.



I.F. 465 KC.

NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning band back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning band is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

POWER SUPPLY - (Standard Models) =
105-120 V. 60 Cycle.
CONSUMPTION 145 WATTS APC + 30
POWER OUTPUT - (MAX.) = 17 W.
SPEAKER = Electro-dynamic SIZE = 15"
V.C.IMP. (400CPS) = 8 Ohms FIELD = 500 Ohms

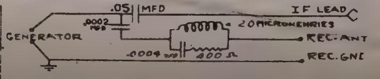
SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at 117 AC.
High voltage reading off rectifier = 435 V.
Drop across speaker field =75 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE	TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6SK7 gt	RF	3½	100	250	6F5 gt	Audio	x	x	60
6A8 gt	Mixer	4	100	250 OP135	6F5 gt	Bass B.	x	x	115
6SK7	1st IF	6	100	250	6J5 gt	Inverter	9	x	195
6SK7	2nd IF	6	100	240	6L6 g	Output	16½	250	350

ALIGNMENT PROCEDURE

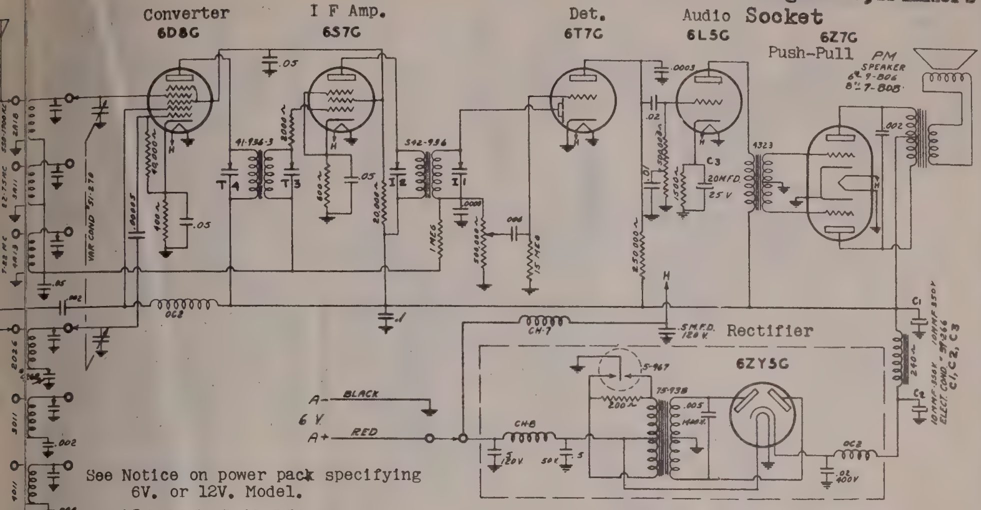
Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	I_5 I_6 IF
SW	18 MC	18 MC	Ant. Post	B,D	O_7 R_8 A_9	Osc. RF. Ant.
PB	6.5 MC	6.5 MC	Ant. Post		O_{10} R_{11} A_{12}	Osc. RF. Ant.
BC	1400 KC	1400 KC	Ant. Post			
			Ant. Post	C	P_{16}	Osc. Pad.



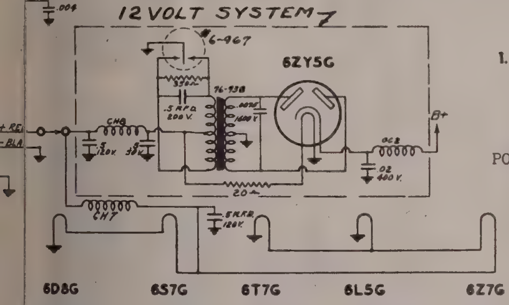
MODEL: 520
DWG. NO. C-60-715 8-3-39
CHKD. BY APPVD. BY

HOWARD RADIO CO.

MODEL 565(6v.,12v)
Schematics,Voltage
Alignment,Trimmers
Socket



See Notice on power pack specifying
6V. or 12V. Model.



I.F. 465 K.C.

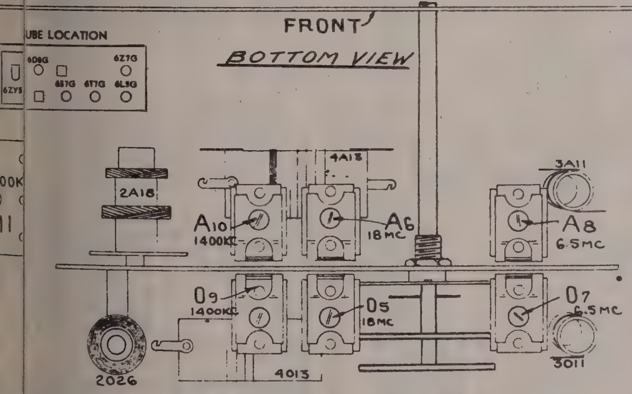
MODEL 565		
DWG. NO. D63-715		10-20-39
DWN. BY.	CHKD. BY	APPVD. BY
RBM		WR

POWER SUPPLY - (Standard Models) = 6 Volt & 12 Volt

DRAIN 2.4 Amps. With 6V. Models
and 1.4 Amps. With 12V. Models

POWER OUTPUT - (MAX.) = 2W.

SPEAKER = Permanent Magnet SIZE = 6" & 8"
V.C.IMP.(400CPS) = 6 Ohms FIELD - PM



NOTES

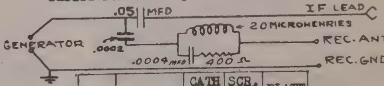
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



ALIGNMENT PROCEDURE

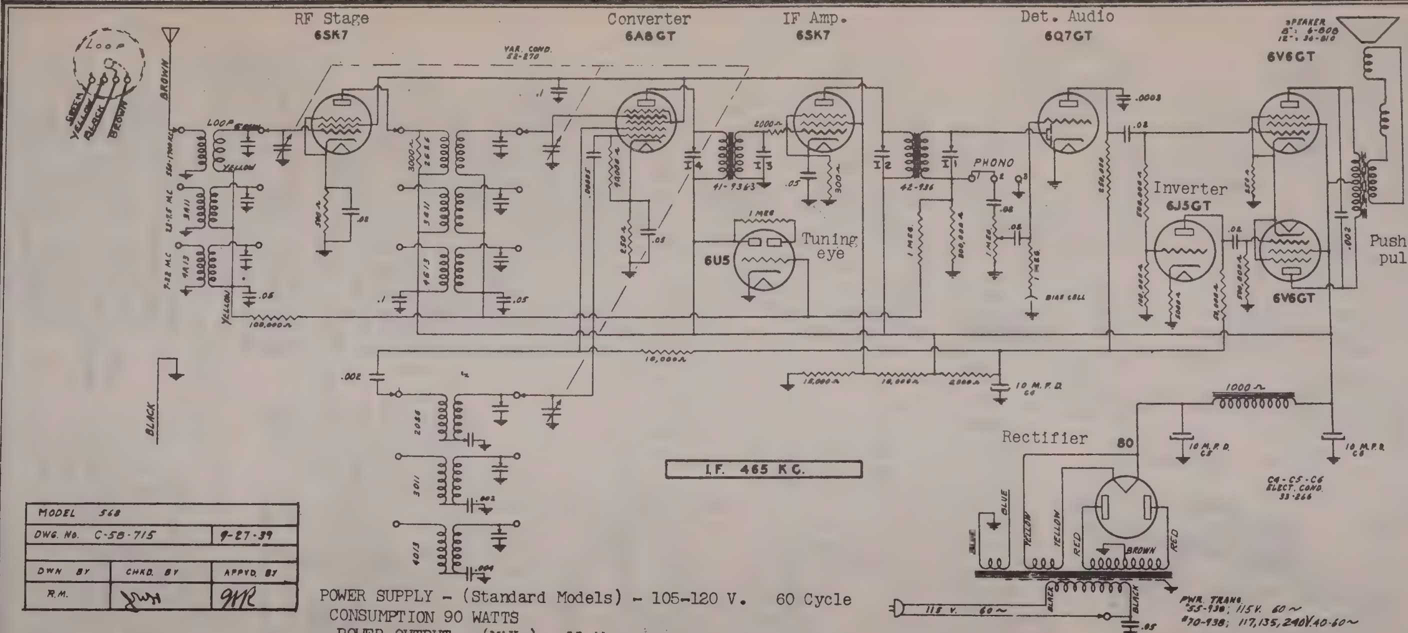
re-Bd witc siti	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6D8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5, A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 KC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc. Pad.

SOCKET VOLTAGE

TUBE	FUNCTION	CATHODE.	SCR. GRID	PLATE
6D8G	Mixer	3	70	145 OP145
6S7G	IF	3	70	145
6T7G	Det.	x	x	50
6L5G	Audio	6 V. Bias	x	145
6Z7G	PP Output	x	x	140

MODEL 568
Schematic, Voltage
Alignment, Trimmers
Socket

HOWARD RADIO CO.



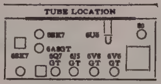
MODEL 568		
DWG. NO. C-58-715		9-27-39
DWN BY	CHKD. BY	APPVD. BY
R.M.		

POWER SUPPLY - (Standard Models) - 105-120 V. 60 Cycle
CONSUMPTION 90 WATTS
POWER OUTPUT = (MAX.) = 11 W. upo 8

SPEAKER = Electro-dynamic SIZE = 8"
V.C. IMP. (400CPS) = 6 Ohms. FIELD = 1000 ohms.

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5 R_6 A_7	Osc. RF. Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_8 R_9 A_{10}	Osc. RF. Ant.
BC	1400 KC	1400 KC	Brown lead		$O_{11}R_{12}A_{13}$	Osc. RF. Ant.
BC	600 KC	600 KC	Brown lead	C	P_{14}	Osc. Pad.



NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21.000 KC

tuning band back and forth and adjust padder until the peak of greatest intensity is obtained.

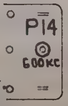
D- See that the tuning band is set exactly on the last line above 540 when the condenser is at maximum capacity.

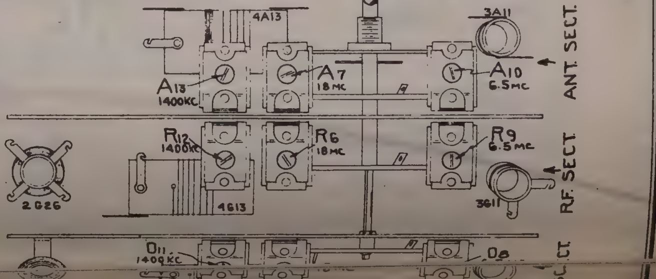
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

.05 MFD I.F LEAD

SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier - 340 V.
Drop across speaker field - 95 V.
Voltage taken with 1,000 Ohm per volt meter -

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
6SK7	RF.	3½	100	245
6A8 gt	Mixer	3½	100	245 OP140
6SK7	IF	3½	100	245
6Q7 gt	Det.	x	x	70
6J5 gt	Inverter	7	x	125

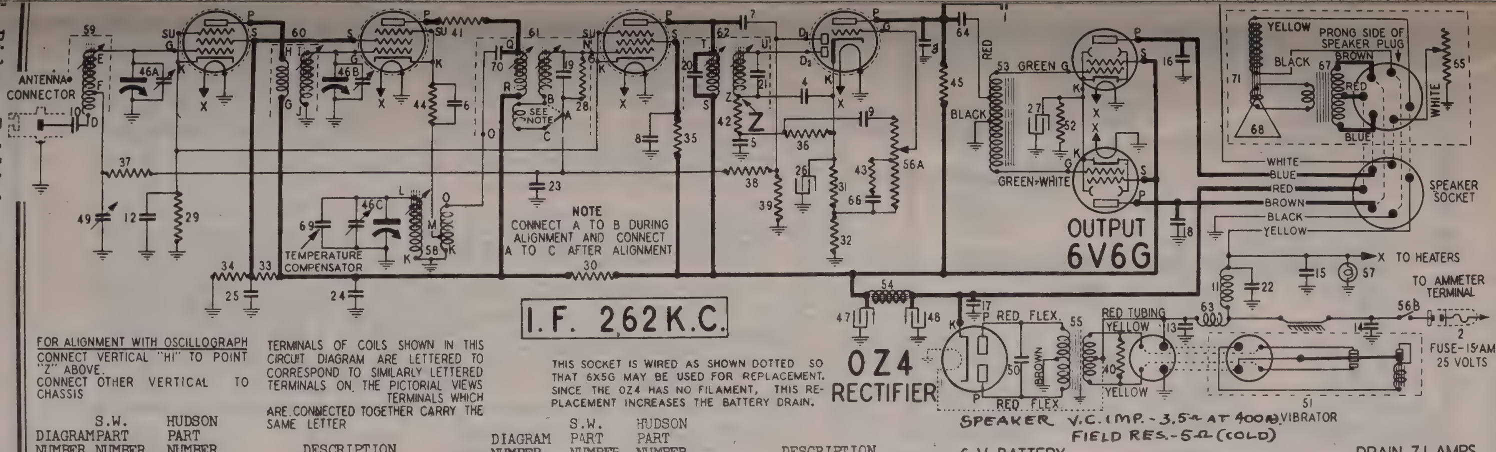




MODEL DB39
Schematic, Voltage
Socket

HUDSON MOTOR CAR CO.

Maximum - 8.5 watts
Undistorted - 5.5 w



NOTE
CONNECT A TO B DURING ALIGNMENT AND CONNECT A TO C AFTER ALIGNMENT

I.F. 262 K.C.

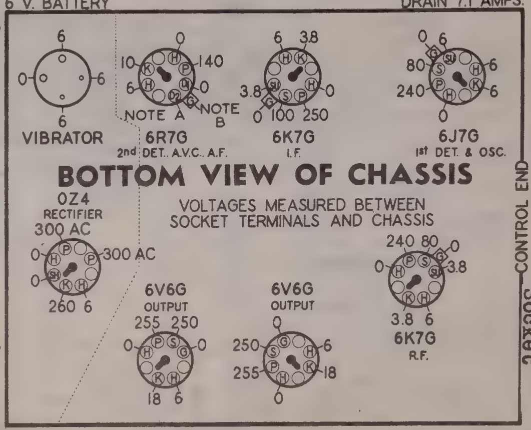
FOR ALIGNMENT WITH OSCILLOGRAPH CONNECT VERTICAL "HI" TO POINT "Z" ABOVE. CONNECT OTHER VERTICAL TO CHASSIS

TERMINALS OF COILS SHOWN IN THIS CIRCUIT DIAGRAM ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE PICTORIAL VIEWS TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER

THIS SOCKET IS WIRED AS SHOWN DOTTED SO THAT 6X5G MAY BE USED FOR REPLACEMENT. SINCE THE 0Z4 HAS NO FILAMENT, THIS REPLACEMENT INCREASES THE BATTERY DRAIN.

SPEAKER V.C. IMP. - 3.5Ω AT 400~
FIELD RES. - 5Ω (COLD)

6 V. BATTERY DRAIN 7.1 AMPS.



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

DIAGRAM NUMBER	S.W. PART NUMBER	HUDSON PART NUMBER	DESCRIPTION
1----	83007	BO-158446	--Condenser-paper.02 mfd. 600V.
2----	83207	BO-158496	--Fuse 15 amp. 25 volt
3-4-5--	83539	BO-158447	--Condenser - mica 260 mmfd.
6----	84282	BO-158449	--Condenser-.001 mfd.mica (10%)
7----	85061	BO-158450	--Condenser - mica 51 mmfd.
8----	88026	BO-158451	--Condenser-paper.02 mfd. 400V.
9-10--	88030	BO-158452	--Condenser-paper.01 mfd. 400V.
11---	88183	BO-158499	--"A" choke coil (short)
12---	88193	BO-158453	--Condenser-paper.25 mfd. 150V.
13-14--	88195	BO-158454	--Condenser-paper .5 mfd. 150V.
15-16 17-18 -	88205	BO-158455	--Condenser - mica 2100 mmfd.
19-20-21	88233	BO-158444	--Condenser-110 mmfd. mica (5%)
22---	88298	BO-158456	--Condenser-.25 mfd. 150 volt
23---	88534	BO-158457	--Condenser-paper.05 mfd. 150V.
24---	88682	BO-158458	--Condenser-paper .1 mfd. 400V.
25---	89421	BO-158459	--Condenser-paper .1 mfd. 200V.
26-27--	110377	BO-158460	--Cond.-elect. 10 mfd. 35 volt
28---	110591	BO-158494	--Resistor-680,000 ohms ¼ watt
29---	112963	BO-158470	--Resistor - 330 ohm 1/4 watt
30---	112964	BO-158471	--Resistor - 1500 ohm 1/4 watt
31-32--	112965	BO-158472	--Resistor - 2000 ohm 1/4 watt
33---	112967	BO-158473	--Resistor - 71000 ohm 1 watt
34---	112968	BO-158474	--Resistor - 80000 ohm 1/4 watt
35---	112969	BO-158475	--Resistor-100,000 ohm ¼W.(10%)
36---	112970	BO-158476	--Resistor-330,000 ohm 1/4 watt
37---	112971	BO-158477	--Resistor-470,000 ohm 1/4 watt
38---	112972	BO-158478	--Resistor - 1 megohm 1/4 watt
39---	112973	BO-158479	--Resistor - 1.5 meg. 1/4 watt
40---	112976	BO-158480	--Resistor - wire wound 220 ohms 1/2 watt (10%)
41---	112977	BO-158481	--Resistor-470 ohm 1/4 watt(10%)
42---	112982	BO-158485	--Resistor - 27000 ohm 1/4 watt
43---	112988	BO-158490	--Resistor-60000 ohm ¼ W. (10%)
44-----	112989	BO-158491	--Resistor - 9500 ohm ¼W. (10%)
45-----	112990	BO-158495	--Resistor -27000 ohm 1/2 watt
46A to 46C	114243	BO-158464	--Condenser - variable gang
47-48----	114258	BO-158461	--Cond.-elect. 8 mfd. 450 volt
49-----	114259	BO-158462	--Condenser - padding
50-----	114277	BO-158463	--Condenser - oil impreg. .01 mfd. 2000 volts
51-----	114300	BO-158505	--Vibrator
52-----	114335	BO-158493	--Resistor - wire wound 430 ohms 2 watt (10%)
53-----	114350	BO-158507	--Transformer - audio input
54-----	114352	BO-158508	--Choke - filter (iron core)
55-----	114354	BO-158509	--Transformer - power
56A - 56B	114363	BO-158530	--Volume control 400,000 ohms; with flex. shft. & switch
57-----	114401	BO-158537	--Dial lamp - 6 volt
58-----	114404	BO-158511	--Oscillator coil
59-----	114406	BO-158512	--Antenna coil
60-----	114410	BO-158513	--R. F. coil
61-----	114411	BO-158514	--Transformer - 1st I.F.
62-----	114415	BO-158516	--Transformer - 2nd I.F.
63-----	114435	BO-158517	--"A" choke coil (long)
64-----	114449	BO-158465	--Condenser-paper.25 mfd. 400V.
65-----	114481	BO-158542	--Tone control (100,000 ohms)
66-----	114482	BO-158466	--Condenser - molded .005 mfd. 400 volts
67---M-	114488	BO-158546	--Transformer - output
68---M-	114489	BO-158547	--Cone - voice coil assembly (for M-115036 speaker)
69-----	114499	BO-158469	--Condenser - temperature compensating - for oscillator
70-----	114523	BO-158443	--Condenser - mica 300 mmfd.5%
71---M-	115036	BO-158549	--Speaker - dynamic (8 inch) (for custom Model DB-39)

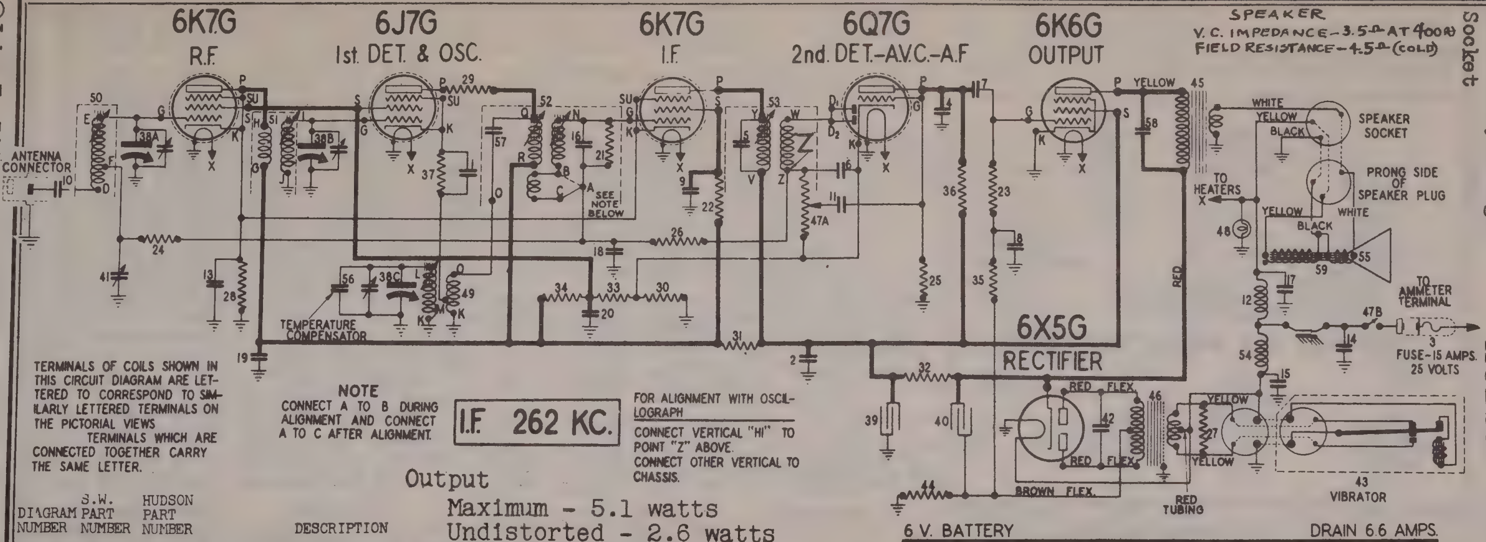
IMPORTANT:- Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A:- Due to the high resistance in this circuit only a slight deflection of the voltmeter will be obtained. This voltage which is 10 volts is measured across resistors No. 31 and 32.

NOTE B:- The bias for the control grid of the triode section of the 6R7G is 5 volts measured across resistor No. 32.

MODEL SA39
Schematic,Voltage
Socket

HUDSON MOTOR CAR CO.



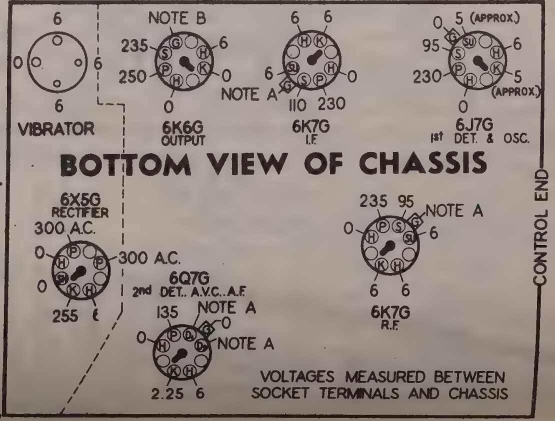
TERMINALS OF COILS SHOWN IN THIS CIRCUIT DIAGRAM ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE PICTORIAL VIEWS. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.

NOTE
CONNECT A TO B DURING ALIGNMENT AND CONNECT A TO C AFTER ALIGNMENT.

I.F. 262 KC.

FOR ALIGNMENT WITH OSCILLOGRAPH
CONNECT VERTICAL "HI" TO POINT "Z" ABOVE.
CONNECT OTHER VERTICAL TO CHASSIS.

Output
Maximum - 5.1 watts
Undistorted - 2.6 watts



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

DIAGRAM NUMBER	S.W. PART NUMBER	HUDSON PART NUMBER	DESCRIPTION
1-2	81156	BO-158445	Condenser - mica .001 mfd.
3	83207	BO-158496	Fuse 15 amp. 25 volt
4	83763	BO-158448	Cond.-mica, 110 mmf. (10%)
5	88233	BO-158444	Cond.-mica, 110 mmfd. (5%)
6	85394	BO-158467	Condenser - mica 500 mmfd.
7-8-9	88026	BO-158451	Condenser - .02 mfd. 400V.
10-11	88030	BO-158452	Condenser - .01 mfd. 400V.
12	88183	BO-158499	"A" choke coil (short)
13	88193	BO-158453	Condenser - .25 mfd. 150V.
14-15	88195	BO-158454	Condenser - .5 mfd. 150 V.
16	88253	BO-158444	Cond.-110 mmfd. mica (5%)
17	88298	BO-158456	Condenser - .25 mfd. 150V.
18	88534	BO-158457	Condenser - .05 mfd. 150V.
19	88682	BO-158458	Condenser - .1 mfd. 400 V.
20	89421	BO-158459	Condenser - .1 mfd. 200 V.
21	110591	BO-158494	Resistor - carb. 680,000 ohms 1/4 watt
22	112969	BO-158475	Resistor - insulated 100,000 ohms 1/4 W. (10%)
23-24	112971	BO-158477	Resistor - insulated 470,000 ohms 1/4 watt
25	112972	BO-158478	Resistor - insulated 1 meg. 1/4 watt
26	112973	BO-158479	Resistor - insulated 1.5 meg. 1/4 watt
27	112976	BO-158480	Resistor - wire wound 220 ohms ½ watt (10%)
28-29	112977	BO-158481	Resistor - insulated 470 ohms ¼ watt (10%)
30	112979	BO-158482	Resistor - insulated 800 ohms ¼ watt (10%)
31	112980	BO-158483	Resistor - insulated
33	112983	BO-158486	Resistor - insulated 33,000 ohms ¼ W. (10%)
34	112984	BO-158487	Resistor - insulated 33,000 ohms 2 W. (10%)
35	112985	BO-158488	Resistor - insulated 68,000 ohms 1/4 watt
36	112987	BO-158489	Resistor - insulated 220,000 ohms 1/4 watt
37	112989	BO-158491	Resistor - carbon 9,500 ohms 1/4 watt (10%)
38A to C	114243	BO-158464	Condenser - variable gang
39-40	114258	BO-158461	Cond.-elect. 8 mfd. 450 V.
41	114259	BO-158462	Condenser - padding
42	114277	BO-158463	Condenser - oil filled .01 mfd. 2000 volts
43	114300	BO-158505	Vibrator
44	114334	BO-158492	Resistor-360 oh. 2 W.(10%)
45	114348	BO-158506	Transformer - output
46	114354	BO-158509	Transformer - power
47A - 47B	114364	BO-158531	Vol. Cont. (500,000 ohms) flex. shaft & switch
48	114401	BO-158537	Dial lamp - 6 volt
49	114404	BO-158511	Oscillator coil
50	114406	BO-158512	Antenna coil
51	114410	BO-158513	R. F. Coil
52	114411	BO-158514	Transformer - 1st I.F.
53	114413	BO-158515	Transformer - 2nd I.F.
54	114435	BO-158517	"A" choke coil (long)
55	R-114487	BO-158545	Cone - voice coil assembly for R-115023 speaker
56	114499	BO-158469	Condenser-temp.comp.-osc.
57	114523	[illegible]	[illegible] - .005 mfd.600V.

IMPORTANT: Use high resistance voltmeter of at least 1000 ohms/volt.
NOTE A: The bias [illegible] volts measured across resistor No. 30.

HUDSON MOTOR CAR CO.

MODEL DB39
MODEL SA39
Alignment,Trimmers
Socket,Coils

ALIGNMENT PROCEDURE

OTHERWISE INDICATED BY NOTES BELOW.

TO PROPERLY ALIGN THESE RECEIVERS IT IS ESSENTIAL THAT YOU FOLLOW THIS PROCEDURE **EXACTLY.**

BEFORE ALIGNING THE I. F. TRANSFORMERS THE GREEN-WHITE JUMPER LOCATED UNDER THE FIRST I. F. TRANSFORMER MUST BE CONNECTED AS SHOWN IN FIGURES 2 AND 4 OTHERWISE ALIGNMENT WILL BE INCORRECT.

AFTER ALIGNING THE I. F. TRANSFORMERS. TRANSFER THE GREEN-WHITE JUMPER LOCATED UNDER THE FIRST I. F. TRANSFORMER TO ITS ORIGINAL POSITION.

1– Connect the output meter across the speaker voice coil or
(a) For Model SA-39, connect between the plate of the 6K6G and chassis in series with a .1 mfd. condenser.
(b) For Model DB-39, connect between the plates of the two 6V6G output tubes.
NOTE:- The more sensitive type of meter should be connected across the voice coil.

2– Connect the ground lead of the signal generator to the receiver chassis and leave it connected in this manner throughout the entire alignment procedure.

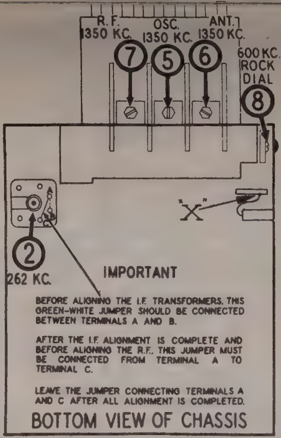
3– Turn the volume control to the maximum volume position.

4– With the gang condenser in full mesh, set the pointer to the end of the calibration slot on the low frequency end of the dial scale. This can be done by loosening the set screw in the dial cord drive drum, (see "K" in figure 5 on page 11) holding the gang condenser in full mesh and turning the drum until the pointer is correctly set. Then retighten the set screw in the dial drum.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GEN. OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.01 MFD CONDENSER	CONTROL GRID OF 6J7G TUBE	262 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1–2	1ST I. F.	IMPORTANT: CHANGE JUMPER ON BOTTOM OF 1ST I.F. TRANSFORMER TO CONNECT TERMINALS A & B INSTEAD OF A & C. (SEE FIGURE 1 OR 3 ON PAGE 9. ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. (TRIMMER NO. 4 IN MODEL DB-39 ONLY)
				3–4	2ND I.F.	
CONNECT A 125 MMFD. MICA CONDENSER TO THE END OF THE SIGNAL GENERATOR LEAD. CONNECT THE OTHER END OF THE CONDENSER TO POINT "X" SHOWN IN FIGURES 1 OR 3 ON PAGE 9.		1350 KC.	1350 KC.	5	OSCILLATOR (SHUNT CONDENSER)	IMPORTANT: CHANGE JUMPER ON BOTTOM OF 1ST I.F. TRANSFORMER TO CONNECT TERMINALS A & C INSTEAD OF A & B. (SEE TRIMMER LOCATION CHART ON PAGE 9) ADJUST TRIMMER TO BRING IN SIGNAL.
SAME AS ABOVE		1350 KC.	TUNE TO 1350 KC. GENERATOR SIGNAL	6	ANTENNA (SHUNT CONDENSER)	ADJUST FOR MAXIMUM OUTPUT.
				7	R.F. (SHUNT CONDENSER)	
SAME AS ABOVE		600 KC.	TUNE TO 600 KC. GENERATOR SIGNAL	8	ANTENNA COMPENSATOR (SERIES CONDENSER)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
SAME AS ABOVE		800 KC.	TUNE TO 800 KC. GENERATOR SIGNAL	9	ANTENNA (IRON CORE)	ADJUST FOR MAXIMUM OUTPUT.
				10	R.F. (IRON CORE)	
SAME AS ABOVE		1350 KC.	TUNE TO 1350 KC. GENERATOR SIGNAL	6	ANTENNA (SHUNT CONDENSER)	ADJUST FOR MAXIMUM OUTPUT.
				7	R.F. (SHUNT CONDENSER)	
SAME AS ABOVE		600 KC.	TUNE TO 600 KC. GENERATOR SIGNAL	8	ANTENNA COMPENSATOR (SERIES CONDENSER)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

AFTER THE SET IS INSTALLED IN THE CAR, TUNE IN A FAIRLY WEAK STATION NEAR 600 KC. AND ADJUST TRIMMER 8 FOR MAXIMUM OUTPUT.

TRIMMER LOCATION CHARTS FOR MODEL SA-39.



IMPORTANT

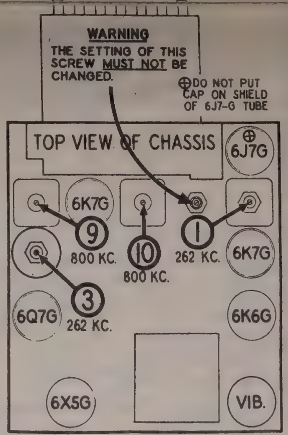
BEFORE ALIGNING THE I.F. TRANSFORMERS, THIS GREEN-WHITE JUMPER SHOULD BE CONNECTED BETWEEN TERMINALS A AND B.

AFTER THE I.F. ALIGNMENT IS COMPLETE AND BEFORE ALIGNING THE R.F., THIS JUMPER MUST BE CONNECTED FROM TERMINAL A TO TERMINAL C.

LEAVE THE JUMPER CONNECTING TERMINALS A AND C AFTER ALL ALIGNMENT IS COMPLETED.

BOTTOM VIEW OF CHASSIS

FIG. 1 FIG. 3

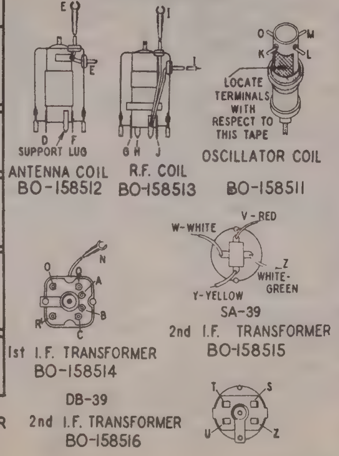


WARNING
THE SETTING OF THIS SCREW MUST NOT BE CHANGED.

⊕DO NOT PUT CAP ON SHIELD OF 6J7-G TUBE

FIG. 2

COIL TERMINALS



SUPPORT LUG

LOCATE TERMINALS WITH RESPECT TO THIS TAPE

ANTENNA COIL
BO-158512

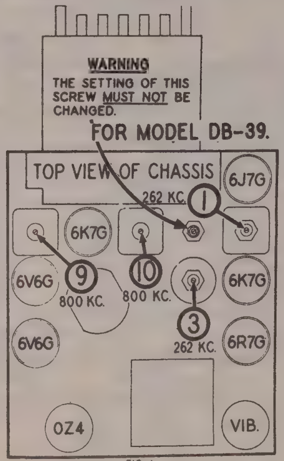
R.F. COIL
BO-158513

OSCILLATOR COIL
BO-158511

1st I.F. TRANSFORMER
BO-158514

SA-39
2nd I.F. TRANSFORMER
BO-158515

DB-39
2nd I.F. TRANSFORMER
BO-158516



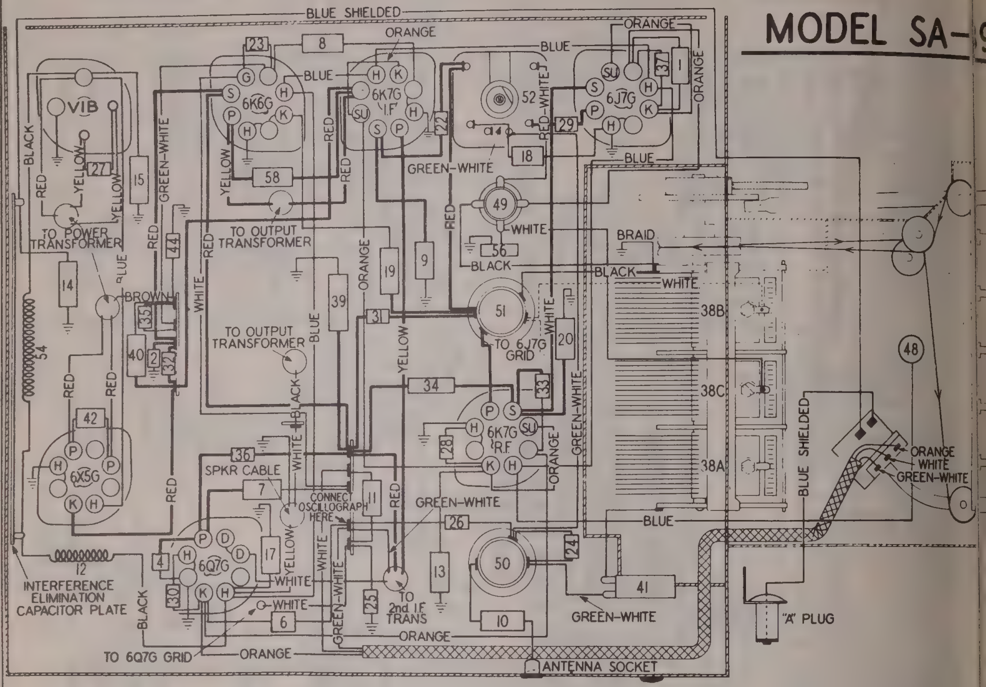
WARNING
THE SETTING OF THIS SCREW MUST NOT BE CHANGED.

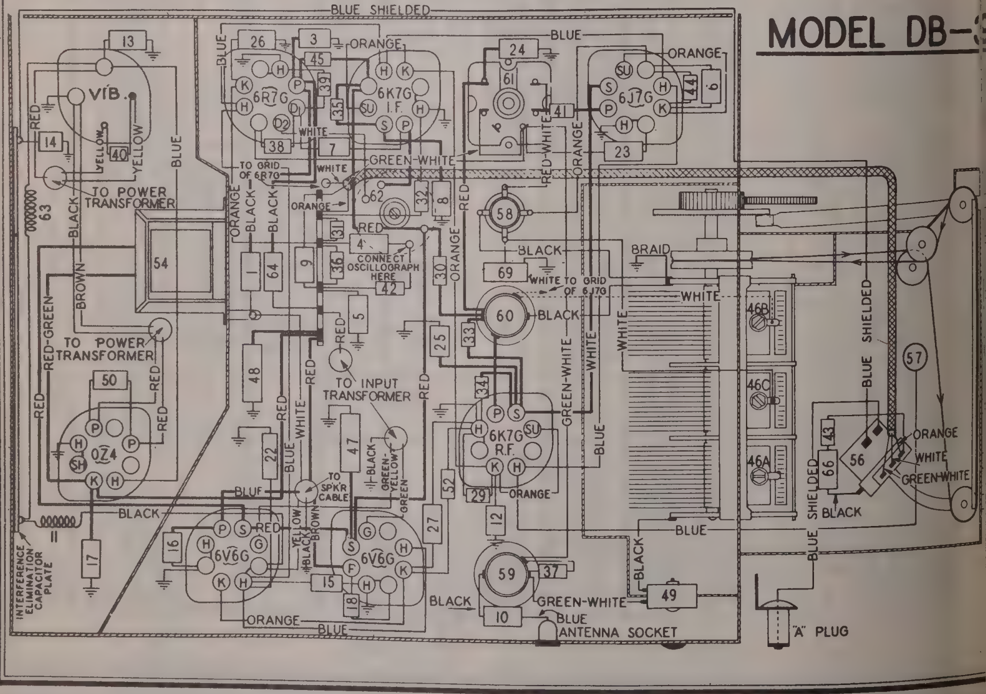
FOR MODEL DB-39.

FIG. 4

MODEL DB39
MODEL SA39
Chassis Wiring

HUDSON MOTOR CAR CO.





HUDSON MOTOR CAR CO.

MODEL DB39
MODEL SA39
Dial and Tuner Data, Notes

ADDITIONAL SERVICE DATA

OW O REPLACE THE DIAL POINTER DRIVE CORD

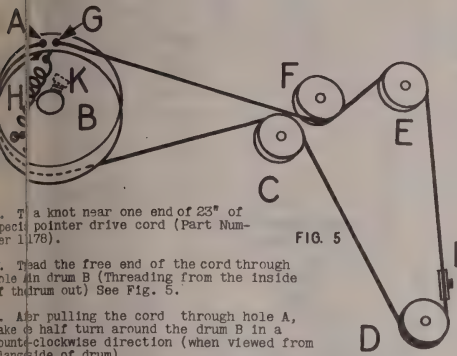


FIG. 5

. T a knot near one end of 23" of pecis pointer drive cord (Part Num- er 1 178).

. Tead the free end of the cord through ole in drum B (Threading from the inside t thdrum out) See Fig. 5.

. Aer pulling the cord through hole A, ake e half turn around the drum B in a ounte-clockwise direction (when viewed from langside of drum).

. Ctinuing, draw the cord over to the back of pulley C nd aund to pulley D. From this point continue across to ulleE and around to pulley F.

. Garound pulley F and up to the top of drum B to hole G.

. Dr the cord through hole G and tie it to the end of ensic spring H in such a manner that when the spring is lippe to lug J, the spring will be extended to approxi- ately/8 inch.

OW TO SET UP THE PUSH BUTTONS.

setp the push buttons, proceed as follows:

. Tu on the set and allow it to operate for at least ne-qter hour before attempting to set up the push buttons.

. Sect the five stations to which the buttons are to be t. e sure to select nearby, powerful stations, since ak snals will generally give better results when tuned manlly. Any button may be set to any desired station.

. Grp the tuning knob and pull it out, (outward movement slit, about 1/8 inch) so that the drive pinion engages e ccenser drive gear and the set may be tuned manually.

. Tu in the station to which you wish to set the partilar tton. Be sure to tune in the station correctly by NINGTO THE POINT WHERE THE PROGRAM IS HEARD WITH THE EAST SS OR DISTORTION, AND NOT TO THE POINT OF GREATEST LUME

Grp the push button being set up, and turn it to the ft (unter-clockwise) about one whole turn.

Pu this button all the way in, and keeping it pushed , tu right (clockwise) until reasonably tight.

Seup the remaining four buttons in a similar manner.

La1 each button with the call letters of the stations u ha selected, using the call letter tabs and celluloid versacked with your receiver. Insert the call letter b inhe recess in the push button, and cover it with the llulid tab.

To se your push button tuner, first push in the tuning ob. Then push in the button labelled with the call letrs othe desired station. Be sure to push the button all e wain.

DIC OSCILLATION IN MODEL DB-39 RECEIVER.

ccasnally audio oscillation or howl may be encountered n th model. This is caused by an audio voltage being fed ack the audio section of receiver from the speaker cord. he redy is to locate the speaker cord away from the 6R7-G nd 6-G tubes, holding it in place with a rubber band if ecesry.

INCORRECT TUNING OF PUSH BUTTONS

Occasionally a receiver may be found which will not tune-in stations accurately when push button tuning is used. The causes and remedies for this are as follows:

1. Push buttons incorrectly set-up. Remedy: Reset the button to the desired station being sure to tune in the station carefully.

2. Extreme sharpness of tuning of the receiver. Remedy: The green-white jumper wire on the bottom of the 1st I. F. transformer may be improperly connected. The correct connection for normal operation of the receiver is shown in Fig. 1 (Terminals A and C should be connected together.

LOW SENSITIVITY

Low sensitivity may be due to improper adjustment of the antenna compensator, trimmer #8 (see alignment procedure page). This trimmer is accessible without removing the set from the car. When the readjustment of the compensator is necessary, care should be taken that the antenna, if of the under-car type, is clean and free of accumulation of mud or slush which would alter its capacity and lower its resistance. In such cases, the antenna and its insulators should be washed, and preferably, allowed to dry before making adjustment. Doing this sharpens the tuning of the compensator and makes possible an accurate setting.

FAILURE OF RECEIVER TO OPERATE

Failure of the receiver to operate may be due to one or more causes. When a receiver is found in such condition, its parts should be checked as follows:

1-FUSE

The fuse may be burned out or making poor contact. In cases of burnout, replace with another 15 Ampere fuse. If second fuse fails, remove receiver from car and investigate condition of vibrator and receiver circuits. DO NOT USE A HIGHER RATING FUSE.

2-TUBES

Unfasten the trunk clamps holding the speaker case cover. This will enable you to reach the tubes. Check to see that all tubes are in their proper sockets. One or more tubes may be defective. To determine their condition, remove them from the receiver and test with a tube tester, or if a tube tester is not available, replace the tubes, one at a time, with tubes known to be good, until the defective tube is located.

3-VIBRATOR

Improper operation of the vibrator is usually evidenced by one of the following symptoms: Receiver blows fuses, receiver is dead or weak, reception is intermittent, reception is noisy and unsteady. To check the vibrator, replace the suspected unit with a new vibrator. Do not attempt to adjust the defective unit.

4-CIRCUIT

Failures within the basic circuits of the receiver may be isolated by a systematic test procedure. The receiver should be removed from the car and placed where it will be readily accessible. The top cover and speaker case cover should be removed from the case. The defect in the receiver can then be located by means of continuity, voltage, or stage analysis, using a signal generator.

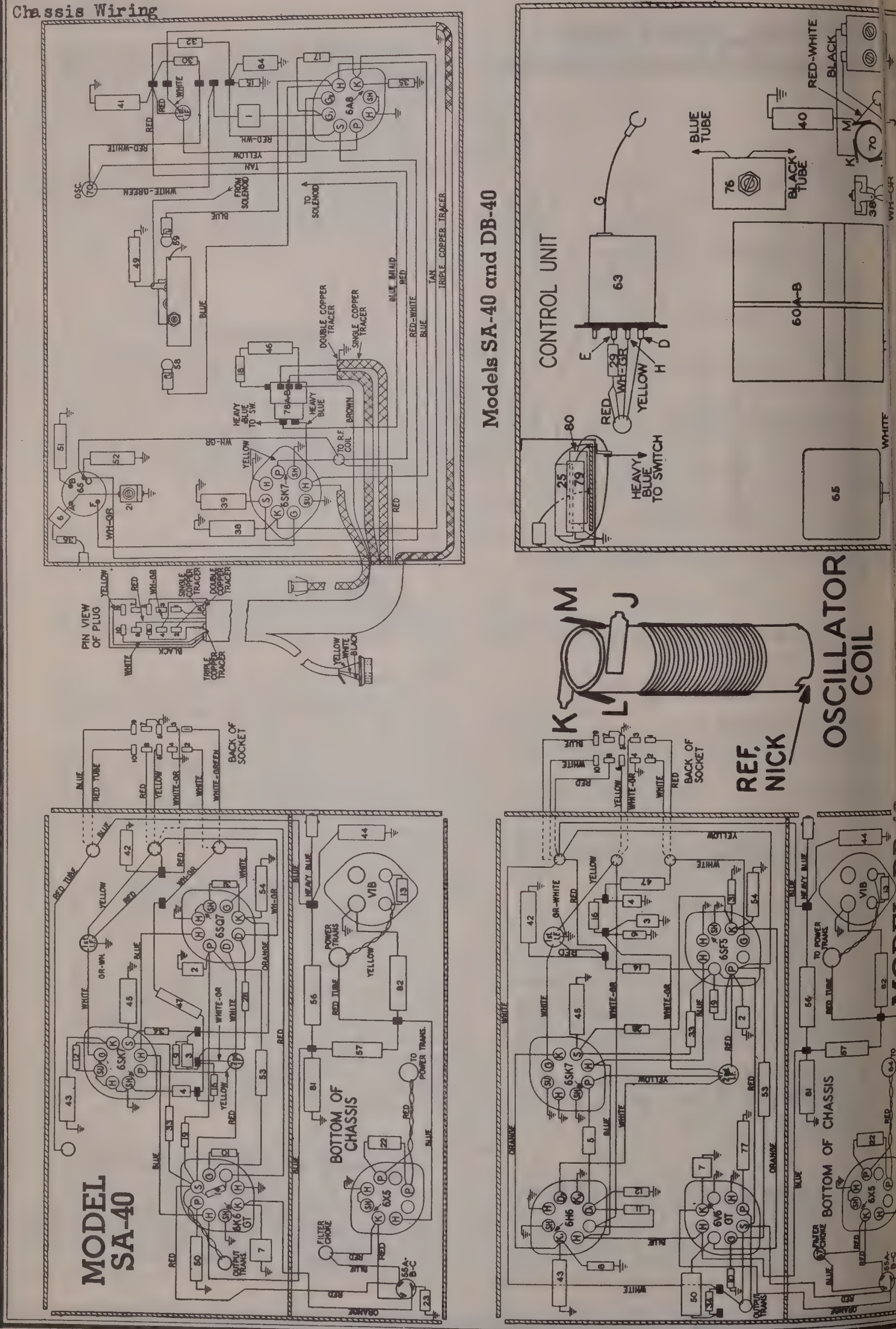
When checking the receiver, using a signal generator, a signal is fed progressively into the I. F. and R. F. stages of the receiver, until the defective stage is located, and a continuity or voltage check may then be given that stage to isolate the defective unit or circuit.

ADJUSTMENT OF IRON CORES IN COILS.

The Antenna, R. F., and Oscillator coils have adjustable iron cores. Any adjustment of these cores will necessarily change the inductance of the coils and therefore extreme caution must be exercised where adjustment becomes necessary. THE CORE OF THE OSCILLATOR COIL MUST NOT BE ADJUSTED AT ANY TIME. The correct method of adjusting the R. F. and antenna coil cores is adequately covered under "Alignment Instructions"

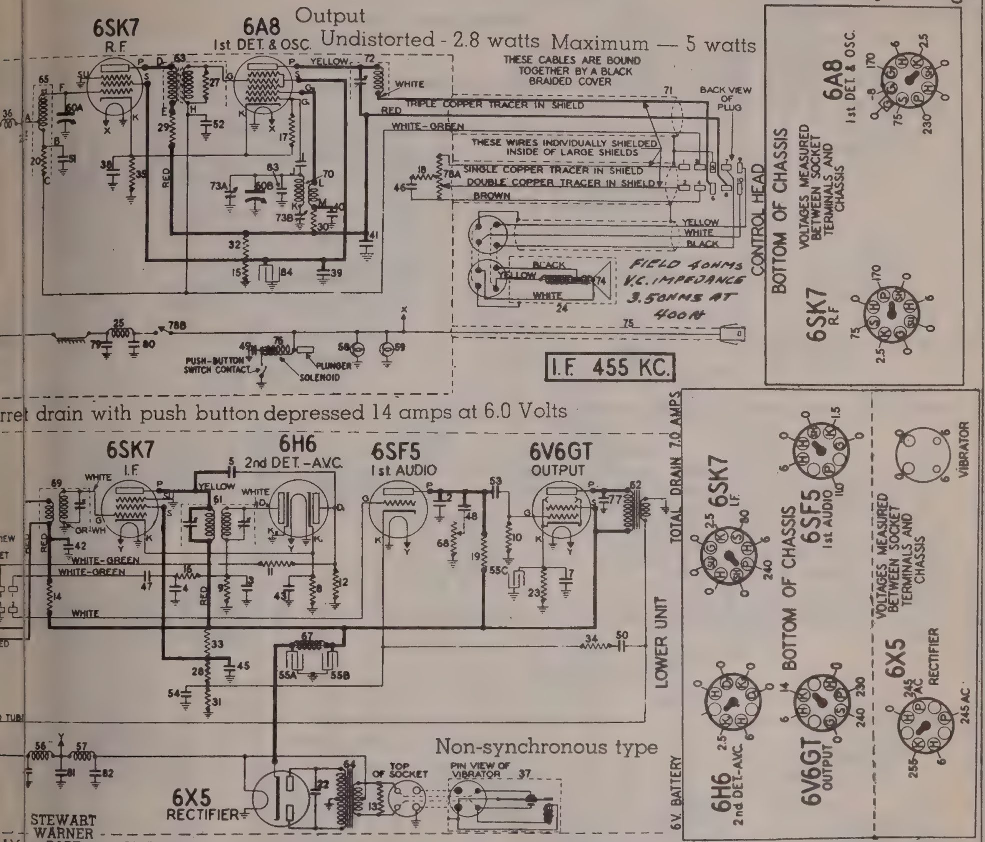
MODEL DB40
MODEL SA40
Control Unit
Chassis Wiring

HUDSON MOTOR CAR CO.



HUDSON MOTOR CAR CO.

MODEL DB40
Schematic, Voltage

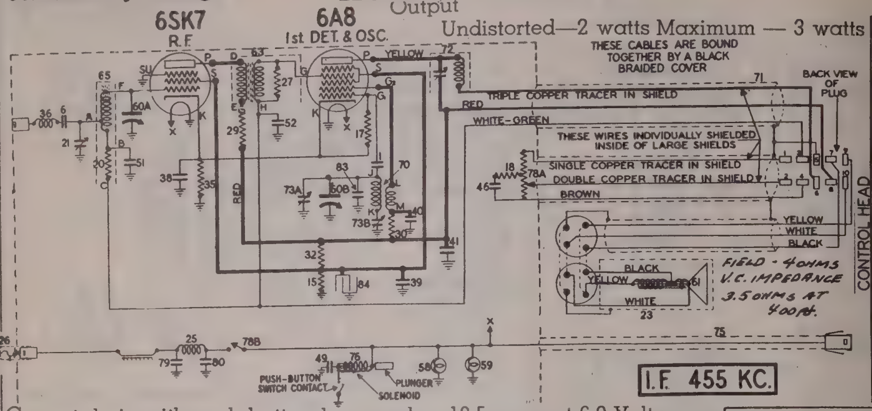


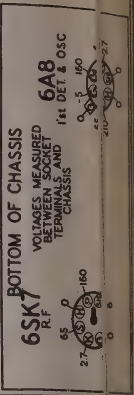
AM ER	STEWART WARNER PART NUMBER	HUDSON PART NUMBER	DESCRIPTION
	83539	BO-158447	Condenser - mica 260 mmfd.
	83783	BO-158448	Condenser - mica 110 mmfd.
	85061	BO-158450	Condenser - mica 51 mmfd.
	88205	BO-158455	Condenser - mica 2100 mmfd.
	112963	BO-158470	Resistor - 330 ohms ¼ W.
	112970	BO-158478	Resistor - 330,000 ohms ¼ W.
	112971	BO-158477	Resistor - 470,000 ohms ¼ W.
	112973	BO-158479	Resistor - 1.5 meg. ¼ W.
	112976	BO-158480	Resistor - 220 ohms ½ W.
	112980	BO-158483	Resistor - 1000 ohms ¼ W.
	112986	BO-161476	Resistor - 100,000 ohms ¼ W.
19	112987	BO-158489	Resistor - 220,000 ohms ¼ W.
	112993	BO-161477	Resistor - 470,000 ohms 1/10W.
	113468	BO-161460	Condenser - trimmer
	114277	BO-158463	Condenser - .01 mfd. 2000 V.
	114335	BO-158493	Resistor - 430 ohms 2 Watt W.W.
	-115073	BO-161559	Speaker - dynamic 8"
	116035	BO-161492	Choke coil (in A supply lead)
	116049	BO-170420	Fuse - 20 amps 25 volts
	116052	BO-161478	Resistor - 33,000 ohms 1/10 W.
	116058	BO-161479	Resistor - 47,000 ohms ¼ W.
	116073	BO-161480	Resistor - 10,000 ohms ½ W.
	116074	BO-161481	Resistor - 22,000 ohms 1 W.
	116078	BO-161482	Resistor - 560 ohms ¼ W.
	116087	BO-161483	Resistor - 47,000 ohms 1 W.
	116091	BO-161486	Resistor - 6,800 ohms ¼ W.
	116095	BO-161488	Resistor - 220 ohms ¼ W.
	118726	BO-161580	Antenna motor noise choke
	116202	BO-161493	Vibrator
5	116625	BO-161461	Condenser - .1 mfd. 600 V.
8	116640	BO-161462	Condenser - .01 mfd. 600 V.
	116647	BO-161463	Condenser - .004 mfd. 600 V.
50	116706	BO-161464	Condenser - .2 mfd. 600 V.
51-52	116819	BO-161465	Condenser - .05 mfd. 600 V.
53	116893	BO-161466	Condenser - .02 mfd. 600 V.
54	117022	BO-161467	Condenser - .002 mfd. 600 V.
55A to 55C	117314	BO-161468	Condenser - electrolytic Section A — 10 mfd. 450 V. Section B — 10 mfd. 450 V. Section C — 10 mfd. 35 V.
56-57	117332	BO-161495	Choke coil
58-59	117499	BO-71550	Dial lamp - mazda No. 55
60A-60B	117883	BO-161470	Condenser - variable tuning
61	117898	BO-161496	Transformer - 2nd I.F.
62	117912	BO-161497	Transformer - output
63	117919	BO-161498	Transformer - R.F.
64	117923	BO-161499	Transformer - power
65	117939	BO-161500	Coil - antenna
66	117944	BO-161501	Socket - 10 terminal
67	117952	BO-161502	Filter choke
68	117965	BO-161503	Tone control
69	117972	BO-161505	Transf. - 1st I.F. (lower unit)
70	117975	BO-161506	Coil - oscillator
71	118001	BO-161508	Cable & Plug - 10 terminal
72	118113	BO-161509	Transformer - 1st I.F. (upper unit)
73A-73B	118117	BO-161471	Condenser - 2 section - oscillator trimmer & padder
74	M-118119	BO-161562	Cone & Voice coil for M-115073 speaker
75	118140	BO-161511	"A" cable connecting units
76	118143	BO-161528	Magnet (coil only)
77	118194	BO-161472	Condenser - .006 mfd. 600 V.
78A-78B	118216	BO-161513	Volume control
79-80-81-82	118225	BO-161473	Condenser - .5 mfd. 150 V.
83	118332	BO-161474	Condenser - temp. compen'tg.
84	118485	BO-161475	Condenser - 4 mfd. 200 V.

MODEL SA40
Schematic, Voltage

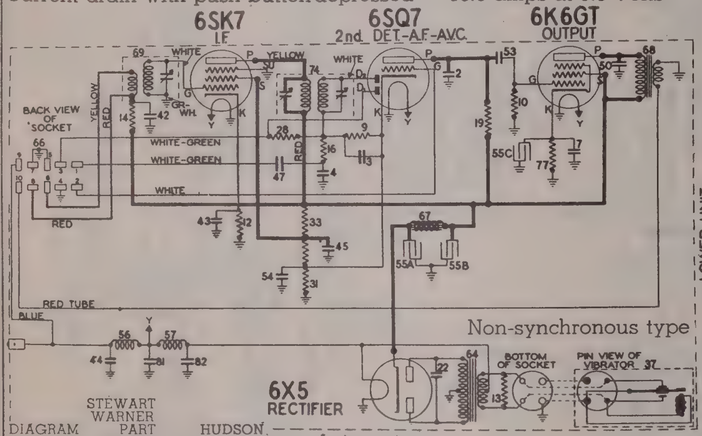
HUDSON MOTOR CAR CO.

Output
Undistorted—2 watts Maximum — 3 watts


6SK7
R.F.
6A8
1st DET. & OSC.
THESE CABLES ARE BOUND TOGETHER BY A BLACK BRAIDED COVER
BACK VIEW OF PLUG
TRIPLE COPPER TRACER IN SHIELD
WHITE-GREEN
RED
YELLOW
THESE WIRES INDIVIDUALLY SHIELDED INSIDE OF LARGE SHIELDS
SINGLE COPPER TRACER IN SHIELD
DOUBLE COPPER TRACER IN SHIELD
BROWN
CONTROL HEAD
YELLOW
WHITE
BLACK
FIELD - 4 OHMS
V.C. IMPEDANCE
3.5 OHMS AT
400 ~
PUSH-BUTTON SWITCH CONTACT
PLUNGER
SOLENOID
I.F. 455 KC.



Current drain with push button depressed — 13.5 amps at 6.0 Volts



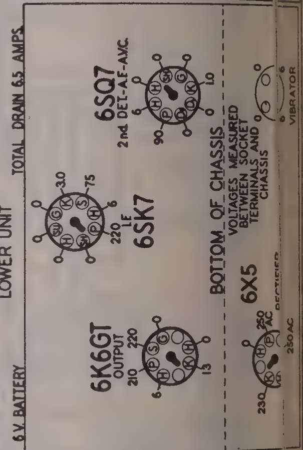


DIAGRAM NUMBER	STEWART WARNER PART NUMBER	HUDSON PART NUMBER	DESCRIPTION
1-2	83539	BO-158447	Condenser - mica 260 mmfd.
3-4	83783	BO-158448	Condenser - mica 110 mmfd.
6-7	88205	BO-158455	Condenser - mica 2100 mmfd.
9	112970	BO-158478	Resistor - 330,000 ohms ¼ W.
10	112971	BO-158477	Resistor - 470,000 ohms ¼ W.
12	112977	BO-158481	Resistor - 470 ohms ¼ W.
13	112976	BO-158480	Resistor - 220 ohms ½ W.
14	112980	BO-158483	Resistor - 1000 ohms ¼ W.
15-16	112986	BO-161476	Resistor - 100,000 ohms ¼ W.
17-19	112987	BO-158489	Resistor - 220,000 ohms ¼ W.
18	118210	BO-161490	Resistor - 50,000 ohms ¼ W.
20	112993	BO-161477	Resistor - 470,000 ohms 1/10 W.
21	113468	BO-161460	Condenser - trimmer
22	114277	BO-158463	Condenser - .01 mfd. 2000 V.
23	U-115072	BO-161558	Speaker - 6" dynamic
25	116035	BO-161492	Choke coil - "A" supply lead
26	116049	BO-170420	Fuse - 20 amps 25 volts
27	116052	BO-161478	Resistor - 33,000 ohms 1/10 W.
28	116090	BO-161485	Resistor - 3.3 meg. ¼ W.
29	116073	BO-161480	Resistor - 10,000 ohms ½ W.
30	116074	BO-161481	Resistor - 22,000 ohms 1 W.
31-35	116078	BO-161482	Resistor - 560 ohms ¼ W.
32-33	116087	BO-161483	Resistor - 47,000 ohms 1 W.
34	116089	BO-161484	Resistor - 47,000 ohms ½ W.
36	118726	BO-161580	Antenna motor noise choke.
37	116202	BO-161493	Vibrator
38 to 45 inc.	116625	BO-161461	Condenser - 1 mfd. 600 V.
46-47	116640	BO-161462	Condenser - .01 mfd. 600 V.
49	116647	BO-161463	Condenser - .004 mfd. 600 V.
50	117571	BO-161469	Condenser - .008 mfd. 600 V.
51-52	116819	BO-161465	Condenser - .05 mfd. 600 V.
53	116893	BO-161466	Condenser - .02 mfd. 600 V.
54	117022	BO-161467	Condenser - .002 mfd. 600 V.
55A to 55C	117314	BO-161468	Condenser - electrolytic Section A — 10 mfd. 450 Section B — 10 mfd. 450 Section C — 10 mfd. 35
56-57	117332	BO-161495	"A" choke
58-59	117499	BO-71550	Dial lamp - mazda No. 5
60A-60B	117883	BO-161470	Condenser - variable tu
61	U-118205	BO-161563	Cone and Voice coil fo U-115072 speaker
63	117919	BO-161498	Transformer - R.F.
64	117923	BO-161499	Transformer - power
65	117939	BO-161500	Coil - antenna
66	117944	BO-161501	Socket - 10 contact
67	117952	BO-161502	Filter choke
68	117979	BO-161507	Transformer - output
69	117972	BO-161505	Transformer - 1st I.F. (l er unit)
70	117975	BO-161506	Coil - oscillator
71	118001	BO-161508	Cable and Plug assembl (10 terminals)
72	118113	BO-161509	Transformer - 1st I.F. (trol unit)
73A-73B	118117	BO-161471	Condenser - 2 sectio oscillator trimmer & pad
74	118118	BO-161510	Transformer - 2nd I.F.
75	118140	BO-161511	"A" cable connecting uni
76	118143	BO-161528	Magnet (coil only)
77	118126	BO-161487	Resistor - 500 ohms 1 Wa
78A-78B	118216	BO-161513	Volume control with sw
79-80-81-82	118225	BO-161473	Condenser - .5 mfd. 600
83	118332	BO-161474	Condenser - temperature compensating
84	118485	BO-161475	Condenser - 4 mfd. 200 electrolytic

HUDSON MOTOR CAR CO.

MODEL DB40
MODEL SA40
Alignment, Trimmers
Changes, Notes

LOW SENSITIVITY

In cases of low sensitivity not traceable to weak tubes or defective parts, check the setting of the antenna trim- tenna other than the 80 mmfd. condenser recommended, the setting of this condenser will be off considerably.

In all cases, the trimmer should be adjusted to the regular car aerial. Install the set in the automobile and connect it to its antenna. Do not mount the control unit, but place it in some accessible place. Tune in a weak station, near 1400 KC, remove the plug button covering the antenna trimmer from the case, and adjust this trimmer for maximum volume.

Another possible cause of low sensitivity is mis-alignment of the I. F. transformers caused by the upper and lower units being aligned at different times, since one I. F. trimmer is on the control unit and the balance are in the lower unit. To correct this, realign both units of the receiver as described under "Alignment Procedure".

REPLACING TUBES IN CONTROL HEAD

1. Remove the two Phillips screws at the bottom of the instrument panel grill. Lift out the grill.
2 Remove the four machine screws holding the speaker plate.
3. Insert a screwdriver blade in the slot in the front of the control head and pry off the lower cover. This will give access to the 6A8 and 6SK7 tubes.

HUM

A possible source of hum difficult to trace, is caused when the lower end of the volume control accidentally becomes grounded in the control unit, in addition to the ground which is made in the lower radio unit. Removing the accidental ground in the control head will clear up this difficulty.

IGNITION NOISE

If ignition noise is excessive, first make sure the installation man has performed all the operations described in paragraphs 20 and 21

Additional bonnet grounding strips (Stewart-Warner Part No. 118718, Hudson Part No. BO-161417) may be helpful in further reducing ignition interference. The best location for these can be determined by grounding the hood to the body at various points with a knife. If the grounding strip is located at a point 10½ inches from the center of the car, install an additional strip at a point 23¼ inches from the center as shown in Fig. B.

A change has been incorporated in the radios now being built to reduce ignition noise. This change can be made in the field by a radio service man if excessive noise is still encountered after following all previous instructions.

One antenna motor noise choke (Hudson Part No. BO-161580, Stewart-Warner Part No. 118726) is required and full instructions to make this change are given here.

INSTALLATION OF ANTENNA CHOKE

The antenna noise choke (Stewart-Warner Part No. 118726, Hudson Part No. BO-161580) is a single layer choke coil wound on a ceramic body which looks like an insulated resistor. It is to be installed inside the control unit in place of the resistor connected in series with the antenna lead on early sets. Later sets already have the choke.

Remove the top cover of the control unit. Check whether a resistor or small choke connects to the blue antenna lead. (See Fig. 1.) If it is a choke wound on a resistor body, the change has already been made. If you find a plain, insulated resistor connected to a terminal lug to which the blue wire from the antenna socket is connected, proceed with the change. This resistor has a value of 68 ohms and can be identified by its blue body, grey end and black dot.

Remove the resistor.

Remove the two screws holding the antenna socket to the case.

The antenna trimmer must now be connected to a different terminal on the antenna coil. This trimmer is the one which can be adjusted through the side of the case. A bare wire runs from the antenna coil terminal A, through the top trimmer lug to the control grid of the 6SK7 tube.

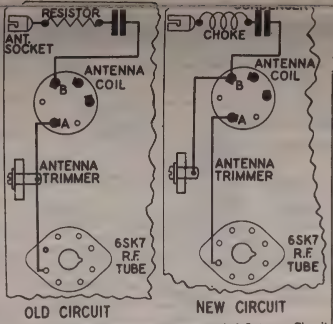


FIG. 1. Diagram Illustrating Recommended Antenna Circuit Changes

Disconnect this wire from the antenna coil terminal and from the trimmer terminal. Slip a piece of spaghetti tubing over this wire and re-connect it to the same lug on the antenna coil. (Marked A in Figure 1.)

Connect the trimmer condenser to the antenna coil terminal nearest the corner of the chassis. (Marked B in Figure 1.) This is the terminal to which the antenna series mica condenser connects.

Replace the antenna socket using the two mounting screws.

Solder the choke to the terminals from which you removed the resistor (see Fig. 1).

Check to see that the wiring of the unit has not been pushed over so as to interfere with the dial drive cord.

After this change is made, it is absolutely essential to realign the antenna trimmer. This must be done with a signal generator and an 80 mmfd. condenser in series with the antenna lead and the signal generator. **If any other capacity is used, adjustment will be incorrect.**

The antenna trimmer can and should be aligned to the regular car aerial. To do this we suggest connecting the radio in the car so it will operate but without mounting the control unit in place on the instrument panel. Arrange it so you can get at the antenna trimmer easily. Tune in a weak station near 1400 kc. on the dial and adjust the antenna trimmer for maximum volume.

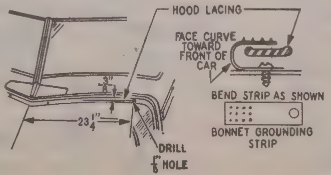


Fig. B. Bonnet Grounding Strip Mounting Details

ALIGNMENT PROCEDURE

For alignment an output meter and accurately calibrated signal generator are required.

condenser. The more sensitive type of meter should be connected across the voice coil.

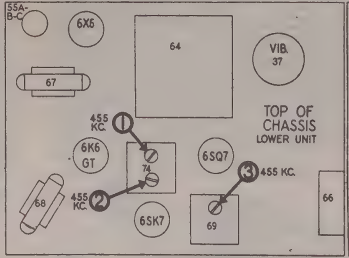
2. Remove only the top cover of the lower unit and the bottom cover of the control unit.
3. Connect the ground lead of the signal generator to the receiver chassis and leave it connected in this manner through the entire alignment procedure.
4. Turn the volume control to maximum volume position and leave it throughout the entire alignment procedure.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GEN. OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8	455 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I.F. LOWER UNIT	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3	1st I.F. LOWER UNIT	
				4	1st I.F. CONT. UNIT	
80 MMFD. MICA CONDENSER	ANTENNA CONNECTION ON SET	1580 KC.	SET SO THAT GANG COND. IS ENTIRELY OUT OF MESH	5	OSCILLATOR (SHUNT) CONDENSER	CAREFULLY ADJUST FOR MAXIMUM OUTPUT.
80 MMFD. MICA CONDENSER.	ANTENNA CONNECTION ON SET	1400 KC.	ACCURATELY TUNE TO 1400 KC. GENERATOR SIGNAL	6	ANTENNA (SHUNT) CONDENSER UNDER PLUG BUTTON ON END OF CONTROL UNIT	ADJUST FOR MAXIMUM OUTPUT.
80 MMFD. MICA CONDENSER	ANTENNA CONNECTION ON SET	600 KC.	TUNE TO 600 KC. GENERATOR SIGNAL	7	OSCILLATOR (SERIES) CONDENSER	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL.

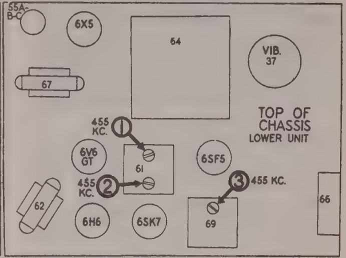
Now repeat adjustments made on trimmer numbers 5, 6 and 7.

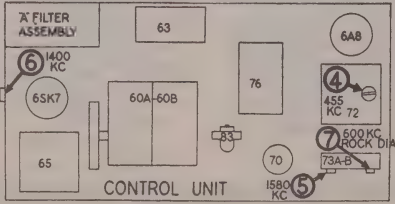
After the set has been installed in the car, tune in a fairly weak station near 1400 KC, and adjust trimmer No. 6 under the plug button on the end of the control head until maximum volume is obtained.

MODEL SA-40



MODEL DB-40





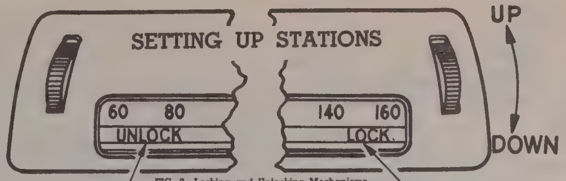


FIG. 2. Locking and Unlocking Mechanisms

TO UNLOCK: Turn Manual Tuning Control DOWN about 70 to 100 strokes AFTER word UNLOCK appears. Turn until control turns hard after turning easily. NEVER FORCE CONTROL AFTER THIS POINT IS REACHED.

TO LOCK: Turn Manual Tuning Control UP about 70 to 100 strokes AFTER word LOCK appears. Turn until control turns hard after turning easily. NEVER FORCE CONTROL AFTER THIS POINT IS REACHED.

The new Hudson Feathertouch Control can be set to stations without any tools. This design has a tremendous advantage over other types of tuners, in that any button can be set to any station. The buttons can be set in any order and one or more buttons later reset without changing the settings of the remaining ones.

IMPORTANT PRECAUTION: In order to assure perfect results you must observe all instructions. One very important precaution during set-up is to never touch a button already set while control unit is unlocked. For example, if some buttons are set and while working on the remainder you accidentally touch one already set, the setting on this button will change. This will necessitate resetting of the button accidentally touched

HOW TO SET UP PUSH BUTTONS

(a) Operate set for about ten minutes before setting up buttons.
(b) TO UNLOCK TUNING MECHANISM: Rotate right (tuning) control downwards until word UNLOCK shows at the left side of dial. Continue to turn until wheel tightens. (70 to 100 strokes will be required). A more complete description of this procedure, is given below under the heading "Unlocking Tuning Mechanism."
(c) Tune in desired station with (tuning) control.
(d) Hold down the button selected and move tuning control up and down leaving it in position where tone is deepest. Release button.
(e) Follow same procedure for other buttons. IMPORTANT: After setting any button, it must not be touched until after mechanism has been locked as in (f). Otherwise it is necessary to reset it as in (c) and (d).
(f) LOCK TUNING MECHANISM: Rotate tuning control upwards until word LOCK appears at right side of dial. Continue to turn until wheel tightens (70 to 100 strokes will be required). A complete description of the locking operation is also given below.
(g) Insert station call letter tab in front of each button The tabs are inserted by flexing them and allowing them to snap into place in the buttons.

SETTING UP EARLY RADIOS

Some of the earliest radios produced require a slightly different set-up procedure than given above. This same procedure can be used on later sets though it is not necessary.

After unlocking the tuning mechanism, proceed as follows for each button:

1. Tune station in manually.
2. Now hold the manual tuning control and push the button to be set up **several times.**
3. After pushing and releasing button several times, hold button down and again tune station carefully by turning manual tuning control back and forth slightly.
4. Repeat for other buttons.

The essential difference between this procedure and the one given above is that the button is pushed and released several times in quick succession after desired station is tuned in but before final tuning adjustment is made.

UNLOCKING TUNING MECHANISM

In setting up this mechanism

The unlocking operation begins AFTER the tuning control is turned to the point where the word UNLOCK appears. To complete the unlocking operation, the tuning control must be turned quite a bit AFTER this point is reached. When unlocking begins, the tuning control may turn quite hard, but then it begins to turn quite easily. You must continue to turn it downwards until it again turns hard. Because of the high gear ratio, it may require 18 to 24 complete turns of the tuning control to reach this point. Since you can turn this control only a quarter of a turn at a time, it may require 70 to 100 strokes of the finger on the control to completely unlock the mechanism. The tuning control will NOT reach a definite stop when the mechanism is unlocked. However, when the control turns easily for quite a while, then turns harder, the unlocked position is reached. In this position the tuning control will spring back when you take your finger off after turning it. At this point, the tuning indicator will function if you turn the tuning control back (up). IMPORTANT: WHEN THIS POSITION IS REACHED, DO NOT FORCE THE TUNING CONTROL FURTHER DOWN.

LOCKING TUNING MECHANISM

The locking action begins when you continue to turn the tuning control upwards after the work LOCK appears.

The action is much the same as described under UNLOCKING and it will require as many turns of the tuning control to lock the mechanism as were needed to unlock it.

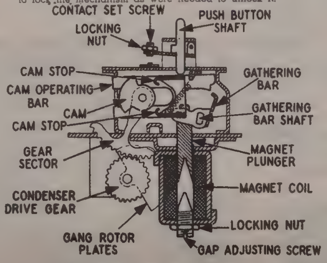


FIG. 3. Magnet Plunger in "OUT" Position

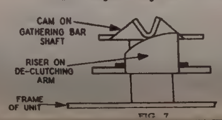


FIG. 7

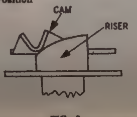


FIG. 8

HOW THE "FEATHERTOUCH TUNER" OPERATES

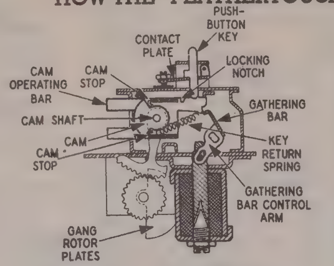


FIG. 4. Magnet Plunger in "IN" Position

Refer to Fig. 3 and Fig. 4. When a push button is depressed, it makes mechanical contact with the cam operating bar located under it, and depresses the bar so that the gathering bar can make contact with it. At the same time, the key forces the contact plate downward, making electrical contact through the contact screw. When the contact screw makes contact, it energizes the winding of the magnet assembly causing the plunger to be drawn completely into the magnet as shown in Fig. 4. The plunger is mechanically coupled to the gathering bar and gathering bar shaft, so that when the plunger is drawn into the magnet, it causes the gathering bar to be forced ahead. The gathering bar engages the cam operating bar which is depressed by the push button key and drives it forward as shown in Fig. 4. This position of the cam operating bar is indicated by the ends of the cam operating bar extending from the mechanism frame (see Fig. 6). When the cam operating bar moves forward, the cam stops attached to the bar, engage the cam, rotating it until it is in the position indicated in Fig. 4. The rotation of the cam causes the cam shaft and gear segment to rotate likewise, rotating the gang condenser to a position corresponding to the station to which this particular key is set.

HOW THE "LOCKING-UP" MECHANISM WORKS

The cam shaft assembly consists primarily of a shaft on which five cams are alternately spaced between friction collars. On the clutch end of this bar is a short threaded section upon which screws the collar which is part of the clutch and clutch spring assembly. When the cams are locked, this threaded collar is turned upon the threaded section of this cam shaft, exerting pressure upon the cams and friction collars, thus locking them securely in position. When the cams are unlocked, this threaded collar is turned so as to unscrew it and exert a minimum of pressure on the cams and friction collars. The only pressure then exerted upon the cams to hold them in position is that exerted by a spring washer near the threaded end of the shaft. Thus the cams are held so they cannot move of their own accord, but are still loose enough to permit them to be set to correspond to the desired station.

The threaded collar is connected through the clutch to the manual tuning control, permitting adjustment of the cams from outside the tuning unit.

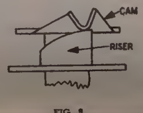


FIG. 9

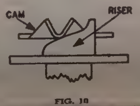


FIG. 10

OPERATION OF CLUTCH AND DE-CLUTCH ARM

The clutch mechanism of this tuner (see Fig. 6) functions every time a push button is depressed. Its purpose is to de-couple the manual tuning control and its associated gears from the automatic portion of the tuner when tuning electrically The clutch is a dual unit, providing positive mechanical coupling between the manual tuning gears and the cam shaft, and it also has a leather friction disc which operates in conjunction with the positive coupling element to remove excessive backlash when tuning mechanically

When the plunger is drawn into the magnet, turning the gathering bar shaft, the cam attached to the shaft (Fig. 6) moves downward on the riser of the de-clutch arm, releasing the pressure on the de-clutch arm, which bears against the inside section of the clutch. When this pressure is released, the clutch return spring contracts, separating the two halves of the clutch, thus disengaging the manual tuning gears

When the push button is again released, allowing the plunger to be withdrawn from the magnet, the cam on the gathering bar shaft moves upward on the de-clutch arm riser, again exerting pressure on the de-clutch arm, and in turn on the clutch, thus engaging the two clutch sections, and making manual tuning possible.

BINDING BETWEEN SECTOR AND PINION GEARS: Excessive friction between these gears can be reduced by changing the position of the pinion gear so that the set screw indicated in Fig. 6 points upward when the gang is completely closed. (See Fig. 6). This draws the pinion gear slightly farther away from the gear sector, reducing the pressure between them.

COUNTER-WEIGHT STRIKES CASE: Should the gang counter-weight strike the wrap-around case, loosen the four screws holding the tuning mechanism to the chassis and shift the tuning mechanism slightly so counter-weight clears case. Keep in mind that the case side may be pulled in slightly when the cover is put on. If the case is warped inward, bend it slightly outward till counter-weight does not strike it.

SLIPPING CLUTCH (BACKLASH)

A slipping clutch is indicated by excessive backlash during manual tuning. First check to see that the correct plunger return spring is used.

The correct type of spring may be determined from the following table giving the dimensions of the three types of springs which have been used.

	Number of Turns	Length of Body	Overall Length	Outside Diameter
CORRECT SPRING	36	7/8"	1 3/8"	7/32"
LIGHT SPRING	34 or more	5/8"	1 1/4"	3/16"
HEAVY SPRING	24	13/16"	1 5/8"	9/32"

If the unit has the light or heavy spring, replace it with correct one (Stewart-Warner Part No. 118154, Hudson Part No. BO-161529). When changing springs, it is also desirable to replace the magnet assembly if it does not have the Locking Nut and Gap Adjusting Screw shown in Fig. 6. However, this is only necessary when there is insufficient pull of the solenoid to operate the mechanism.

Next check the position of the cam on the end of the gathering bar shaft (copper plated shaft) with relation to the riser of the de-clutch arm **while the plunger is out.** See Fig. 6 and Fig. 7. The cam should be halfway up the curved portion of the riser as shown in Fig. 7.

If the cam is not halfway up the riser while plunger is out, as shown in Fig. 7 loosen the two Bristol set screws in the retaining collar on the other end of the gathering bar shaft and move the retaining collar on the shaft until the cam is properly positioned on the riser. A special set screw wrench (Stewart-Warner Part No. 112484) is needed to fit the Bristol set screws.

In all cases where slipping clutches are reported, check to see that there is no excessive friction in the gang condenser

HUDSON MOTOR CAR CO.

MODEL DB40
MODEL SA40
Tuner Assembly
Notes

TUNER TROUBLES AND REMEDIES

SET TUNES IMPROPERLY

the set-up of the various buttons. If the set-up is incorrect, the set will tune consistently to the same point, and this condition can be remedied by resetting the buttons.

If the set will not tune in stations, although the plunger tends to move, make sure the Bristol headed set screws in the retaining collar are tight. This is the collar which is almost touched by the condenser drive gear sector when the condenser plates are unmeshed. A loose set screw may strike the unit frame, causing the plunger to stick in either the IN or OUT position.

If the set fails to tune properly, and the dial stops at different points when approaching the station from opposite ends of the dial the mechanism may not be properly locked up (see "Locking Tuning Mechanisms"). The next step is to check for binding of the mechanism (see section on "Binding"). This trouble also may occur if the pulling force of the magnet is not great enough. This may occur when the battery voltage is low (below 5 volts). It may also be due to too large a gap between the plunger and the pole piece of the magnet assembly. On later sets the gap can be adjusted as described in paragraphs 5 and 6 of "Replacing Magnet Coil Assembly." The adjustable magnet assemblies are identified by the Gap Adjusting Screw and Locking Nut shown in Fig. 6.

In the early type of magnet assemblies, the gap is not adjustable. If one of these magnets is found to have insufficient pull, the remedy is installation of the new type magnet assembly. However, before replacing a magnet assembly, make sure that improper tuning is not due to low battery voltage or the other causes mentioned above

MECHANISM WHERE TUNING CONTROL FAILS TO REACH STOP DURING UNLOCKING

This is probably due to the shearing off of the "C" washer on the clutch end of the cam shaft (See Fig. 6.) On the earlier mechanisms, this "C" washer holding the clutch and gear assembly to the shaft was made of a fairly soft steel. Occasionally these washers may shear off if the customer continues turning the tuning wheel after the mechanism has become completely unlocked. This continued turning forces the gear and clutch assembly against the "C" washer, shearing it off completely. You can replace this washer with the new hardened washer (Stewart-Warner Part No. 118676, Hudson Part No BO-161579). This can be done without removing the tuning unit from the case. First lock the mechanism, then remove the nuts holding the triangular plate on the clutch end of the tuner. Unhook the plunger return spring so that no pressure will be exerted by the clutch. The washer can now be removed and a new washer installed.

On all early sets, replace this "C" washer even if the old one is still all right.

Shearing or partial shearing of this washer may cause slipping of the clutch or sticking of the plunger in the OUT position.

If a bronze washer is present between the "C" washer and the gear, remove it and discard it If a steel washer is present, it must be left in place. On early mechanisms, a $\frac{1}{32}$" steel washer was used in this position and it must be left in place.

BINDING

If the radio tunes improperly, check for binding in the dial and tuning mechanisms. Below are enumerated some of the reasons for binding:

RUBBING LIGHT DIFFUSION PLATE: Two types of light diffusion plates were used, the new type being riveted to the cover, while the old type is mounted on the unit itself. (See Fig. 5) If the new type light diffusion plate, which is mounted in the cover of the control head rubs against the dial scale due to warping of the celluloid, cut this plate as shown by the shading in Fig. 5 This can be done without removing the shield from the cover. In some early units, this diffusion plate was mounted on the unit itself In this case, enlarge the notch fitting over the dial lamp wire as shown in Fig 5. Exercise care when enlarging the notch, as the celluloid is quite brittle and may break. Then cement the that the shield rests flat against this metal plate.

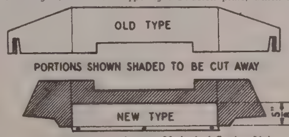


FIG. 5. Illustration Showing Method of Cutting Light Diffusion Plate

ENDS OF DRUM RUBBING BRACKETS: The dial drum should have a slight amount of end play. If it doesn't, it may be binding. This may be due to improper placement of the volume control mounting bracket. To correct this difficulty loosen the two screws holding this bracket and move this bracket slightly farther away from the drum.

Similar binding may also be due to a loose end cap on the dial drum. In this case, force the cap back on the drum and punch-mark the cap to hold it in place on the dial drum.

In a few cases it may be found that dial end bearing is out of line or slightly off center. The bearing can generally be bent slightly to restore it to its proper position. If this cannot be done, replace the dial scale assembly.

Binding of the drum on the mounting brackets may be due to the fact that the control units fitted too tightly in early cars. This causes the escutcheon to be forced sideways, thus pressing on the tuning controls, which may move the dial drum brackets. This binding can generally be eliminated by bending the brackets slightly outward.

Similar difficulties will be encountered if the control head is not properly installed. When mounting the head, tighten the wing nuts evenly, so the control head will not have a tendency to bind against the dash opening, which would push the escutcheon against the controls.

DRIVE PULLEY STRIKING ANTENNA COIL SHIELD: Check to see that the dial drive pulley is properly located on condenser shaft. Its bushing should touch the condenser pinion gear.

Also, the antenna coil shield can may be moved slightly away from the drum by loosening the two nuts holding down the can.

It may also be possible to move the entire tuning unit slightly away from the shield can. Loosen the four screws holding down the unit and shift it.

CHASSIS WIRING IMPROPERLY PLACED: If the leads from the on-off switch and other leads in the vicinity of the "A" filter assembly are not properly located, they may interfere with free motion of the dial cord or the condenser drive gear sector Dress these leads so that they cannot touch these moving parts.

STICKING MAGNET PLUNGERS

If the automatic tuning mechanism does not operate but manual tuning is possible, the plunger may be stuck in the OUT position, (See Fig. 3). If manual tuning control turns easily but does not tune stations, the plunger may be stuck in the "IN" position (See Fig. 4). A loose set screw on the retaining collar on the gathering bar shaft, may strike the frame and cause the plunger to stick so check the set screws first.

If the plunger sticks when the plunger is all the way in, it is sticking against the conical pole piece of the magnet assembly

On the later sets, the gap between the plunger and the pole piece is adjustable. Adjustable magnets are identified by the gap adjusting screw and locking nut on the end of the magnet assembly. (See Fig. 6.) In these sets, loosen the locking nut on the rear of the magnet and turn the gap adjusting screw outward (counter-clockwise) one-half turn, and re-tighten the locking nut. If this sticking occurs in early units, replace the magnet with the newer type assembly. Read the paragraph "Replacing Magnet Coil Assembly" for instructions for replacing and adjusting the magnet assembly.

The plunger may stick in the OUT position, if the "C" washer on the clutch end of the cam shaft (Fig. 6) is totally or partially sheared off. Check this washer, and if found defective, replace with the hardened type of washer, (Stewart-Warner Part No. 118676, Hudson Part No. BO-161579), See Fig. 6 of page 14. A faulty "C" washer allows the plunger to come out too far, and also allows the cam to reach a position too high on the de-clutch arm riser (See Fig. 9)

After checking the "C" washer, check the adjustment of the cam on the riser, as explained under "SLIPPING CLUTCH".

If the cam is too far up on the riser (See Fig. 9) it lets the plunger come out of the magnet too far and this may cause sticking. If the cam is not far enough up on the riser (See Fig. 8) the clutch may slip.

If the position of the cam is correct as shown in Fig. 7 but the plunger still sticks loosen the two screws holding down the magnet and shift it slightly until the plunger moves freely, then retighten the screws. If this does not clear up the difficulty, replace the entire magnet assembly

REPLACING MAGNET COIL ASSEMBLY
(Stewart-Warner Part No. 118177, Hudson Part No. BO-161517)

To replace a magnet coil assembly, proceed as follows:

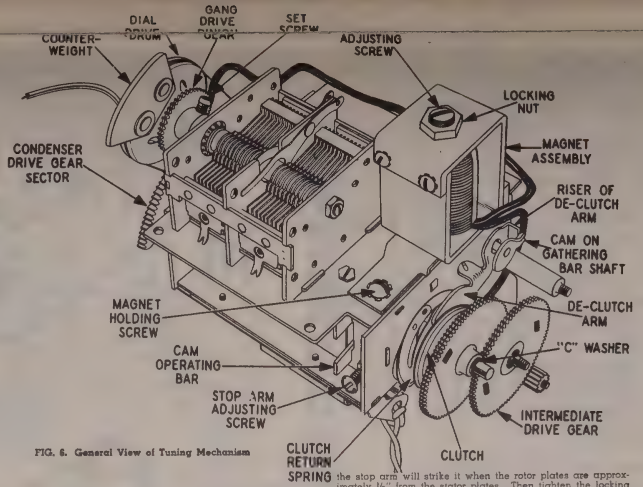


FIG. 6. General View of Tuning Mechanism

1. Remove top and bottom covers of tuning unit. Unsolder red and black magnet wires from points to which they connect.
2. Take out two round headed screws holding magnet to mounting plate
3. Lift off old magnet assembly and install new assembly.
4. When replacing this magnet assembly, before tightening the screws holding down the unit, check to see that the plunger moves freely inside the magnet coil. If it has a tendency to bind, shift the position of the magnet slightly, until the plunger moves freely, then tighten down the holding screws
5. It is now necessary to set the large adjusting screw on the top of the new magnet. Loosen the nut and turn the screw out several turns. Now push down one of the push button shafts next to the drum dial. Then with a screwdriver, push the plunger into the magnet as far as it will go.
6. While holding the plunger in **very tightly**, you can now release the push button shaft and turn the magnet adjusting screw in, until you feel the screw striking the plunger.

   When this happens, back the screw out one complete turn and retighten the locking nut. **This adjustment must be made very carefully since if the threads are tight, it is difficult to notice the exact point where the screw strikes the plunger.**

IMPORTANT: To get proper adjustment, a push button shaft must be depressed before pushing in the plunger so that the plunger operates the tuning mechanism as indicated by one of the cam operating bars extending from the frame (Fig. 6). If the above adjustment is done while the power is on the unit, the plunger will pull in by itself as soon as you depress one of the push button shafts. It is then merely necessary to hold the plunger in tightly with a screwdriver and **release the push button shaft.** The adjustment can then be made.

STOP ARM ADJUSTING SCREW

The function of this screw (Fig. 6) is to prevent damage to the gang condenser plates when the rotor plates are fully opened. This screw is adjusted so that the stop arm on the cam shaft will strike it just before the gang condenser plates open so far as to strike the stationary plates. Set this screw so the stop arm will strike it when the rotor plates are approximately ⅛" from the stator plates. Then tighten the locking nut so as to hold the screw in this position.

There is also a fixed stop whose purpose it is to stop the condenser plates just before they strike the fixed plates when the plates are fully meshed. This fixed stop is part of the frame assembly. When the gang condenser or any of its associated parts are replaced or otherwise adjusted, before tightening the set screws holding the condenser drive pinion gear to the shaft, set the rotor plates so that their upper edges are flush with the top edges of the stator plates. Then turn the condenser drive gear segment until the stop arm on the cam shaft strikes the fixed stop on the frame, then tighten the set screws When this adjustment is properly made, and when the stop arm adjusting screw is correctly set, no strain is put on the rotor plates of the condenser in either the open or closed position of the gang condenser.

ADJUSTMENT OF CONTACT SCREW

The contact screw, once properly set, seldom requires re-adjustment. Improper adjustment may be identified by the following symptoms:

CONTACT SCREW TOO FAR IN: When a push button key is depressed, the magnet will operate, but the cam operating bar may not be pushed through as shown in Fig. 6.

CONTACT SCREW TOO FAR OUT: This may permit the push button key to exert too much pressure on the cam operating bar and cause it to stick.

Chattering of the mechanism may be caused when the screw is either too far in or too far out. Adjust the screw until the unit operates properly when any one of the push buttons is depressed.

POSITION OF GANG CONDENSER COUNTER-WEIGHT

Refer to Fig. 14. The purpose of the counter-weight shown in this illustration is to counter balance the weight of the gang condenser. To function properly, the weight must be in the position illustrated in Fig. 14 when the gang condenser is closed. When the weight is in this correct position the edge of the weight nearest the set screw is approximately straight up and down with the gang condenser fully meshed. When replacing the dial drive drum, always check to see that this weight is in the position described above, or the tuning unit may not operate satisfactorily.

REMOVING TUNING UNIT CHASSIS FROM CASE

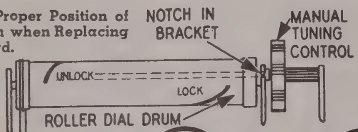
1. Pry off bottom cover, utilizing screwdriver slot at front of case.
2. Remove four self-tapping screws holding down top cover and pry cover off.
3. Unsolder the blue wire extending from the on-off switch to the "A" choke assembly.
4. Remove two screws holding antenna receptacle to case. Also remove the screw holding down the cable grounding plate. Then remove four screws holding chassis assembly to case.
5. The entire tuning unit chassis can now be lifted from the case.

REMOVING TUNING MECHANISM FROM CHASS

1. Unsolder the green-white and the white wire from gang condenser.
2. Unsolder brown cable wire from low end of volu control.
3. Unsolder gray rubber covered shielded wire (2 cop tracers) from center terminal of volume control.
4. Unsolder gray rubber covered shielded wire (1 cop tracer) from high end of volume control.
5. Unsolder blue wire from on-off switch on volume contr Also unsolder shielding from volume control bracket.
6. Unsolder 2 blue pilot light wires at 6A8 socket.
7. Unsolder ground of .05 mfd. condenser from frame tuning mechanism. Mechanism can now be lifted out

HOW TO REPLACE THE DIAL DRIVE CORD

FIG. 11. Proper Position of Dial Drum when Replacing Drive Cord.



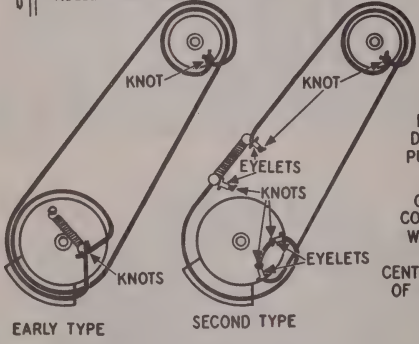


FIG. 12
Early Type
Dial Drive System

FIG. 13
Second Type
Dial Drive System

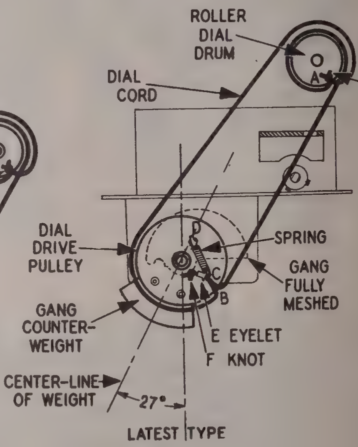


FIG. 14
Details of Latest Type
Dial Drive Systems

Three dial drive systems are illustrated here. The method marked "Second Type" (Fig. 13) can be used in sets originally using the "Early Type" (Fig. 12). The second type is preferable to the early type.

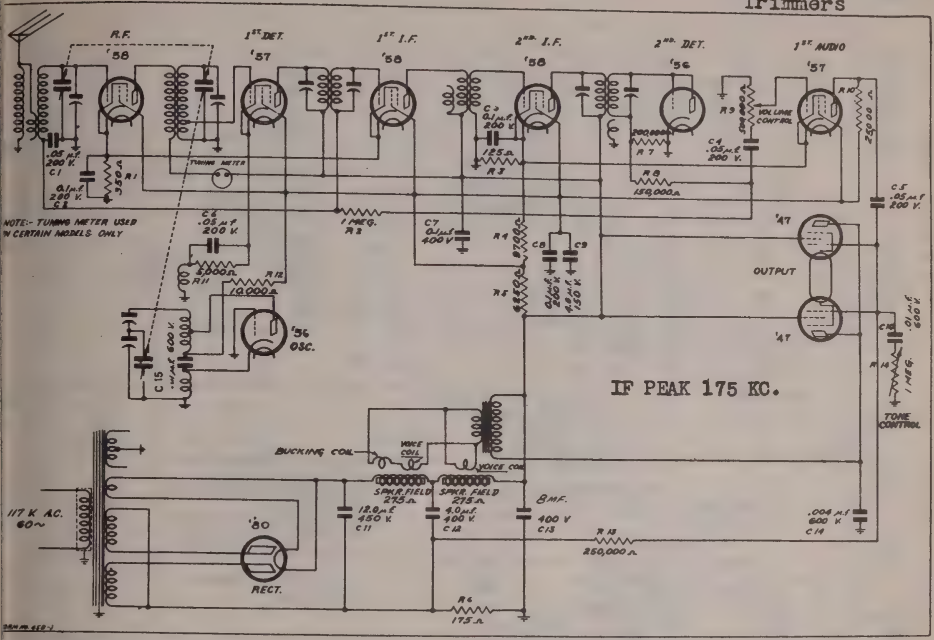
The method marked "Latest Type" (Fig. 14) is the best but uses a different Dial Drive Pulley. Therefore early type or second type drives **cannot** be restrung as shown for latest type unless a new Dial Drive Pulley (Stewart-Warner Part No. 118176, Hudson Part No. BO-161539) is installed.

The dial cord in the latest type dial drive can be replaced as follows:

1. Remove chassis from case as described on this page.
2. Remove the antenna coil shield can by removing the two nuts holding it to the chassis. This will give access to the dial drive drum.
3. Refer to Fig. 11. Rotate the dial so the word "UNLOCK" is directly in line with the reference notch in the right hand dial support bracket. Block the dial in this position, using a small block of rubber or other soft material which will not mar or damage the dial.
4. Rotate the gang condenser so its plates are fully meshed. (See Fig. 14.) Keep the gang in this position until the dial cord has been replaced.
5. About 26 inches of dial drive cord (Stewart-Warner Part No. 113178, Hudson Part No. BO-158521) are required. Tie a large knot in the center of this dial cord.
6. Pass both ends of the cord outward through hole A i the roller dial drum. (Fig. 14.)
7. Pass one end of the dial drive cord clockwise aroun the roller dial drum, through the hole in the suppo bracket and through hole B in the dial drive pulley.
8. Pass the other end of the cord counter-clockwise aroun the roller dial drum, counter-clockwise around the dic drive pulley and inward through hole B in the dial driv pulley.
9. At this point, make sure that the gang is fully meshec that the counter-weight is in the proper position, and th dial is in the position shown in Fig. 11. Otherwise cali bration will be incorrect.
10. Tie a spring to the ends of the dial drive cord inside th dial drive pulley so that the cord extends about 3/8 incl inside the pulley when the cord is pulled taut. See Fig 14. This illustration shows the recommended method o fastening the spring using an eyelet. Fasten the othe end of the spring to the tab D on the pulley. The sprinc should be stretched only very slightly when in place Too much spring tension may cause binding.
11. Remove the material used to hold the dial in position as described in Step 2. If the above procedure has beer followed, the calibration of the dial will be correct wher the unit is replaced in the case.

MODEL C-10 Late
Schematic, Voltage
Alignment, Socket
Trimmers

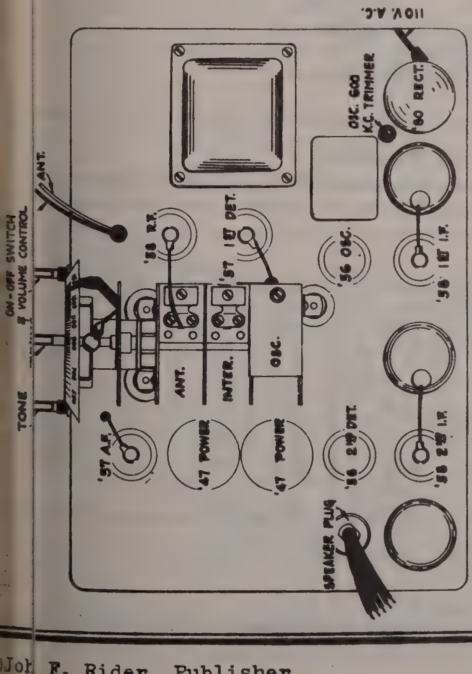
LAFAYETTE RADIO MFG. CO.



S the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tub through a .05 mfd. condenser. Turn the tuning conden r rotor until the plates are completely out. The gro d lead from the signal generator goes to the ground lea of the receiver. Then adjust the four intermediate fre ency condensers for maximum output. The adjusting scre s for these condensers are reached from the bottom of e chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.



Voltages at Sockets

LINE VOLTAGE, 115 — ANTENNA LEAD SHORTED TO GROUND

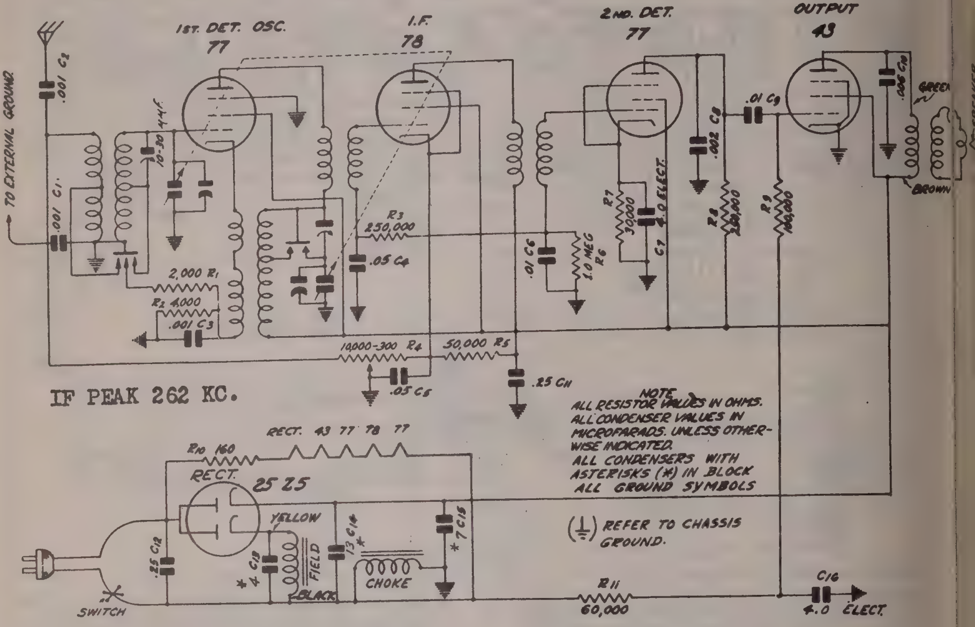
Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
58	R.F.	2.4	275	100	4.2(1)	5.2
57	1st Det.	2.4	265	99	5.4	.9
56	Osc.	2.4	28		0	8.6
58	1st I.F.	2.4	275	100	4.2(1)	5.2
58	2nd I.F.	2.4	275	102	3.0	8.5
56	2nd Det.	2.4	0		0	0
57	1st Audio	2.4	12	102	3.0(1)	1.8
47	Output	2.4	265	280	18.5(2)	30.0
80	Rect.	4.9				55.0 per plate

(1) Measured from cathode to ground.

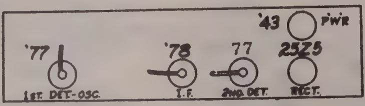
(2) Measured across Resistor R6.

MODEL L-20,Nomad
Schematic,Voltage
Socket

LAFAYETTE RADIO MFG. CO.



IF PEAK 262 KC.



Voltages at Sockets

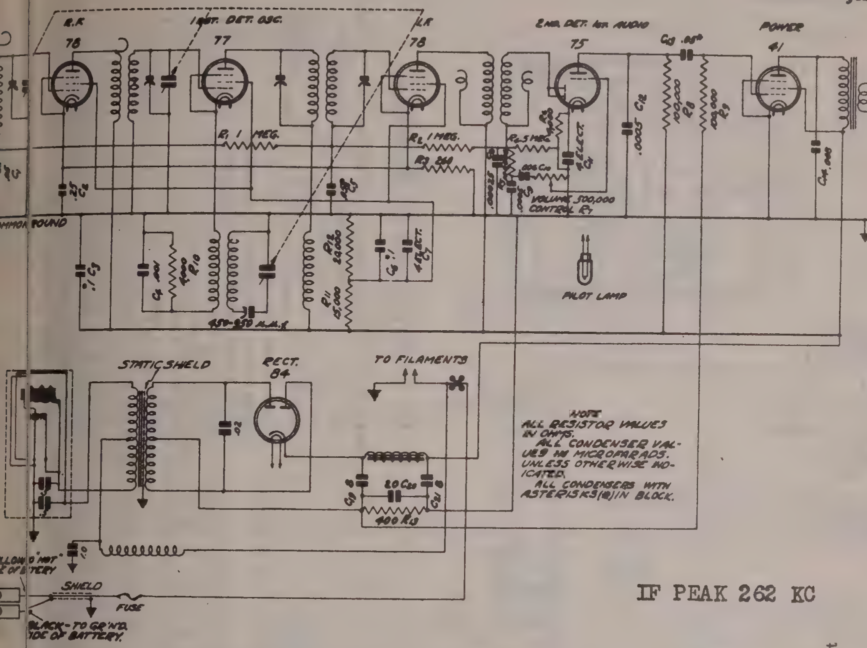
Antenna lead connected to ground lead (not external ground).—Volume Control at Maximum.
CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

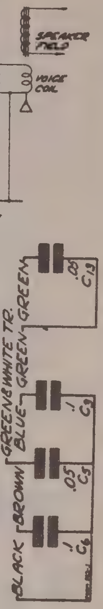
		A.C. Line Voltage—115 Use High Resistance A.C. Meter, Rectifier Type, for Heater Voltage Measurements					D.C. Line Voltage—110 Use High Resistance D.C. Meter for Heater Measurements			
Type of Tube	Function	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode
77	1st Det. Osc.	5.8	106	106	5.2	.8	5.6	87	87	4.3
78	I F.	5.8	108	108	3.0(1)	7.4	5.6	88	88	2.4(1)
77	2nd Det.	5.8	65(2)	104	6.0(3)	.14	5.6	58(2)	82	5.0(3)
43	Output	24.	95	110	18.0(4)	22.0	23.0	80	90	15.0(4)
25Z5	Rect.	24.	110 } (5) 155 }			84.0 Total	23.0	5.0 } (5) 6.0 }		

(1) Cathode to Ground.
(2) With 1,000,000 ohm meter—reading will be lower with lower resistance meter.
(3) Cathode to ground—read with 100,000 ohm meter.
(4) Read across filter choke.
(5) Readings from plate to two cathodes with 250,000 ohm meter

LAFAYETTE RADIO MFG. CO.

MODELS L-22,L-23
Schematic,Voltage
Socket,Alignment





Condenser Block—Internal Wiring

IF PEAK 262 KC

Typ of Tub	Function	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
78	R. F.	6.1	182	80	3.(1)	7.0
77	1st Det. and Osc.	6.1	178	77	5.(2)	1.3(2)
78	I. F.	6.1	182	80	3.(1)	7.0
75	2nd Det. 1st Audio	6.1	70(3)		1.4(1)	.35
41	Output	6.1	172.5	176.5	12.5(4)	16.0
84	Rect.	6.1	205			17.5 per plate

atho to Ground
ubje to Variation
riode Plate to Cathode
ead ross 400-Ohm Resistor, R13

a .05 mfd. condenser. The ground lead of the generator plates of the tuning condenser completely out and keep the signal weak enough to prevent A.V.C. action. Note from Fig.10 that the second I.F. transformer is self tuned and cannot be adjusted. Adjust the frequency of the signal generator until the output meter shows maximum output. The intermediate frequency setting of the generator is then correct, although it may be a very small percentage higher or lower than 262 K.C.

Next connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Then adjust the two intermediate frequency condensers for maximum output. One of the I.F. condenser screws is reached through the hole on the top of the 1st I.F. assembly can. The other I.F. condenser screw is reached from the bottom of the sub-panel through a hole at the bottom of this assembly.

Now set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the generator is, in this instance, connected to the antenna lead of the receiver. Connect the flexible drive shaft to the chassis if it has been disconnected. As explained previously, the dial scale should be at the low frequency end stop when the rotor is completely in mesh. Then turn the station selector knob until the dial scale is at 1400 K.C.

Then adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator section first.

Next, set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached through a hole in the back wall of the sub-panel.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

Trying Out the Set and Adjusting

After the wiring has all been completed and before the chassis is permanently installed, try out the set and adjust the antenna trimmer. The location of the tubes is shown in Fig. 8. To adjust the antenna trimmer, tune in a weak signal between 1200 and 1400 K.C. with the volume control about three-fourths on. On one end of the chassis box are two small metal plates. Remove the smaller of these two plates. Directly under the hole in the chassis box is the antenna trimmer condenser screw. Turn this adjusting screw up or down until maximum output is obtained.

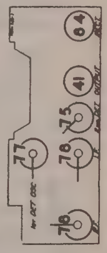
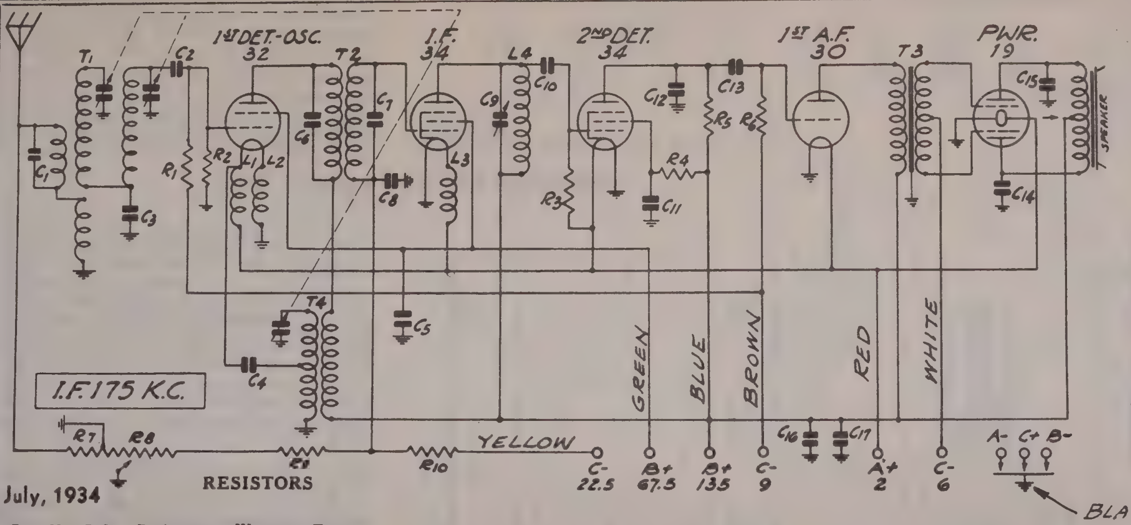


Fig. 8—Location of Tubes

MODEL B-61
Schematic, Voltage
Socket, Resistance

LAFAYETTE RADIO MFG. CO.



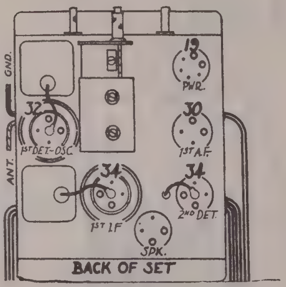


Fig. 1—Schematic Circuit Diagram.

July, 1934

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A94505	R1	5 Megohm	0.2	Carbon
P-A94105	R2	1 Megohm	0.2	Carbon
P-A94205	R3	2 Megohm	0.2	Carbon
P-B94104	R4	100,000 Ohm	0.5	Carbon
P-B94403	R5	40,000 Ohm	0.5	Carbon
P-A95105	R6	1 Megohm	0.2	Carbon
P-96001	R7 R8	3,000 Ohm 60,000 Ohm		Volume Control
P-A94901ww	R9	900 Ohm	0.2	Wire Wound
P-A94652	R10	6,500 Ohm	0.2	Carbon
*P-A94106	R1	10 Megohm	0.2	Carbon
*P-A94205	R2	2 Megohm	0.2	Carbon

*These resistors were used on first models.

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81812	C1	200 mmf		Wire—Part of Ant. Assem
P-81801	C2	35 mmf		Wire—Part of Ant. Assem.
P-80862	C3	0.05 mf	200V	Tubular
P-80862	C4	0.05 mf	200V	Tubular
P-80862	C5	0.05 mf	200V	Tubular
P-81806	C6	70 mmf		Wire
P-81804	C7	45 mmf		Wire
P-80862	C8	0.05 mf	200V	Tubular
P-1685	C9	70 ± 30 mmf		I. F. Trimmer
P-81800	C10	50 mmf		Wire
P-81045	C11	.0.25 mf	200V	Tubular
P-80863	C12	0.004 mf	600V	Tubular
P-80898	C13	0.006 mf	600V	Tubular
[illegible]	C15	0.01 mf	400V	[illegible]
P-80864	C16	0.1 mf	200V	Tubular

VOLTAGES AT SOCKETS

Volume Control at Maximum—Antenna Shorted to Ground
B+135 Volts
Voltages to Chassis

Type of Tube	Function	Across Fila-ment	Plate to Cath.	Screen to Cath.	Grid to Cath.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5(1) (2)	2.5
34	I. F.	2.0	135	67.5	2.5(3)	2.8
34	2nd Det.	2.0	50	40(1)	0	1.8
30	1st Audio	2.0	135		9(4)	3.0
19	Output	2.0	135		6	1.8

(3) With 25,000 ohm meter.

D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Item	Code	D. C. Resistance in Ohms
Double Tuned Ant. Coil Pri.	T1	19.2
Double Tuned Ant. Coil Sec. (Preselector)	T1	3.2
Double Tuned Ant. Coil Sec. (1st Det.)	T1	3.2
1st I.F. Coil Pri.	T2	90.0
1st I.F. Coil Sec.	T2	116.0
D Audio Input Trans. Pri.	T3	1010.
Audio Input Trans. Sec. Cent. Tap to outside end	T3	648.
Audio Input Trans. Sec. Cent. Tap to inside end	T3	588.
Oscillator Coil, Grid Winding	T4	4.1
Oscillator Coil, Plate Winding	T4	10.4
Double Filament Reactor Assem.	L1	.61
Double Filament Reactor Assem.	L2	.61
Single Filament Reactor Assem.	L3	.61
2nd I.F. Reactor Coil	[illegible]	[illegible]
to outside end		272.
6" Magnetic Speaker, Center Tap		

MODEL B-64
Schematic, Voltage
Socket

LAFAYETTE RADIO MFG. CO.

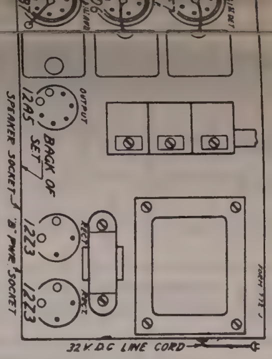


Fig. 2—Arrangement of Tubes

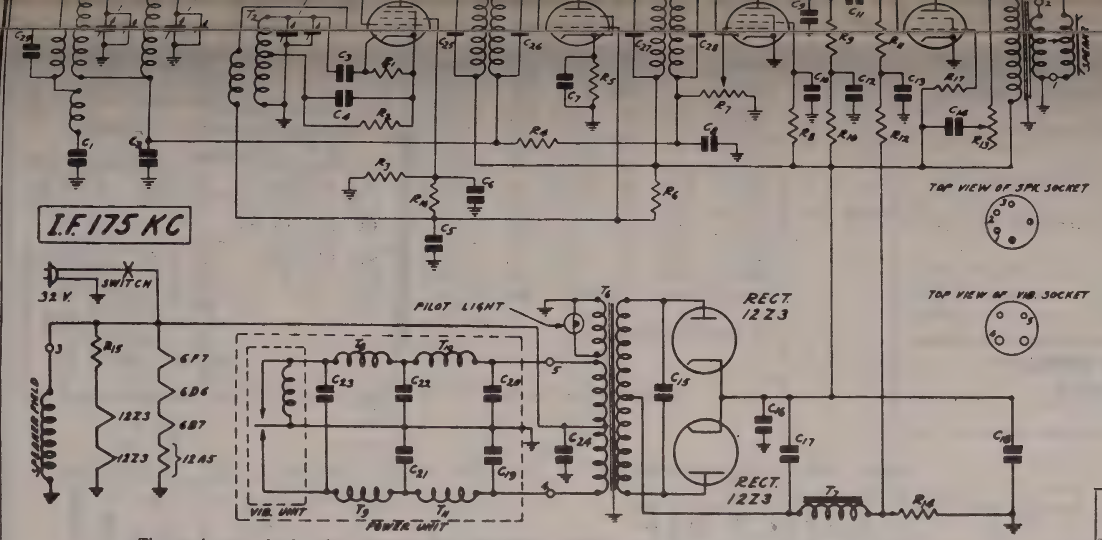
VOLTAGES AT SOCKETS

Input 32 Volts—Antenna Shorted to Ground

Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6F7	1st Det. & Osc.	6.3	167(1)	90	2.6	7.0(1)
			117(2)		0	2.8(2)
6D6	I. F.	6.3	172	120	3.2	8.2
6B7	2nd Det.	6.3	25	25	7.25	2.0
12A5	Output	12.6	180	180	25	32
12Z3	Rectifier	12.6	225			25

(1) Pentode Section of Tube

(2) Triode Section of Tube



The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown in the circuit.

Fig. 1—Schematic Circuit Diagram

Oct, 1934

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-80862	C1	.05 Mf.	200V	Tubular
P-80862	C2	.05 Mf.	200V	"
P-81801	C3	35 Mmf.		Wire Capacitor Part of Osc. Assem
P-80862	C4	.05 Mf.	200V	Tubular
P-80888	C5	.25 Mf.	200V	"
P-81049	C6	.05 Mf.	200V	"
	C7	.05 Mf.	200V	"
P-81811	C8	100 Mmf.		Wire Capacitor
P-81051	C9	.002 Mf.	600V	Tubular
P-80888	C10	.25 Mf.	200V	"
P-80872	C11	.01 Mf.	600V	"
P-80888	C12	.25 Mf.	200V	"
P-81062	C13	.01 Mf.	140V	"
P-81055	C14	.05 Mf.	400V	"
P-81052	C15	.015 Mf.	1600V	"
P-80887	C16	.10 Mf.	400V	"
P-81016	C17	8.0 Mf.	300V	Electrolytic Block
	C18	8.0 Mf.	300V	
P-80993	C24	.5 Mf.	140V	Tubular
P-81806	C25	70 Mmf.		Wire Capac. Part of 1st I.F. Assem.
P-81804	C26	45 Mmf.		Wire Capac. Part of 1st I.F. Assem.
P-81808	C27	90 Mmf.		Wire Capac. Part of 2nd I.F. Assem
P-81810	C28	100 Mmf.		Wire Capac. Part of 2nd I.F. Assem
P-81812	C29	200 Mmf.		Wire Capac. Part of Ant. Assem.
P-81015				Three Gang Condenser.

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A95104	R1	100,000 Ohm	.2	Carbon
P-A95152	R2	1,500 Ohm	.2	Carbon
P-B94303	R3	30,000 Ohm	.5	Carbon
P-A982[illegible]	R4	2 Megohm	.2	Carbon
P- 98021	R5	400 Ohm	.2	Wire Wound
P-C93702	R6	7,000 Ohm	1.0	Carbon
P- 96014	R7	500,000 Ohm		Volume Control
P-B94204	R8	200,000 Ohm	.5	Carbon
P-B94603	R9	60,000 Ohm	.5	Carbon
P-A95203	R10	20,000 Ohm	.2	Carbon
P-A95504	R11	500,000 Ohm	.2	Carbon
P-A94104	R12	100,000 Ohm	.2	Carbon
P- 97011	R13	150,000 Ohm		Tone Control
P- 98035	R14	450 Ohm	2.0	Wire Wound
P- 98034	R15	25 Ohm	3.0	Wire Wound
P-B95602	R16	6,000 Ohm	.5	Carbon

MODEL B-65
Schematic,Voltage
Socket

LAFAYETTE RADIO MFG. CO.

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A95104	R1	100,000 Ohm	.2	Carbon
P-A93803	R2	30,000 Ohm	.2	Carbon
P-A95104	R3	100,000 Ohm	2	Carbon
P-A93602	R4	6,000 Ohm	.2	Carbon
P-B93902	R5	9,000 Ohm	.5	Carbon
P-A95505	R6	5 Megohm	.2	Carbon
P- 96012	R7	1 Megohm		Volume Control.
P-A95505	R8	5 Megohm	.2	Carbon
P-A94603	R9	60,000 Ohm	.2	Carbon
P-A95104	R10	100,000 Ohm	.2	Carbon
P-A95104	R11	100,000 Ohm	.2	Carbon

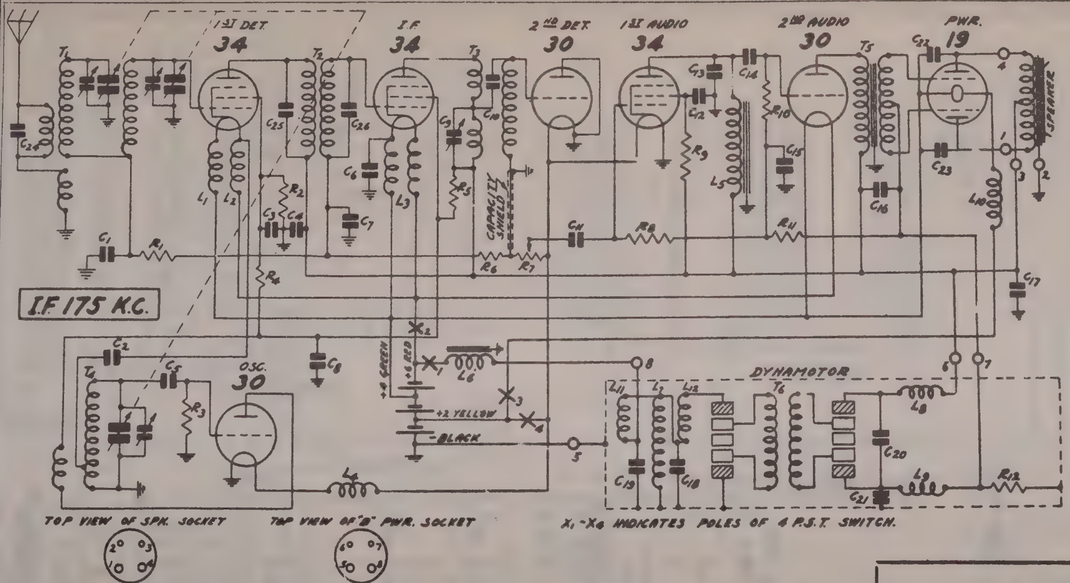


Fig. 1. Schematic Circuit Diagram

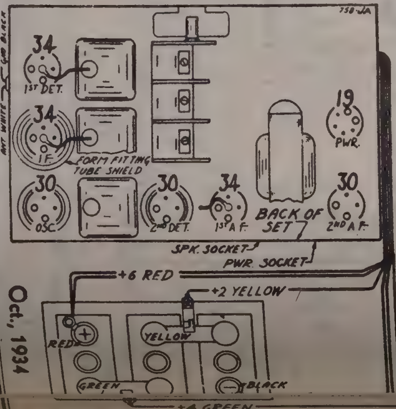
Voltages at Sockets

ANTENNA SHORTED TO GROUND

Type of Tube	Function	Fila- ment Volt.	Plate to Neg. Filament	Screen to Neg. Filament	Grid to Neg. Filament	Normal Plate M. A.
34	1st Detector	2.0	135	55	3.0 av.	1.90
30	Oscillator	2.0	75		0.0	3.70
34	I. F.	2.0	135	70	3.0 av.	3.00
30	2nd Detector	2.0	2			
34	1st A. F.	2.0	140	65	4.0	2.30
30	2nd A. F.	2.0	135		8.0	3.10
	Output		137			per plate

CONDENSERS

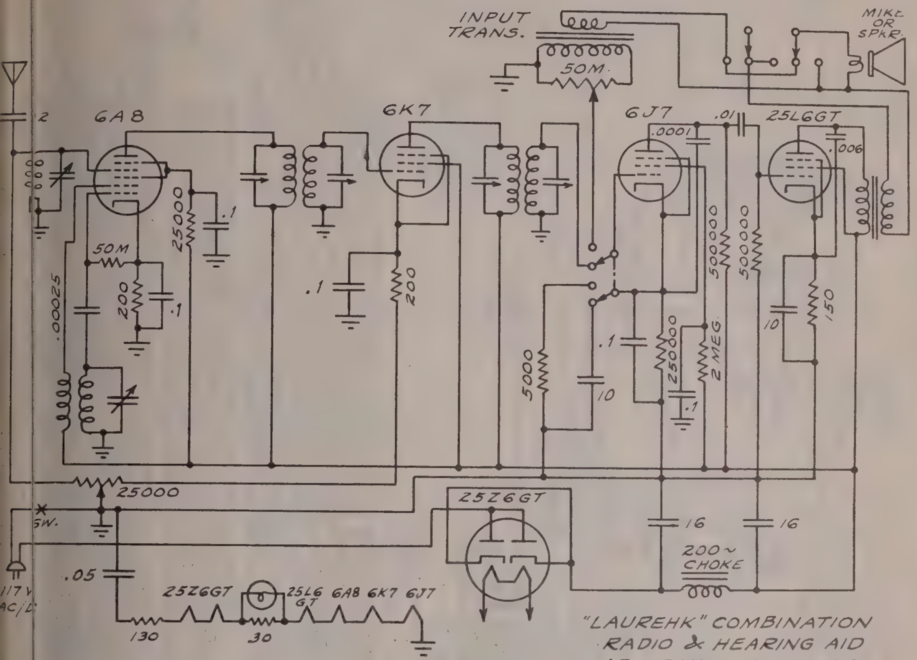
Part No.	Code	Capacity		Voltage	Type
P-80862	C1	0.050	Mf.	200V	Tubular
P-80862	C2	0.050	Mf.	200V	Tubular
P-80862	C3	0.050	Mf.	200V	Tubular
P-80864	C4	0.100	Mf.	200V	Tubular
P-81801	C5	35	Mmf.		Cap. Part of Osc. Coil Assem.
P-80888	C6	0.250	Mf.	200V	Tubular
P-80862	C7	0.050	Mf.	200V	Tubular
P-80988	C8	1.500	Mf.	140V	Tubular
P-1965	C9	70-140	Mmf.		Trimmer
P-81800	C10	50	Mmf.		Cap. Part of 2nd I.F. Coil As.
P-80981	C11	0.010	Mf.	400V	Tubular
P-80888	C12	0.250	Mf.	200V	Tubular
P-80945	C13	500	Mmf.		Moulded
P-80862	C14	0.050	Mf.		Tubular
P-80888	C15	0.250	Mf.	200V	Tubular
P-81014	C16 C17	16.00 16.00	Mf. Mf.		Electrolytic Block
P-80914	C22	0.002	Mf.	600V	Tubular
P-80914	C23	0.002	Mf.	600V	Tubular
P-81805	C26	45	Mmf.		Cap. Part of 1st I.F. Coil As.
P-81015		Three Gang Conden-c:			



Oct., 1934

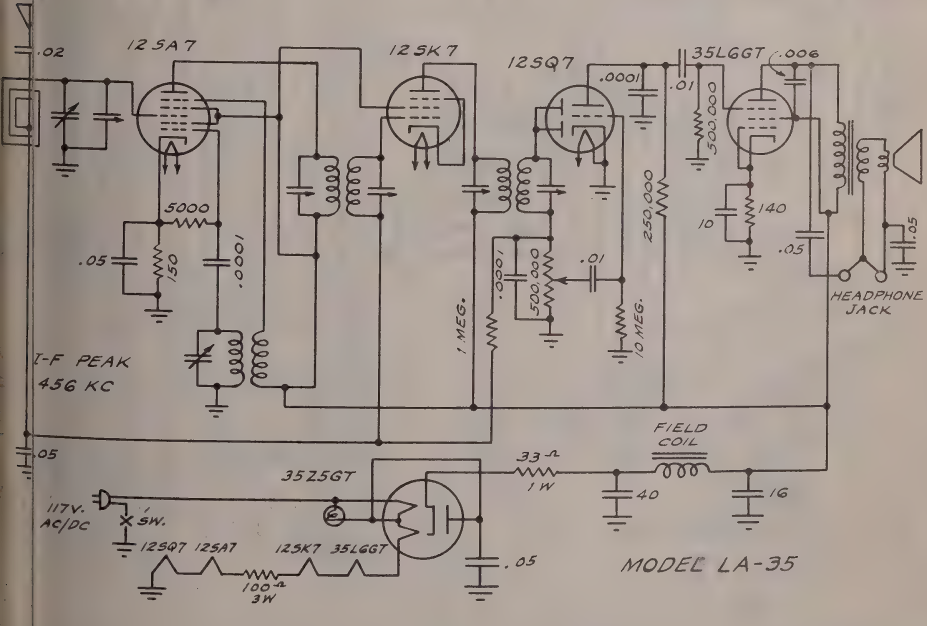
Fig. 2. Location of Tubes and Battery Connections

LAUREHK RADIO MFG. CO. MODEL LA35
MODEL Radio-Hearing Aid
Schematics



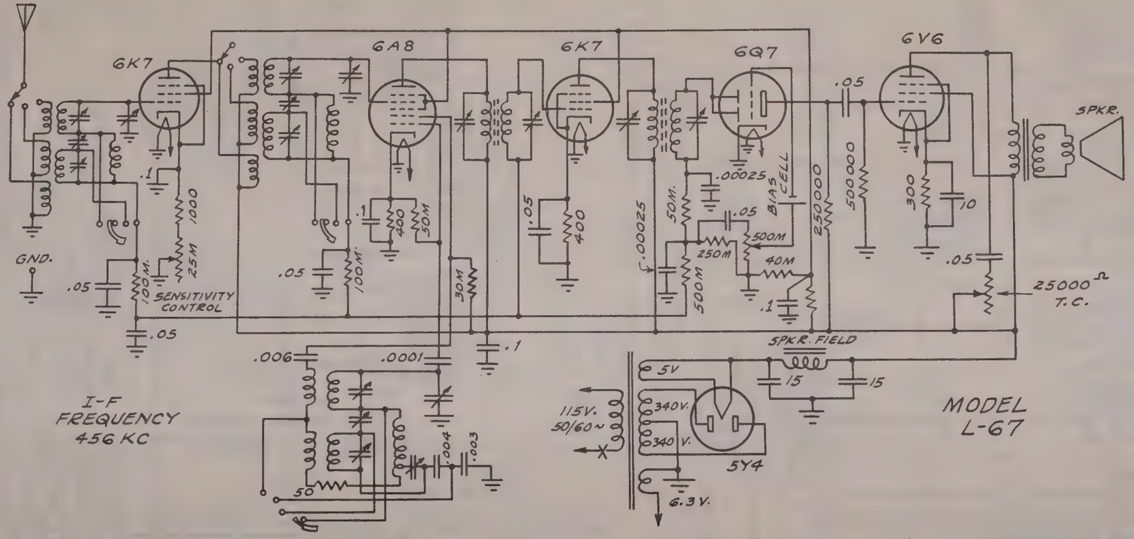
"LAUREHK" COMBINATION RADIO & HEARING AID

IF PEAK - 456 - KC



MODEL LA-35

LAUREHK RADIO MFG. CO.



The I. F. Amplifier is aligned in the usual manner. Connect a service oscillator between the chassis and the grid of the 6A8 tube, using a condenser .0005 mfd. to .25 mfd. between the grid and the high side of the generator output. Do not remove the grid clip for this operation. The Range Switch should be turned to the Broadcast band and the dial set near 600 Kc; then proceed with alignment at 456 Kc.

Turn the audio Volume Control and Sensitivity Controls on full. Increase the output of the service oscillator until a signal is just audible. Adjust each I. F. Trimmer so that maximum volume is obtained. It is best to repeat this procedure two or three times on each trimmer to obtain the most accurate adjustment. These trimmers are adjusted with a small screw driver through the openings in the top of the shield on each I.F. transformer.

The service oscillator should now be connected to the Antenna and Ground terminals of the receiver, through the proper dummy antenna.

Close the gang condenser and see that the dial pointer position coincides with the last line at the low-frequency end of the dial. If this condition does not obtain, loosen the set-screw on the dial drum, make the necessary correction, and firmly tighten the screw.

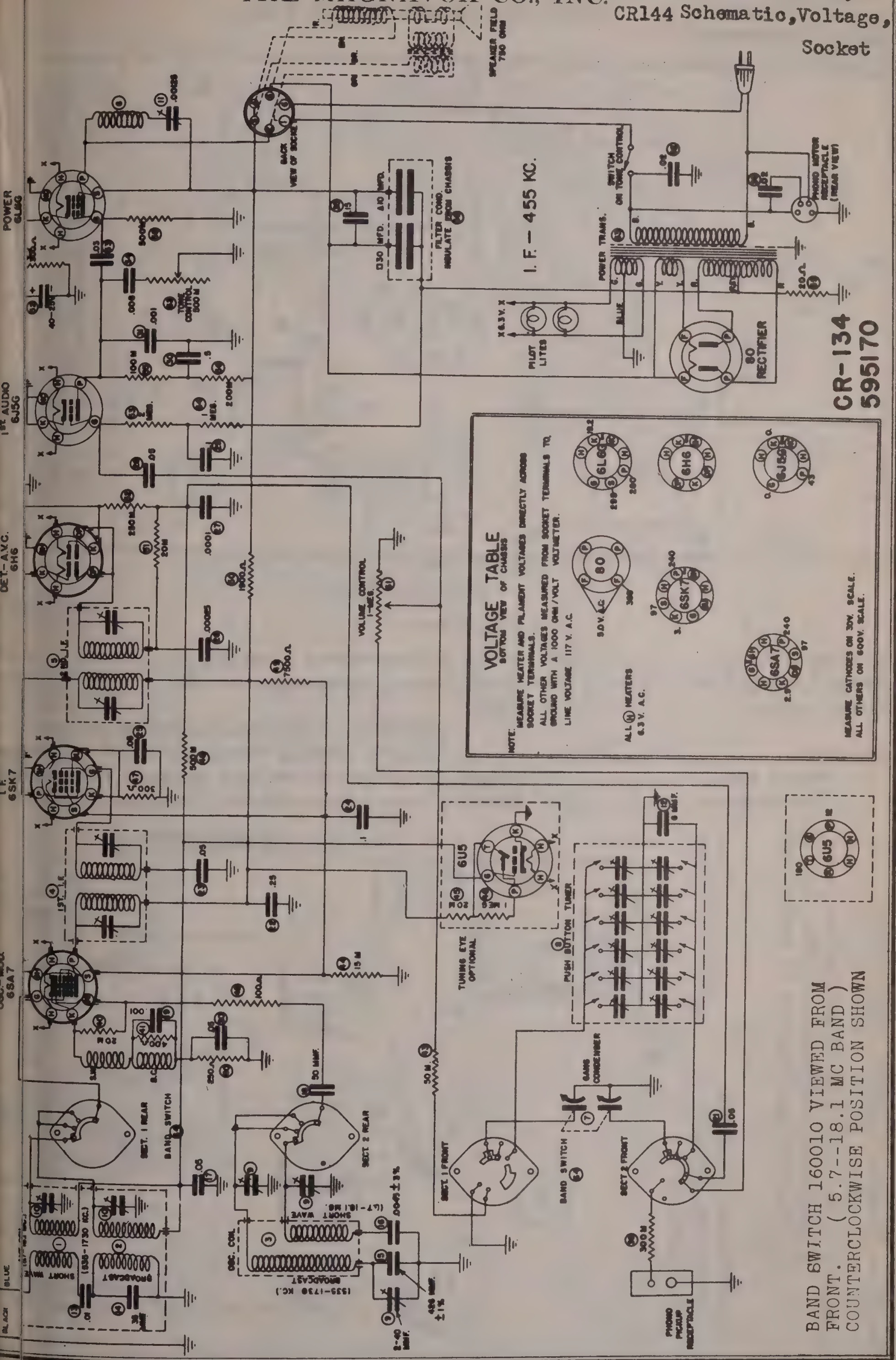
Turn the range switch to the Short-Wave)extreme clockwise) position, set the dial and the service oscillator to 17 Mc, connect a 400 ohm resistor between the service oscillator and the antenna binding post as a dummy antenna, turn the output of the service oscillator up to maximum, tighten the top trimmer in the oscillator coil until just snug, then loosen it four turns and then as the trimmer is tightened, set it to the position of maximum response, reducing the output of the service oscillator as alignment proceeds. (If two responses are found of nearly equal top trimmers in the RF coil, but since the RF adjustment has some effect on the oscillator frequency it will be necessary to rock the dial slightly to keep the signal tuned in. Having aligned the oscillator and RF circuits adjust the top trimmer in the Antenna coil for maximum sensitivity, reducing the output of the service oscillator as the receiver becomes progressively more sensitive. If the receiver tends to "motor-boat", turn down the service oscillator output until the trouble stops. Some service oscillators, however, leak through enough signal that even with the output control set at zero, the receiver is still overloaded, in which case it is necessary to turn down the Sensitivity and Audio Controls until the receiver behaves properly.

Turn the Range Switch to the "Police" or middle range and set the service oscillator and dial at 4.8 Mc. Align first the oscillator, then the RF and Antenna coils on this band - lower trimmer on all three coils, in a manner similar to that used on the Short Wave band. Both the Short Wave and Police band ranges have fixed padding condensers.

Turn the Range Switch to the Broadcast position, substitute a 200 mmfd. condenser for the 400 ohm resistor as a dummy antenna, set the dial and the service oscillator to 1400 Kc. and align the circuits again (middle trimmer) in the same manner as described above. Having done this, set the service oscillator to 600 Kc. and tune the receiver dial for maximum response in the neighborhood of 600 Kc. Next, rock the dial back and forth across the signal, at the same time adjusting the padder condenser, turning continuously in one direction until the output of the receiver, as it is rocked across the signal, becomes maximum. If the padder is turned too far, the output will drop off again. Afew minutes experiment with this operation will show more than a lengthy description. Having completed the padding operation, return the receiver and the generator to 1400 Kc. and realign as before

THE MAGNAVOX CO., INC.

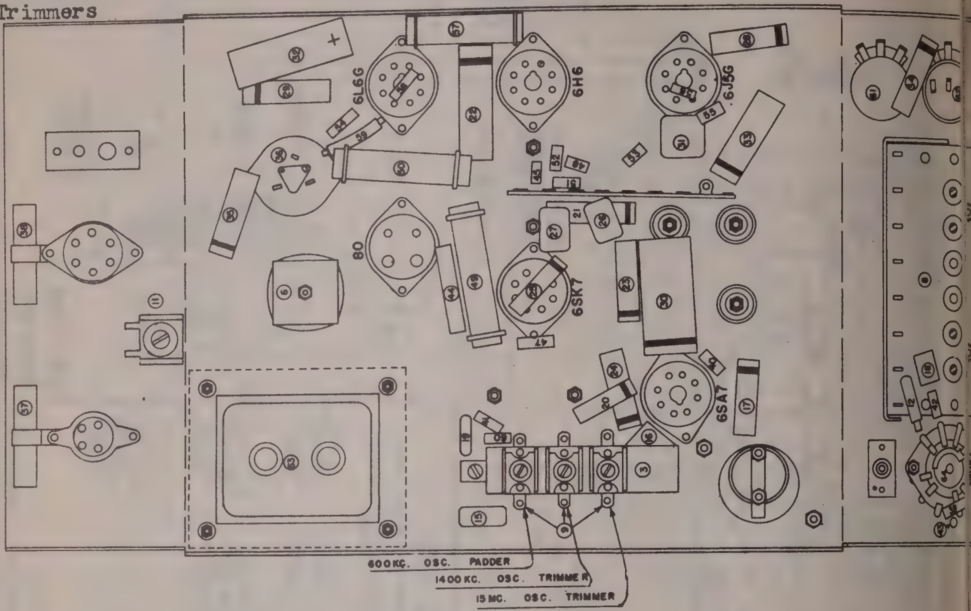
CHASSIS CR134,CR137, CR144 Schematic,Voltage, Socket



BAND SWITCH 160010 VIEWED FROM FRONT. (5.7--18.1 MC BAND) COUNTERCLOCKWISE POSITION SHOWN

CHASSIS CR134,CR137
CR144
Chassis,Alignment
Trimmers

THE MAGNAVOX CO., INC.



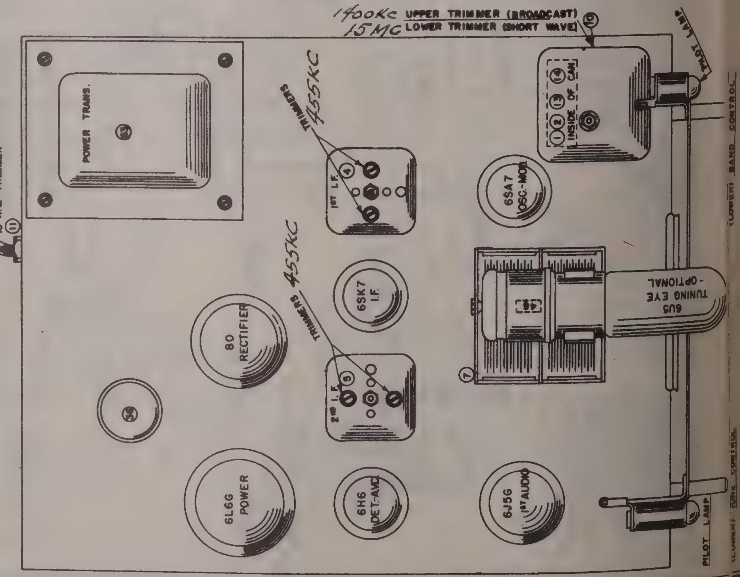
SPECIFICATIONS

Primary voltage...........117 V. AC; Intermediate frequency...........455 K
Power consumption......... 90 watts; Tuning frequency range: 535 - 1730 K
Power output............. 6 watts; 5.7 - 18.1 M
Circuit: Superheterodyne with two tuni
Speaker: ranges, treble control, A.V.C.; bass co
Field coil.......... 750 ohms; pensation in volume control for phonogr h
Transformer.........3500 ohms; pickup; push-button condenser-type tune

CR-134 — Used in Concerto Combination.

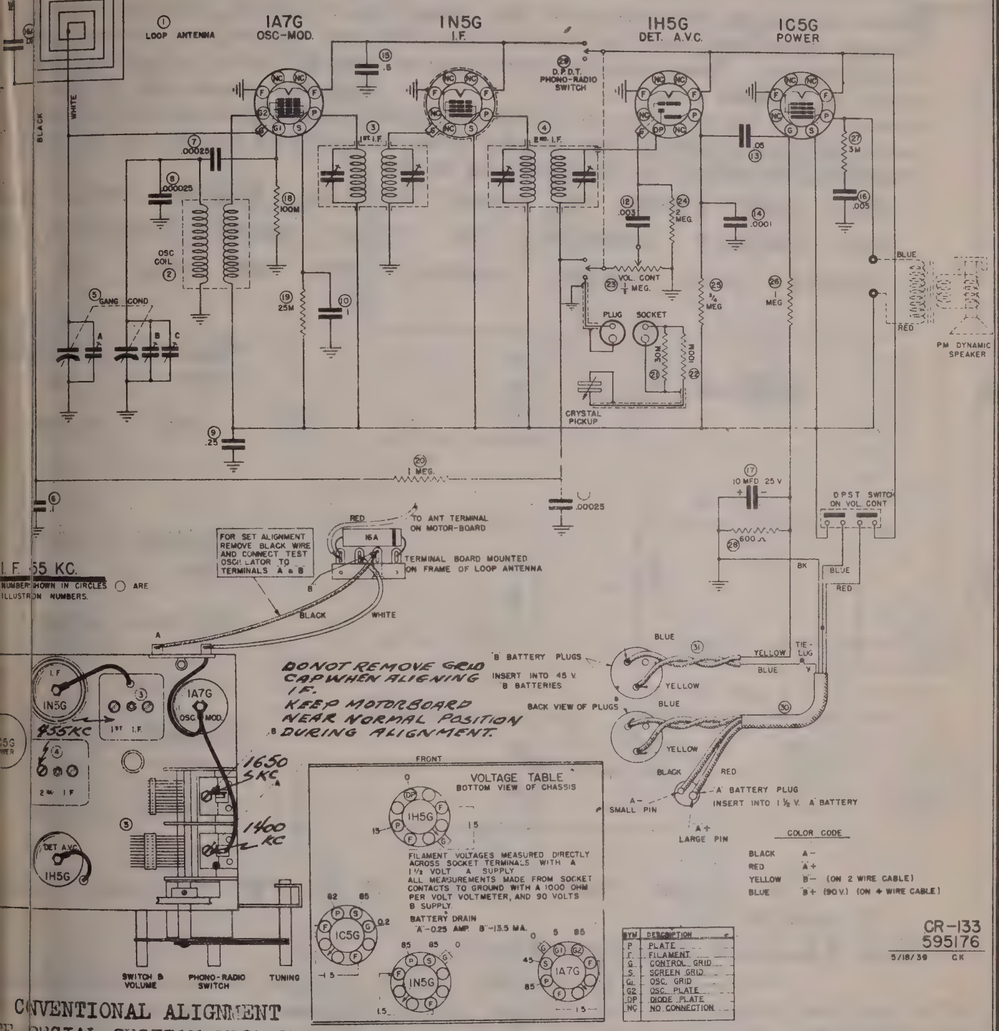
CR-144 — Used in Chairside and Modern American Combinations, same as CR-134 with addition of tuning eye.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



THE MAGNAVOX CO., INC.

CHASSIS CR133
Schematic, Voltage
Alignment, Trimmers
Socket, Chassis


ANT.
LOOP ANTENNA
BLACK
WHITE
1A7G OSC-MOD.
1N5G I.F.
1H5G DET. A.V.C.
1C5G POWER
D.P.D.T. PHONO-RADIO SWITCH
1ST I.F.
2ND I.F.
OSC COIL
GANG COND
VOL. CONT ¼ MEG.
PLUG
SOCKET
CRYSTAL PICKUP
PM DYNAMIC SPEAKER
BLUE
RED
1 MEG.
.00025
10 MFD 25 V
600 Ω
D P S T SWITCH ON VOL. CONT
FOR SET ALIGNMENT REMOVE BLACK WIRE AND CONNECT TEST OSCILLATOR TO TERMINALS A & B
TO ANT TERMINAL ON MOTOR-BOARD
TERMINAL BOARD MOUNTED ON FRAME OF LOOP ANTENNA
I. F. 55 KC.
NUMBERS SHOWN IN CIRCLES ○ ARE ILLUSTRATION NUMBERS.
DO NOT REMOVE GRID CAP WHEN ALIGNING I.F.
KEEP MOTORBOARD NEAR NORMAL POSITION DURING ALIGNMENT.
455 KC
1650 KC
1400 KC
'B' BATTERY PLUGS
INSERT INTO 45 V. B BATTERIES
BACK VIEW OF PLUGS
YELLOW
TIE-LUG
'A' BATTERY PLUG
INSERT INTO 1½ V. 'A' BATTERY
A- SMALL PIN
A+ LARGE PIN
SWITCH & VOLUME
PHONO-RADIO SWITCH
TUNING
FRONT
VOLTAGE TABLE BOTTOM VIEW OF CHASSIS
CR-133
595176
5/18/38 CK

FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS WITH A 1½ VOLT A SUPPLY
ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER, AND 90 VOLTS B SUPPLY.
BATTERY DRAIN 'A'-0.25 AMP. 'B'-13.5 MA.

COLOR CODE

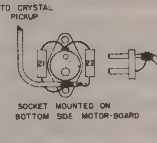
BLACK	A-
RED	A+
YELLOW	B- (ON 2 WIRE CABLE)
BLUE	B+ (90 V.) (ON 4 WIRE CABLE)

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

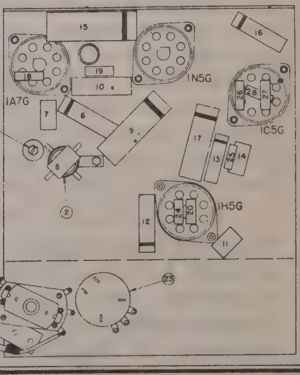
C NVENTIONAL ALIGNMENT
E PECIAL SECTION VOLUME VIII

SPECIFICATIONS

" ttery voltage...........1.5 volt;
" ttery voltage........... 90 volt;
" ttery drain............0.25 amp.;
" ttery drain............13.5 m.a.;
wer output................ 0.2 watt;
te mediate frequency.......455 K.C.;
ni g frequency range:
540 -- 1650 K.C.;
pea er transformer.........8000 ohms;
ype circuit:........ Superheterodyne;



SOCKET MOUNTED ON BOTTOM SIDE MOTOR-BOARD



CHASSIS CR134,CR136,CR140
CR142,CR143 to CR153 incl.
10-kc Filter Adjustment
CHASSIS CR141,CR142
Changes

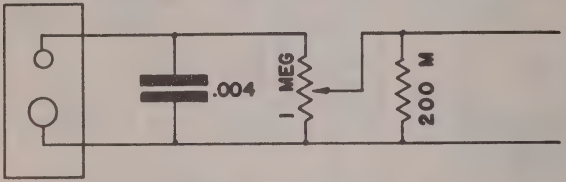
THE MAGNAVOX CO., INC.

MODEL CR-141 and CR-142.

Since the first production of this model was released, several circuit changes have been made to improve the fidelity and volume of phonograp reproduction. These changes were made at two different times and are shown in Figures B and C. Figure A shows the original circuit. It is possible to check the phonograph input circuit on this radio without removing the chassis from the cabinet by the use of an ohmmeter, according to instructions shown.

TURN WAVE SWITCH TO PHONO POSITION, REMOVE PICKUP P G AND CONNECT OHMMETER TO PICKUP SOCKET — MEASURE ES- ISTANCE WITH VOLUME CONTROL OFF AND FULL ON.

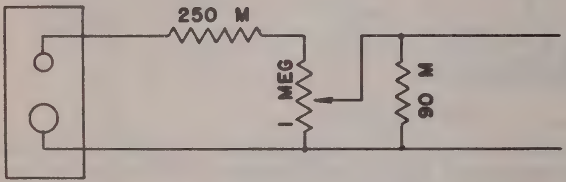
A



VOLUME CONTRO

OFF	ON
1 MEG	157,000~

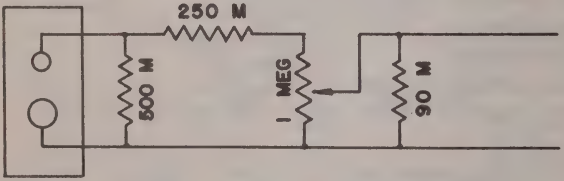
B



VOLUME CONTROL

OFF	ON
1,250,000~	332,500~

C



VOLUME CONTROL

OFF	ON
356,000~	200,000~

IF IT IS FOUND THAT CIRCUIT "A" OR "B" IS USED, CHANE TO CIRCUIT "C".

10 K.C. FILTER ADJUSTMENT

MODELS CR-136, CR-146, CR-147, CR-148, CR-149, CR-152, CR-153

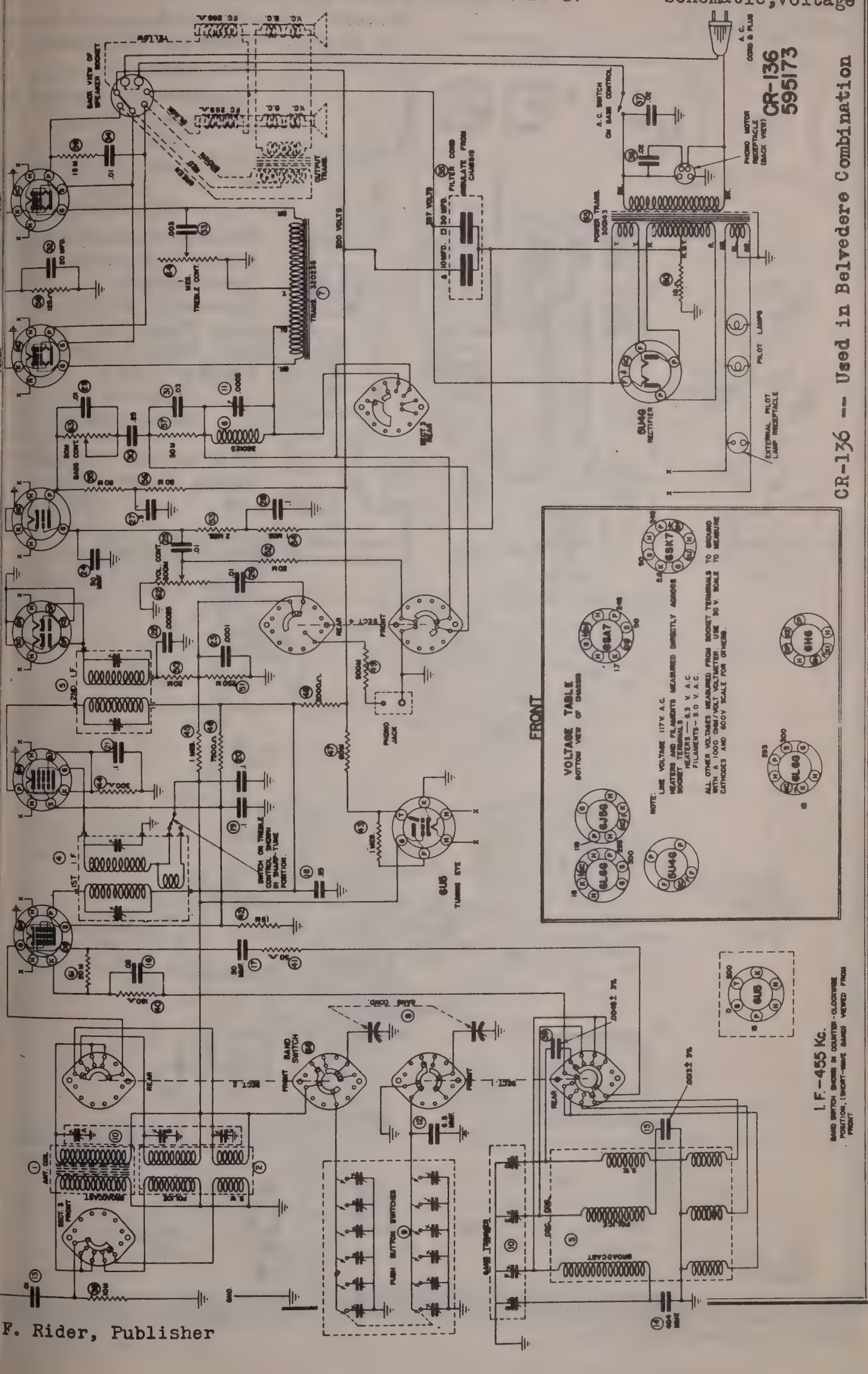
With the tone control set for maximum treble response and the Band Expander set in the High Fidelity position (accomplished by rotating the treble control to the right as far as possible), tune the receiver to a point betwee two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 trimmer condenser at the rear center of the chassis. In the absence of such a signal source in the daytime, an ACCURATE audio oscillator may be used to feed a 10 KC into the volume control.

MODELS CR-134, CR-140, CR-142, CR-144, CR-143, CR-145, CR-150, CR-151.

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis.

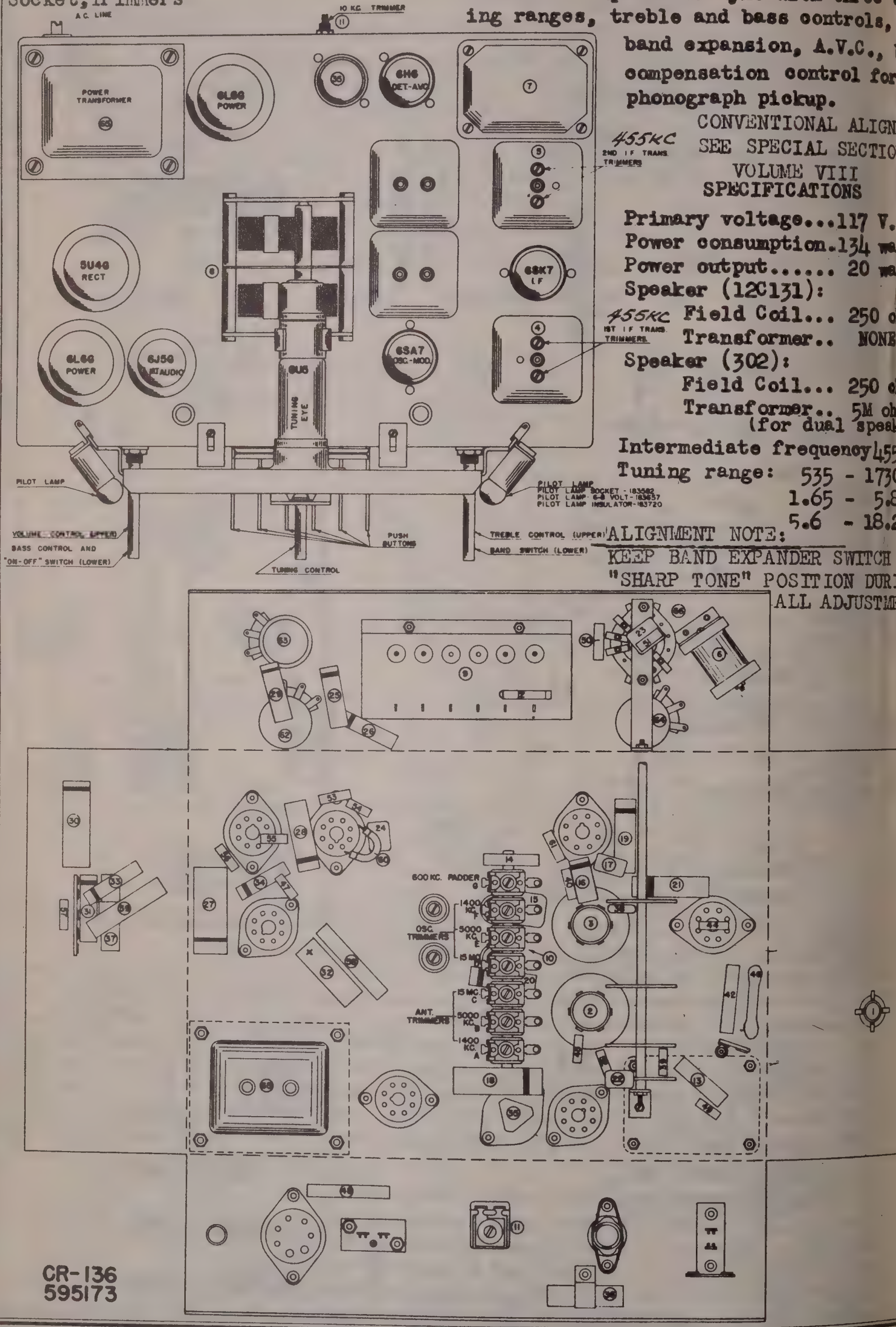
THE MAGNAVOX CO., INC.

CHASSIS CR136
Schematic,Voltage


CR-136 -- Used in Belvedere Combination
CR-136
595173
6L6G
6J5G
6H6
6SK7
6SA7
5U4G RECTIFIER
6U5 TUNING EYE
OUTPUT TRANS.
POWER TRANS.
A.C. CORD & PLUG
A.C. SWITCH ON BASS CONTROL
PHONO MOTOR RECEPTACLE (BACK VIEW)
PILOT LAMPS
EXTERNAL PILOT LAMP RECEPTACLE
PHONO JACK
BAND SWITCH
PUSH BUTTON SWITCHES
BAND TRIMMER
BROADCAST
POLICE
S.W.
ANT. COIL
OSC. COIL
1ST. I.F.
2ND. I.F.
I.F.—455 Kc.
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION, (SHORT-WAVE BAND) VIEWED FROM FRONT
SWITCH ON TREBLE CONTROL SHOWN IN SHARP-TUNE POSITION
FRONT
VOLTAGE TABLE
BOTTOM VIEW OF CHASSIS
NOTE:
LINE VOLTAGE 117V. A.C.
HEATERS AND FILAMENTS MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
HEATERS — 6.3 V. A.C.
FILAMENTS — 5.0 V. A.C.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER. USE 50 V. SCALE TO MEASURE CATHODES AND 500V SCALE FOR OTHERS.
300 VOLTS
327 VOLTS

CHASSIS CR136
Chassis,Alignment
Socket,Trimmers

THE MAGNAVOX CO., INC.



Circuit: Superheterodyne with three t ing ranges, treble and bass controls, F. band expansion, A.V.C., b s compensation control for phonograph pickup.

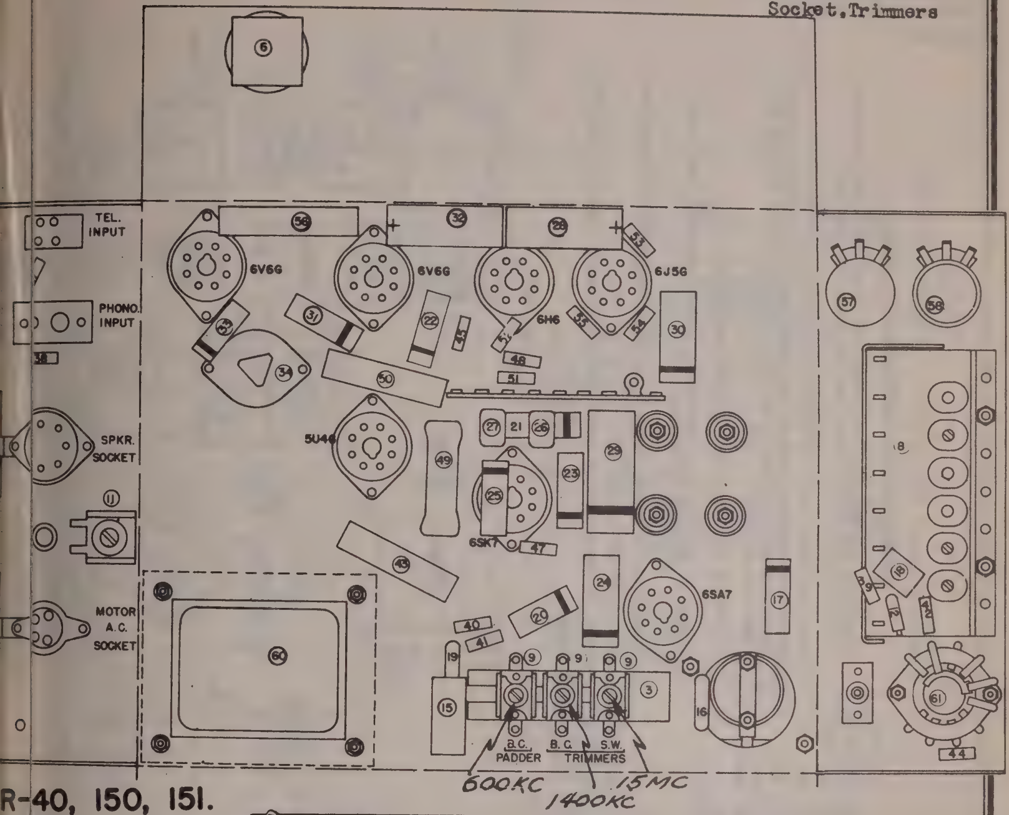
CONVENTIONAL ALIGN T
SEE SPECIAL SECTIO
VOLUME VIII

SPECIFICATIONS

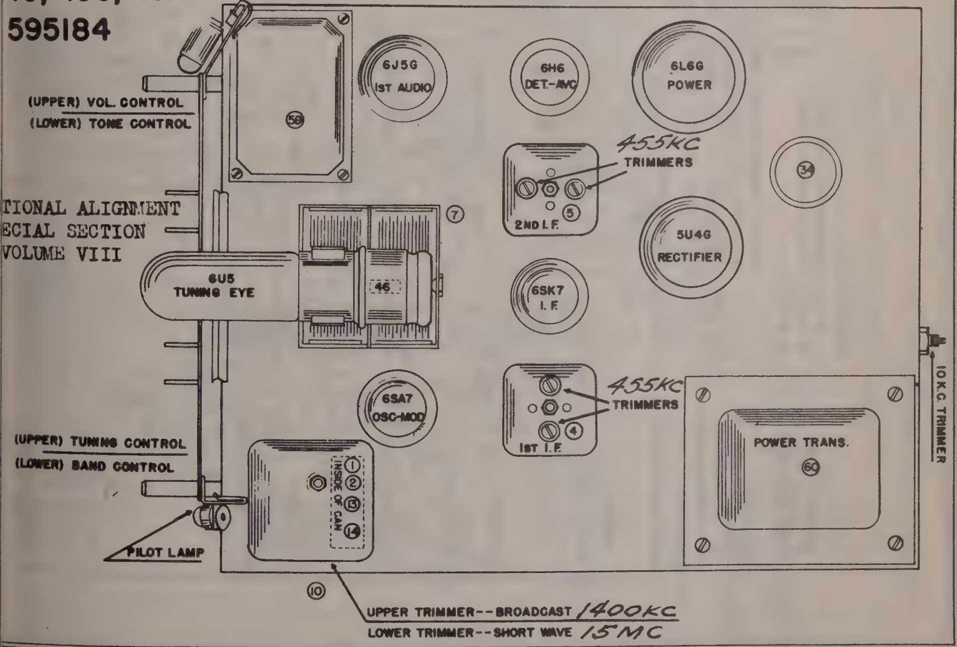
Primary voltage...117 V.
Power consumption.134 wat
Power output...... 20 wat
Speaker (12C131):
Field Coil... 250 oh
Transformer.. NONE
Speaker (302):
Field Coil... 250 oh
Transformer.. 5M ohm
(for dual speak s)
Intermediate frequency 455 C;
Tuning range: 535 - 1730 C;
1.65 - 5.8
5.6 - 18.2

ALIGNMENT NOTE:

KEEP BAND EXPANDER SWITCH
"SHARP TONE" POSITION DURI
ALL ADJUSTME S.



R-40, 150, 151.
595184



NVETIONAL ALIGNMENT
E SECIAL SECTION
VOLUME VIII

CHASSIS CR153
Chassis,Alignment
Socket,Trimmers
Notes

THE MAGNAVOX CO., INC.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

SPECIFICATIONS

Primary voltage.........117 V. AC; Intermediate frequency..........455 KC;
Power consumption.......103 watts; Tuning frequency range 535 - 1730 KC;
Power output............12 watts; 1.65 - 5.8 MC;
5.60 - 18.2 MC;

Speaker:

Field Coil.........1000 ohms;
Transformer........8000 ohms;

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, bass compensation in volume control for phonograph pickup, A.V.C., condenser type push-button tuner, variable selectivity.

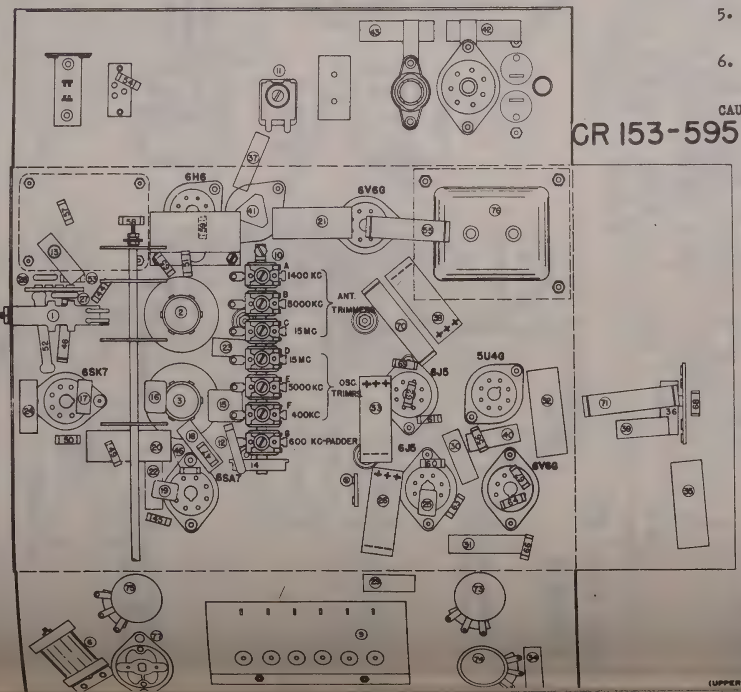
TO REMOVE THE CHASSIS FROM THE CABINET:

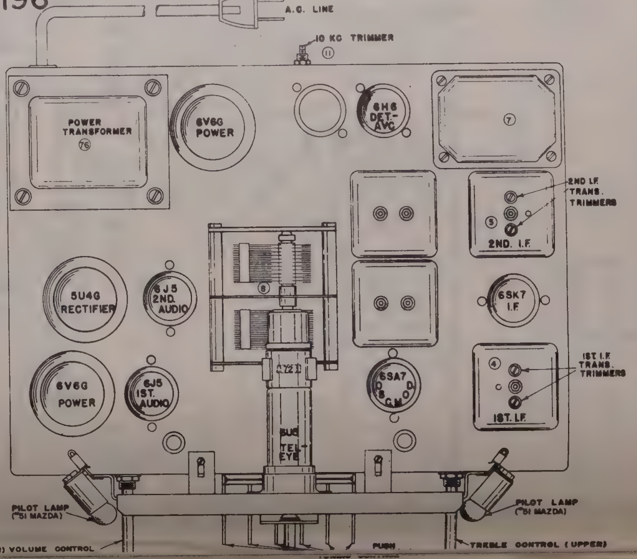
BERKELEY AND HEPPLEWHITE UNITS

1. Remove the four plugs from the lower side of the chassis and remove the antenna-ground terminal board from the side of the cabinet.
2. Pull the control knobs and the push button knobs from their shafts.
3. Remove the stay-hinge from the lid of the cabinet by removing the two upper wood screws holding it in place. Tilt the cabinet lid back and rest it on a support.
4. Remove the stay-hinge plate from the radio panel.
5. Remove the Phillips-head wood screws, securing the radio panel, and lift the panel from the cabinet.
6. Loosen the four screws securing the chassis to the cabinet cleats, and lift the chassis from the cabinet.

CAUTION: Do not remove the mounting brackets from the chassis at any time.

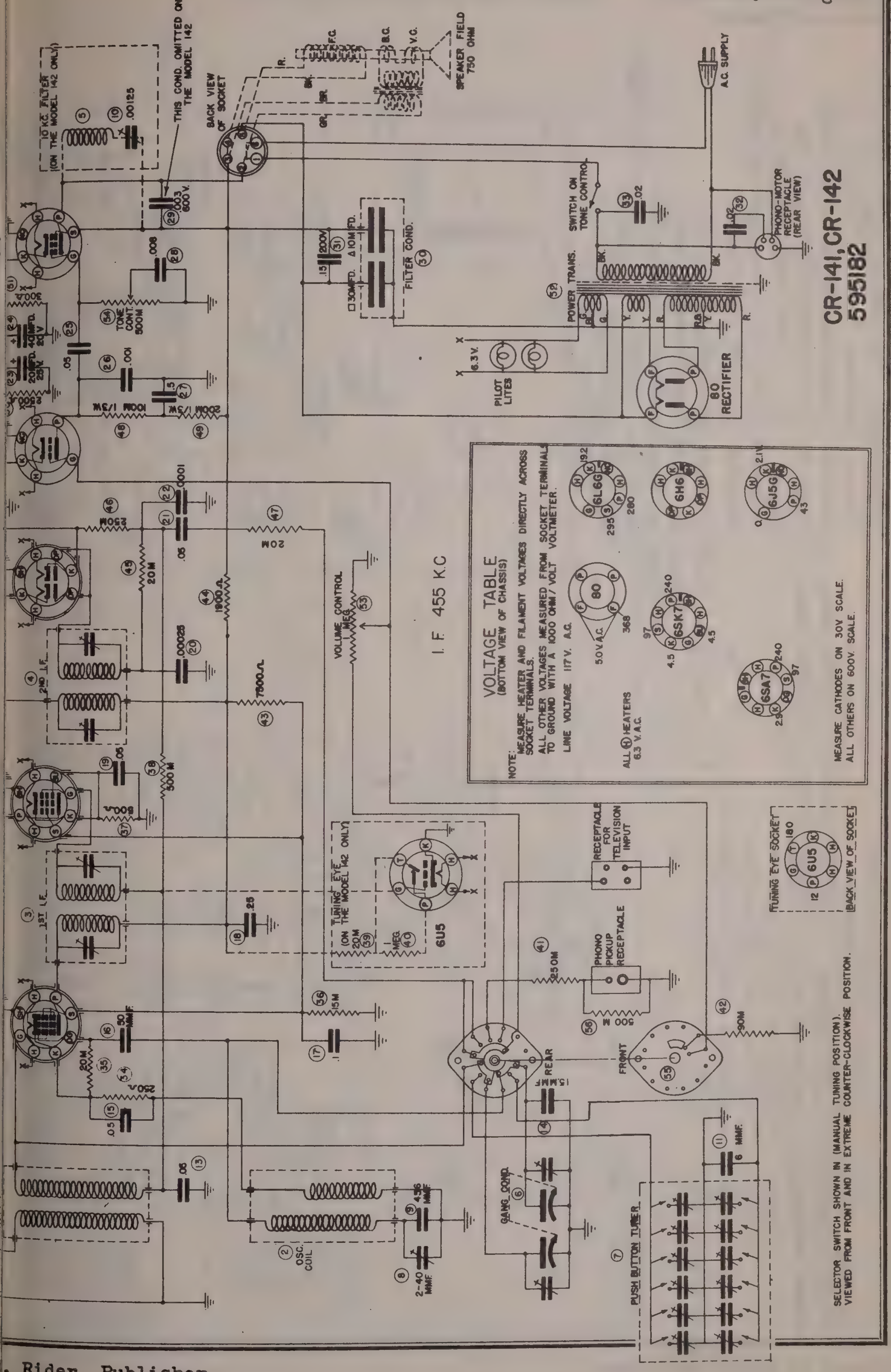
CR 153-595196





THE MAGNAVOX CO.. INC.

CHASSIS CR141,CR142
Schematic ,Voltage



CHASSIS CR141,CR142
Chassis,Alignment
Socket,Trimmers

THE MAGNAVOX CO., INC.

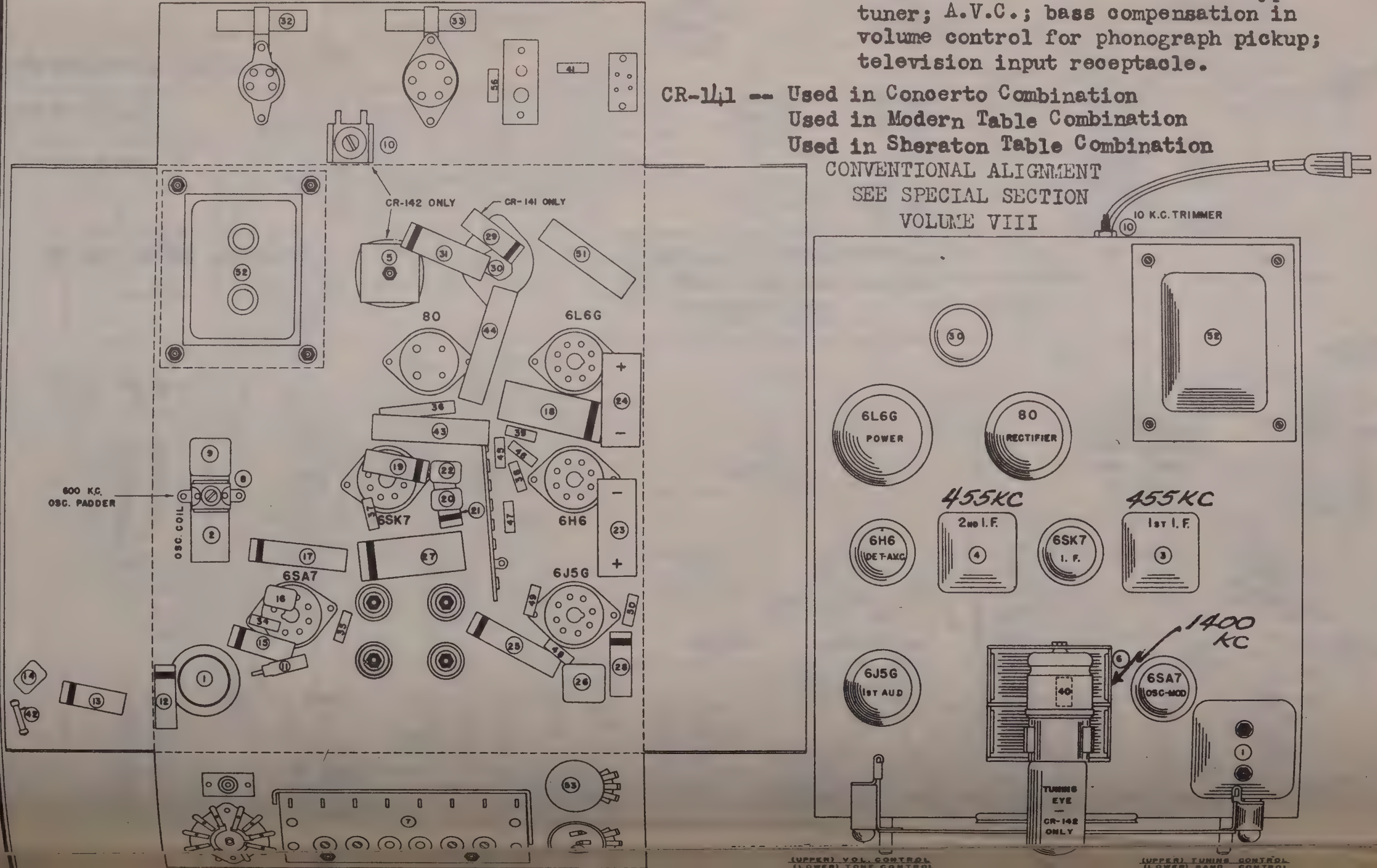
SPECIFICATIONS

Primary voltage.....117 V. AC; Speaker:
Power consumption....82 watts; Field Coil.......1000 ohms;
Power output......... 6 watts; Transformer......8000 ohms;

Intermediate frequency.........455 KC;
Tuning frequency range... 535-1730 KC;
Circuit: Superheterodyne with treble control; push-button condenser type tuner; A.V.C.; bass compensation in volume control for phonograph pickup; television input receptacle.

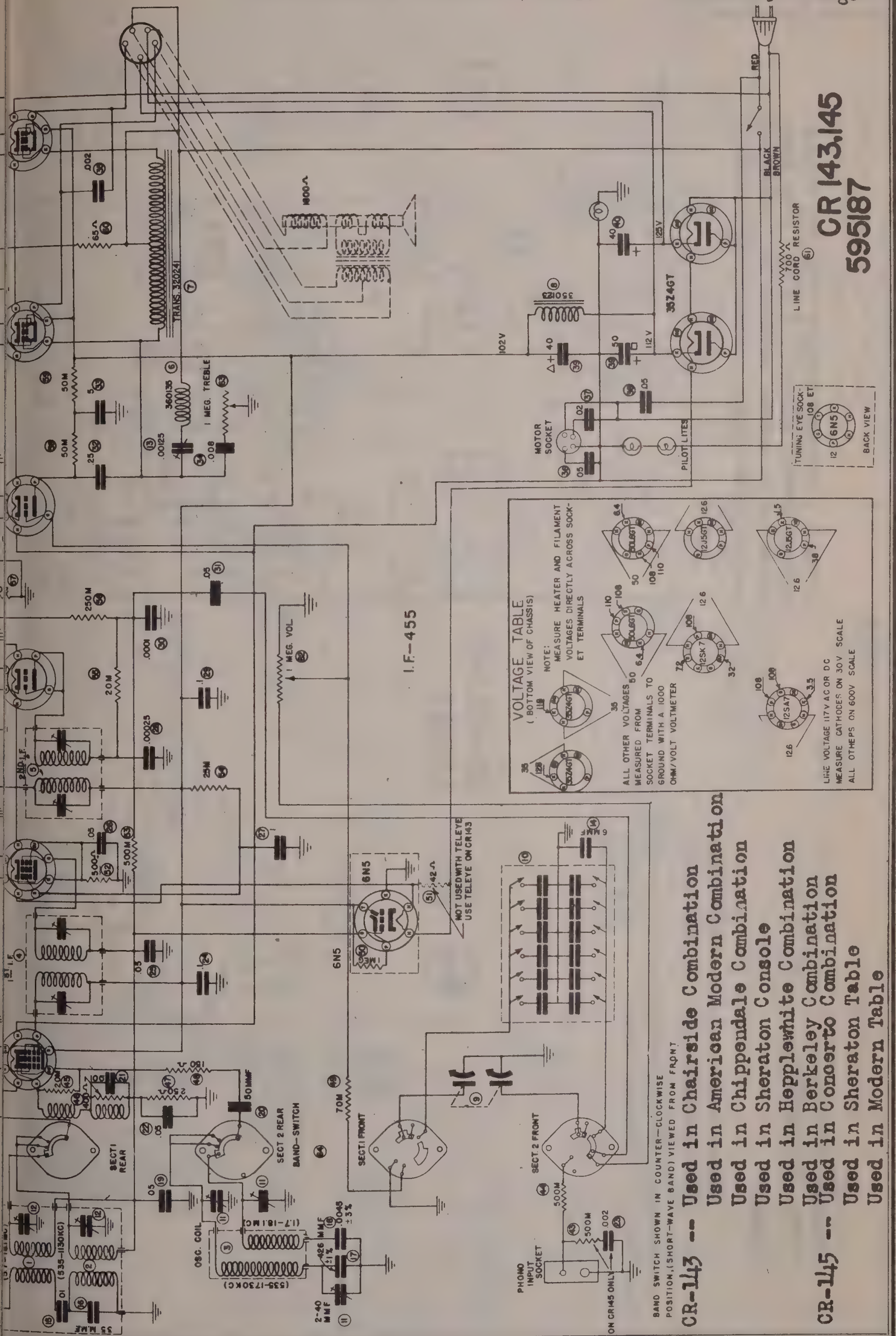
CR-141 -- Used in Concerto Combination
Used in Modern Table Combination
Used in Sheraton Table Combination

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



THE MAGNAVOX CO., INC.

CHASSIS CR143,CR145
Schematic,Voltage



CR-143 -- Used in Chairside Combination
Used in American Modern Combination
Used in Chippendale Combination
Used in Sheraton Console
Used in Hepplewhite Combination
Used in Berkeley Combination

CR-145 -- Used in Concerto Combination
Used in Sheraton Table
Used in Modern Table

CHASSIS CR143,CR145
Chassis,Alignment
Socket,Trimmers

THE MAGNAVOX CO., INC.

SPECIFICATIONS

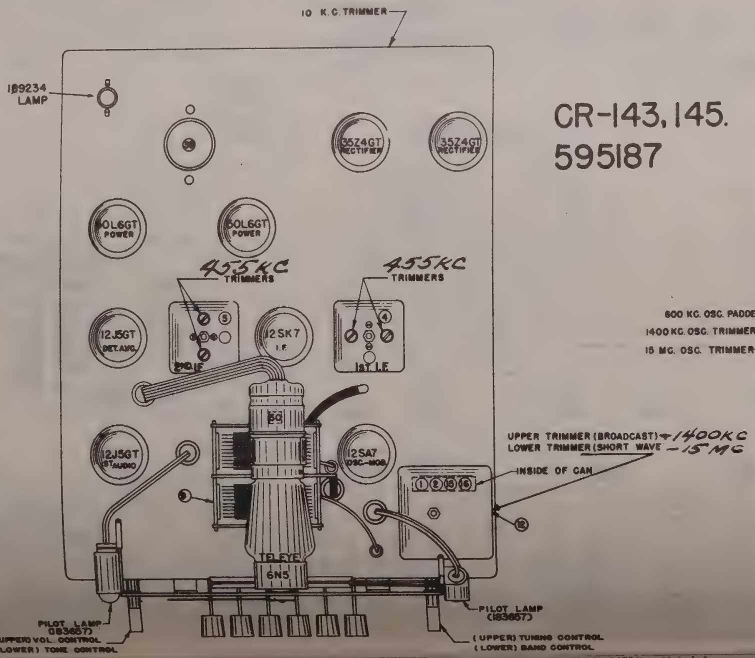
Primary voltage........117 V. AC-DC;
Power consumption......... 85 watts;

Speaker:

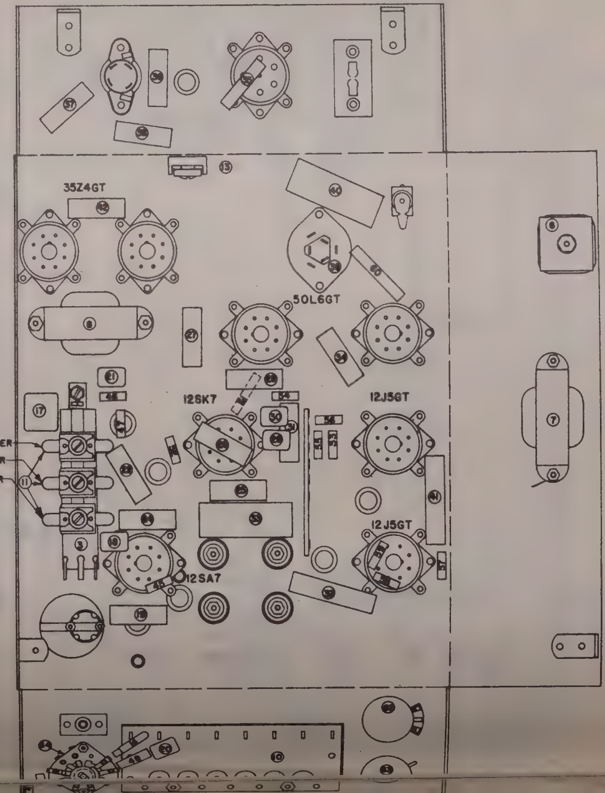
Field Coil...........1800 ohms;
Transformer..........3000 ohms;

Intermediate frequency.............455 KC;
Tuning frequency range: 535 - 1730 KC;
5.7 - 18.1 MC;

Circuit: Superheterodyne with two tuning ranges, treble control; A.V.C.; bass compensation in volume control for phonograph pickup; push-button condenser-type tuner.

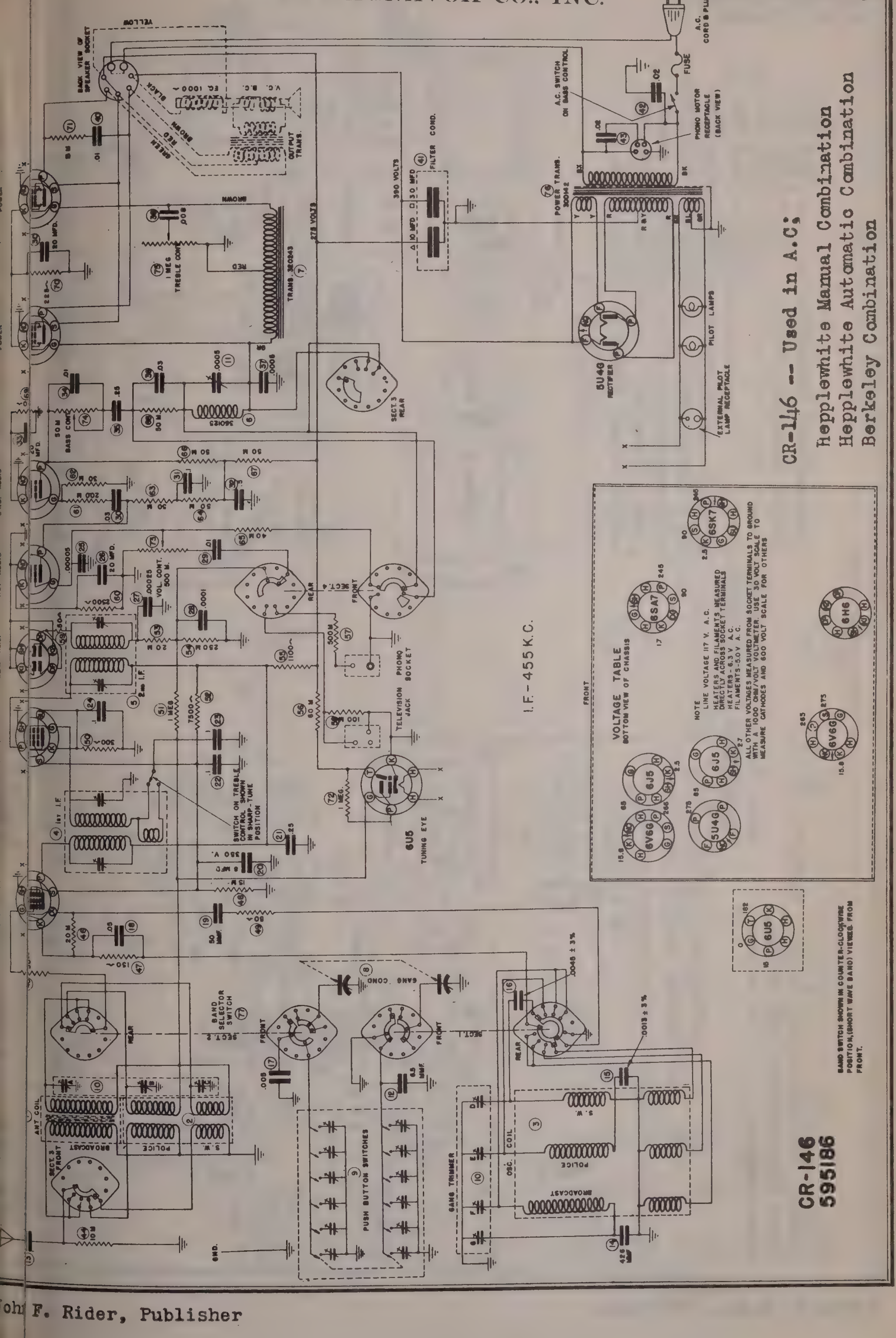


CR-143,145.
595187



CHASSIS CR146
Schematic ,Voltage

THE MAGNAVOX CO., INC.



CR-146 -- Used in A.C.;
Hepplewhite Manual Combination
Hepplewhite Automatic Combination
Berkeley Combination

VOLTAGE TABLE
BOTTOM VIEW OF CHASSIS

FRONT

NOTE
LINE VOLTAGE 117 V. A.C.
HEATERS AND FILAMENTS MEASURED DIRECTLY ACROSS SOCKET TERMINALS
HEATERS-6.3 V A.C.
FILAMENTS-5.0 V A.C.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER. USE 30 VOLT SCALE TO MEASURE CATHODES AND 600 VOLT SCALE FOR OTHERS

BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION, (SHORT WAVE BAND) VIEWED FROM FRONT.

CR-146
595186

CHASSIS CR146
Chassis, Alignment
Socket, Trimmers

THE MAGNAVOX CO., INC.

SPECIFICATIONS

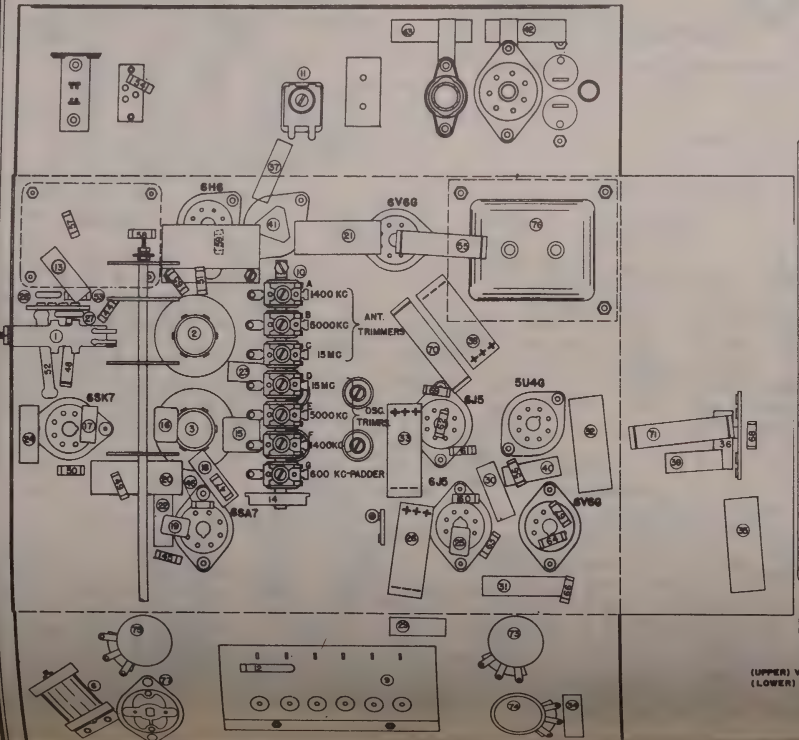
Primary voltage....117 V. AC; Speaker:
Power consumption..103 watts;
Power output........12 watts;

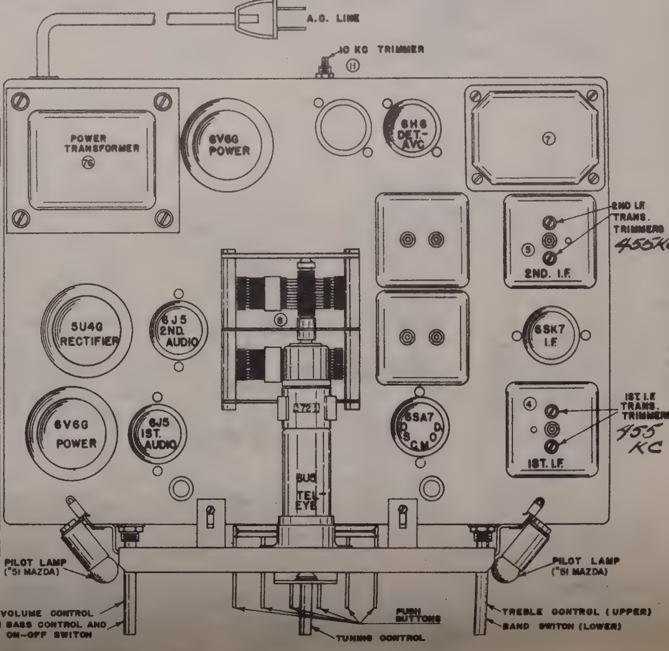
Field Coil....1000 ohms;
Transformer...8000 ohms;

Intermediate frequency..........455 KC;
Tuning frequency range 535 - 1730 KC;
1.65 - 5.8 MC;
5.60 - 18.2 MC;

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, bass compensation in volume control for phonograph pickup, A.V.C., condenser type push-button tuner, variable selectivity.

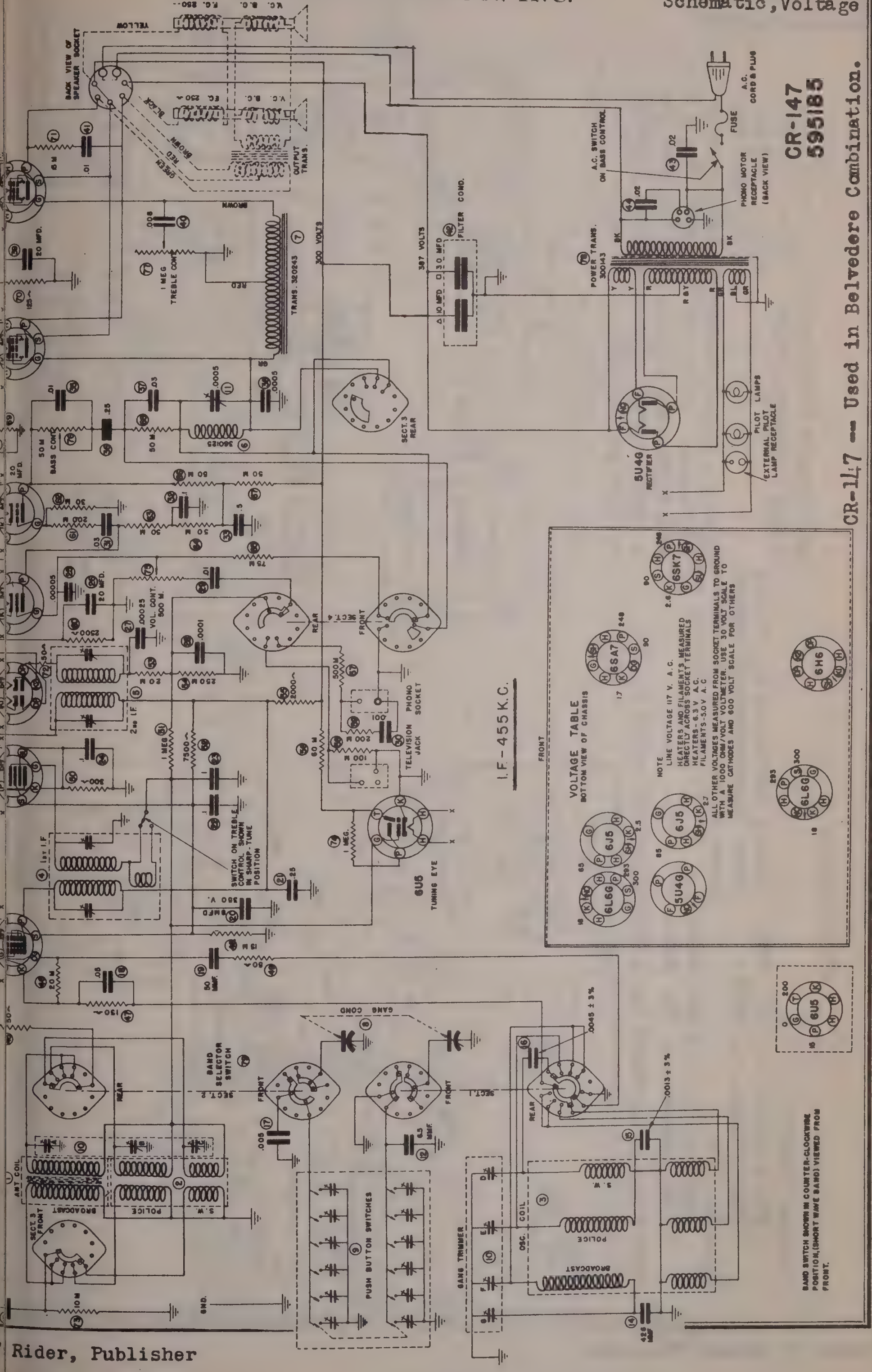
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII





THE MAGNAVOX CO., INC.

CHASSIS CR147
Schematic, Voltage



CR-147
595185

CR-147 — Used in Belvedere Combination.

THE MAGNAVOX CO., INC.

SPECIFICATIONS

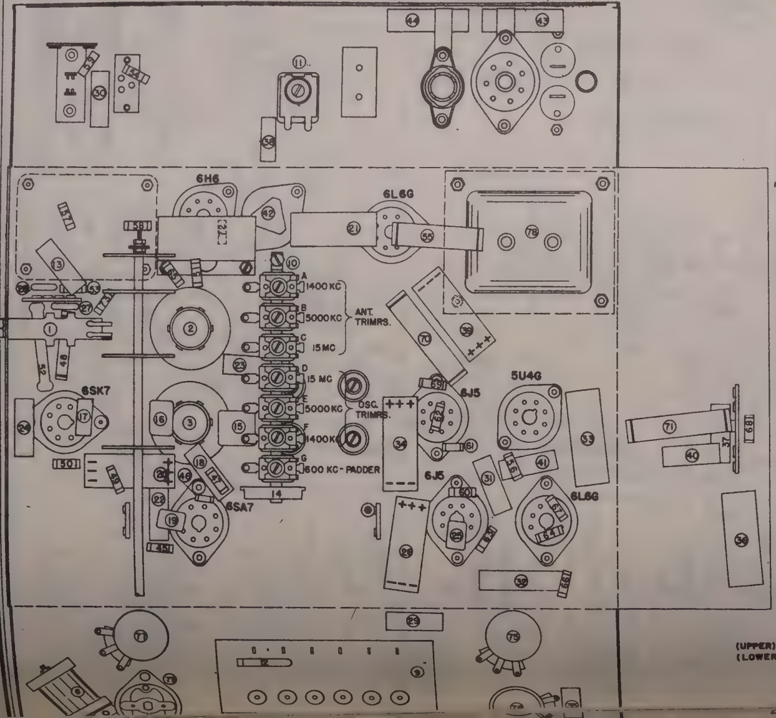
Speaker (12C131):
Field Coil...... 250 ohms;
Transformer..... NONE
Speaker (302):
Field Coil...... 250 ohms;
Transformer..... 5M ohms;

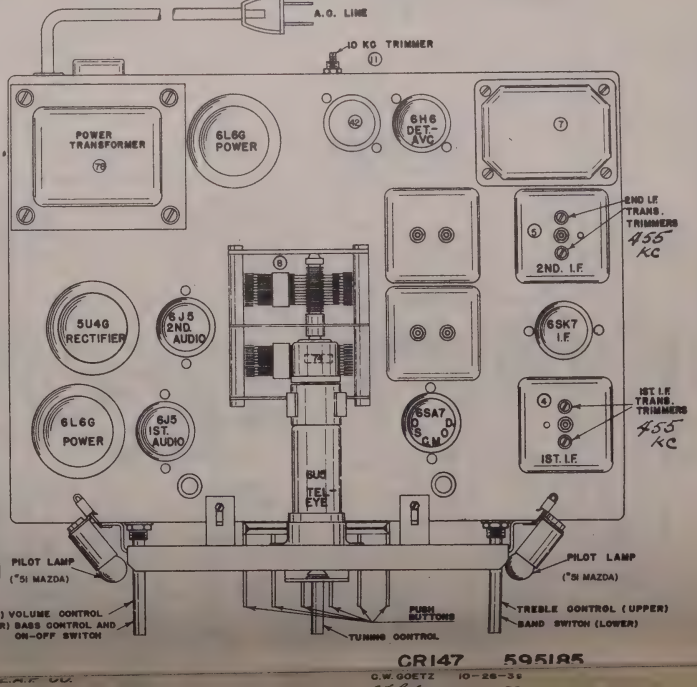
Primary voltage... 117 V. AC;
Power consumption. 160 watts;
Power output...... 20 watts;

Intermediate frequency..........455 KC;
Tuning frequency range: 535 - 1730 KC;
1.65 - 5.8 MC;
5.6 - 18.2 MC;

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V.C., bass compensation in volume control for phonograph pickup, variable selectivity.

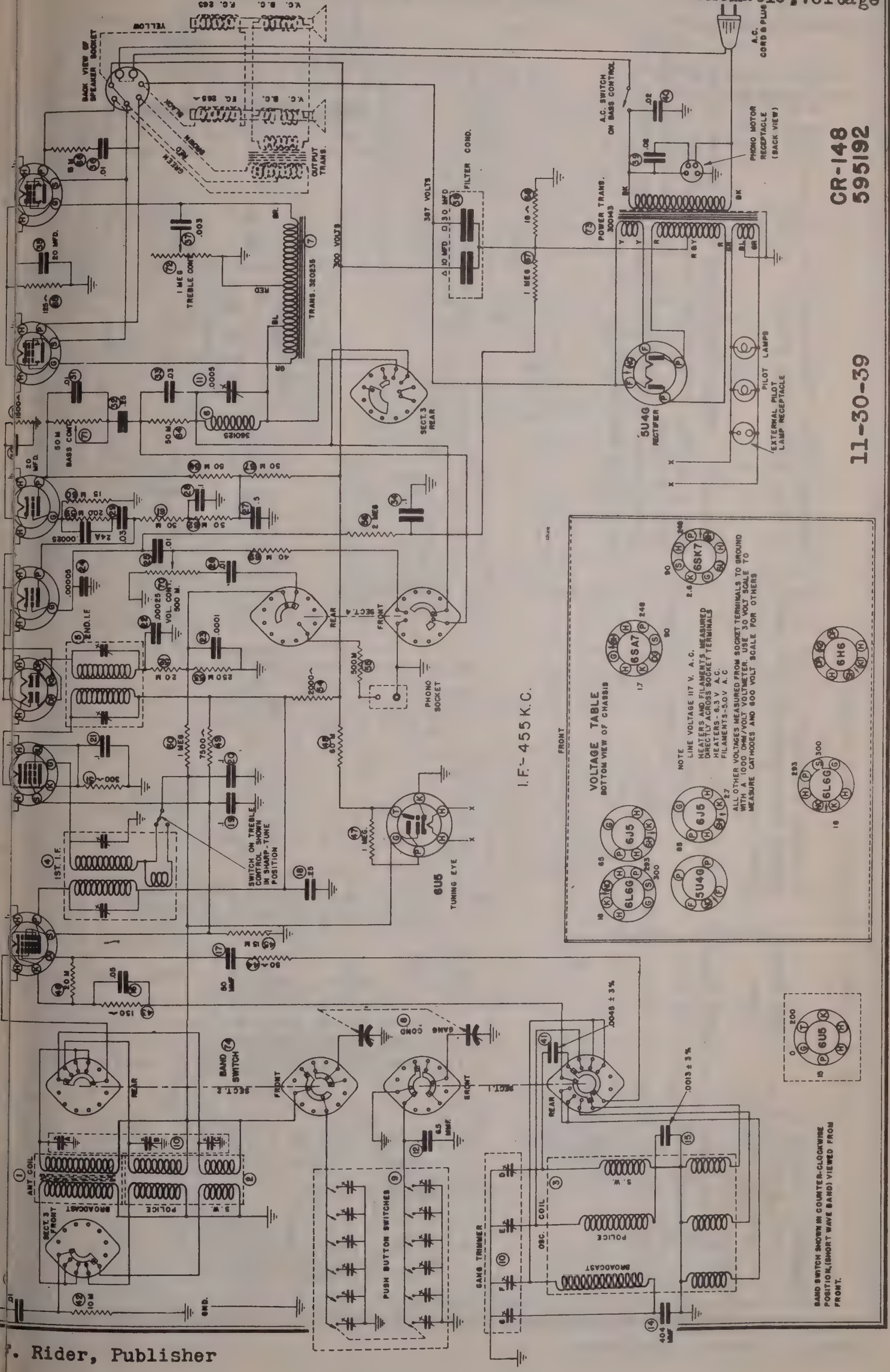
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII





THE MAGNAVOX CO., INC.

CHASSIS CR148
Schematic, Voltage



CHASSIS CR148
Chassis, Alignment
Socket, Trimmers

THE MAGNAVOX CO., INC.

CR-148 -- Used in Belvedere Combination

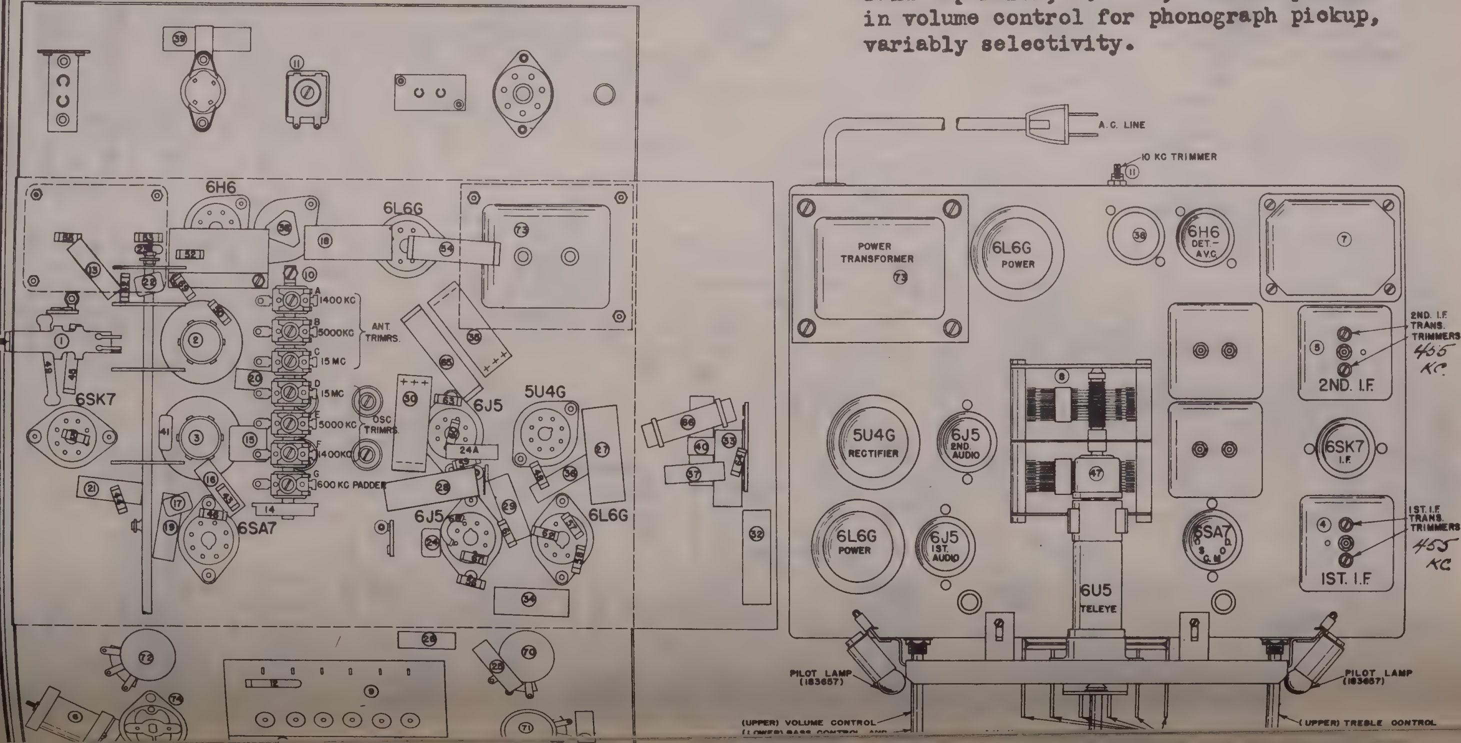
Speaker (12C131):
Field Coil........250 Ohms;
Transformer....... None
Speaker (302):
Field Coil........250 Ohms;
Transformer....... 5M Ohms;

Primary voltage...117 V. AC;
Power consumption.160 watts;
Power output...... 20 watts;

Intermediate frequency...........455 KC;
Tuning frequency range: 535 - 1730 KC;
1.65 - 5.8 MC;
5.6 - 18.2 MC:

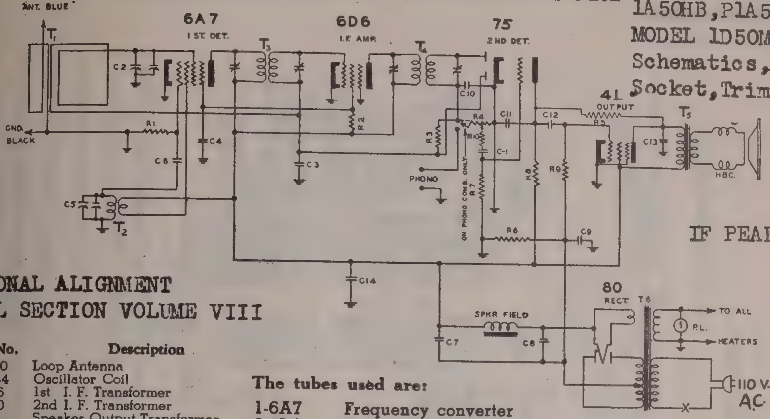
Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V. C., bass compensation in volume control for phonograph pickup, variably selectivity.

CR148 595192



MODELS 1A50A, 1A50F
1A50H, 1A50AB, 1A50FB
1A50HB, P1A50, P1A50B
MODEL 1D50MB
Schematics, Alignment
Socket, Trimmers, Tuner

MAJESTIC RADIO & TELEV. CORP



IF PEAK 455 KC

COVENTIONAL ALIGNMENT
EE PECIAL SECTION VOLUME VIII

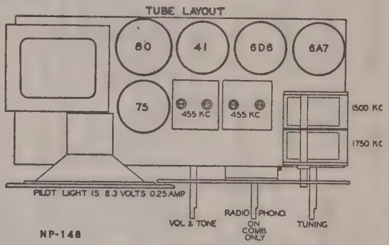
Part No.	Description
Y-CR-40	Loop Antenna
Y-CS-64	Oscillator Coil
Y-CI-36	1st I. F. Transformer
Y-CI-60	2nd I. F. Transformer
	Speaker Output Transformer
Y-TP-30	Power Transformer
C-15754	Tubular cond. .01 mfd. 400V
Y-CV-37	Variable Condenser
C-15752	Tubular cond. .05 mfd. 200V
C-15756	Tubular cond. .05 mfd. 400V
CM-29	Mica cond. 50 mmf. 30%
CM-30	Mica cond. 250 mmf. 30%
Y-CE-43	Electrolytic Condenser
C-25	Tubular cond. .006 mfd. 400V
C-15757	Tubular cond. .1 mfd. 400V
R-15511	Carbon res. 50K ohm ¼W20%
R-83	Carbon res. 35K ohm 1W20%
R-15500	Carbon resistor 2meg ¼W20%
Y-VC-30	Volume Control
R-15559	Carbon resistor 3meg ¼W20%
R-117	Carbon res. 275 ohm ½W20%
R-109	Carbon resistor 5meg ¼W20%
R-15520	Carbon res. 500K ohm ¼W20%
R-15515	Carbon res. 100K ohm ¼W20%
LB-44	Pilot Light Mazda #44

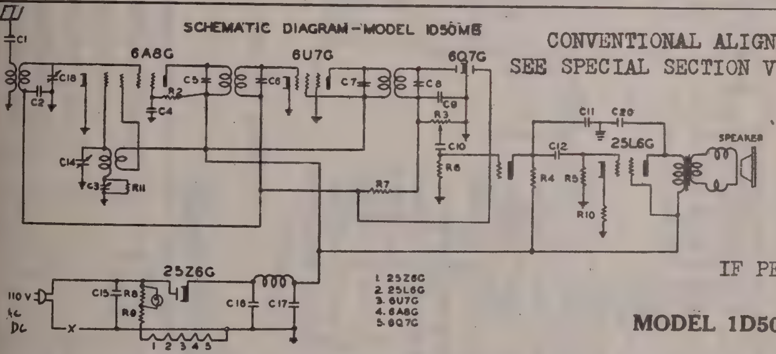
The tubes used are:

1-6A7	Frequency converter
1-6D6	Intermediate frequency amplifier
1-75	2nd Detector, AVC, and audio driver
1-41	Power output
1-80	Rectifier

Model 1A50-A
Model 1A50-F
Model 1A50-H
Model P-1A50

Model 1A50-A-B
Model 1A50-F-B
Model 1A50-H-B
Model P-1A50-B





CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

IF PEAK 455 KC

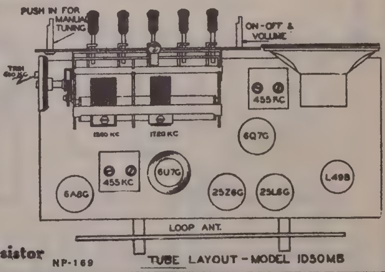
MODEL 1D50-MB

PUSH-BUTTONS: Unscrew the push-button on which you desire to receive a certain station. Tune in this station manually. Push in the push button and screw it tightly while holding it in. Repeat for other stations.
Insert station tabs in the ~~escutcheon by snapping them~~ in place. Pushing in any button will cause the desired station to be heard.

Part No.	Description
C-15754	Tubular cond. .01 mfd. 400V
C-15752	Tubular cond. .05 mfd. 200V
C-15756	Tubular cond. .05 mfd. 400V
C-15753	Tubular cond. .002 mfd. 600V
Y-CE-46	Electrolytic
CM-30	Mica cond. 250 mmf. 30%
CM-31	Mica cond. 100 mmf. 30%
Y-CP-8	Padding Condenser
R-15511	Carbon res. 50K ohm ¼W20%
R-15520	Carbon res. 500K ohm ¼W20%
R-15512	Carbon res. 250K ohm ¼W20%
R-79	Carbon resistor 15meg ¼W20%
R-46	Carbon res. 110 ohm ½W20%
R-15500	Carbon resistor 2meg ¼W20%
Y-CV-25	Volume Control
L-49-B	Plug in Ballast Resistor

The tubes used are:

1-6A8G	**Converter**
1-6U7G	**I. F. Amplifier**
1-6Q7G	**2nd Detector**
1-25L6G	**Beam Output**
1-25Z6G	**Rectifier**
1-L49B	**Plug-in Ballast Resistor**



MODEL 1D59-EB-PL
Schematic, Socket
Alignment, Trimmers
Tuner

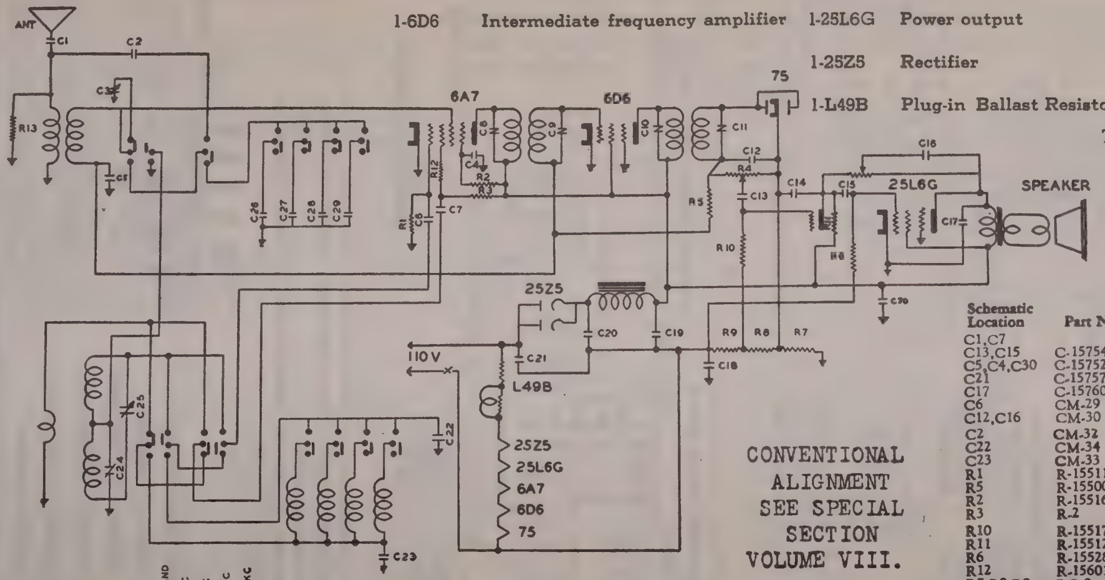
MAJESTIC RADIO & TELEV. CORP.

The tubes used are:			
1-6A7	Frequency converter	1-75	2nd detector, AVC, and A. F. Amplifier
1-6D6	Intermediate frequency amplifier	1-25L6G	Power output
		1-25Z5	Rectifier
		1-L49B	Plug-in Ballast Resistor

The bands covered are:

(A) 538 to 1750 Kilocycles.

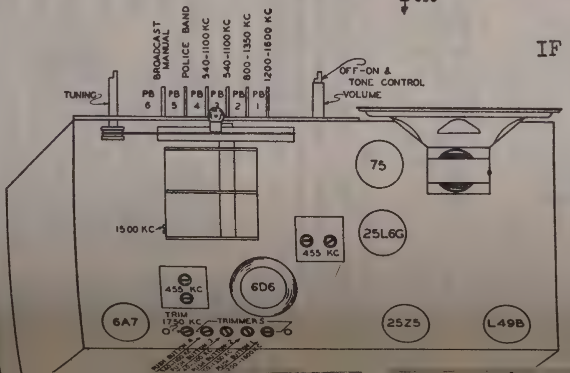
(B) 2.3 to 6.5 Megacycles.



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

IF PEAK 455 KC

Schematic Location	Part No.	Description
C1,C7		
C13,C15	C-15754	Tubular cond. .01 mfd. 400 V
C5,C4,C30	C-15752	Tubular cond. .05 mfd. 200V
C21	C-15757	Tubular cond. .1 mfd. 400V
C17	C-15760	Tubular cond. .02 mfd. 400V
C6	CM-29	Mica cond. 50 mmf. 30%
C12,C16	CM-30	Mica cond. 250 mmf. 30%
C2	CM-32	Mica cond. 10 mmf. 30%
C22	CM-34	Mica cond. 150 mmf. 5%
C23	CM-33	Mica cond. 250 mmf. 5%
R1	R-15511	Carbon res. 50K ohm ¼W20%
R5	R-15500	Carbon res. 2 meg. ¼W20%
R2	R-15516	Carbon res. 15K ohm ¼W20%
R3	R-2	Carbon res. 5K ohm ¼W 20%
R10	R-15517	Carbon res. 1 meg. ¼W20%
R11	R-15512	Carbon res. 250K ohm ¼W20%
R6	R-15528	Carbon res. 400K ohm ¼W20%
R12	R-15601	Carbon res. 100 ohm ¼W20%
R7,R8,R9	RC-8	Candohm Resistor
R13	R-15531	Carbon res. 10K ohm ¼W20%
	Y-VC-33	Volume and tone control

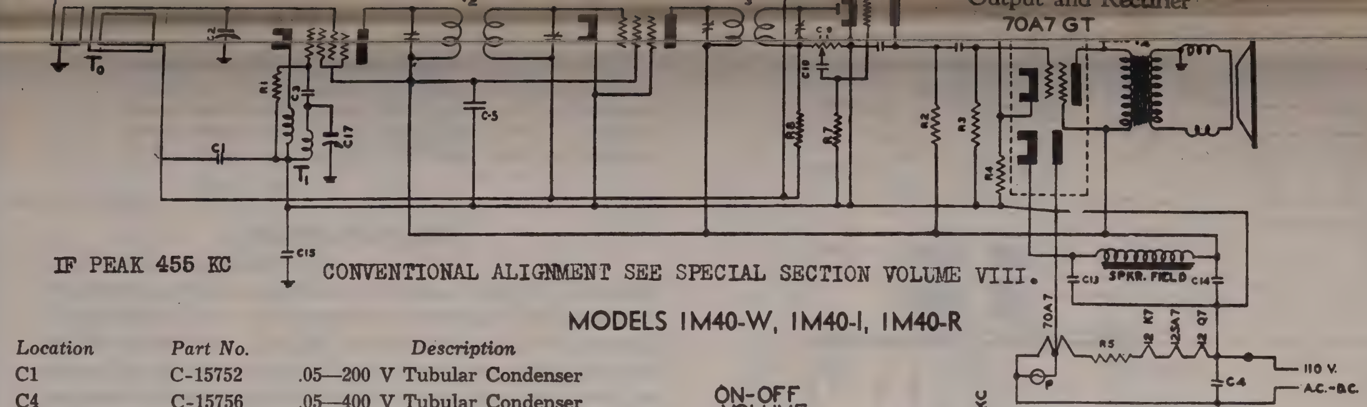


ADJUSTMENTS OF PUSH BUTTONS

These push-buttons are adjusted so as to come within three (3) frequency ranges. The first button from the left is for stations lying between 1200 and 1600 kylocycles. The second (2) button is for stations lying between 800 and 1350 kilocycles. The third (3) and fourth (4) buttons are for stations lying between 540 and 1100 kilocycles. To set up these buttons, determine which four (4) stations you wish to receive most frequently. Ascertain their frequencies and determine on which button they should be set up. Push in the button on which a particular station is to be set up and, with a screw driver, turn the screw at the rear of the chassis corresponding to this push-button, until the station you desire to hear is received with best quality and tone. Go to the top rear of the chassis and adjust the corresponding trimmer [illegible] maximum volume. Repeat for the other push-buttons. The location of these adjustment points

MAJESTIC RADIO & TELEV. CORP.

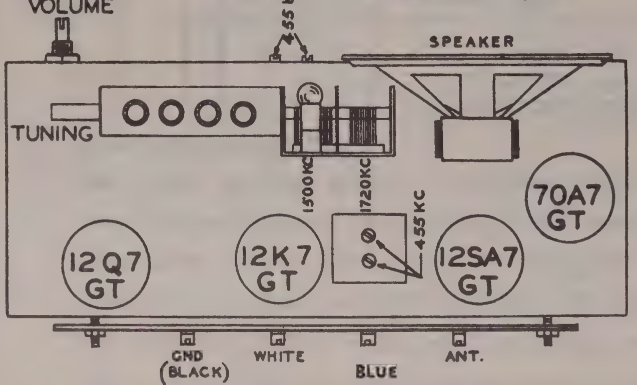
MODELS 1M40I, 1M40R
1M40W
Schematic, Socket
Alignment, Trimmers



IF PEAK 455 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

MODELS 1M40-W, 1M40-I, 1M40-R



Location	*Part No.*	*Description*
C1	C-15752	.05—200 V Tubular Condenser
C4	C-15756	.05—400 V Tubular Condenser
C5	C-15757	.1—400 V Tubular Condenser
C10	C-15774	.002—400 V Tubular Condenser
C12	C-15754	.01—400 V Tubular Condenser
C15	C-15751	.25—200 V Tubular Condenser
C16	C-15760	.02—400 V Tubular Condenser
C3	CM-29	50 mmfd. 30% Mica Condenser
C9	CM-30	250 mmfd. 30% Mica Condenser
C11	CM-31	100 mmfd. 30% Mica Condenser
C2, C17	Y-CV-48	Variable Condenser
C13, C14	Y-CE-50	Electrolytic Condenser
R1	R-15510	20K ohm ¼ W 20% Carbon Resistor
R2	R-15512	250K ohm ¼ W 20% Carbon Resistor
R3	R-15520	500K ohm ¼ W 20% Carbon Resistor
R4	R-106	150 ohm ¼ W 20% Carbon Resistor
R5	R-86	70 ohm 2 W Flexible Resistor
R6	Y-VC-40	500K ohm Volume Control
R7	R-107	7 megohm ¼ W 20% Carbon Resistor
R8	R-15500	2 megohm ¼ W 20% Carbon Resistor
To	Y-CR-44	Loop Antenna
T1	Y-CS-113	Oscillator Coil
T2	Y-IFA-7	1st I.F. Transformer
T3	Y-CI-32	2nd I.F. Transformer
T4		Speaker Output Transformer

MODELS 3C80,3C80P,380;3SC80,3SC80B;3C90,390;3SC90.

PUSH BUTTON TUNING

Six buttons on this set are provided to allow you to select your favorite station in the broadcast band instantaneously without any operation except that of pushing a button. These buttons start from the fourth from the left to the fourth from the right, inclusive, and numbering them from the left to the right, as 1, 2, 3, 4, 5, and 6.

The buttons numbered 1, 2, and 3 are designed to cover the frequency range from 1700 to 800 Kc. Buttons number 4, 5, and 6 are designed to cover the range from 1200 to 540 Kc. To set up these buttons it is only necessary to select one of the buttons which includes the frequency of the station which you wish to receive, and depress that button. Select the corresponding screw in the back of the receiver and with a small screw driver adjust it by turning the screw in or out until the station is being received as well as possible. Then, using the same screw driver, adjust the corresponding trimmer from the top of the chassis until maximum volume is obtained on that station. The other buttons may be adjusted in exactly the same fashion to different stations. Every time a button is adjusted for a certain station, remove the call letter tab from the sheet of call letters furnished with the receiver, and insert it through the small slit in the side of the knob so that the call letters show through the top of the knob. After the buttons have been once adjusted in this fashion, it is only necessary to press the button marked with the call letters of the station you wish to receive, whereupon it will be heard instantaneously.

MODELS 5BDA, 5BEA

PUSH BUTTONS: Looking at the front of the set counting from left to right, the first four push buttons are for setting up stations.

Button number 1 is for stations lying between 975 and 1550 Kilocycles
Button number 2 is for stations lying between 850 and 1350 Kilocycles
Button number 3 is for stations lying between 540 and 1100 Kilocycles
Button number 4 is for stations lying between 540 and 1100 Kilocycles
Button number A is for Broadcast Band.
Button number B is for Short Wave Band

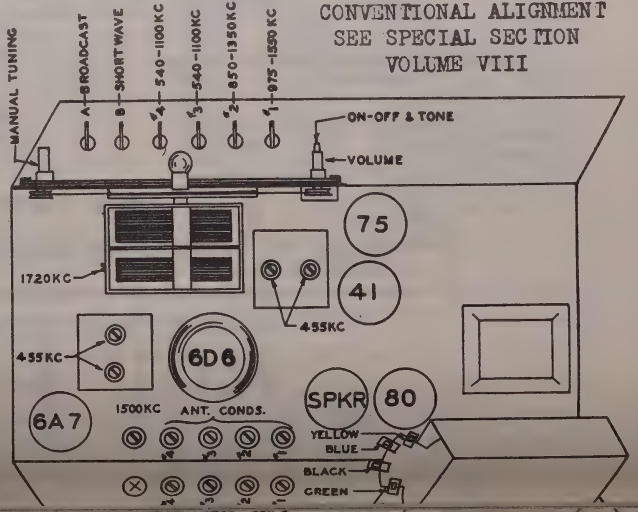
Determine on which button a desired station is to be set up. Push that button in. Going to the rear

MODEL 1M40.

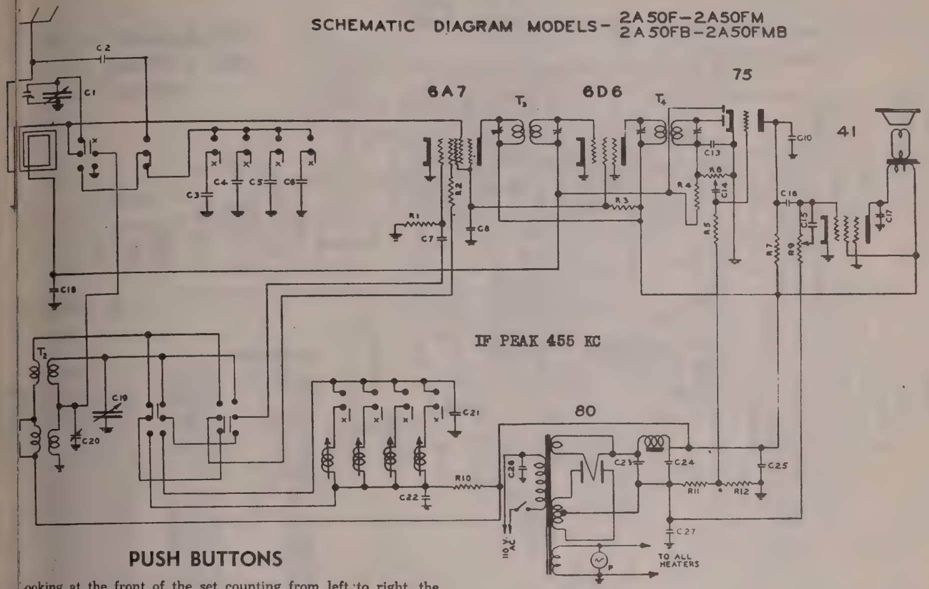
ADJUSTMENT OF PUSH BUTTONS

Determine on which push button you wish to set a particular station. Pull off that button. Using a screw driver, loosen the screw covered by the button. Tune the set manually by means of the station dial drum until the desired station is heard with best tone and volume. Push the push button shaft as far as it will go, tighten the screw, insert the proper station tab in the slot of the push button, and replace the push button on the push button shaft. Repeat for other stations.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



SCHEMATIC DIAGRAM MODELS- 2A50F-2A50FM
2A50FB-2A50FMB

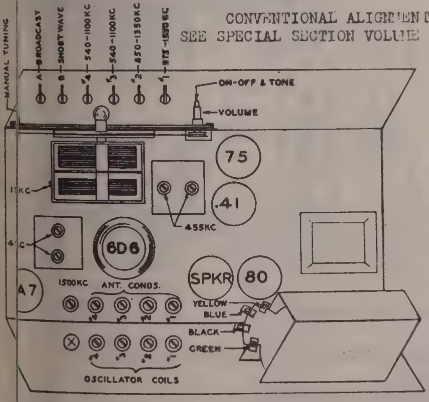


PUSH BUTTONS

Looking at the front of the set counting from left to right, the fir four push buttons are for setting up stations.
Bu on number 1 is for stations lying between 975 and 1550 Kilocycles.
Bu on number 2 is for stations lying between 850 and 1350 Kilocycles.
Bu on number 3 is for stations lying between 540 and 1100 Kilocycles.
Bu on number 4 is for stations lying between 540 and 1100 Kilocycles.
Bu on number A is for Broadcast Band.
Bu on number B is for Short Wave Band.

Determine on which button a desired station is to be set up. Push tha button in. Going to the rear of the receiver adjust the coil corresnding to the chosen push button until the desired station is hed with maximum volume and best tone. Adjust the trimmer cosponding to the chosen button until that station is heard with mamum volume. Repeat for other push buttons.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



TUBE LAYOUT MODEL 2A50
(See Figure No. 1)

Plug in the line cord to an AC power line of 105-130 Volts of 60 Cycles for Models 2A50-F and 2A50-F-M, and 50 or 60 Cycles for Models 2A50-F-B and 2A50-F-M-B.

The tubes used are:

1—6A7	Frequency converter
1—6D6	Intermediate frequency amplifier
1—75	Second detector, AVC, and Audio frequency amplifier
1—41	Output
1—80	Rectifier

RACEMENT PARTS LIST FOR MODELS 2A50-F, 2A50-F-B, 2A50-F-M, 2A50-F-M-B

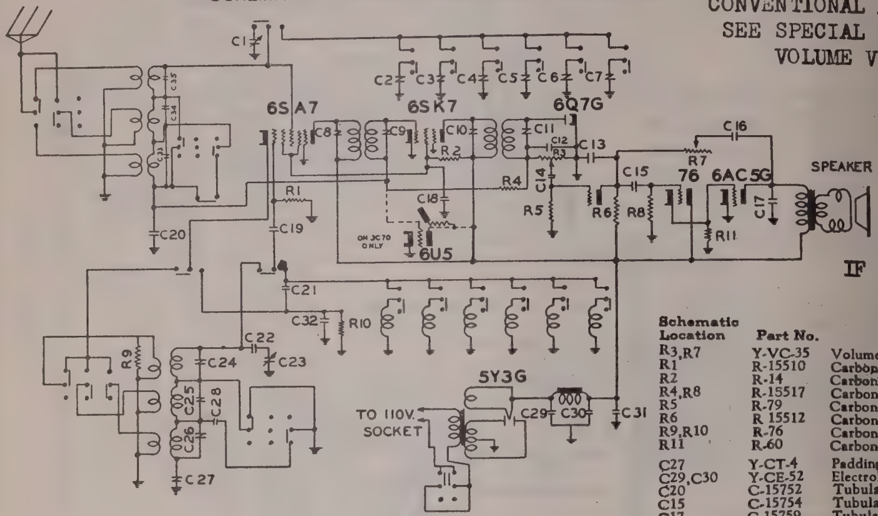
Sematic Lation	*Part Number*	*Description*
R	R-15511	50K ohm ¼ W 20% Carbon Resistor
R	R-15601	100 ohm ¼ W 20% Carbon Resistor

Schematic Location	*Part Number*	*Description*
R3	R-15544	15K ohm 1 W 20% Carbon Resistor
R4	R-15500	2 megohm ¼ W 20% Carbon Resistor
R5	R-15517	1 megohm ¼ W 20% Carbon Resistor
R6, R9	Y-VC-33	Volume and Tone Control
R7	R-15512	250K ohm ¼ W 20% Carbon Resistor
R10	R-2	5000 ohm ¼ W 20% Carbon Resistor
R11	R-82	35 ohm ¼ W 20% Carbon Resistor
R12	R-98	150 ohm ½ W 10% Carbon Resistor
T1	Y-CS-100	Loop Antenna
T2	Y-CS-102	Oscillator Coil
T3	Y-CI-40	1st I.F. Transformer
T4	Y-CI-42	2nd I.F. Transformer
C2, C14	C-15754	.01 mfd. 400 V Tubular Condenser
C8, C25	C-15756	.05 mfd. 400 V Tubular Condenser
C15	C-30	.001 mfd. 400 V Tubular Condenser
C16, C17	C-25	.006 mfd. 400 V Tubular Condenser
C18	C-15752	.05 mfd. 200 V Tubular Condenser
C26	C-18	.01 mfd. 400 V 20% Tubular Ceramic
C7	CM-29	50 mmf. 30% Mica Condenser
C10	CM-31	100 mmf. 30% Mica Condenser
C22	CM-33	250 mmf. 5% Mica Condenser
C21	CM-34	150 mmf. 5% Mica Condenser
C3, C4, C5, C6 C20	Y-CT-30B	Trimmer Strip
C23, C24, C27	Y-CE-43	Electrolytic Condenser

MODELS 3C70,360
Schematic,Alignment
Socket,Trimmers
Tuner

MAJESTIC RADIO & TELEV. CORP.

SCHEMATIC DIAGRAM–MODEL 3C70 360



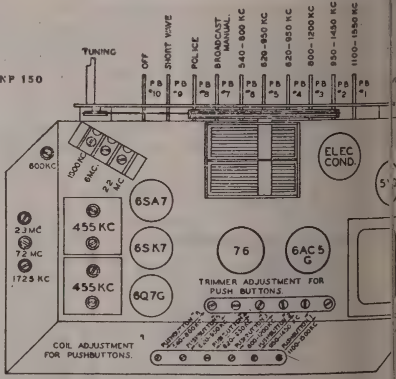
CONVENTIONAL ALIGNME
SEE SPECIAL SECTIO
VOLUME VIII

IF PEAK 4

Schematic Location	Part No.	Description
R3,R7	Y-VC-35	Volume and Tone c
R1	R-15510	Carbon res. 20K ohm
R2	R-14	Carbon res. 10K ohr
R4,R8	R-15517	Carbon res. 1 meg.
R5	R-79	Carbon res. 15 meg.
R6	R 15512	Carbon res. 250Kohi
R9,R10	R-76	Carbon res. 400 ohi
R11	R-60	Carbon res. 25K ohm
C27	Y-CT-4	Padding Condenser
C29,C30	Y-CE-52	Electrolytic Condens
C20	C-15752	Tubular cond. .05 m
C15	C-15754	Tubular cond. .01 m
C17	C-15759	Tubular cond. .006
C31	C-15757	Tubular cond. .1
C14	C-15774	Tubular cond. .002
C18	C-15756	Tubular cond. .05
C12,C13,C19	CM-31	Mica cond. 100 mmf
C16	CM-30	Mica cond. 250 mmf
C22	CM-2	Mica cond. 4330 mmf
C28	CM-36	Mica cond. 2770 mmf
C21	CM-13	Mica cond. 100 mmf
C32	CM-27	Mica cond. 2000 mmf
C2,C3,C4, C5,O6,C7	CT-28	Trim. capacities for P.

The receiver operates with the following tubes:

1-6SA7	Single ended frequency converter
1-6SK7	Single ended intermediate frequency amplifier
1-6Q7G	2nd detector, A. V. C. and A. F. driver
1-76	Output tube driver
1-6AC5G	Dynamically coupled output stage
1-5Y3G	Rectifier
1-6U5	Tuning indicator (Model 3C70 only)



SETTING UP OF PUSH—BUTTONS

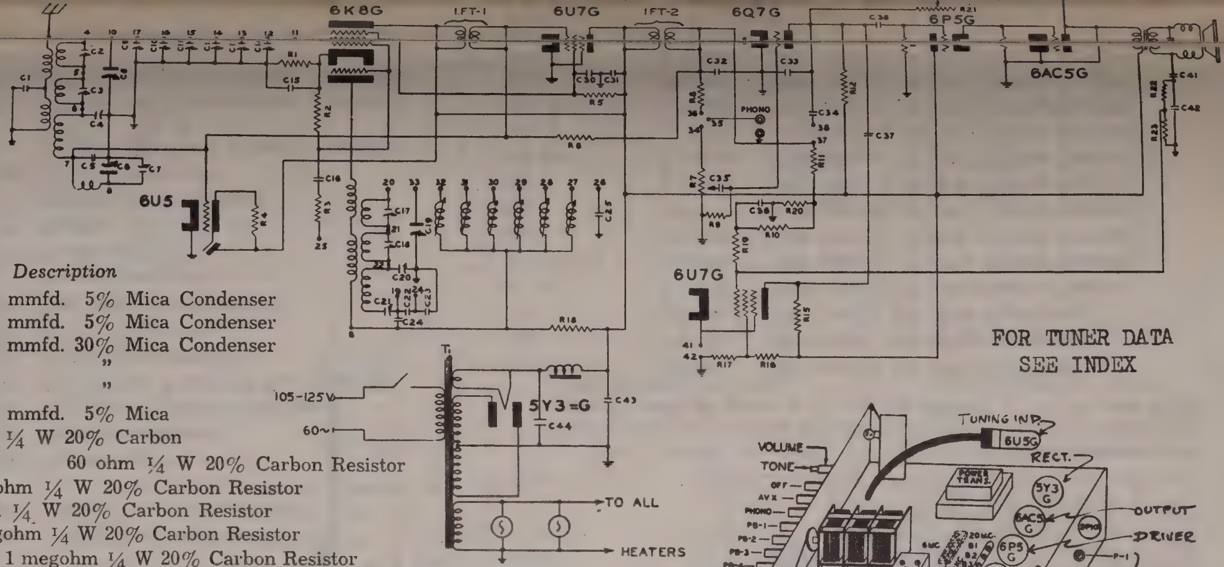
Button No. 1 is for stations lying between 1100 and 1550 KC's.
" No. 2 is for stations lying between 950 and 1450 KC's.
" No. 3 is for stations lying between 800 and 1200 KC's.
" No. 4 is for stations lying between 620 and 950 KC's.
" No. 5 is for stations lying between 620 and 950 KC's.
" No. 6 is for stations lying between 540 and 800 KC's.

1. Select the stations that you wish to set up on the push-buttons.
2. Determine on which push-buttons these stations should be set up, according to above table.
3. Push the button on which you should set up a particular station.
4. Using a screw driver, adjust the coil corresponding to the proper push-button until the desired station is heard with maximum volume and best tone.
5. Adjust the trimmer condenser corresponding to the proper push-button until the desired station is heard with maximum volume.
6. Repeat for other push-buttons.

MAJESTIC RADIO & TELEV. CORP.

MODELS 3C80,3C80P
380
Schematic,Socket
Alignment,Trimmers
MODELS 3SC80,3SC80B
Alignment,Socket
Trimmers

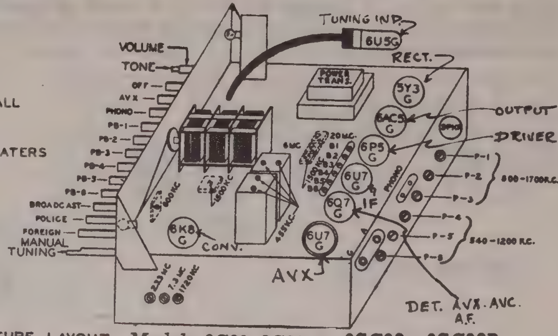
IF PEAK 455 KC



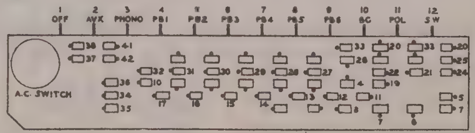
Schematic Location	Part Number	Description
C23	CM-38	4900 mmfd. 5% Mica Condenser
C22	CM-39	2300 mmfd. 5% Mica Condenser
C32	CM-31	100 mmfd. 30% Mica Condenser
C33	"	"
C16	"	"
C25	CM-13	100 mmfd. 5% Mica
R2	R-15511	50K ¼ W 20% Carbon
R16 R8 R3	R-111	60 ohm ¼ W 20% Carbon Resistor
R1	R-108	250 ohm ¼ W 20% Carbon Resistor
R19	R-15520	500K ¼ W 20% Carbon Resistor
R6	R-15500	2 megohm ¼ W 20% Carbon Resistor
R10 R13	R-15517	1 megohm ¼ W 20% Carbon Resistor
C9, C10, C11, C12, C13, C14	Y-CT-28	Condenser Strip
C6, C8, C19	Y-CV-47	3 Gang Variable Condenser
C44, C43	Y-CE-52	16-8 mfd. Electrolytic Condenser
R21, R7	Y-VC-39	Combination Volume & Tone Control
IFT-1	Y-IFA-5	1st I.F. Transformer
IFT-2	Y-IFA-6	2nd I.F. Transformer
T	Y-TP-5	Power Transformer
C24 C29 C37 C38 C41	C-15754	.01 400 Volts Tubular Condenser
C5 C15 C36	C-15752	.05 200 Volts Tubular Condenser
C30, C31	C-15756	.05 400 Volts Tubular Condenser
C40 C34 C35	C-21	.005 400 Volts Tubular Condenser
C42	C-15753	.002 600 Volts Tubular Condenser
C39	C15767	.001 600 Volts Tubular Condenser
R17	R-2	5K ¼ W 20% Carbon Resistor
R12	R-15515	100K ¼ W 20% Carbon Resistor
R14	R-15529	25K ¼ W 20% Carbon Resistor
R5	R-15501	25K 1 W 20% Carbon Resistor
R23	R-76	400 ohm ¼ W 20% Carbon Resistor
R22	R-15601	100 ohm ¼ W 20% Carbon Resistor
R15	R-15512	250K ¼ W 20% Carbon Resistor
R18	R-15552	30K ½ W 20% Carbon Resistor

FOR TUNER DATA
SEE INDEX

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

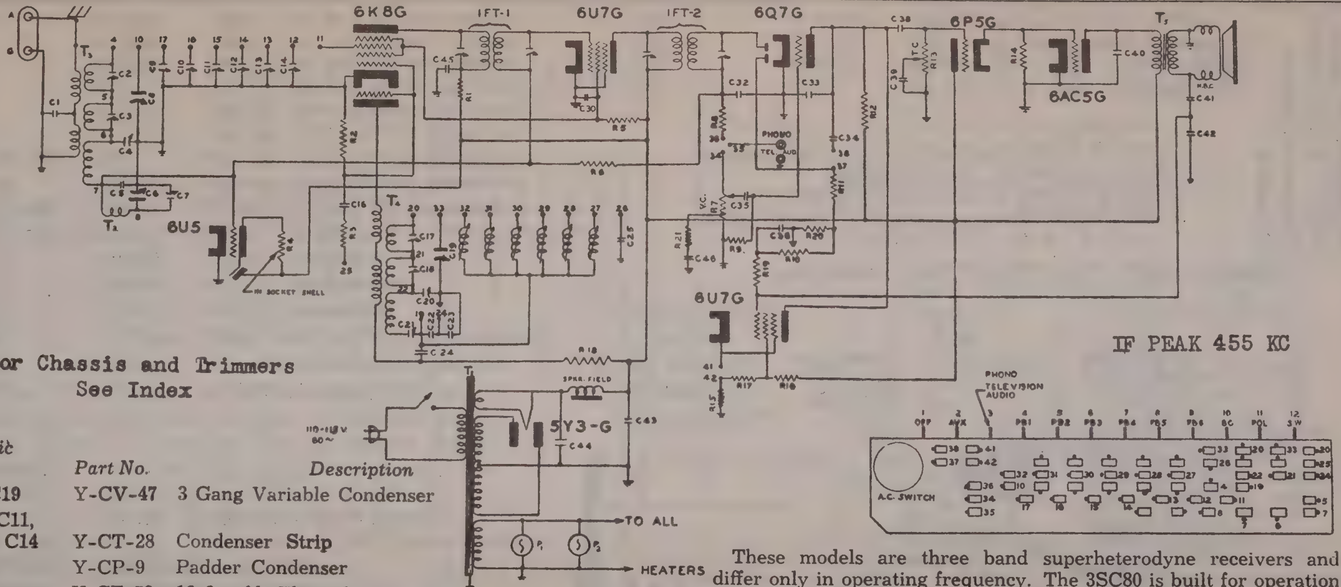


TUBE LAYOUT Models 3C80.3C80-P, 3SC80—3SC80B.



MODELS 3SC80,3SC80B
Schematic,Tuner Layout

MAJESTIC RADIO & TELEV. CORP.



For Chassis and Trimmers
See Index

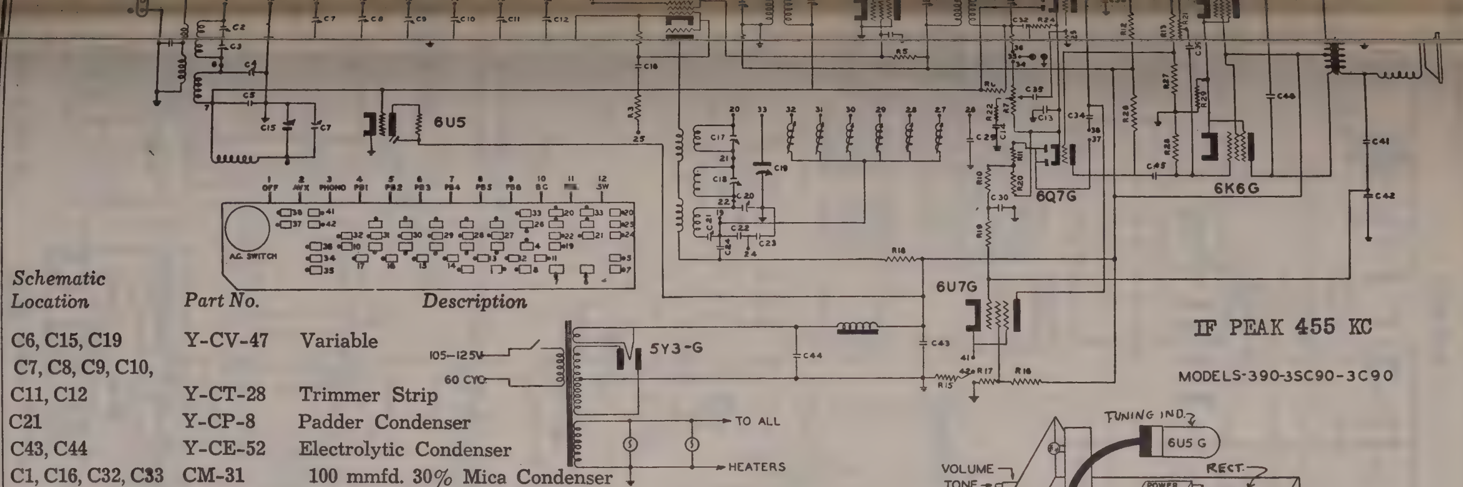
Schematic Location	Part No.	Description
C6, C8, C19	Y-CV-47	3 Gang Variable Condenser
C9, C10, C11, C12, C13, C14	Y-CT-28	Condenser Strip
C21	Y-CP-9	Padder Condenser
C43, C44	Y-CE-52	16-8 mfd. Electrolytic Condenser
R7, R13	Y-VC-39	Combination Volume & Tone Control
IFT-1	Y-IFA-5	1st I.F. Transformer
IFT-2	Y-IFA-6.	2nd I.F. Transformer
P1, P2	LB-51	Pilot Lights Mazda No. 51
T1	Y-TP-5	Power Transformer
T2	Y-CS-120	Preselector Coil
T3	Y-CS-116	Antenna Coil Assembly
T4	Y-CS-115	Oscillator Coil Assembly
T5	Y-SPA-64	Output Transformer
C5, C36	C-15752	.05 mfd. 200 Volts Tubular Condenser
C24, C38, C41, C45, C46	C-15754	.01 mfd. 400 Volts Tubular Condenser
C30	C-15756	.05 mfd. 400 Volts Tubular Condenser
C34, C35, C39, C40	C-21	.005 mfd. 400 Volts Tubular Condenser
C42	C-15753	.002 mfd. 600 Volts Tubular Condenser

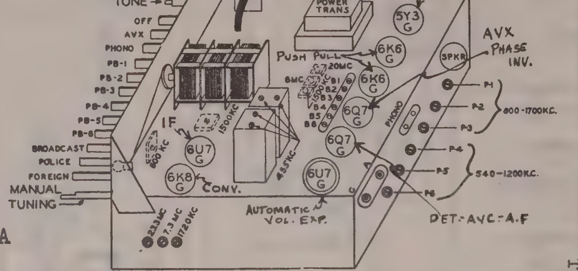
These models are three band superheterodyne receivers and differ only in operating frequency. The 3SC80 is built for operation on 115 volts 60 cycles A.C. and the 3SC80B is for 115 volts 50-60 cycles A.C.

C22	CM-39	2300 mmfd. 5% Mica Condenser
C23	CM-38	4900 mmfd. 5% Mica Condenser
C25	CM-13	100 mmfd. 5% Mica Condenser
R1, R15	R-15542	1000 ohm ¼ W 20% Carbon Resistor
R2, R8, R21	R-15511	50K ohm ¼ W 20% Carbon Resistor
R3	R-15536	100 ohm ¼ W 20% Carbon Resistor
R4	R-43	1 megohm ¼ W 20% Carbon Resistor
R5	R-15501	25K ohm 1 W 20% Carbon Resistor
R6, R10	R-15500	2 megohm ¼ W 20% Carbon Resistor
R9	R-109	5 megohm ¼ W 20% Carbon Resistor
R11, R19, R20	R-15520	500K ohm ¼ W 20% Carbon Resistor
R12	R-15515	100K ohm ¼ W 20% Carbon Resistor
R14	R-15529	25K ohm ¼ W 20% Carbon Resistor
R16	R-15524	50K ohm 1 W 20% Carbon Resistor

MODELS 3C90,3SC90
390
Schematic,Alignment
Socket,Trimmers
Tuner Layout

MAJESTIC RADIO & TELEV. CORP.





CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

FOR TUNER DATA
SEE INDEX

Schematic Location	Part No.	Description
C6, C15, C19	Y-CV-47	Variable
C7, C8, C9, C10, C11, C12	Y-CT-28	Trimmer Strip
C21	Y-CP-8	Padder Condenser
C43, C44	Y-CE-52	Electrolytic Condenser
C1, C16, C32, C33	CM-31	100 mmfd. 30% Mica Condenser
C23	CM-38	4900 mmfd. 5% Mica Condenser
C22	CM-39	2300 mmfd. 5% Mica Condenser
C29	CM-13	100 mmfd. 5% Mica Condenser
C35	CM-15909	500 mmfd. 20% Mica Condenser
C5, C30	C-15752	.05 mfd. 200 V Tubular Condenser
C13, C14, C24, C38, C41, C45	C-15754	.01 mfd. 400 V Tubular Condenser
C30, C31	C-15756	.05 mfd. 400 V Tubular Condenser
C34, C48	C-21	.005 mfd. 400 V Tubular Condenser
C39, C42	C-15753	.002 mfd. 600 V Tubular Condenser
R1, R24	R-15542	1000 ohm ¼ W 20% Carbon Resistor
R2, R8, R22	R-15511	50K ohm ¼ W 20% Carbon Resistor
R3	R-15601	100 ohm ¼ W 20% Carbon Resistor
R5	R-15501	25K ohm 1 W 20% Carbon Resistor
R6	R-15500	2 megohm ¼ W 20% Carbon Resistor
R7, R21	Y-VC-39	Volume and Tone Control
R10, R11, R25	R-15517	1 megohm ¼ W 20% Carbon Resistor
R12, R26	R-15515	100K ohm ¼ W 20% Carbon Resistor
R13, R19, R28	R-15520	500K ohm ¼ W 20% Carbon Resistor

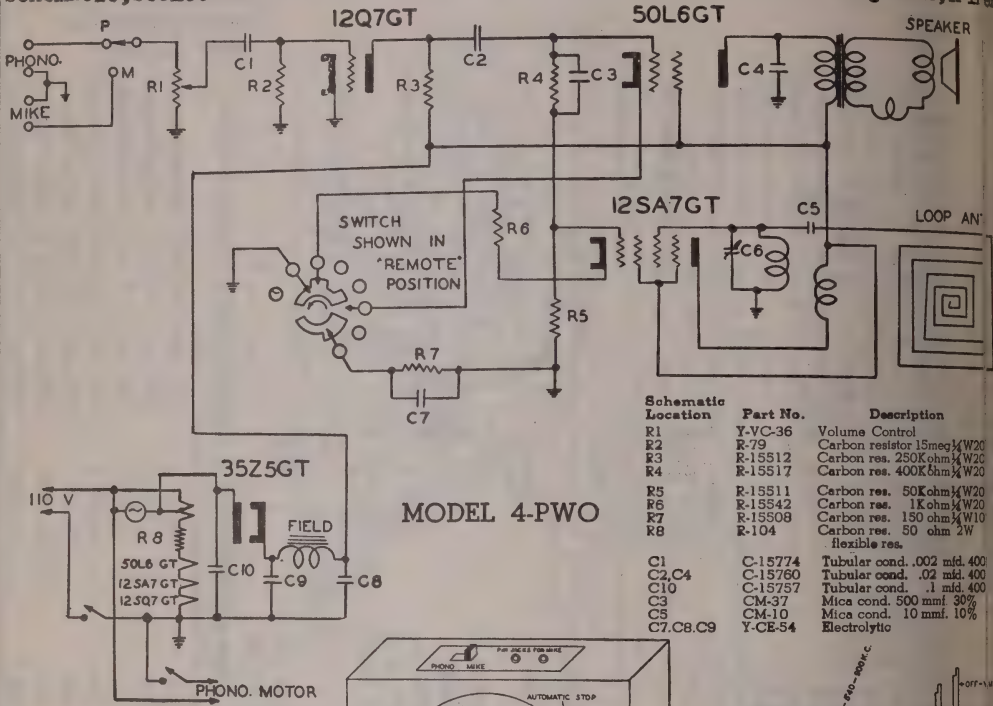
These models are three band superheterodyne receivers and differ only in the provision for record changer.

R15	R-16	8K ohm ¼ W 20% Carbon Resistor
R16	R-15524	50K ohm 1 W 20% Carbon Resistor
R17	R-15576	5000 ohm ¼ W 10% Carbon Resistor
R18	R-15506	30K ohm ½ W 20% Carbon Resistor
R20	R-15512	250K ohm ¼ W 20% Carbon Resistor
R27	R-15531	10K ohm ¼ W 20% Carbon Resistor
R29	R-15600	200 ohm 1 W 20% Carbon Resistor

MODEL 4-PWO
Wireless Record Player
Schematic,Socket

MAJESTIC RADIO & TELEV. CORP

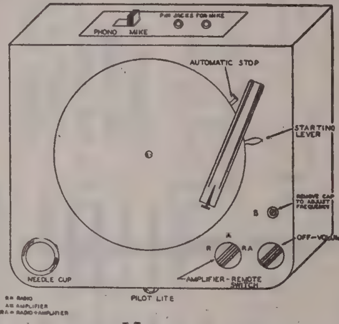
MODEL 6UL51
Schematic,Soc
Alignment,Tri

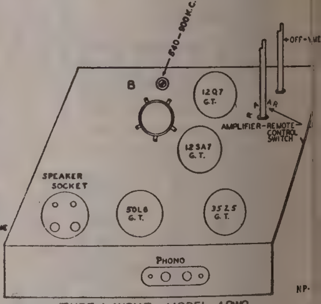


Schematic Location	Part No.	Description
R1	Y-VC-36	Volume Control
R2	R-79	Carbon resistor 15meg¼W20
R3	R-15512	Carbon res. 250Kohm¼W20
R4	R-15517	Carbon res. 400Kohm¼W20
R5	R-15511	Carbon res. 50Kohm¼W20
R6	R-15542	Carbon res. 1Kohm¼W20
R7	R-15508	Carbon res. 150 ohm¼W10
R8	R-104	Carbon res. 50 ohm 2W flexible res.
C1	C-15774	Tubular cond. .002 mfd. 400
C2,C4	C-15760	Tubular cond. .02 mfd. 400
C10	C-15757	Tubular cond. .1 mfd. 400
C3	CM-37	Mica cond. 500 mmf. 30%
C5	CM-10	Mica cond. 10 mmf. 10%
C7.C8.C9	Y-CE-54	Electrolytic

The tubes used are

1-12Q7GT	**Pre Amplifier**
1-50L6GT	**Beam power output**
1-12SA7GT	**Modulator oscillator**
1-35Z5GT	**Rectifier**





TUBE LAYOUT— MODEL 4PWO

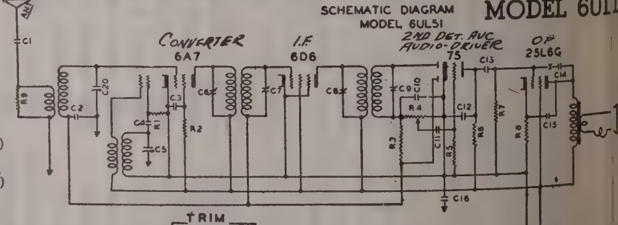
Model 4PWO operates on 105-130 volts, 60 cycles, AC. It can be made to operate on 50-cy
AC by changing a bushing on the motor shaft.

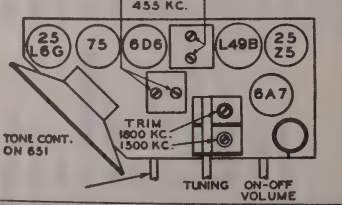
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

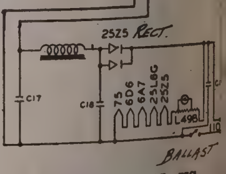
Schematic Location	Part No.	Description
C1,C13	C-15754	Tubular cond. .01 mfd. 400V
C2	C-15752	Tubular cond. .05 mfd. 200V
C5 C20	Y-CV-22	Variable cond.(Osc. Section) Variable cond.(SignalSection)
C6,C7	Y-CT-1	Trimmer cond. 1st I.F. Trans.
C8,C9	Y-CT-1	Trimmer cond. 2nd I.F. Trans.
C16	C-20	Paper cond..25 mfd.200V(Mol.)
C15	C-15760	Tubular cond. .02 mfd. 400V
C4	CM-29	Mica cond. 50 mmf.
C10,C12,C14	CM-31	Mica cond. 100 mmf.
C17	Y-CE-40	Electr. cond. 16 mfd.150V(Met.)
C18	Y-CE-39	Electr. cond. 40mfd.200V(Clad)
C19	C-24	Paper cond. .1 mfd. 300V(Mol.)
C11	C-15774	Tubular cond. .002 mfd. 400V
C3	C-28	Paper cond. .05 mfd.200V(Mol.)
R1	R-15511	Carbon res. 50K ohm¼W20%
R2	R-15516	Carbon res. 15K ohm¼W20%
R3	R-15500	Carbon resistor 2meg ¼W20%
R5	R-79	Carbon resistor15meg¼W20%
R6	R-15512	Carbon res. 250K ohm¼W20%
R7	R-15520	Carbon res. 500K ohm¼W20%
R9	R-15531	Carbon resistor 10K ¼W20%
R8	R-56	Carbon res. 100 ohm½W10%
R4	Y-VC-21	Volume Control

MODEL 6UL1

SCHEMATIC DIAGRAM
MODEL 6UL51





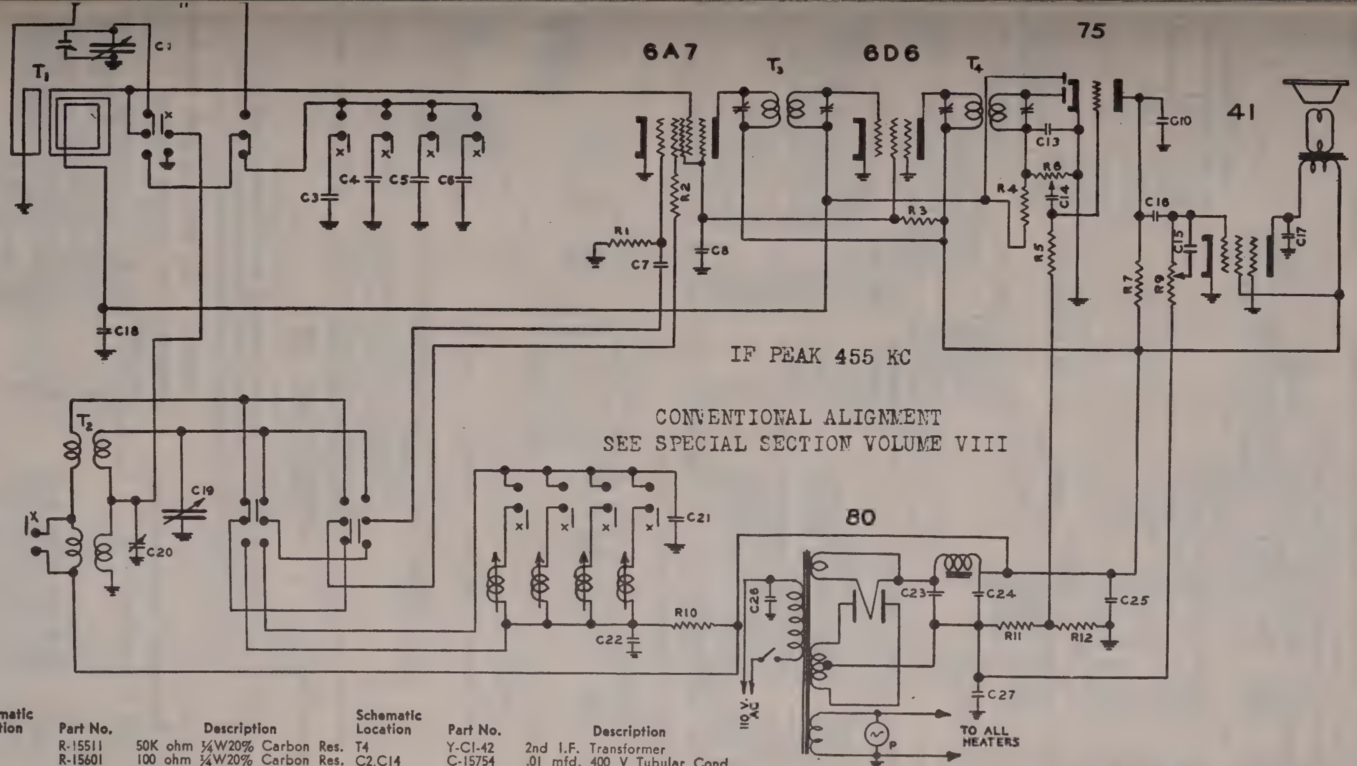


IF PEAK 455 KC

This is a 5-tube, 2-band receiver, operating on alternating current of 110-115 Volts, 60 Cycles for Model 5BDA, and 50-60 Cycles for Model 5BEA. The tuning range for the broadcast band is from 535 to

MAJESTIC RADIO & TELEV. CORP.

MODELS 5BDA, 5BEA
Schematic



IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

FOR TUNER AND LAYOUT
SEE INDEX

Schematic Location	Part No.	Description
R1	R-15511	50K ohm ¼W20% Carbon Res.
R2	R-15601	100 ohm ¼W20% Carbon Res.
R3	R-15544	15K ohm 1W20% Carbon Res.
R4	R-15500	2 meg. ¼W20% Carbon Res.
R5	R-15517	1 meg. ¼W20% Carbon Res.
R6,R9	Y-VC-33	Volume and Tone Control
R7	R-15512	250K ohm ¼W20% Carbon Res.
R10	R-2	5000 ohm ¼W20% Carbon Res.
R11	R-82	35 ohm ¼W20% Carbon Res.
R12	R-98	150 ohm ½W10% Carbon Res.
T1	Y-CS-100	Loop Antenna
T2	Y-CS-102	Oscillator Coil
T3	Y-CI-40	1st I.F. Transformer

Schematic Location	Part No.	Description
T4	Y-CI-42	2nd I.F. Transformer
C2,C14	C-15754	.01 mfd. 400 V Tubular Cond.
C8,C25	C-15756	.05 mfd. 400 V Tubular Cond.
C15	C-30	.001 mfd. 400 V Tubular Cond.
C16,C17	C-25	.006 mfd. 400 V Tubular Cond.
C18	C-15752	.05 mfd. 200 V Tubular Cond.
C26	C-18	.01 mfd. 400 V Ceramic
C7	CM-29	50 mmf. Mica Condenser
C10	CM-31	100 mmf. Mica Condenser
C22	CM-33	250 mmf. 5% Mica Condenser
C21	CM-34	150 mmf. 5% Mica Condenser
C3,C4,C5,C6 C20	Y-CT-308	Trimmer Strip
C23,C24,C27	Y-CE-43	Electrolytic Condenser

The tubes used are:

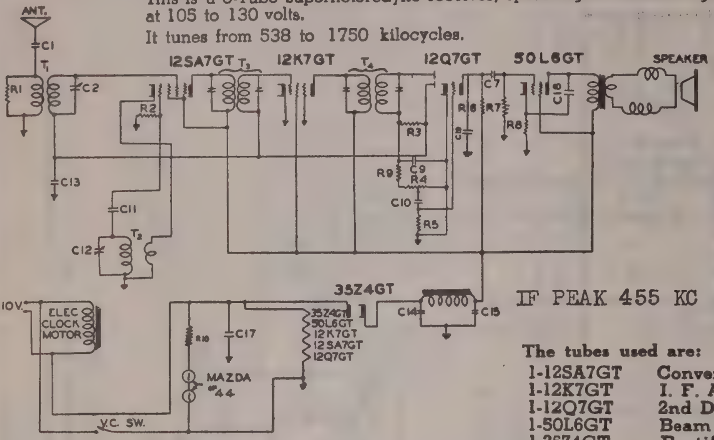
1—6A7	Frequency converter
1—6D6	Intermediate frequency amplifier
1—75	Second detector, AVC, and Audio frequency amplifier
1—41	Output
1—80	Rectifier

MODELS 5T,5TO
MODELS 140,148
Schematics,Socket
Trimmers,Alignment

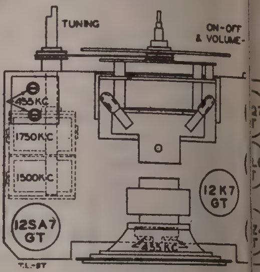
MAJESTIC RADIO & TELEV. CORP.

This is a 5-Tube superheterodyne receiver, operating on alternating current of 60 cycles only, at 105 to 130 volts.

It tunes from 538 to 1750 kilocycles.



IF PEAK 455 KC



TUBE LAYOUT MODEL 5T

The tubes used are:

1-12SA7GT	Converter
1-12K7GT	I. F. Amplifier
1-12Q7GT	2nd Detector, A.V.C., Driver
1-50L6GT	Beam Power Output
1-35Z4GT	Rectifier

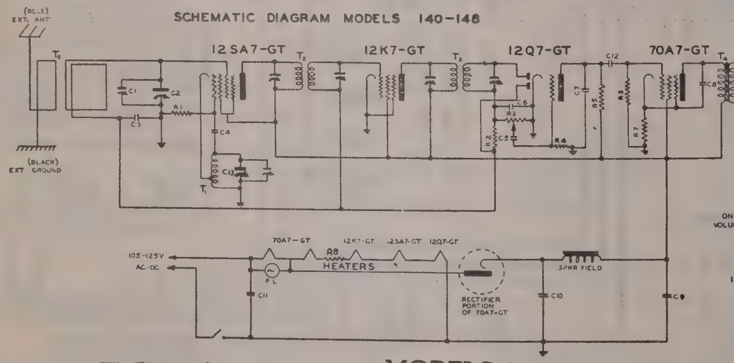
MODELS 5T—5TO

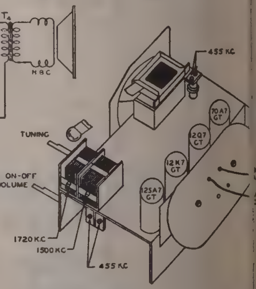
Schematic Location	Part No.	Description
R1	R-15531	Carbon res. 10Kohm¼W20%
R2	R-15510	Carbon res. 20Kohm¼W20%
R3	R-15500	Carbon resistor 2meg ¼W20%
R4	Y-VC-21	Volume Control
R5	R-50	Carbon resistor 5meg¼W20%
R6	R-15512	Carbon res. 250Kohm¼W20%
R7	R-15520	Carbon res. 500Kohm¼W20%
R8	R-80	Carbon res. 110 ohm½W20%
R9	R-15515	Carbon res. 100K ohm¼W20%
R10	LC-14	Line Cord

Schematic Location	Part No.	Description
C1,C7	C-15754	Tubular cond. .01 mfd. 400V
C13	C-15752	Tubular cond. .05 mfd. 200V
C10	C-15774	Tubular cond. .002 mfd. 400V
C17,C18	C-15760	Tubular cond. .02 mfd. 400V
C11	CM-29	Mica cond. 50 mmfd. 30%
C9,C19	CM-30	Mica cond. 250 mmfd. 30%
C14,C15	Y-CE-55	40 16 mfd. 150 V
T-1	Y-CS-111	Antenna Coil
T-3	CI-69	1st I. F. Transformer
T-4	Y-CI-32	2nd I. F. Transformer
	Y-M-26	Electric Clock
T-2	CS-112	Osc. Coil

CONVENTIONAL ALIGNMENT FOR ALL MODELS SEE SPECIAL SECTION VOLUME VIII

SCHEMATIC DIAGRAM MODELS 140-148





TUBE LAYOUT MODELS-140-1

IF PEAK 455 KC

MODELS 140, 148

This set is a one band, 4-tube superheterodyne receiver equipped with a Majestic High Q loop. This set will operate on 105-125 volts AC or DC current, and will receive stations lying between 540 and 1720 Kc. This includes standard broadcast and most police stations.

The tubes used are:

1-12SA7GT	Frequency Converter and Osc.
1-12K7GT	I. F. Amplifier
1-12Q7GT	2nd Detector, AVC, First Audio
1-70A7GT	Output and Rectifier

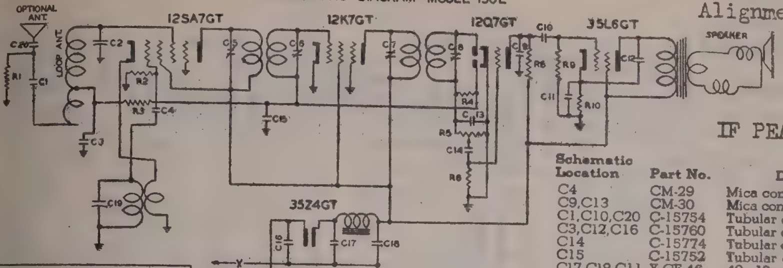
Schematic Location	Part No.	Description
C3	C-15752	Tubular cond. .05 mfd. 200V
C5	C-15753	Tubular cond. .002 mfd. 600V
C8	C-15760	Tubular cond. .02 mfd. 400V
C11	C-15756	Tubular cond. .05 mfd. 400V
C12	C-15754	Tubular cond. .01 mfd. 400V
C2,C13	Y-CV-15	Variable Condenser
C9,C10	Y-CE-56	Electrolytic Condenser
C4	CM-29	Mica cond. 50 mmfd.
C6,C7	CM-30	Mica cond. 250 mmfd.

Schematic Location	Part No.	Description
R1	R-15510	Carbon res. 20K ohm¼W20%
R2	R-15500	Carbon resistor 2meg ¼W20%
R3	Y-VC-15	Volume Control
R4	R-15559	Carbon resistor 3meg ¼W20%
R5	R-15512	Carbon res 250Kohm¼W20%
R6	R-15520	Carbon res. 500Kohm¼W20%
R7	R-106	Carbon res. 150 ohm¼W20%
R8	R-86	Flexible res. 70 ohm 2W
T0	Y-CS-131	Loop Assembly
T1	Y-CS-105	Oscillator Coil
T2	Y-CS-106	1st I. F. Transformer
T3	Y-CS-107	2nd I. F. Transformer
P.L.	LB-47	Pilot Light Mazda #47

MAJESTIC RADIO & TELEV. CORP.

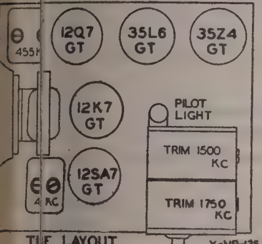
MODELS 130,130U
MODEL 150L
Schematics,Socket Alignment,Trimmers

SCHEMATIC DIAGRAM-MODEL 150L



IF PEAK 455 KC

Schematic Location	Part No.	Description
C4	CM-29	Mica cond. 50 mmf. 30%
C9,C13	CM-30	Mica cond 250 mmf. 30%
C1,C10,C20	C-15754	Tubular cond. .01 mfd. 400V
C3,C12,C16	C-15760	Tubular cond. .02 mfd 400V
C14	C-15774	Tubular cond. .002 mfd. 400V
C15	C-15752	Tubular cond. .05 mfd. 200V
C17,C18,C11	Y-CE 46	40 16 mfd. 150V 20 mfd. 25V
C2 C19	Y-CV-35	Variable Condenser
C5,C6,C7,C8		I. F. Trimmer Condenser
R5	Y-VC-29	Volume Control and Switch
R11	R-96	Carbon res. 50 ohm 1W20%
R2	R-15510	Carbon res. 20K ohm ¼W20%
R9	R-15520	Carbon res. 500K ohm ¼W20%
R4	R-15500	Carbon res. 2 meg. ¼W20%
R6	R-79	Carbon res. 15 meg ¼W20%
R10	R-80	Carbon res. 110 ohm ½W20%
R1	R-15531	Carbon res 10K ohm ¼W20%
R3	R-15515	Carbon res. 100K ohm ¼W20%
R12	R-83	Carbon res. 35 ohm 1W20%



TUBE LAYOUT MODEL 150L

MODEL 150-L

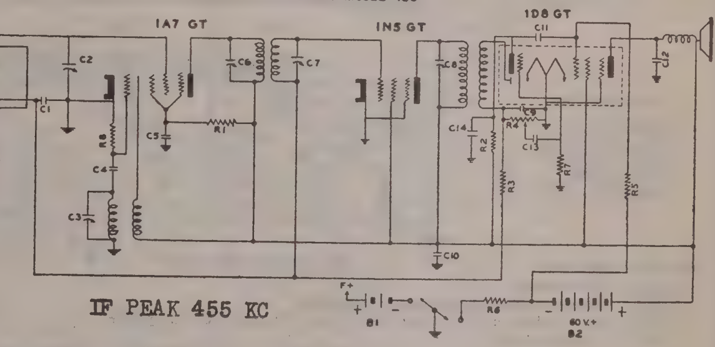
The tubes used are:

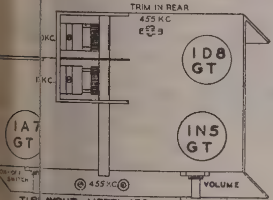
1-12SA7-GT	Frequency converter
1-12K7-GT	Intermediate frequency amplifier
1-12Q7-GT	Second Detector, Automatic Volume, and Audio Driver
1-35L6-GT	Beam power output
1-35Z4-GT	Rectifier

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

MODEL
130, 130U

SCHEMATIC DIAGRAM MODEL-130





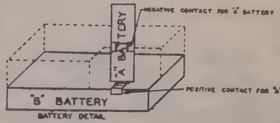
TUBE LAYOUT-MODEL 130 130U

IF PEAK 455 KC

NVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

To change the "A" battery, remove the old one from its bracket. Remove the wrapping or tube from the new battery and snap it in position as shown in Figure 1, making certain that the small center contact of the battery makes a good connection to the spring contact as shown in Figure 1.

To change the "B" battery, slide the old one from underneath he chassis. Remove the plug from this battery. Insert the plug nto the new battery and replace the new battery.


NEGATIVE CONTACT FOR "A" BATTERY
"A" BATTERY
POSITIVE CONTACT FOR "A" BATTERY
"B" BATTERY

BATTERY DETAIL

The tuning range is from 540 to 1750 kilocycles.

he tubes used are:

1–1A7GT	Combined oscillator and 1st detector.
1–1N5GT	Intermediate frequency amplifier.
1–1D8GT	Combined second detector, Audio driver, and Power output.

MODEL 130

B1	No. 9	Majestic Battery No. 9 1.5V
B2	No. 3A40P	Majestic Battery No. 3A40P 60V

MODEL 130U

1—P-94A Majestic Battery No. P-94A 1.5V
2—P-5303 Majestic Battery No. P-5303 45V

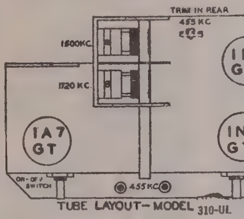
Schematic Location	Part No.	Description
C1	C-45	Tubular cond. .05 mfd. 200V
C2, C3	Y-CV-46	Variable Condenser
C4	CM-31	Mica cond. 100 mmfd.
C5, C11	C-48	Tubular cond. .01 mfd. 400V
C6, C7	CT-1	Trimmer condenser
C8	CT-32	Trimmer condenser
C9, C14	CM-30	Mica cond. 250 mmfd.
C10	CE-58	4 mfd. 100V Electrolytic
C12, C13	C-47	Tubular cond. .004 mfd. 400V
R1	R-105	Carbon res. 5K ohm
R2	R-102	Carbon res. 1 meg.
R3, R5, R7	R-101	Carbon res. 2 meg.
R8	R-99	Carbon res. 200K ohm
R6	R-103	Carbon res. 60 ohm

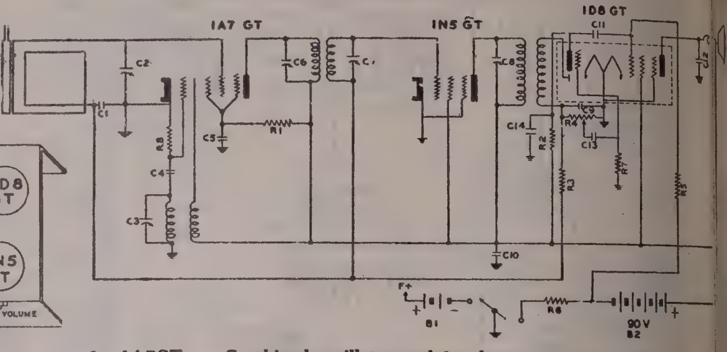
MODEL 310UL
MODELS 419B,420
420PL,421,421PL
Schematics,Socket
Trimmers,Alignment

MAJESTIC RADIO & TELEV. CORP.

MODEL 310UL

IF PEAK 455 KC



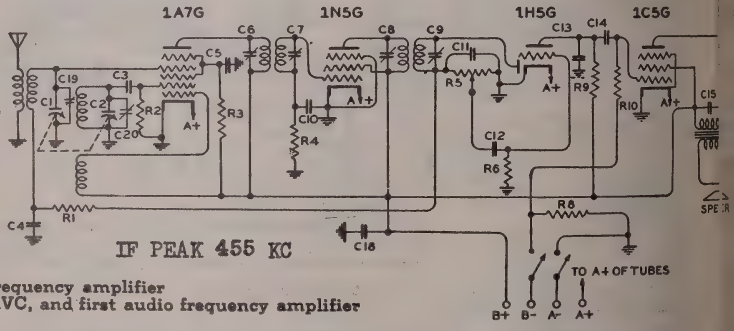


The tubes used are:
1—1A7GT Combined oscillator and 1st detector.
1—1N5GT Intermediate frequency amplifier.
1—1D8GT Combined second detector, Audio driver, and Power output

Schematic Location	Part No.	Description			
C1	C-45	Tubular cond. .05 mfd. 200V	R1	R-105	Carbon res. 5K ohm
C2, C3	Y-CV-46	Variable Condenser	R2	R-102	Carbon res. 1 meg.
C4	CM-31	Mica cond. 100 mmfd.	R3, R5, R7	R-101	Carbon res. 2 meg.
C5, C11	C-48	Tubular cond. .01 mfd. 400V	R8	R-15515	Carbon res. 100K ohm
C6, C7	CT-1	Trimmer condenser	R6	R-103	Carbon res. 600 ohm
C8	CT-32	Trimmer condenser			
C9, C14	CM-30	Mica cond. 250 mmfd.	B1	1—P-94A	Majestic Battery No. P-96 1.5V
C10	CE-58	4 mfd. 100V Electrolytic	B2	2—P-5303	Majestic Battery No. P-530 45V
C12, C13	C-47	Tubular cond. .004 mfd. 400V			

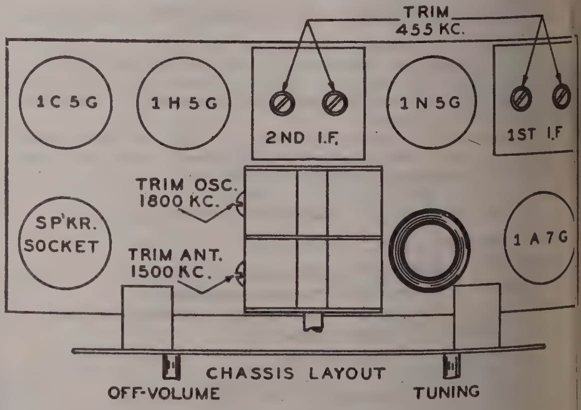
CONVENTIOIL
ALIGNMEN
SEE SPECI
SECTION
VOLUME VII.

Model 419-B
Model 420
Model 420-PL
Model 421
Model 421-PL



IF PEAK 455 KC

The tubes used are:
1-1A7G Converter
1-1N5G Intermediate frequency amplifier
1-1H5G 2nd detector, AVC, and first audio frequency amplifier
1-1C5G Output tube



Schematic Location	Part No.	Description
C4,C5	C-15752	.05 mfd. 200V
C10,C12,C14	C-15763	.01 mfd. 200V
C15	C-25	.006 mfd. 400V
C3,C11,C13	CM-15918	100 mmf Type "O" Mica
C1,C2	Y-CV-26	Variable Condenser
C6 C7,C8,C9	Y-CT-2	I. F. Trimmer Condenser
C18	CE-35	8 mfd. 150V Electrolytic
R9	R-15520	500K ¼W 20%
R10	R-15517	1 meg. ¼W 20%
R8	R-72	600 ohms ¼W 20%
R2	R-15523	200K ¼W 20%
R6	R-15559	3 meg. ¼W 20%
R3	R-44	70K ¼W 10%
R1,R4	R-15500	2 meg. ¼W 20%
R5	Y-VC-26	Volume Control

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

This receiver is designed to operate on the following dry batteries.

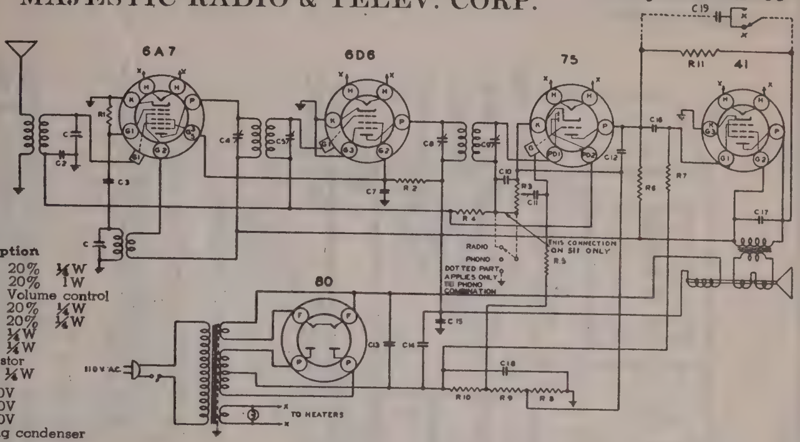
1. 1½ volt A-battery — Eveready 742A — RAY-O-VAC P-94A or the equivalent.
2. 45 volt B-batteries — Eveready 762 — RAY-O-VAC P-5303 or the equivalent.

hema c,Socket
imme ,Alignment
DEL 9P
hema c

M lel 511
M lel 511A
M lel 519P
M lel 519PA

MAJESTIC RADIO & TELEV. CORP.

MODELS 511,511A 519P,519PA Late

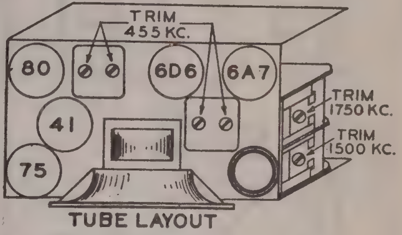


matic tion	rt No.	Description
	15511	5CK ohms 20% ¼W
	15544	15K ohms 20% 1W
	VC 17	500K ohms Volume control
	15500	2 meg ohms 20% ¼W
	15517	1 meg ohm 20% ¼W
	15520	500K 20% ¼W
	15528	400K 20% ¼W
9,R8	-7	Candohm resistor
	50	5 meg 20% ¼W
	-15752	.05 mfd. 2C0V
15	-15756	.05 mfd. 400V
C16	-15754	.01 mfd 400V
	-CV-17	Variable gang condenser
5 C8,C	-CT-1	I. F. Trimmers
C12	M-15918	100 mmfd. 20%
	M-15929	50 mmfd. 20%
C14,C1	-CE-43	Electrolytic condenser 12 8 mfd. 300 V 20 mfd. 25 V
	M-16	150 mmfd. 20%
	-15759	.006 mfd. 600V

tube used are:

A7	Converter tube
D6	I. F. Amplifier
5	Second detector, automatic volume control and audio amplifier
1	Power output
0	Rectifier

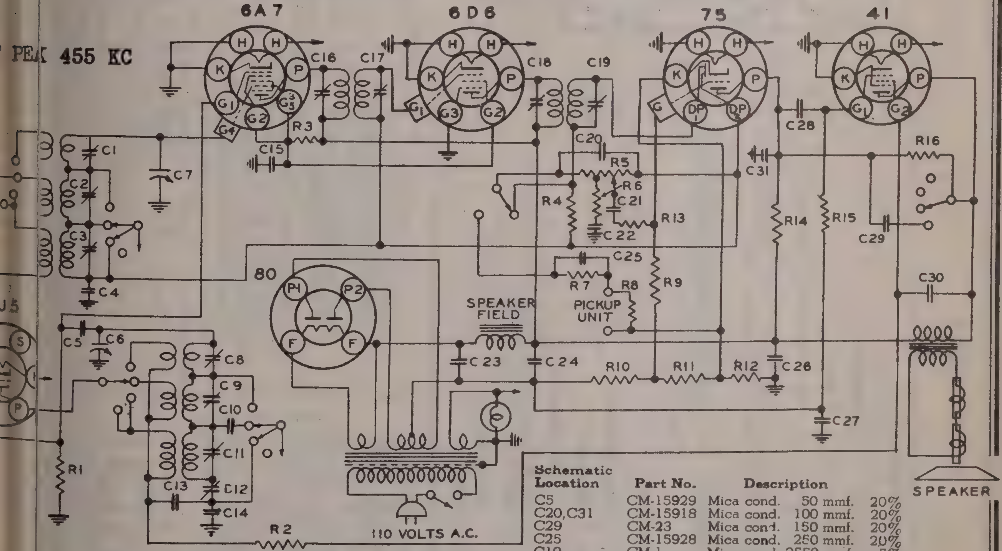
IF PEAK 455 KC



TUBE LAYOUT

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

PE K 455 KC



Schematic Location	Part No.	Description
C5	CM-15929	Mica cond. 50 mmf. 20%
C20,C31	CM-15918	Mica cond. 100 mmf. 20%
C29	CM-23	Mica cond. 150 mmf. 20%
C25	CM-15928	Mica cond. 250 mmf. 20%
C10	CM-1	Mica cond 2550 mmf 5%
C14	CM-17	Mica cond. pre. 4330 mmf. 3%
C15,C26	C-15756	Tubular cond. .05 mfd. 400 V
C13,C21 C22,C28	C-15754	Tubular cond. .01 mfd. 400 V
C30	C-15759	Tubular cond. .006 mfd. 400 V
C4	C-15752	Tubular cond. .05 mfd. 200 V
C1,C2,C3	Y-CP-1	Trimmer cond. ant.
C8,C9,C11	Y-CP-1	Trimmer cond. ant.
C12	Y-CP-16472	Osc. Padder condenser
C16,C17	Y-CT-1	Trimmer cond. 1st I. F.
C18 C19	Y-CT-1	Trimmer cond. 2nd I. F.
C23,C24,C27	Y-CE-7	Elect. cond. 16.16 mfd. 400 V, 12 mfd, 25V
C6,C7	Y-CV-19	2 gang variable cond.

MODEL 699-P

chematic ocation	Part No.	Description
1,R6	R-15511	Carbon resistor 50K ¼W 20%
4,R7,R16	R-15500	Carbon resistor 2 Meg ¼W20%
13,R8,R14	R-15512	Carbon resistor 250K ¼W20%
5	R-2	Carbon resistor 5K ¼W 20%
9	R-15517	Carbon resistor 1 Meg ¼W20%
15	R-15520	Carbon resistor 5 Meg ¼W20%
3	R-15535	Carbon resistor 13K 2W20%
10,R11,R12	RC-6	Candohm resistor
5	Y-VC-22	Volume control

MODEL 699-P

Model 699-P is a six tube radio phonograph combination operating on a 110 volts 50-60 cycles. The receiver tunes to three bands, these are:

A—Broadcast band 538 to 1750 kilocycles.

B—Police and airplane 1.75 to 5.8 M.C.

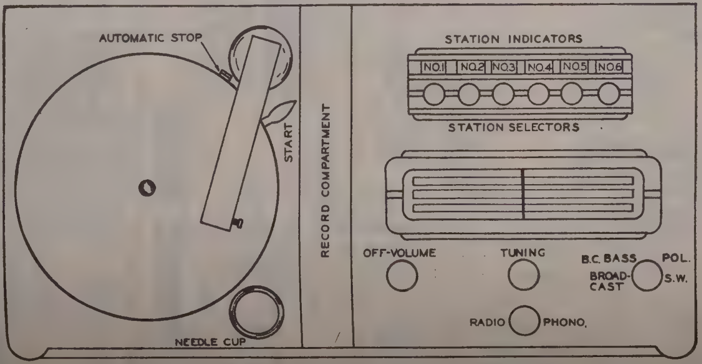
C—American and foreign short wave receptions 5.8 to 18.6 M.C.

The receiver is equipped with automatic volume control, inverse feedback, inverse feedback tone control, base compensation, and mechanical push button tuning.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

The tubes used are:

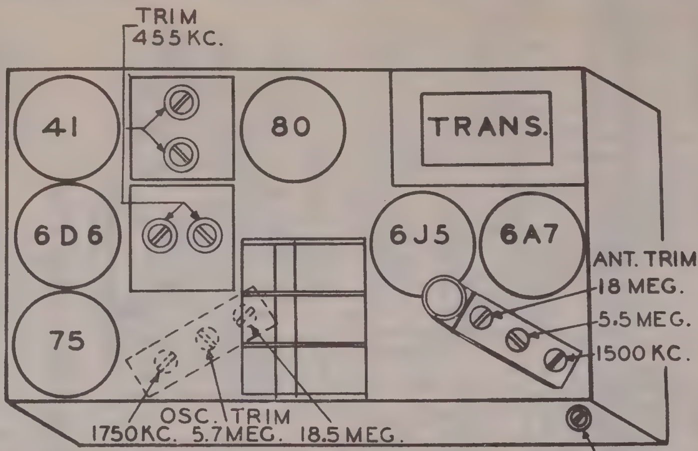
1—6A7	**First detector**
1—6J5	**Oscillator**
1—6D6	**I. F. Amplifier**
1—75	**Second detector, automatic volume control and first audio amplifier**
1—41	**Power output**
1—80	**Rectifier**



Operations For Setting Up Of Buttons

(1) Decide which station you desire to hear on any one button.

(2) Loosen this button by turning it to the left.



CHASSIS LAYOUT

(3) Tune in your desired station manually until it is heard with best quality.

(4) Push in the button while holding the manual tuning knob fixed on the station.

(5) **Tighten the button by turning it to the right while the button is pushed all the way in, as tightly as possible. Allow the button to come out and tighten still more. It is of the utmost importance that the buttons be logged as tightly as possible.**

(6) **Repeal this procedure to set up the other buttons.**

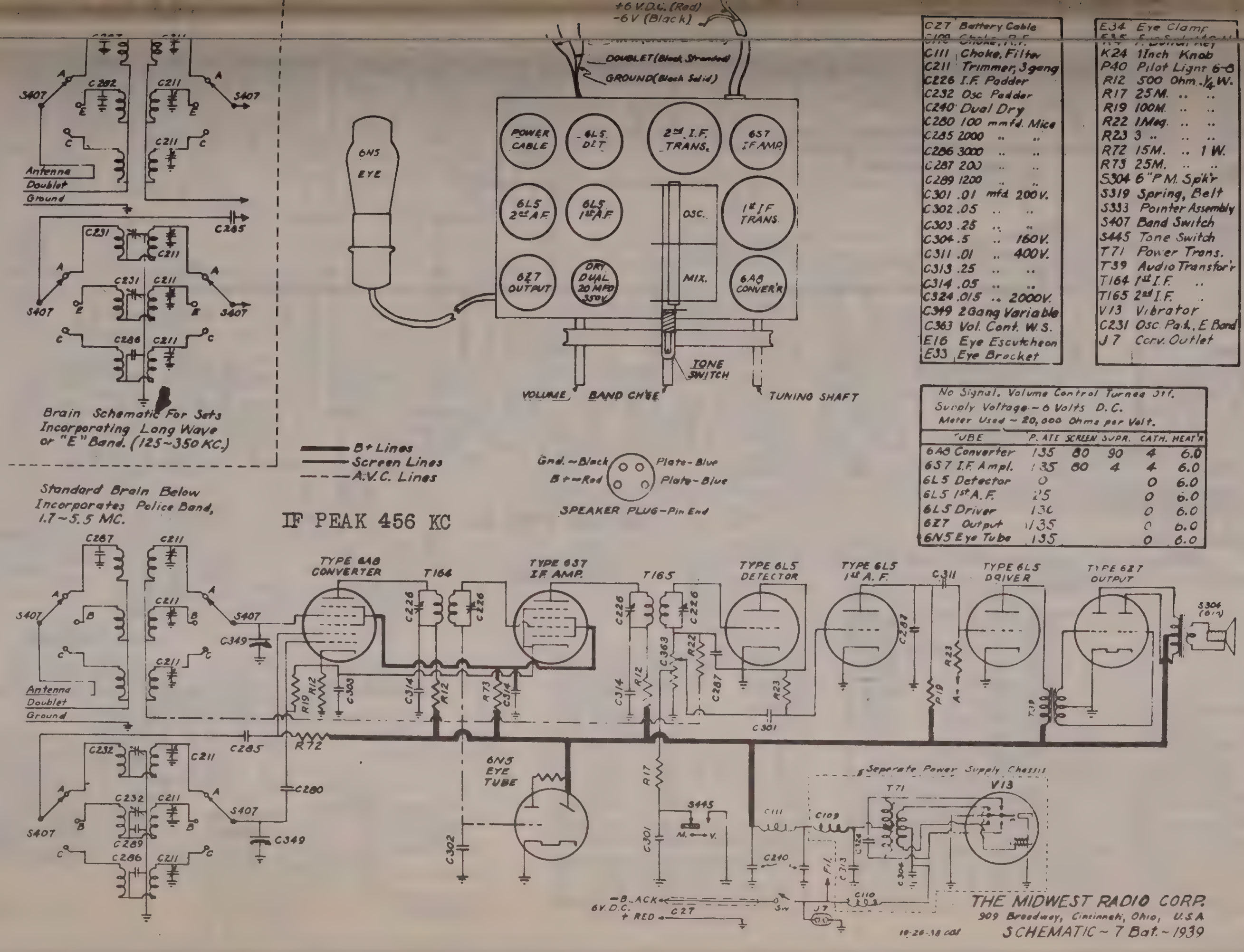
IT IS IMPORTANT THAT ALL THE BUTTONS BE LOGGED ON STATIONS LYING BETWEEN 550 AND 1700 KILOCYCLES AND THAT THESE BUTTONS BE SCREWED TIGHTLY. IF THIS IS NOT DONE THE CAMS OPERATING THE PUSH BUTTON UNIT MAY WANDER AND JAM THE WHOLE UNIT.

If there are not enough stations in your locality to log all six buttons, the unused buttons should be logged somewhere between 550 and 1700 kilocycles:

To change any one setting at any time repeat the above procedure. After that, to **get this** station, push the desired button with an even firm push until it has reached **the end of its** travel. **After the push buttons** are adjusted to your desired station, cut out the **proper station** call letters from the enclosed station call letter sheet, and snap this tab into the rectangular with the call letters. These openings are shown in Fig. 1 as No. 1, No. 2, No. 3, No. 4, No. 5 and No. 6.

MIDWEST RADIO CORP.

MODEL 7-39 Batt.
Schematic, Socket Voltage



IF PEAK 456 KC

C27	Battery Cable
C109	Choke, R.F.
C111	Choke, Filter
C211	Trimmer, 3 gang
C226	I.F. Padder
C232	Osc Padder
C240	Dual Dry
C280	100 mmfd. Mica
C285	2000 .. ..
C286	3000 .. ..
C287	200 .. ..
C289	1200 .. ..
C301	.01 mfd 200V.
C302	.05 .. ..
C303	.25 .. ..
C304	.5 .. 160V.
C311	.01 .. 400V.
C313	.25 .. ..
C314	.05 .. ..
C324	.015 .. 2000V.
C349	2 Gang Variable
C363	Vol. Cont. W.S.
E16	Eye Escutcheon
E33	Eye Bracket

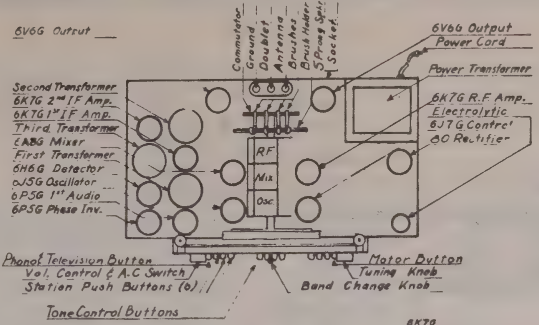
E34	Eye Clamp
E35	[illegible]
K4	[illegible]
K24	1 Inch Knob
P40	Pilot Light 6-8
R12	500 Ohm. 1/4 W.
R17	25M. .. ..
R19	100M. .. ..
R22	1 Meg. .. ..
R23	3 .. .. ..
R72	15M. .. 1 W.
R73	25M. .. ..
S304	6" P.M. Spk'r
S319	Spring, Belt
S333	Pointer Assembly
S407	Band Switch
S445	Tone Switch
T71	Power Trans.
T39	Audio Transfor'r
T164	1st I.F. ..
T165	2nd I.F. ..
V13	Vibrator
C231	Osc. Pad., E Band
J7	Conv. Outlet

No Signal, Volume Control Turned Off.
Supply Voltage ~ 6 Volts D.C.
Meter Used ~ 20,000 Ohms per Volt.

TUBE	PLATE	SCREEN	SUPR.	CATH.	HEAT'R
6A8 Converter	135	80	90	4	6.0
6S7 I.F. Ampl.	135	80	4	4	6.0
6L5 Detector	0			0	6.0
6L5 1st A.F.	25			0	6.0
6L5 Driver	130			0	6.0
6Z7 Output	135			0	6.0
6N5 Eye Tube	135			0	6.0

MODEL 12-40
Schematic, Socket Voltage

MIDWEST RADIO CORP.



OPERATING VOLTAGES

No Signal. Volume Control Turned Off. Motor Switch In Off Position.
Line Voltage 117 Volts, 60 Cycles.
Meter Used ~ 20,000 Ohms per Volt.

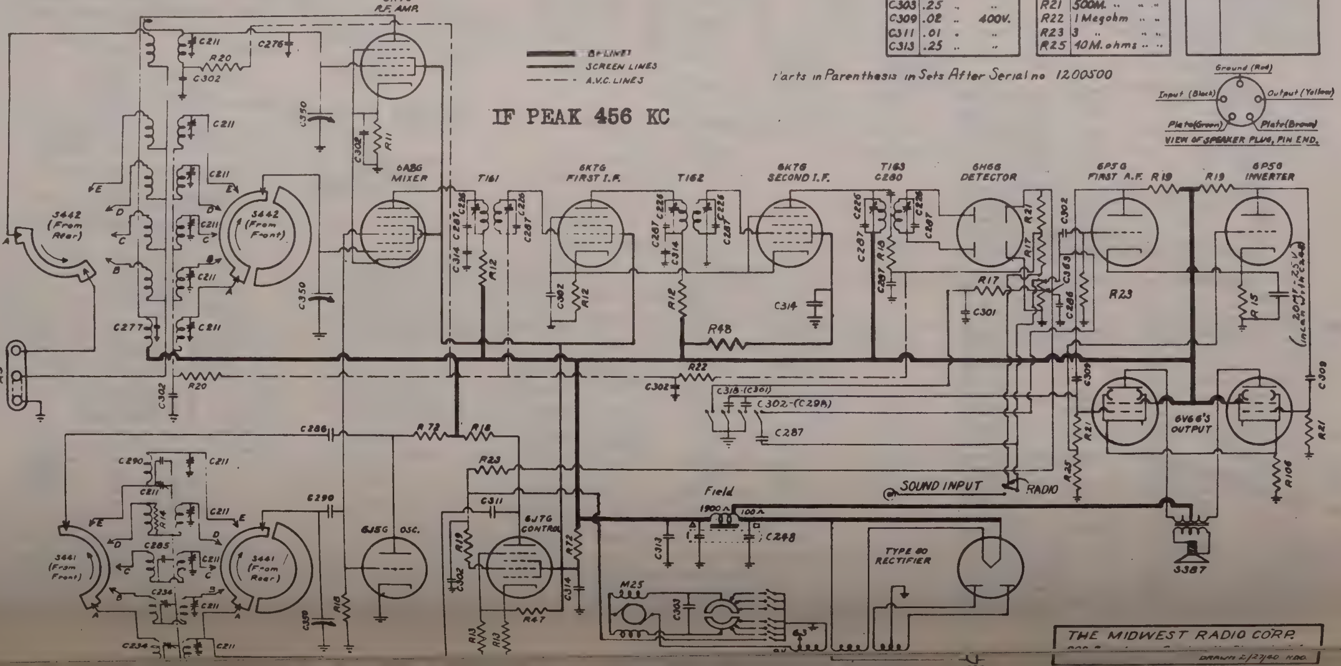
TUBE	PLATE	SCREEN	SUPR.	CATH.	HEATER
6K7 R.F.	230	78	2.4	2.4	6.0
6A8 Mixer	233	78		2.4	6.0
6J5 Osc.	125			0	6.0
6J7 Control	188	78	4.4	4.4	6.0
6K7 1st I.F.	230	78	4.4	4.4	6.0
6K7 2nd I.F.	230	78	4.4	4.4	6.0
6H6 2nd Det.					6.0
6P5 1st A.F.	135			8.6	6.0
6P5 Inverter	135			8.6	6.0
6V6 Outputs	280	220		12.5	6.0
80 Rectifier	350	(A.C.)		300	4.8

A9	Antenna Strip
B26	Brush Holder
B27	Brush Clip
B28	Brush Contact
C26	Cable & Plug, A.C.
C145	Commutator Disk
C146	Commutator Segm'ts
C211	3 gang Trimmer
C226	I.F. Padder
C234	Osc. Padder
C248	20 Mfd. 400V. □ 20 Mfd. 350V. △
C276	10 Mmfd Mica
C277	25 .. ..
C280	100 .. ..
C285	2000 .. ..
C286	3000 .. ..
C287	200 .. ..
C290	60 .. ..
C301	.01 Mfd. 200V.
C302	.05 .. ..
C303	.25 .. ..
C309	.02 .. 400V.
C311	.01 . ..
C313	.25 .. ..

C314	.05 Mfd. 400V.
C350	3 Gang Variable
C363	Control, Volume
C401	Fish Line, Belts
D3	Dial Background
D4	Dial Glass
K24	Knob, 1 inch
K25	Knob, 2 inch
M25	Motor
P9	Panel, Molded
P46	Pilot Light-6-8
P59	Pointer & Slide
R11	200 Ohm, ¼ W.
R12	500 .. .. ..
R13	1000 .. .. ..
R14	2000 .. .. ..
R15	5000 .. .. ..
R17	25M. .. .. ..
R18	50M. .. .. ..
R19	100M. .. .. ..
R20	200M. .. .. ..
R21	500M. .. .. ..
R22	1 Megohm .. ..
R23	3 .. .. ..
R25	40M. ohms .. ..

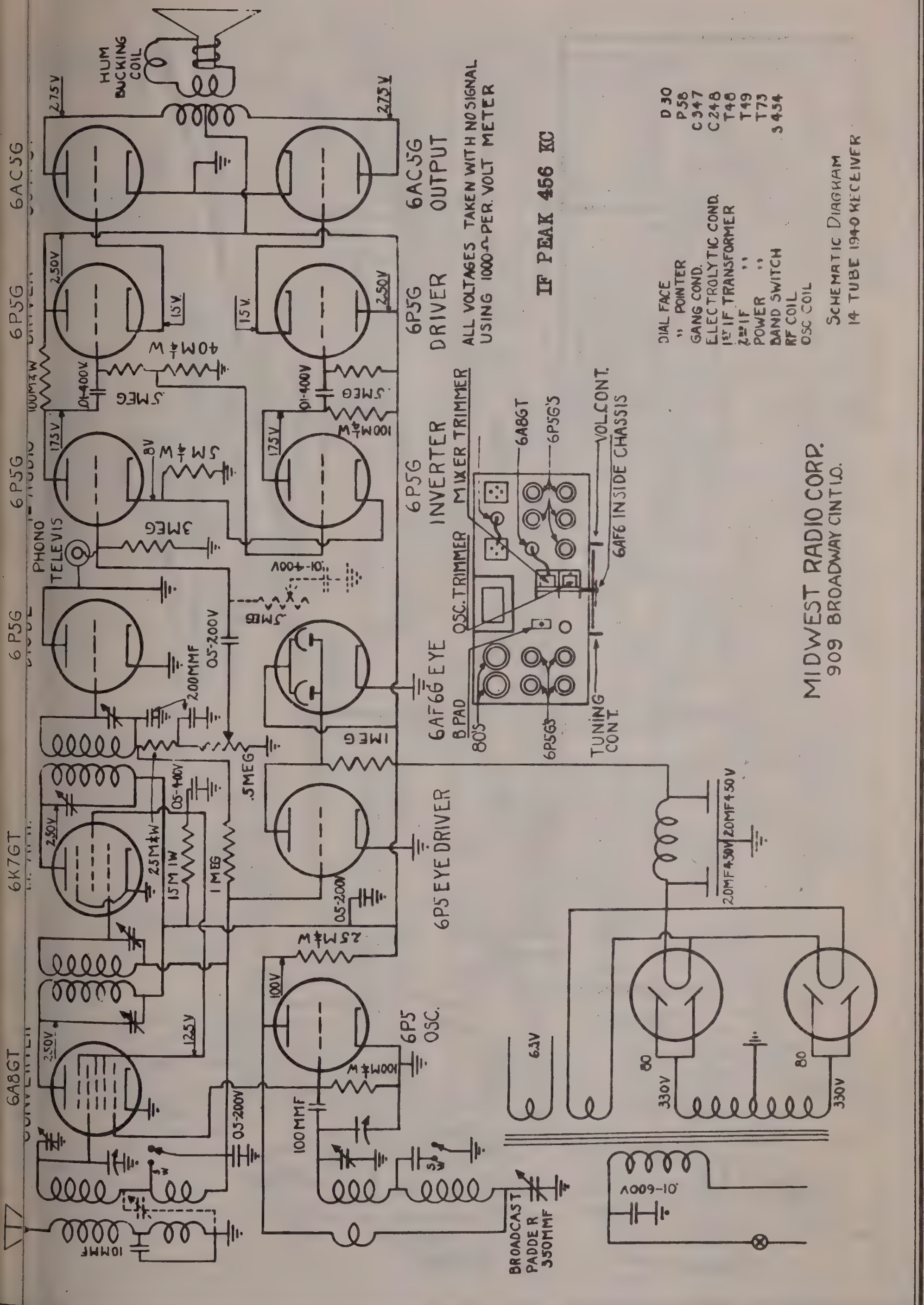
R47	25M. Ohm, ½ W.
R48	50M .. ..
R72	15M .. 1 W.
R106	200 Ohm, 2W.
S319	Spring, Belt Ten.
S387	Speaker, 12 inch
S441	Coil Switch, Osc.
S442	.. .. , R.F.
S443	Switch, Clicker
C318	.03 200V.
C298	.004 - 200
T73	Power Trans.
T161	1st I.F. Trans.
T162	2nd .. ..
T163	3rd .. ..
W56	Window, Tuning

Parts in Parenthesis in Sets After Serial no 1200500



MIDWEST RADIO CORP.

MODEL 14-40
Schematic,Voltage
Socket,Trimmers



ALL VOLTAGES TAKEN WITH NO SIGNAL USING 1000Ω PER. VOLT METER

IF PEAK 456 KC

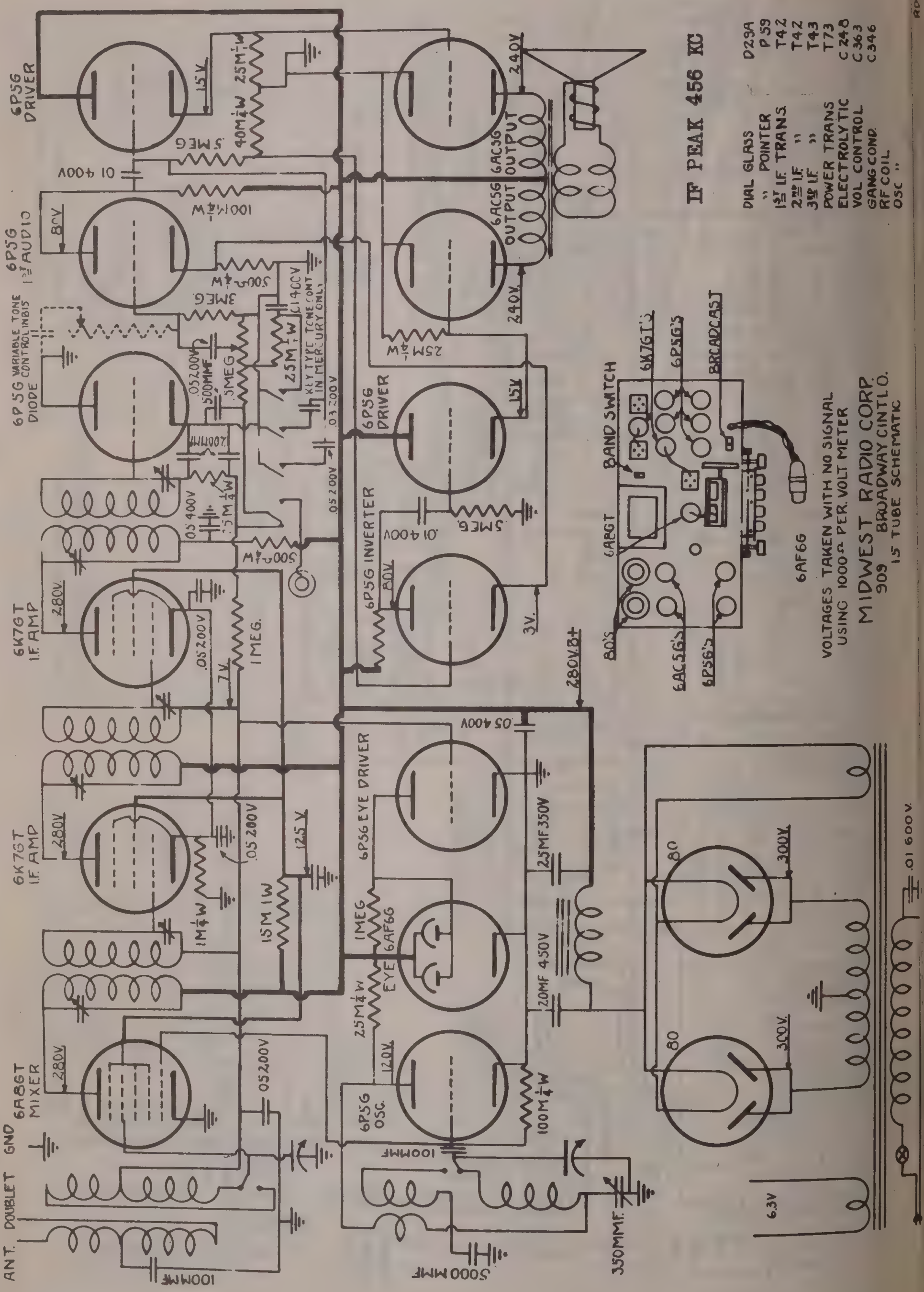
DIAL FACE	D30
" POINTER	P58
GANG COND.	C347
ELECTROLYTIC COND.	C248
1ST IF TRANSFORMER	T48
2ND IF "	T49
POWER "	T73
BAND SWITCH	3454
RF COIL	
OSC COIL	

SCHEMATIC DIAGRAM
14 TUBE 1940 RECEIVER

MIDWEST RADIO CORP.
909 BROADWAY CINT'I O.

MODEL 15-40
Schematic, Voltage
Socket

MIDWEST RADIO CORP.



IF PEAK 456 KC

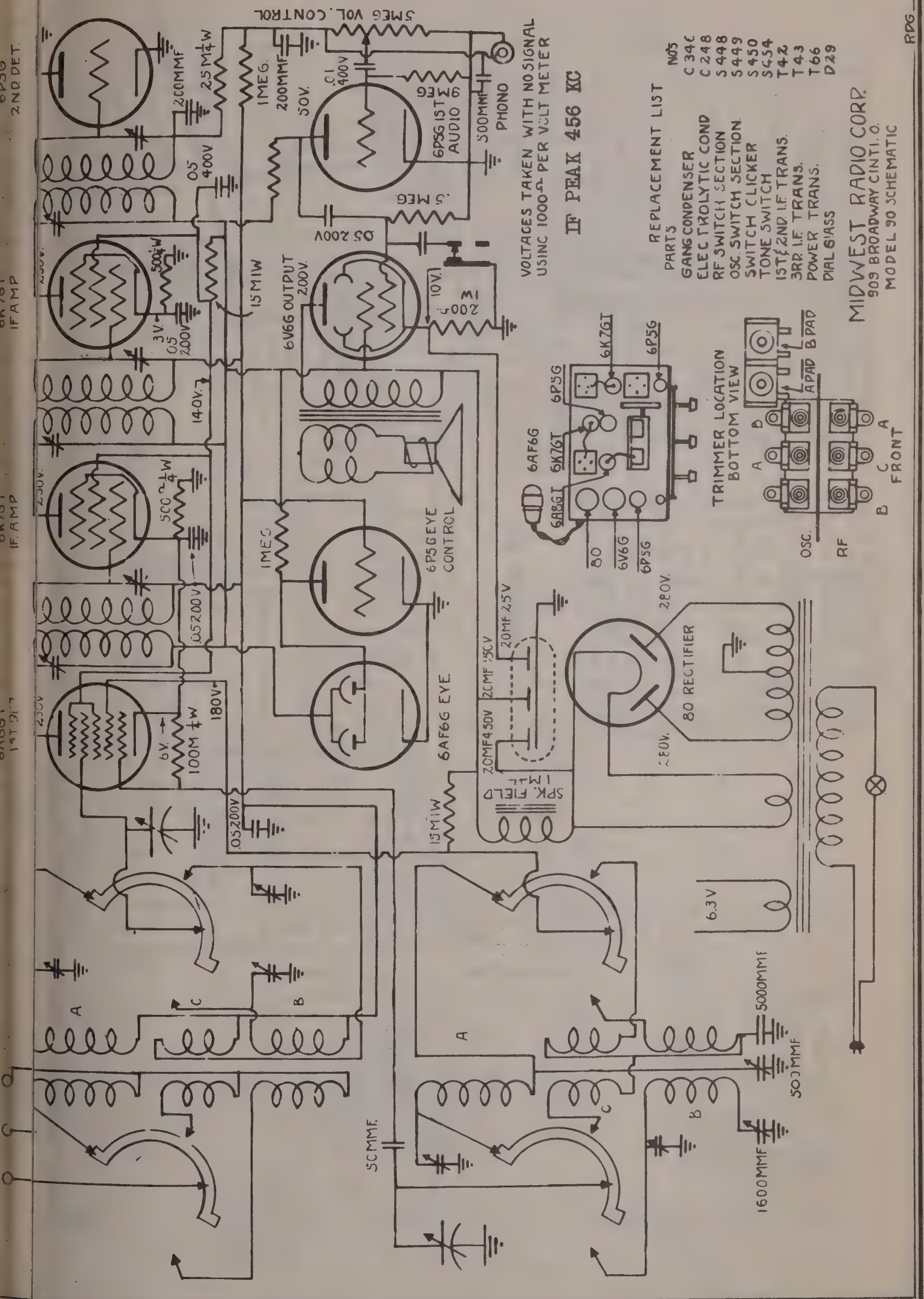
DIAL GLASS	D29A
" POINTER	P59
1ST I.F. TRANS	T42
2ND I.F. "	T42
3RD I.F. "	T43
POWER TRANS	T73
ELECTROLYTIC	C248
VOL CONTROL	C363
GANG COND.	C346
RF COIL	
OSC "	

VOLTAGES TAKEN WITH NO SIGNAL
USING 1000Ω PER. VOLT METER

MIDWEST RADIO CORP.
909 BROADWAY CINTI. O.
15 TUBE SCHEMATIC

MODEL 90
Schematic, Voltage
Socket, Trimmers

MIDWEST RADIO CORP.



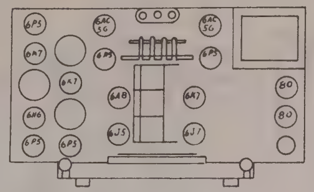
REPLACEMENT LIST

PARTS	NOS
GANG CONDENSER	C34C
ELECTROLYTIC COND	C248
RF SWITCH SECTION	S448
OSC. SWITCH SECTION	S449
SWITCH CLICKER	S450
TONE SWITCH	S454
1ST & 2ND I.F. TRANS.	T42
3RD I.F. TRANS.	T43
POWER TRANS.	T66
DIAL GLASS	D29

MIDWEST RADIO CORP.
909 BROADWAY CINTI. O.
MODEL 90 SCHEMATIC

MODEL 170
Schematic, Voltage
Socket

MIDWEST RADIO CORP.



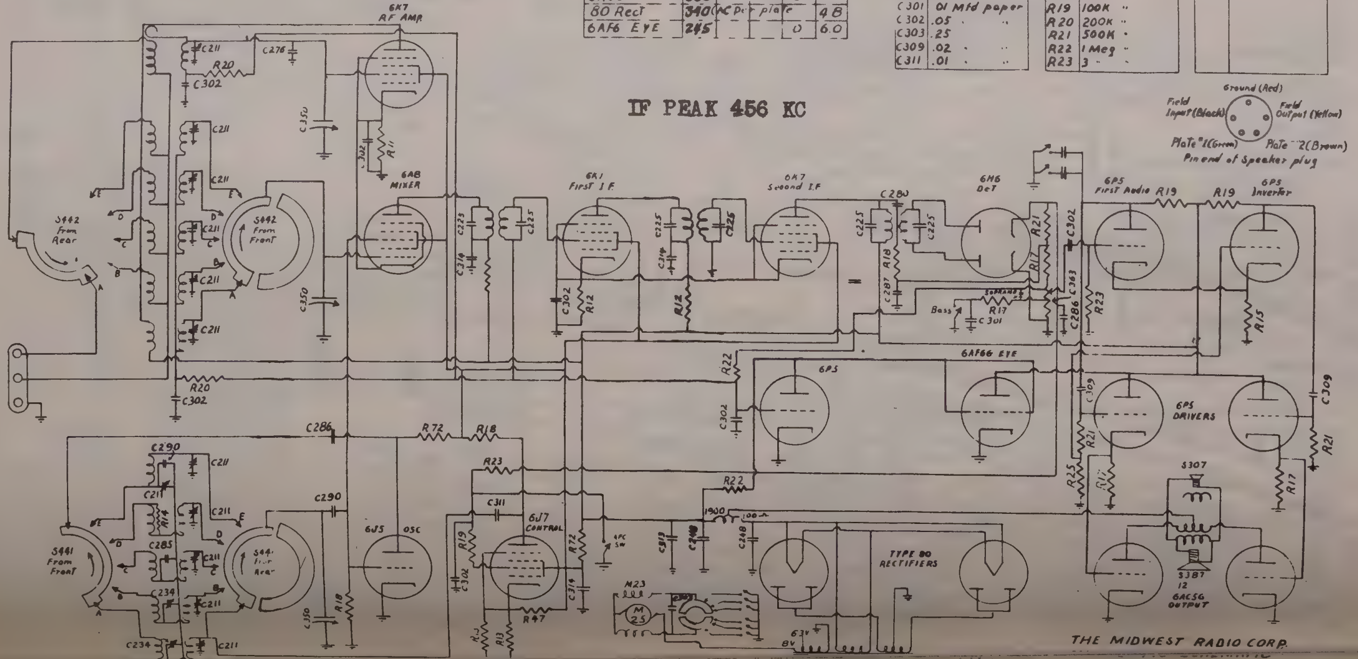
OPERATING VOLTAGES

No Signal Volume Control Turned Down. Motor Switch In UP Position.
Line Voltage 117 Volts, 60 Cycles
Meter Used 20,000 ohms per Volt

TUBE	PLATE	SCREEN	SUP	CATH	HEATER
6K7 RF	245	85	2.4	2.4	6.0
6A8 Mixer	"	"		"	"
6J5 Osc.	140			0	"
6J7 Control	200	85	4.4	4.4	"
6K7 1st IF	245	85	"	"	"
6K7 2nd IF		"	"	"	"
6P5 DC AMP					"
6H6 2nd Det					"
6P5 1st AF	150			92	"
6P5 Inverter	"			"	"
6P5 Drivers	245			10	"
6AC5	335			0	"
80 Rect	340 AC per plate				4.8
6AF6 EYE	245			0	6.0

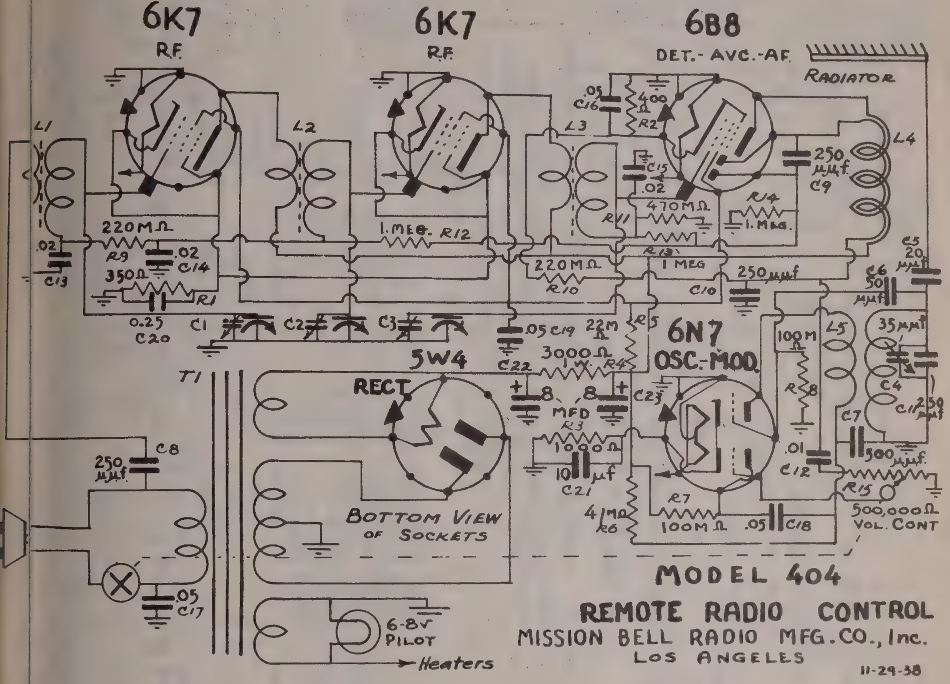
A9	Ant Binding post
B26	Brush Holder
B27	Brush Clip
B28	Brush Contact
C20	Cable & Plug
C145	Commutator Disk
C 46	" Segment
C211	3 Gang Trimmer
C225	IF Padder
C234	Osc Pad (2 gang)
C248	Filter Cond.
C270	10 MMFD.
C277	25 "
C280	100 "
C285	2000 "
C286	3000 "
C287	200 "
C290	60 "
C301	.01 Mfd paper
C302	.05 " "
C303	.25
C309	.02 " "
C311	.01 " "
C313	.25 Mfd
C314	.05
C350	3 Gang Var Cond
C363	Control Volume
C401	Drive Cable
D3	Dial Background
D4A	Dial Glass
K24	Knob (Brown-1")
M23	Motor
P10	Panel
R18	50K ohm.
P46	Pilot Light 6-8V
P59	Pointer & Slide
R11	200 Ohm
R12	500 "
R13	1000 "
R14	2000 "
R15	5000 "
R17	25K "
R19	100K "
R20	200K "
R21	500K "
R22	1 Meg "
R23	3 " "
R25	40K Ohms
R47	25K "
R48	50K "
R72	15K "
S307	Speaker 3½"
S387	" 12"
S441	Band Sw. Osc
S442	" " RF
T73	Pwr Trans.

IF PEAK 456 KC



MISSION BELL RADIO MFG. CO., INC.

MODEL 404
MODELS 407,408,412
Schematics

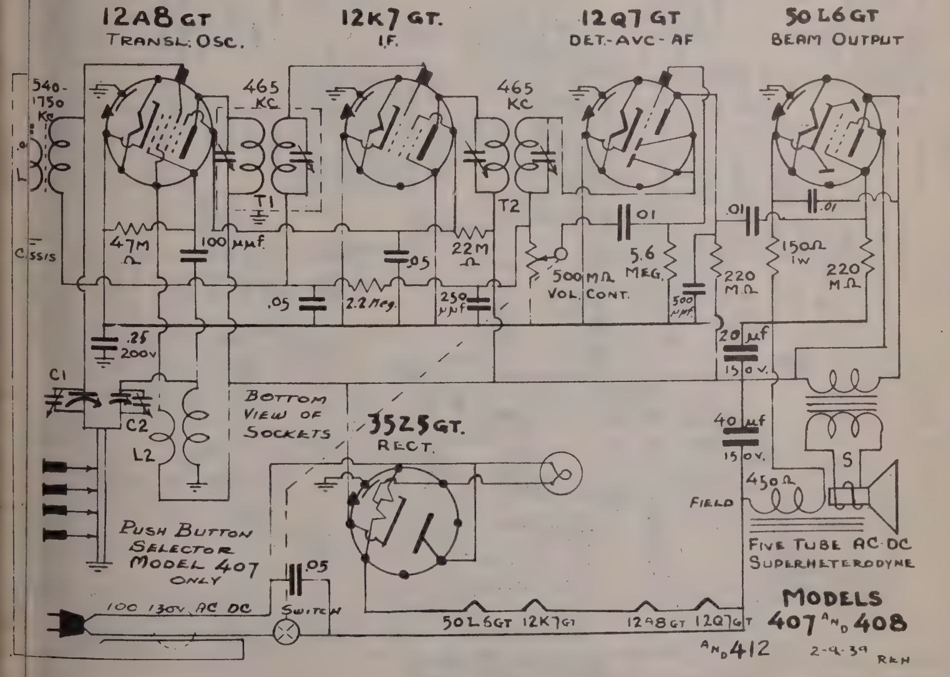


MODEL 404

REMOTE RADIO CONTROL

MISSION BELL RADIO MFG. CO., Inc.
LOS ANGELES

11-29-38



FIVE TUBE AC-DC SUPERHETERODYNE

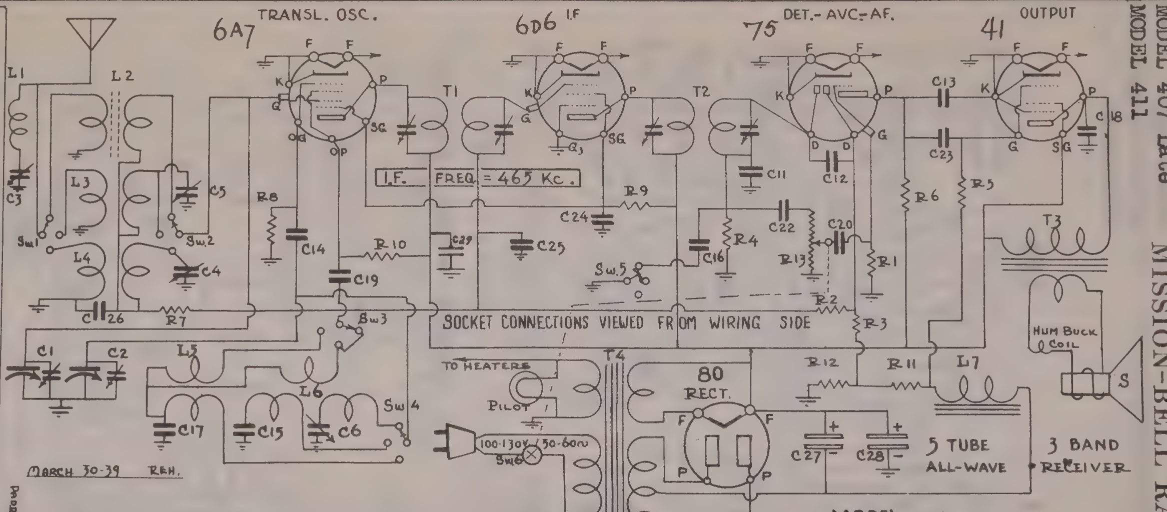
MODELS 407 AND 408 AND 412

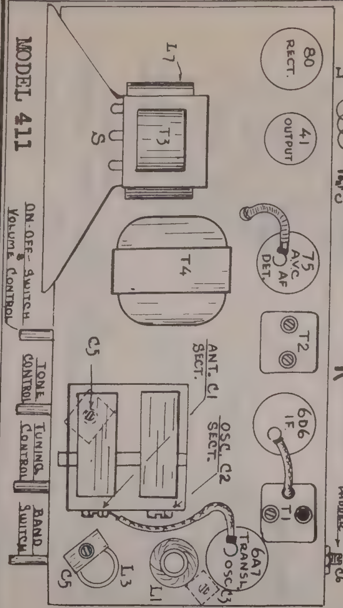
2-4-39 RKH

MODEL 407 Late
MODEL 411

MISSION-BELL RADIO MFG. CO., INC.

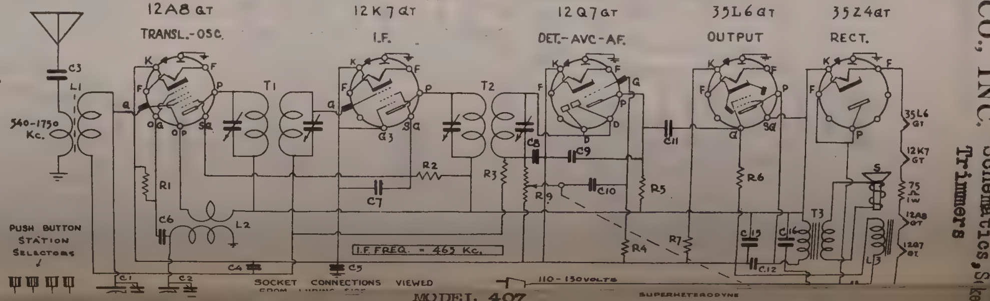
Schematics,Socket
Trimmers

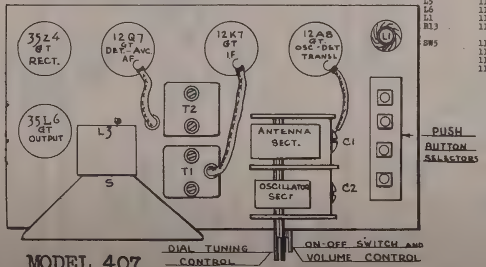




MODEL 411

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
T1	113394111	Coil-Input IF	1.50
T2	113394112	Coil-Output IF	1.50
L2	113284113	Coil-B.C. Ant.	.75
L4	113284114	Coil-S.W. Ant.	.25
L3	113284115	Coil-Int. Ant.	.25
L5	113284116	Coil-S.W. Osc.	.25
L6	113284117	Coil-2 Band Osc.	.50
L1	113314118	Coil-I.F. Trap	.30
R13	113244119	Control-Volume 500M Ohm with Switch	.85
SW5	1132541110	Control-Tone	.45
	1134941111	Pilot Lamp-Mazada 44	.15
	1134541113	Dial Drive Assembly	1.75
	1134041114	Dial Scale	.50
	1134441115	Escutcheon Complete	.65
	1133941116	Knob-Volume Control	.15
	1133941116	Knob-Tone Control	.15
	1133941116	Knob-Wave Switch	.15
	1133941116	Knob-Selector	.15
	1135341123	Tube Shield Assembly	.15
	1135841124	Speaker 6" Dynamic	5.00
T3	1131341124I	Transformer	2.00
L7	1131541124 2	Field Coil	2.00
	1135741124 3	Cone & Voice Coil	2.50
	1135441125	Cord-Power	.25
SW1,SW2 SW3,SW4	1133741126	Switch-Wave Change 3 Band	.50
C3,C4,C5	1131741143	Trimmer-Single	.15
	1135441149	Grid Cap	.05
T4	1131041150	Transformer-Power	3.50
C1,C2	1131641152	Cond.-Variable	2.00
C27,C28	1132041153	Cond.-Electrolytic 8 Mfd. 300-350Volt	1.10
C18		Cond.-.01 Mfd.600V	.15
C19		" .01 " 400V	.15
C21		" .02 " 600V	.15
C20		" .01 " 200V	.15
C22		" .02 " 400V	.15
C16		" .001 " 600V	.15
C25,C26		" .05 " 200V	.15
C24,C29		" .05 " 400V	.15
C17		" .005 " 400V	.15
C11,C12,C13		" .00025 " Mica	.15
C14		" .00005 " "	.15
C15		" .0016 " "	.15
C6	1131741171	" Padder	.30
R11		Resistor-300 Ohms LW	.10
R12		" 50 " 1W	.10
R1		" 5.6 Meg 1/3"	.10
R4,R5		" 470M Ohms	.10
R1,R7		" 220M " "	.10
R2,R3		" 2.2 Meg "	.10
R10		" 10M Ohms "	.10
R8		" 33M " "	.10
R9		" 22M " 1W	.10
	1131841185	Socket-4 Prong	.10
	1131841187	" 6 Prong	.12
	1131841188	" 7 Prong	.12





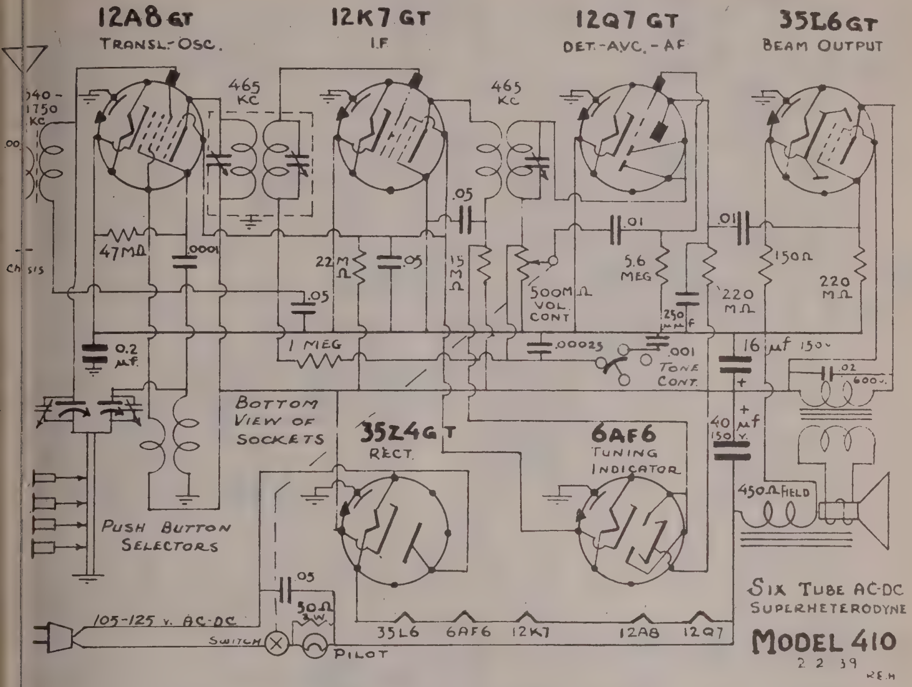
MODEL 407

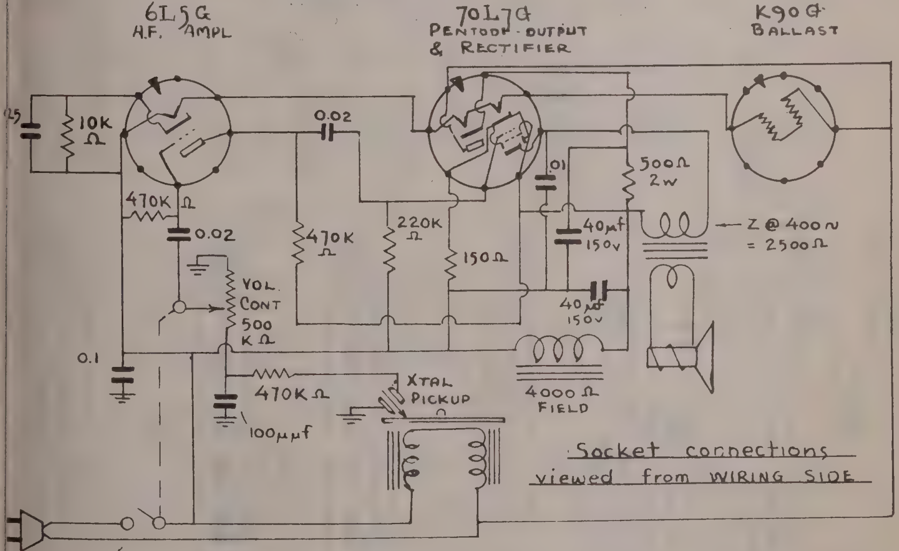
SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
T1	113394071	Coil-Input I.F.	1.00
T2	113394072	Coil-Output I.F.	1.00
L1	113284073	Coil-Antenna	.75
L2	113284074	Coil-Oscillator	.40
R9	113244079	Control-Volume 500M Ohm with Switch	.85
	1135840724	Speaker 5" Dynamic	3.50
T3	11313407241	Transformer	1.50
L3	11315407242	Field Coil	1.50
	11357407243	Cone & Voice Coil	2.00
	1135440725	Cord-Power	.25
	1135440749	Grid-Cap	.05
C1,C2	1131640752	Cond. Variable	2.00
C15	1132040753	Cond.- Electrolytic 20 Mfd. 150 Volt	60
C16	1132040754	Cond. - Electrolytic	[illegible]
[illegible]		" .02 " 600V	.15
C10,C11		" .01 " 200V	.15
C3		Cond.-.005 Mfd. 600V	.15
C5		" .25 " 200V	.20
C6		" .0001 " Mica	.15
C8.C9		" .0005 " "	.15
R1		Resistor 47M Ohms 1/3W	.10
R2		" 22M " 1/2W	.10
R3		" 2.2 Meg 1/3W	.10
R4		" 5.6 " 1/3W	.10
R5,R6		" 220M Ohms 1/3W	.10
R7		" 150 " 1W	.10
	1131840785	Socket-4 Prong	.10
	1133840726	Push Button Selector Assembly	1.85
	1134540713	Dial Drive Assembly	.85
	1130940716	Dial-Calibrated Knob	.30
	[illegible]	Knob-Volume Control	.10

All Prices Are Subject To Change Without Notice

MISSION BELL RADIO MFG. CO., INC.

MODEL 410
MODEL 498 Record Player



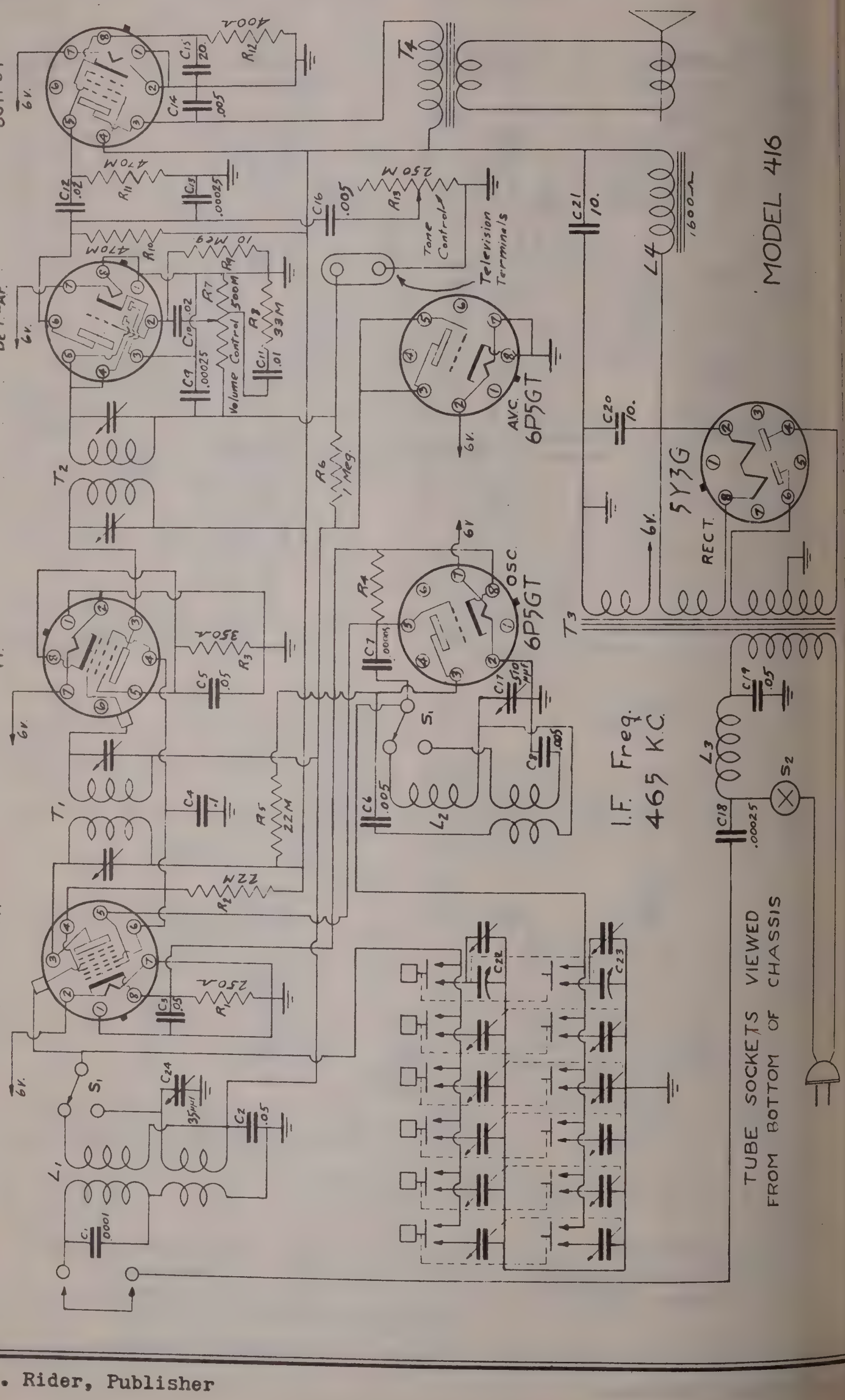


AMPLIFIER
RECORD PLAYER
MODEL 498

MISSION BELL RADIO
MFG. CO., INC.
LOS ANGELES
6-19-39 REH

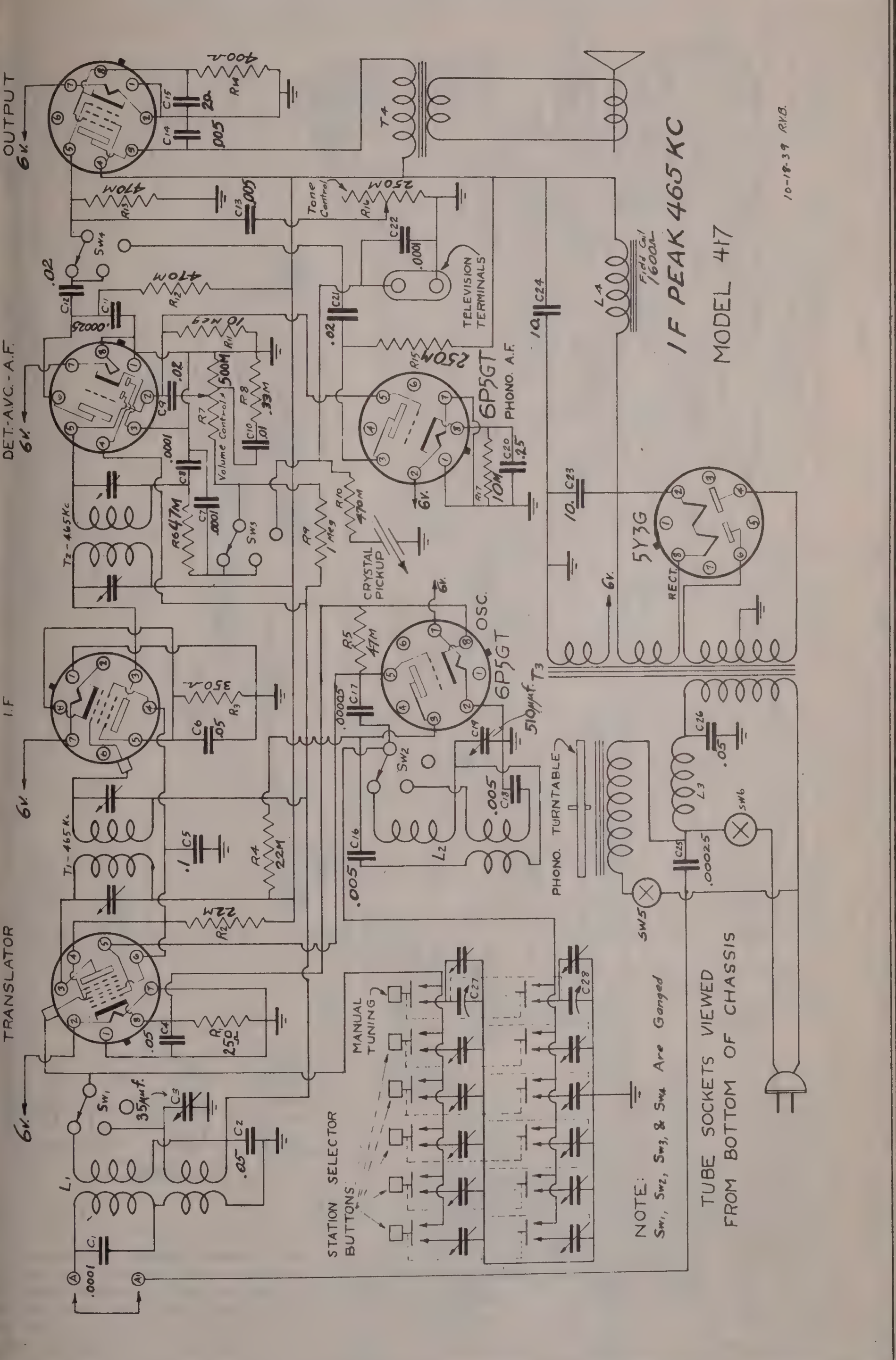
MODEL 416
Schematic

MISSION BELL RADIO MFG. CO., INC.



MISSION BELL RADIO MFG. CO., INC.

MODEL 417
Schematic



I F PEAK 465 KC

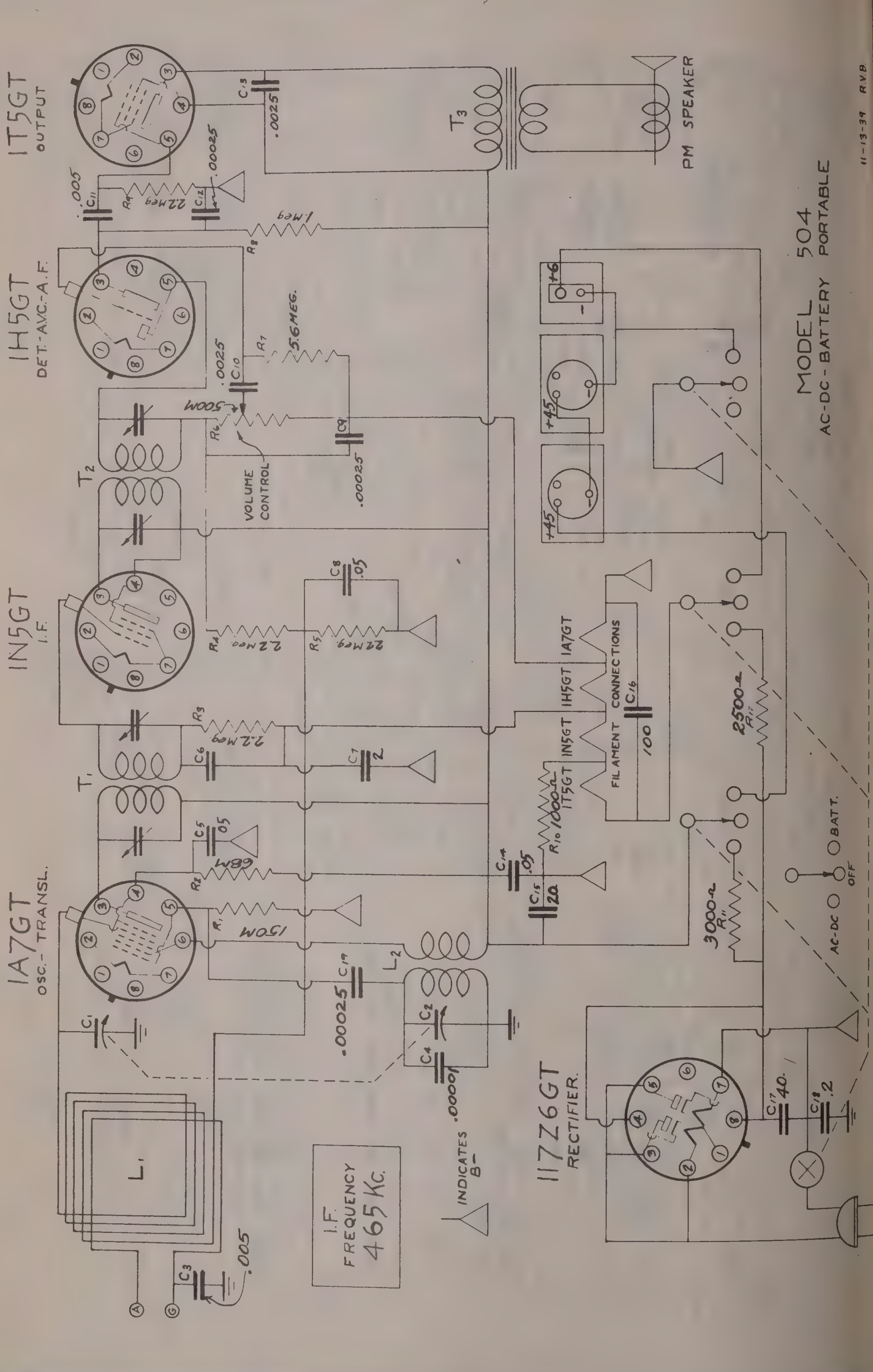
MODEL 417

NOTE: Sw1, Sw2, Sw3, & Sw4 Are Ganged

TUBE SOCKETS VIEWED FROM BOTTOM OF CHASSIS

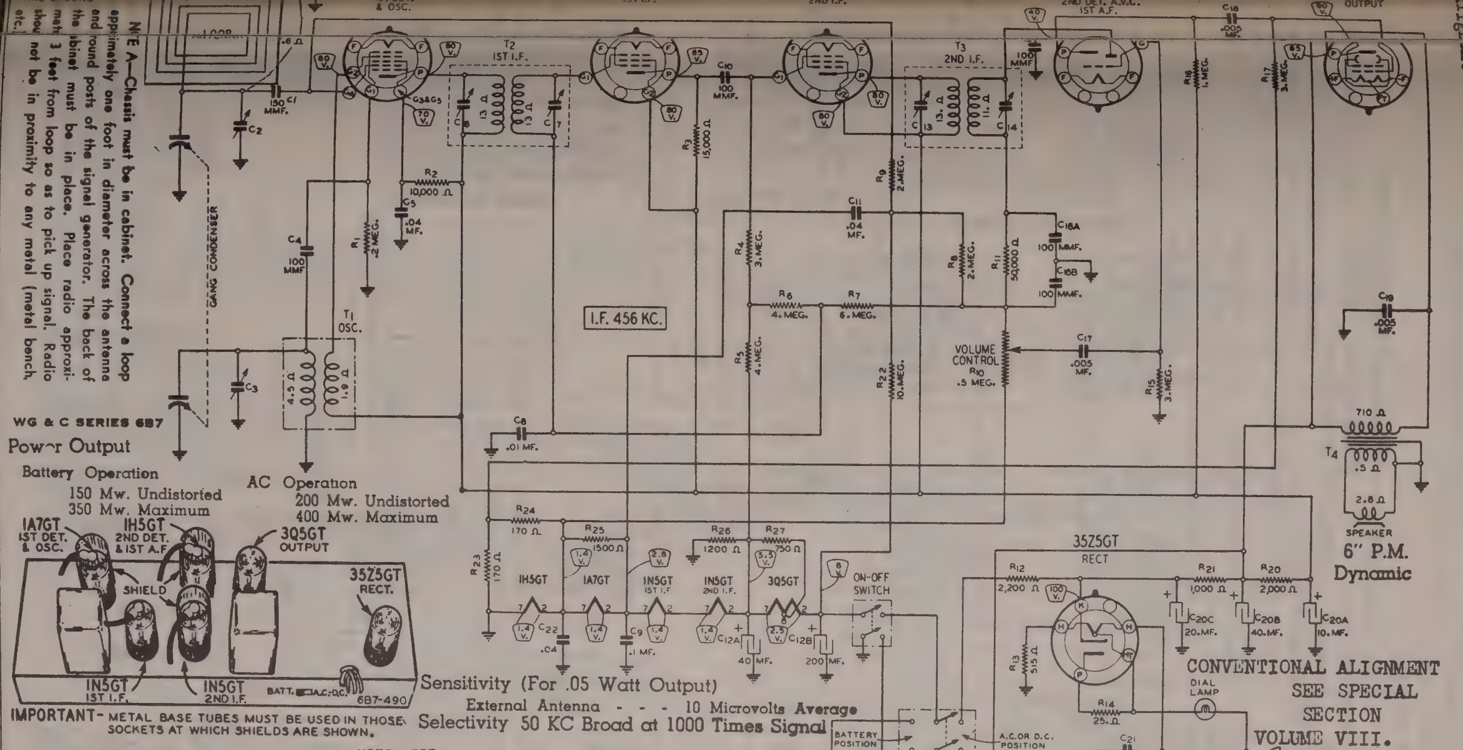
MODEL 504
Schematic

MISSION BELL RADIO MFG. CO., INC.



MONTGOMERY WARD & CO.

MODELS 04WG-663,04WG-668
Schematic,Voltage,Socket



NOTE A—Chassis must be in cabinet. Connect a loop app imately one foot in diameter across the antenna and round posts of the signal generator. The back of the abinet must be in place. Place radio approxi-met 3 feet from loop so as to pick up signal. Radio shou not be in proximity to any metal (metal bench, etc.)

Powr Output

Battery Operation
150 Mw. Undistorted
350 Mw. Maximum

AC Operation
200 Mw. Undistorted
400 Mw. Maximum

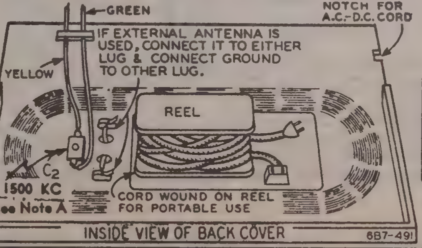
IMPORTANT- METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

Sensitivity (For .05 Watt Output)
External Antenna - - - 10 Microvolts Average

Selectivity 50 KC Broad at 1000 Times Signal

CONVENTIONAL ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

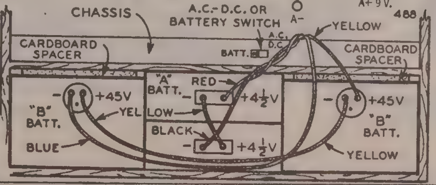
Power Consumption (At 117 volts AC Supply) 28 Watts



IF EXTERNAL ANTENNA IS USED, CONNECT IT TO EITHER LUG & CONNECT GROUND TO OTHER LUG.

CORD WOUND ON REEL FOR PORTABLE USE

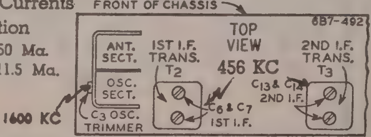
INSIDE VIEW OF BACK COVER



Input Voltages and Currents
—Battery Operation

"A" Battery 9 Volts—50 Ma.
"B" Battery 90 Volts—11.5 Ma.

6B7-543



MODEL 04WG-725
Schematic,Voltage
Socket,Trimmers
Sensitivity

MONTGOMERY WARD & CO.

Power Consumption 55 Watts (At 117 volts 60 cycles)
Power Output - - - - - - 3.0 Watts Undistorted
4.5 Watts Maximum
Selectivity - 38 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - 10" P.M. Dynamic

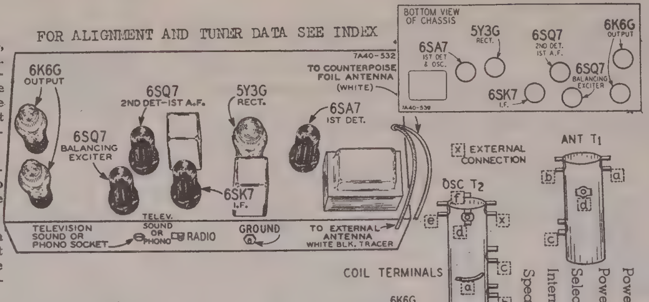
Tuning Frequency Range

B Range	528 to 155
D Range	5750 to 1830

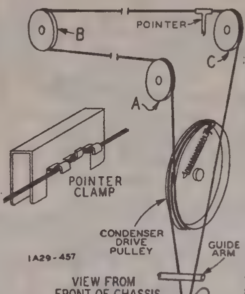
Sensitivity—External Antenna—(For 0.5 Watt output)

B Range	25 Microvolts Aver
D Range	45 Microvolts Aver

FOR ALIGNMENT AND TUNER DATA SEE INDEX



Drive Cord Replacement



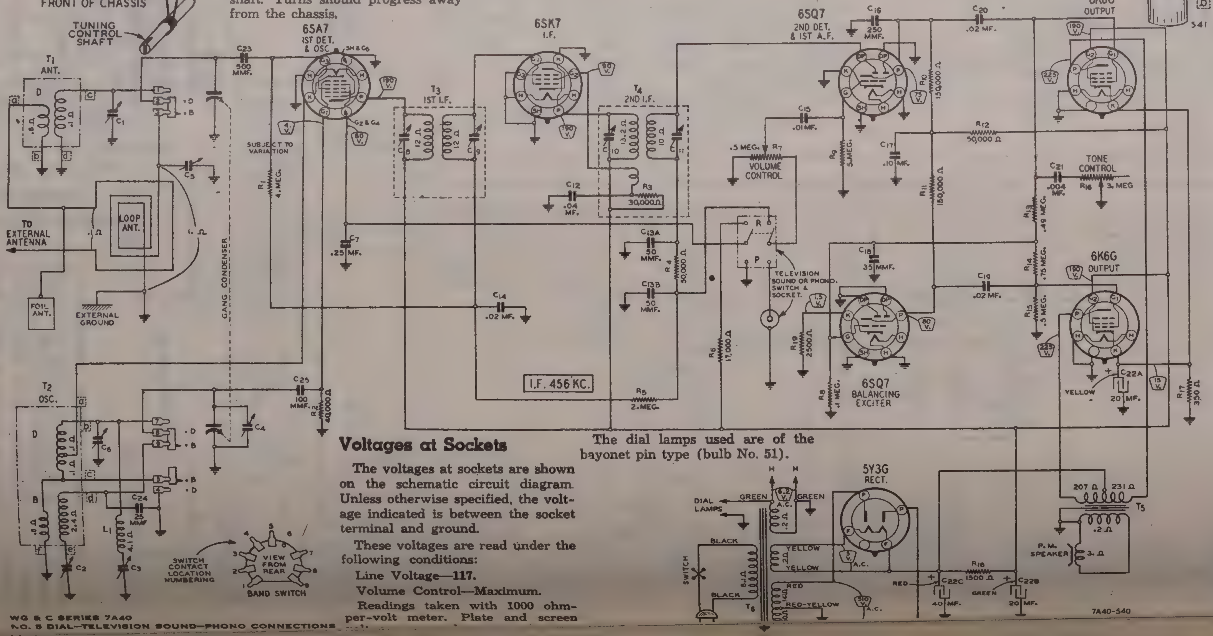
Tie one end of the new drive cord (approximately 70 inches in length) to tension spring. Turn gang condenser to full open position. Thread free end of drive cord up through hole in rim of condenser drive pulley and pull spring flush against pulley rim.

Wind one turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. This turn should progress to the left (from front of chassis). Pass cord in back of guide arm—see illustration. Then wind drive cord 3½ turns counter-clockwise (from front of chassis) around tuning control shaft. Turns should progress away from the chassis.

Pass cord around pulleys C, B, and A as shown in illustration. Then wind cord ¾ turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. The turn should be at right side (from front of chassis) of pulley groove.

Thread cord through hole in pulley groove and knot securely to spring. Stretch spring and secure free end to hook on drive pulley.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.



The dial lamps used are of the bayonet pin type (bulb No. 51).

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Readings taken with 1000 ohm-per-volt meter. Plate and screen

MONTGOMERY WARD & CO.

MODELS 62-303,62-309,62-321
62-347,62-417,62-433,62-447
62-449,62-451
Drive Panel Adjustments
Compound Gear Notes

General Adjustments

PUSHED IN, THE MOTOR DOES NOT TURN

Push the button which has previously been depressed or any other touch tuning button, all the way in and release. Then again push in the button which is wanted and this time the drive should function.

The motor On-Off switch may be out of adjustment - See article on that subject in this manual.

JUMPY ACTION WHEN TUNING THE RADIO MANUALLY

Put gear drive in motor - Return electric drive panel to factory to have this done.

EXCESSIVE BACKLASH IN MANUAL TUNING

If there is too much backlash when tuning the radio manually, free the film drum cable. To do this, stretch the tension spring which holds the idler pulley on the film drum cable. Also stretch the phosphor bronze film drum cable and oil the pulleys on which this cable runs. Check the tightness of the set screws holding the drive drum to the tuning condenser shaft.

MOTOR ROTATES BUT DIAL FIGURES DO NOT MOVE

Correct this condition in the same manner as described above under "Backlash in Manual Tuning" (early models only).

Occasionally this condition can be remedied by turning the electric-manual lever to the manual position and holding it in this position. Then turn the tuning knob with the other hand a slight amount in the direction in which it turns most easily. Then turn the electric-manual lever back to the electric position.

The friction disc in the motor may slip. Change to the gear drive in the motor - Return electric drive panel to factory to have this done.

The fibre gear No. 1 (see Fig. 6) may be slipping on its hub. Replace this gear - See article on that subject in this manual.

IF THE DIAL DOES NOT STOP AT THE SAME POINT EACH TIME THE BUTTON IS DEPRESSED

IF THIS OCCURS ON ONE BUTTON ONLY - It will be necessary to replace the defective setting disc at the top of the electric drive assembly which corresponds to that button. Return the electric drive panel to the factory to have this done.

IF THIS OCCURS ON ALL BUTTONS - Tighten the main drive cable by means of the turnbuckle.

See if set screws on top pulley of main drive cable are tight.

Check spring clip on drive drum of tuning condenser which holds drive arm to see whether or not it is gripping this arm tightly.

The silencer switch spring assembly at the front of the electric drive panel may not have sufficient spring tension to push back the motor armature after the circuit is broken. This assembly has a two-fold purpose. First, it silences the radio while the motor is in operation. Its second function is to exert a slight amount of spring tension on the end of the armature shaft which extends from the motor.

Inside of the motor is a small pinion gear which rotates freely on the front motor bearing. There are two pins on the armature and two extensions on this gear. The entire armature shaft assembly slides back and forth in its bearings. action causes the armature shaft to slide toward the front of the panel. The force is strong enough to overcome the tendency of the silencer switch spring to prevent this movement.

The small gear comes into close proximity with the armature and the two pins and two extensions mentioned above engage, causing this gear to rotate with the armature. The electric tuning mechanism turns as a result. When the circuit thru the motor is broken, the magnetic pull on the armature is released and the silencer switch spring forces the armature toward the back of the panel, causing the small gear to disengage from the armature proper.

Now to get back to our original thought. If there is insufficient tension in this spring, it will not push back the armature shaft after the circuit is broken and the inertia of the motor will continue to exert a driving force on the train of gears. To overcome this condition, tighten the spring by bending it. Care must be taken not to get too much tension on this spring as this would prevent engaging the gear with the armature when the current is on. Care should also be taken not to bend the spring assembly in such a manner that the two points will be permanently in contact.

DRIVE SLIPPAGE WHEN TUNING THE RADIO MANUALLY

Excessive amount of oil on drive belt - Clean off oil.

Increase tension on drive belt by re-adjusting position of idler (early models only).

Both drive cables too tight - Loosen tension on main drive cable by means of turnbuckle, and on film drum cable by lessening tension on idler tension spring.

Friction disc in motor binds - Change to gear drive in motor - Return electric drive panel to factory to have this done.

BUTTONS WORK STIFFLY

The touch tuning buttons may not push in easily. This may be due to the fact that the chassis is too far forward in the cabinet - Pull it back slightly.

Put some grease on each touch tuning button shaft at the point where it passes thru the front locking plate.

IF THE DIAL FIGURES REACH THE END OF THE SCALE AND STOP, BUT MOTOR CONTINUES TO OPERATE

Loosen the reversing switch mounting screws and adjust position of this bracket up or down until the switch operates properly. If this procedure does not remedy the condition, put one of the centering springs on the reversing switch - one of these can be obtained from the factory. Later models are already equipped with this spring. See Fig. 5.

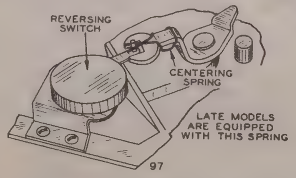


Fig.5 - Use of Centering Spring on Early Models

Adjusting or Replacing the Motor On-Off Switch

The motor On-Off switch is at the upper right side of the panel (from back of radio). If this switch is not adjusted properly, the motor may not start when the touch tuning button is depressed or the circuit thru the motor may not be broken at the proper moment when the station is tuned in by means of the electric mechanism.

To check this switch, remove the fibre cover by taking out the screw which holds the bracket over this fibre cover.

When the switch operating lever (offset metal piece across back of assembly which interacts with the 8 setting discs - see Fig. 6) is in its lowest position, the switch should be off. As this lever is raised, the switch will close and at the highest position of the lever the switch will again open.

If the switch does not appear to operate in this manner, loosen the 2 screws which hold it in place. Grasp the bakelite base of the switch at the left side (from back) and raise or lower it until the action as mentioned above is obtained. In exceptional cases, the switch base may have to be bent toward the switch operating lever to get the proper throw of the switch mechanism.

REPLACING SWITCH

If the switch mechanism is broken or cannot be put in proper working order, a new one may be ordered. The old switch is removed by taking out the 2 screws which hold it in place and unsoldering the 2 switch leads.

Replacing Compound Gear

In a few of the first sets incorporating the gear drive from the motor, the fibre gear of compound gear 1 (See Fig. 6) may slip on its hub. There is a spring washer which holds this gear to its hub and this washer may become too loose. When this occurs, the large fibre gear will be seen to rotate while the hub and small metal pinion gear which engages with gear 2, remains stationary.

In a case of this kind, compound gear 1 must be replaced. In the later type, the metal hub is rigidly secured to the fibre gear. Following is the replacement procedure:

Remove electric panel assembly from chassis and lay it face down on the bench.

Remove belt and idler pulley - See Fig. 6.

Refer to turnbuckle take-up on steel drive cable - See Fig. 6. Observe position of hex nut on the stud of this turnbuckle, that is, see how many threads this nut is from the end of the stud.

Loosen the main drive cable by loosening the hex nut on turnbuckle and backing off the round knurled nut about 5 half turns.

Remove horseshoe washer from gears 1 and 2, spreading the horseshoe washers by means of long nose pliers and screwdriver.

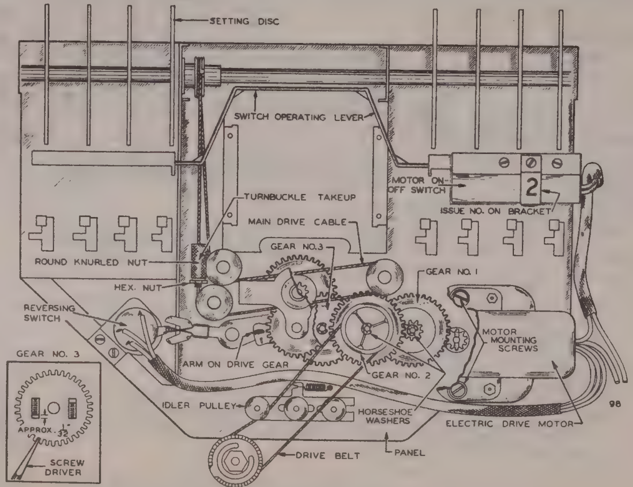


Fig.6 - Rear View of Electric Drive Panel Showing Gear Assembly

Take out the 2 motor mounting screws and lift the motor out of place - See Fig. 6.

Lift up the main drive cable to clear the teeth at the top of gear 2 - take care not to nick the cable.

Remove gears 2 and 1.

Put the new fibre tooth gear 1 on the shaft and replace horseshoe washer.

Now refer to gear assembly 3- See Fig. 6. The top gear of this assembly is movable and the bottom gear is fixed. Rotate the top gear one tooth clockwise relative to the bottom gear and hold the two in this position with a screwdriver - See Fig. 6.

Slide gear 2 on its shaft, pulling the main drive cable over the top of the teeth - again care must be taken not to nick the cable.

Push gear 2 all the way on its shaft, engaging gears 1 and 3. Replace the horseshoe washers.

Check for take-up on gear 3. Approximately 1/32 inch of the fixed gear (bottom) will show through slot in top gear - See Fig. 6.

Reassemble motor to frame, pushing tension spring under motor shaft. Be sure to use the same screws to mount the motor to the frame that were taken off. Care must be taken that the pinion gear in the motor meshes properly with the teeth of fibre gear No. 1. If these two gears appear to be so close together that they bind, pull the motor away from gear No. 1 before tightening the mounting screws.

Replace belt and idler pulley.

Retighten turnbuckle on main drive cable bringing hex nut to its former position and round knurled nut down tight against hex nut washer.

Reassemble electric drive panel to chassis.

Replacing Main Drive Cable
(No. 2 and Later Issue Panels)

The main drive cable is the steel cable which has the turnbuckle take-up. A change was made in this cable and the method of stringing it early in production.

Later models with the new cable can be identified by the numeral 2 stamped on the bracket over the motor On-Off switch and also by the large drop of solder adjacent to one of the set screws which hold the top pulley of this cable in place.

EARLY MODEL CABLE - Should cable breakage or any kind of major cable trouble be experienced which would require restringing of this cable in the early models, do not attempt to restring this cable. Instead, order a new electric drive panel assembly from Wells-Gardner and Co. (except in case of early 7-tube set).

LATER MODEL CABLE - Should cable restringing be required in the case of the later type, this can readily be accomplished by ordering a new drive cable, if one is necessary, and putting it on in accordance with the following instructions:

Remove electric drive panel from chassis.

Remove the old drive cable. It will have to be unsoldered at pulleys B and E, See Fig. 11. Turn electric-manual lever to manual position.

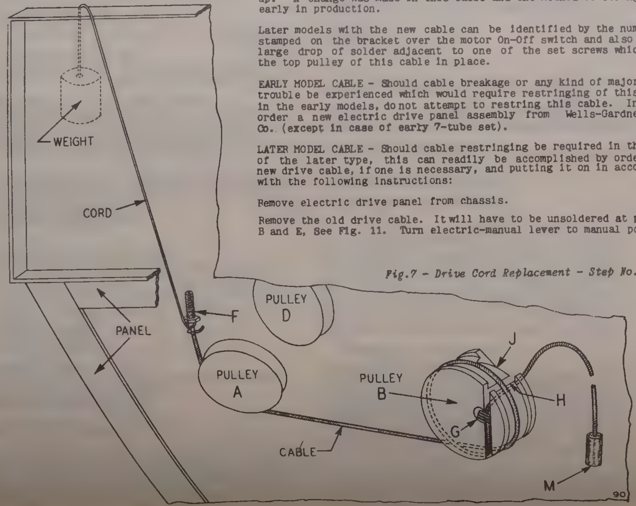


Fig.7 - Drive Cord Replacement - Step No.1

From the front of the panel, turn manual tuning knob to the right (clockwise) as far as it will go. This will bring the arm on the drive gear to the left (from back of panel) - See Fig. 6.

Now support the panel in such a manner that it is held firmly in an upright position, the back of the panel toward the operator. The bottom of the casting can be gripped at a number of points in a vise or clamp - care should be taken not to distort the casting.

Referring to the new drive cable, it will be noted that one end has a screw fitting and the other end has a round knurled nut fitting. These two fittings together with the hex nut and lock washer comprise the turnbuckle take-up.

With screw end F (Fig. 7) hanging down, place the cable into the vertical slot at the back of pulley B with the knot inside of the opening at point G.

Then wind the screw end of the cable on pulley B in a clockwise direction one turn, passing over the portion of this cable which is in slot H.

Bring the screw end of the cable over to pulley A and hold it in this position. This can be done by fastening a 10 inch stout cord to the end of cable F. Attach a weight to the other end of this cord and let the weight hang over the top of the panel as shown in Fig. 7. Instead of a stout cord, the round knurled nut and old cable can be secured to the screw end of the new cable.

Now refer to the portion of the cable that is in the slot at point H pulley B. Using a small wooden prod, bend this cable and bring it back onto pulley B at groove J. CAUTION: Do not use a metal prod as this may damage the cable. It is important that the cable at groove J be kept close to the front flange of pulley B (flange nearest panel) while the portion of the cable which extends downward from point G be kept close to the back flange of this pulley so that the cable from pulley A will ride freely in the center of pulley B - as shown in Fig. 11.

Then from groove J bring the cable in a counterclockwise direction 1/2 turn around pulley B, over to pulley C, 1/2 turn around pulley C, over to the bottom of pulley D, and then up to the shaft at the right of pulley E - Be sure the cable is well down in slot H, pulley B.

Wind the cable LOOSELY one and one-half turns around this shaft, progressing toward the left as shown in Fig. 8.

Rotate the setting discs until pulley E is approximately in the position shown in Fig. 9. Using a thin wooden prod, place cable in slot L with knot in hole at point K of pulley E. Rotate the setting discs a slight amount back and forth. This will provide clearance while getting the cable in the slot. Push the cable well down into slot L - See Fig. 9.

Rotate the setting discs 3/4 of a complete revolution in such a direction that the top of the discs move toward the front of the panel. Bring the round knurled

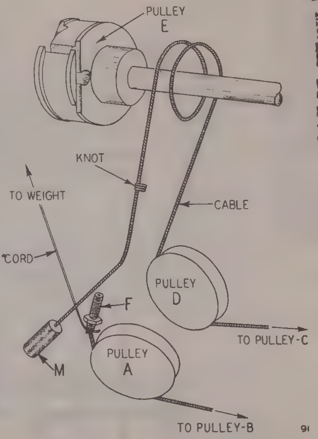
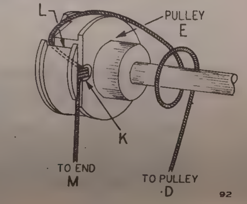


Fig.8 - Drive Cord Replacement - Step No.2



MODELS 62-303,62-309,62-321
62-347,62-417,62-433,62-447
62-449,62-451
Drive Cord Data,Movie Dial

Remove weight and cord (or round nut) from screw end F of the cable. Put the lock washer against the hex nut on this cable. Screw round knurled nut onto screw end

25 Cycle Electric Drive Panel

The 25 cycle electric drive panel assembly is iden-

motor and a different gear No. 1 (see Fig. 6). are used.

The pinion gear in the 25 and 60 cycle motors are not the same. If, therefore, one of these pinions is ordered, the type of motor must be specified. (Both 25 and 60 cycle motors are furnished with pinion included.)

40 Cycle Power Supply

An electric drive chassis equipped with a 117-234

mentioned below. The electric drive panels of these sets are equipped with 60 cycle motors and these will function satisfactorily only at that frequency.

If one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Movie Dial Adjustments and Replacements

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only a No. 81 lamp, Wards catalogue No. 61-8204.

Turn the radio off and turn the band switch to the standard wave position.

Remove the lamp housing by unscrewing and removing the two screws which hold this housing in place—See Fig. 1.

Remove the old lamp from the housing. It will be necessary to depress the contact plug retaining spring which will be seen in the narrow slot near the upper end of the housing and pull the plug out a slight amount from the housing, in order to remove the lamp. Replace the lamp and push the plug down until the locking spring snaps into place.

Replace the lamp housing by means of the two screws, but do not tighten these screws yet.

Turn the radio on.

Then grasp the top of the lamp housing assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in the illustration in the instruction book. Tighten the two screws.

Replacing Film

Turn the band switch to the standard wave position. Then remove the lamp housing (See article "Replacing and Positioning the Dial Lamp").

Unscrew and take out the six screws spaced around the edge of the film drum casting. Then carefully lift the edge of the film nearest the back of the chassis. At the same time, lower the opposite edge of the film and slide it in toward the center of the film drum casting. (On two band radios, it will be necessary to lift the lens assembly as high as it will go while removing the film.) When the film clears the lens, it may be lifted out.

To replace the film, reverse the above procedure. Make certain that the entire lower edge of the film rests on the shoulder near the bottom inside the film drum. The radio is calibrated as described in the article under that name in this manual.

Calibrating the Radio

To calibrate the electric drive movie dial radios, tune in a station of known frequency between 530 and 900 KC. In the early models loosen the two set screws in the hub of the film drum pulley. Turn the film drum until it is at the correct kilocycle mark on the dial scale and then tighten the pulley set screws.

In the case of later models, the film drum is held in position by a friction washer which will be seen under the drum. In these models, the film drum can be turned without loosening the set screws.

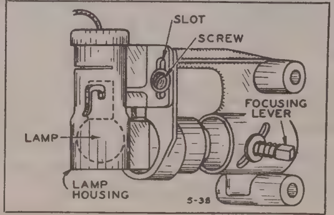
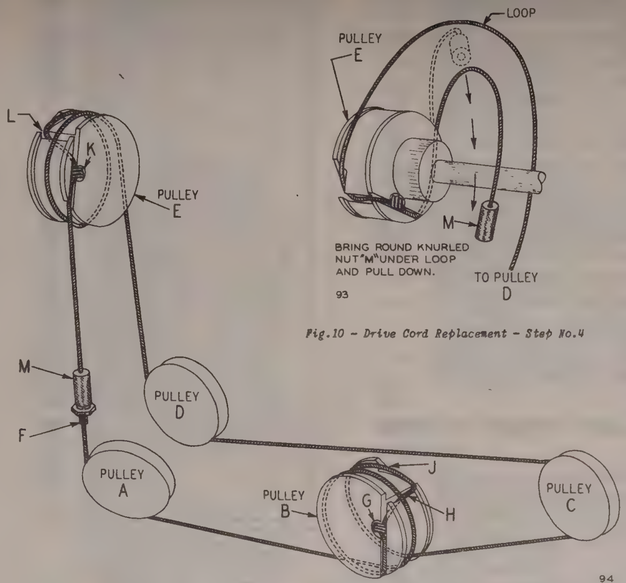


Fig. 1—Adjusting Lamp Height



93

Fig.10 - Drive Cord Replacement - Step No.4

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Fig.11 - Drive Cord Replacement - Complete Assembly

should be grasped by another person and rotated as far as they will go in such a direction that the top of the discs moves away from the front of the panel. The purpose of this is to take up all slack in the cable and to enable the two ends of the turnbuckle to be secured together.

The cable must be firm and with all slack out. It should not be so tight, however, that the setting discs and pulleys do not turn freely. Tension of the cable is regulated by the position of the hex nut. The round knurled nut must be screwed tightly against the lock washer next to the hex nut.

Solder knots at points G and K on pulleys B and E respectively. Reassemble the electric drive panel to chassis.

Place cable from pulley D on pulley E at left flange (from back of panel). Now holding cable from pulley D, rotate setting discs in such a direction that the top of the discs move away from the front of the panel. Rotate the discs approximately 3/4 of a turn or until the slack in the cable from pulley D is all taken up. Pulley E and the cable will then be in the position shown in Fig. 11 and the knurled nut end M of the cable will be hanging down from pulley E and must be held in tension.

The next step is to connect the two portions of the turnbuckle together. Before doing this, see that the cable is on all of the pulleys as shown in Fig. 11. Tension should still be applied to both ends of the cable.

MODELS 62-303,62-309,62-321
62-347,62-417,62-433,62-447
62-449,62-451
Film Drum Cable,Notes,Parts

MONTGOMERY WARD & CO.

Replacement Parts List

There is a number on the On-Off switch bracket which identifies the panel as to major part changes. Be sure to mention this issue number when ordering parts for the Electric Drive Panel.

For names of parts shown in the Electric Drive Panel list, refer to the illustrations especially Figs. 3, 6, 7, 8, 9, 10 and 11.

ELECTRIC DRIVE PANEL REPLACEMENT PARTS

Bin No.	Part No.	Description	Selling Price
	25A176	60 Cycle Electric Drive Panel Complete—includes Main Casting, Gears, Pulleys, Switches, Motor, Setting Discs, Tuning and Setting Button Plungers, and Tone and Volume Indicators. (Less Gang Condenser and Movie Dial Projector Assembly, Tuning and Setting Buttons, and Glass Screen and Screen Clamps.)	$18.04
	25A247	25 Cycle Electric Drive Panel Complete—Same as above except with 25 Cycle Motor and No. 1 Gear Assembly	18.88
	57X8	Locking Plate	.28
	28X139	Spring for Locking Plate ... Doz.	.14
	37X93	Interlocking Lever	.06
	37X95	Clutch Release Lever	.06
	28X137	Spring used on above Lever ... Doz.	.16
	26X259	Tuning Knob Shaft	.06
	37X94	Yoke for Clutch Lever (Fits in Groove on above Shaft)	.06
	19X88	Keyway Washer (Used on Clutch Bearing) .. Doz.	.08
	24X294	Pulley for Manual Drive Belt (On Back of Tuning Shaft)	.14
	20X212	Roller Bearing for above Pulley ... Doz.	.08
	57X10	Clutch Plate	.06
	28X152	Clutch Release Spring (In front of Clutch Plate from Back of Panel) ... Doz.	.04
	8X57	Manual Drive Belt	.16
	26A74	Belt Tension Pulley and Bracket Assembly	.10
	28X150	Spring for above Assembly ... Doz.	.10
	24X316	Belt Idler Pulley only	.06
	25A178	Setting Disc Assembly	.36
	28X134	Tension Spring (Fastened to Auxiliary and Drum Release Levers) ... Doz.	.12
	28X151	Tension Spring for Pawl of Setting Disc. Doz.	.12
	26X255	Setting Disc Shaft	.20
	20X192	Ball Bearings in Retainer (For Setting Disc Shaft)	.06
	20X207	Bearing Cone (Without Set Screw)—On Setting Disc Shaft	.08
	20X195	Bearing Cone (With Set Screw)—On Setting Disc Shaft	.10
	24X288	Pulley for Drive Cable (On Setting Disc Shaft)	.08
	25X403	Support Bracket for Setting Disc Shaft (Left side from back)	.06
	25X412	Support Bracket for Setting Disc Shaft and Motor On-Off Switch	.08
	26A75	Adjusting and Support Rod for Motor On-Off Switch (Panel Issue No. 4 and Later)	.06
	2A105	Motor On-Off Switch Assembly Complete	.48
	37X85	Switch Lever (Right section from back)	.10
	37X96	Switch Lever (Left section from back)	.10
	25X413	Switch Lever (Center section)	.08
	28X137	Switch Lever Spring ... Doz.	.16
	37X82	Stop Lever	.06
	28X148	Stop Lever Spring ... Doz.	.08
	25A181	Rocker Arm and Rocker Arm Stop Assembly Complete with Spring	.10
	28X131	Spring for Rocker Arm Stop ... Doz.	.06
	26X256	Rocker Arm Shaft	.06
	26X261	Setting Button Plunger	.06
	10A114	Setting Button only	.06
	26X254	Tuning Button Plunger with Stop Pin	.08
	28X138	Tuning Plunger Spring ... Doz.	.06
	10A113	Tuning Button only	.06
	28X129	Hairpin Springs for Tuning Buttons ... Doz.	.06
	10X26	Main Drive Cable Complete with Turnbuckle	.40
	12X75	60 Cycle Motor Complete	2.28
	24X296	Pinion Gear only (On Motor Armature Shaft)—60 Cycle	.06
	12X82	25 Cycle Motor Complete	3.08
	25A233	No. 1 Pinion and Gear Assembly (For 60 Cycle Operation)	.22
	25A248	No. 1 Pinion and Gear Assembly (For 25 Cycle Operation)	.28
	24X307	No. 2 Gear and Pulley	.10
	25A184	No. 3 Gear Assembly	.16
	25A221	No. 4 Gear Assembly	.26
	28X141	Spreader Springs for Gears No. 3 and 4. Doz.	.04
	26A73	Pulley Bracket Assembly complete with Gear No. 5, Pulleys and Roller Bearing Assembly	.80
	25A186	No. 5 Gear and Drive Arm Assembly only	.14

RETAIL STORES: Order any parts from Repair Service Department at Chicago or Oakland, on Repair Parts Order Form No. 19567. Order by bin number and description. If no bin number is shown, order by part number and description.

Return defective parts to Repair Service Department only.

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the model number and this issue letter.

Bin No.	Part No.	Description	Selling Price
	2A97	Reversing Switch	$0.18
	37X98	Lever for Operating Reversing Switch	.06
	28X158	Centering Spring (Used on Reversing Switch Lever)	.06
	[illegible]	Bracket for Reversing Switch	.06
	25A239	Silencer Spring Assembly complete with Shield	.10
	58X226	Glass Screen	.26
	30X89	Clamps for Glass Screen ... Doz.	.14
	15X107	Tone Indicator Assembly	.08
	15X108	Volume Indicator Assembly	.08
	28X147	Spring for Tone or Volume Indicator .. Doz.	.12
		8" Black Cord for Tone or Volume Indicator ... Doz.	.10
10631	29X20	Brass Collars (Used on Tone or Volume Control Shafts)	.04
	26A56	Station Call Letter Discs and 25 Celluloid Discs	.16
	25X405	Shipping Support Bracket (Top of Electric Drive Panel to Wood Brace)	.10
10565	8X23	Rubber Cushion (Used with Shipping Support Bracket)	.04

PROJECTOR ASSEMBLY PARTS

Bin No.	Part No.	Description	Selling Price
	26A76	Gang Condenser and Projector Assembly Complete (Series 57A4) includes Condenser Mounting Bracket, Condenser Drive Drum, Film Drum Cable and Pulleys, Film Drum Support Bracket, Film Drum, Film, Lamp Housing Bracket, Lamp Contact Plug, Lens Housing, Lens Housing Bracket, Color Filter, Projector Compartment, and Elevator and Link Assembly	$8.40
	26A77	Gang Condenser and Projector Assembly Complete (Series 53A3), includes same parts as above	9.24
	26A78	Gang Condenser and Projector Assembly Complete (Series 59A5 and 51A2) includes same parts as above	8.40
	25A194	Front Support Bracket for Gang Condenser—Complete with Two Pulleys and Shafts	.40
	8X43	Rubber Cushion (Mounted on above Bracket)	.06
	20X152	Stud—Used with Rubber Grommet (6X8) on Front Support Bracket for Gang Condenser	.06
	26A79	Drive Drum for Gang Condenser	.24
	25X393	Support Bracket for Lens Housing, Projector Compartment and Elevator Lever	.44
	25A198	Elevator Lever Arm and Bakelite Link Assembly	.26
	29X83	Lever Bearing Rod	.06
	19X21	Horse Shoe Washer for above Rod ... Doz.	.04
	37X90	Lever Arm—Short. (Fastened to Band Switch Shaft)	.08
	28X59	Hairpin Spring (Used on above Lever Arm) Doz.	.04
	28X136	Tension Spring for Elevator Lever ... Doz.	.16
	29X85	Support Bracket for Film Drum Shaft and Pulley (Series 57A4, 59A5, 51A2)	.24
	29X88	Support Bracket for Film Drum Shaft and Pulley (Series 53A3)	.28
	26A80	Film Drum Pulley Assembly	.12
	26X253	Shaft for Film Drum	.06
	25A196	Tension Arm Assembly for Film Drum Cable less Tension Spring	.08
	24X236	Guide Pulley only for above Arm and for Front Support Bracket on Gang Condenser	.04
	28X149	Spring only for Tension Arm ... Doz.	.14
	6X8	Rubber Grommets—Small (For Mounting Rear of Gang Condenser to Film Drum Support Bracket) ... Doz.	.08
	20X201	Stud (Used with above Grommet) ... Doz.	.12
	20X150	Stud (For Mounting Rear of Gang Condenser to Chassis)	.06
	25X362	"L" Bracket (For Mounting Rear of Gang Condenser to Chassis)—Series 57A4, 59A5, 51A2	.06
	25X382	"L" Bracket (Same as above)—Series 53A3	.06
	6X18	Rubber Grommet (Used on above Bracket) Doz.	.14
	2X236	Rubber Washer (Flat—Used with above Bracket) ... Doz.	.08
	10X28	Film Drum Drive Cable	.10
	24X284	Film Drum only less Film (Early type with Flat Side in Drum Center Hole—Spring Washer not used with this type)	.16

Bin No.	Part No.	Description	Selling Price
	24X284A	Film Drum only less Film (Late type with Round Drum Center Hole—Spring Washer used with this type)	$0.16
	26A70	Film and Rim (Used on Series 59A5, 51A2, 53A3)	.24
	26A71	Film and Rim (Used only on Series 57A4)	.24
	[illegible]	Clamp for Holding Film to Drum ... Doz.	.08
	[illegible]	Spring Washer with Three Fingers (Used under Film Drum on late models)	.06
	25A199	Color Filter Assembly Bracket (Series 59A5, 51A2, 53A3)	.06
	25A214	Color Filter Assembly Bracket (Used only on Series 57A4)	.06
	[illegible]	Lens Housing Casting less Condenser and Projector Lens and Bearing Rods	$0.24
	29X84	Bearing Rod only for above Casting	.06
	19X67	Horse Shoe Washer (Used on above Rod) Doz.	.08
	12X73	Condenser Lens (Lens nearest Dial Lamp)	.08
	28X128	Lens Retaining Spring ... Doz.	.06
	12X72	Projector Lens	.60
11551	29X77	Focusing Lever Assembly	.06
	7A58	Lamp Housing and Socket	.14
	61-8204	Dial Lamp No. 81	.10
	26A81	Plug Assembly for Dial Lamp with Wire less Dial Lamp and Housing	.14
	32X85	Projector Compartment	.08

Prices Subject to Change Without Notice.

Replacing Film Drum Cable

Remove the electric drive panel from the chassis as explained in the article "Replacing Electric Drive Panel on Chassis" in Manual 124, and lay it face down in front of the chassis. It is unnecessary to unsolder motor or silencer switch connections or to disconnect tone and volume control collars.

Remove the old film drum cable, unsoldering it from pulley "F" at point "S" on early models, or from the pin on later models—See Fig. 2.

Close the gang condenser completely and arrange to hold it in this position while replacing the cable.

Now insert one end of the new cable in hole "B" of condenser drive drum "A" which will be in the position shown in Fig. 2. Bring the cable down and around ½ turn in the groove in the drum, progressing in a clockwise direction, passing it over pulley "C."

Extend the cable horizontally toward the back of the chassis passing it through the groove on the left side of pulley "D" and through the groove on the right side of pulley "E." (See Fig. 2, view from front.)

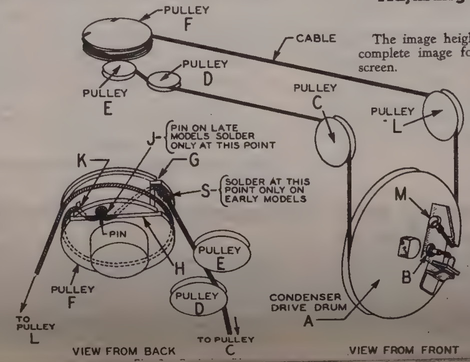
Place pulley "F" in the position shown in the back view in Fig. 2, with the slot "H" nearly parallel with the back of the chassis. Continue the cable from pulley "E" to the slot on the right side (from back) of pulley "F" keeping the cable in the upper part of the slot. The cable should rest on about ⅛ inch of the pulley surface before entering slot "G."

Insert the cable in slot "G" and continue down and out through slot "H" at point "K." If pulley "F" is the later type, wrap the cable once around the pin as shown in Fig. 2.

Wind the cable one complete turn around pulley "F" keeping it below the cable on the right side and above the cable on the left side. Now extend the cable horizontally to pulley "L" and down to the groove in condenser drive drum "A." Insert end of cable in slot "M."

Now solder the cable to the pin on pulley "F" on late models, or solder the cable to the pulley at point "S" on early models.

Replace the electric drive panel on the chassis and calibrate the dial as explained in the article "Calibrating the Radio."



Adjusting Height of Image on Screen

The image height should be so adjusted that the complete image for each band will appear on the screen.

If any portion of the image on any band is cut off, turn the radio on and turn the band switch to the 2nd short wave (green) position. Loosen the two set screws of the lever arm on the band switch shaft. This lever arm is connected to the bakelite strip which in turn moves the lamp assembly height mechanism.

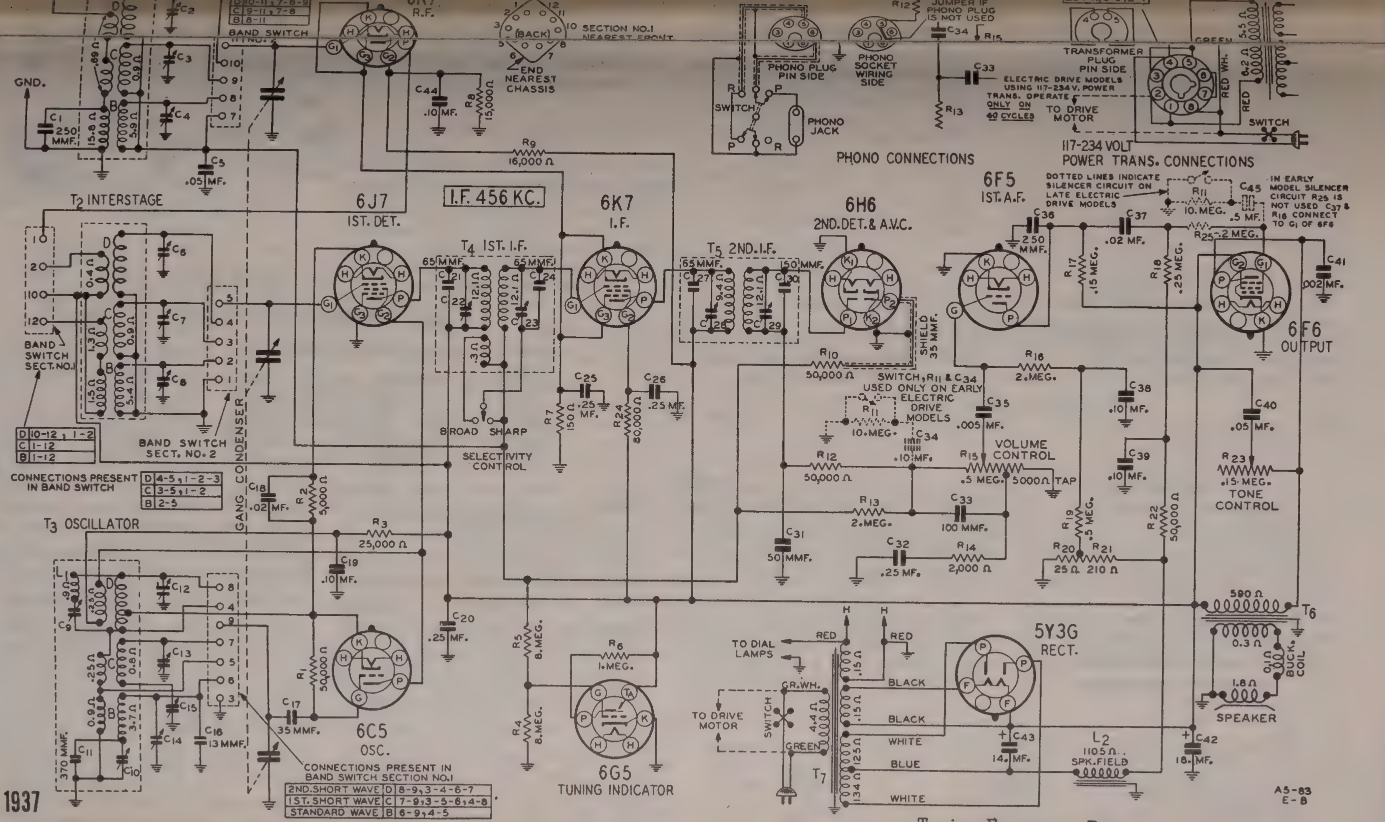
Turn the tuning knob until the high frequency end (22.0 MC) of the band is reached. Move the lever arm until the megacycle line is lined up with the letter "W" of the word "West" at either side of the glass screen. Tighten the set screws.

The image height should then be correct for the other two

FOR ECTRIC DRIVE
DATA EE INDEX

MONTGOMERY WARD & CO.

MODELS 62-309,62-449
Schematic,Selectivity
Transformer Data



JULY, 1937

NOTE: RESISTANCES OF WINDINGS LESS THAN 0.1 Ω ARE NOT SHOWN

Fig. 2—Schematic Circuit Diagram

SPECIFICATIONS

Power Consumption -	75 Watts (At 117 volts 60 cycles) 113 Watts (Motor Operating)
Power Output - - - - - -	3.0 Watts Undistorted 5.0 Watts Maximum
Selectivity (Sharp) -	27 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - -	456 KC.
Speakers - - - - - - - -	8" or 10" Dynamic

Tuning Frequency Range

B Range	528 to 1830 KC.
C Range	1810 to 6350 KC.
D Range	6300 to 22000 KC.

Sensitivity

B Range	1.0 Microvolts Average
C Range	1.0 Microvolts Average
D Range	2.0 Microvolts Average

MODELS 62-309,62-449
Circuit Data,Voltage Socket,Coils,Notes

MONTGOMERY WARD & CO.

Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and interstage R.F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively.

The band switch completes connections to the coils in use. The band switch sections are designated in the schematic as section 1 and section 2.

The antenna transformer with tuned secondary feeds into a type 6K7 R.F. amplifier tube. The output of this tube is fed through the interstage R.F. transformer with tuned secondary into a 6J7 tube which functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

Referring to Fig. 2, it will be noted that there is a coupling winding connected in series with the secondary of I.F. transformer T4. When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A 6H6 tube functions as a diode 2nd detector. AVC voltage is applied to the control grid circuits of the R.F. and I.F. tubes.

Across the volume control resistor R15 is a filter composed of condensers C32 and C33 and resistor R14. At high volume settings, the filter is not effective. At low volume settings, the action of this filter results in an increase of high and low frequency amplitudes relative to the other frequency amplitudes.

A 6F5 triode tube functions as the first audio amplifier while the output stage uses a 6F6 output pentode tube. A dynamic reproducer is employed.

The power unit uses a 5Y3G full wave rectifier. A 6G5 tuning indicator tube is employed.

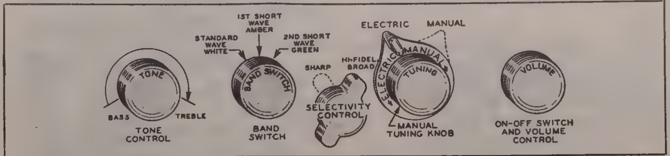


Fig. 1—Arrangement of Controls

General Service Data

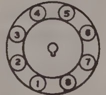
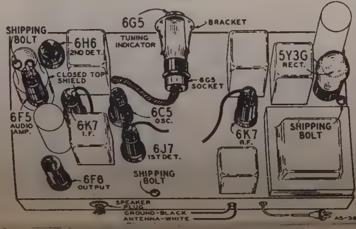


Fig. 5—Octal Tube Terminal Numbering (bottom of socket).



Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used.

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

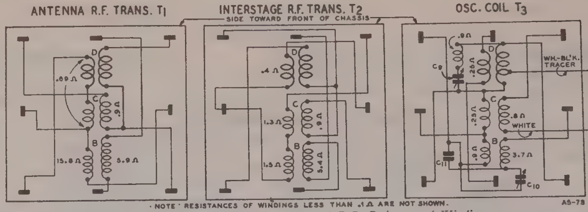
The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

117-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. *It is important that these sets be operated on a 60 cycle power supply only.*

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a 1⅛ inch round knockout on the back panel of the chassis which may be removed to permit installation of a special octal socket. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.



· NOTE · RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN.

Fig. 6—Coil Terminal Arrangement and D.C. Resistance of Windings

Phonograph Connections

Phonograph connections are made as shown in Fig. 2. On the front panel of the chassis base is a round knockout 1⅛ inch in diameter. An octal base socket is mounted in this knockout opening and wired as illustrated.

A phono cable assembly may then be purchased (see parts list). On one end of this cable is an octal plug and on the other end is a phonograph radio switch and double tip jack.

Dial and Drive Assembly

SEE INDEX.

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	R.F.	0	6.2(1)	245	118	2.5		6.2(1)	2.5
6J7	1st Det.	0	6.2(1)	245	114	0		6.2(1)	6.2
6C5	Osc.	0	6.2(1)	114				6.2(1)	0
6K7	I.F.	0	6.2(1)	245	118	2.5		6.2(1)	2.5
6H6	2nd Det.	0	6.2(1)		0			6.2(1)	0
6F5	1st A.F.	0	6.2(1)		155			6.2(1)	0(2)
6F6	Power	0	6.2(1)	230	245	16(3)		6.2(1)	0
5Y3G	Rectifier	0	5.0(4)		680(5)		680(5)		5.0(4)
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 245		Cathode to Ground 0		Across Heater 6.2	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.5 volts) as read across resistor R20.
(4) A.C. voltage as read across filament terminals 2 and 8.
(5) A.C. voltage as read across terminals 4 and 6.

MONTGOMERY WARD & CO.

MODELS 62-309,62-449
MODELS 62-321,62-451
MODELS 62-347,62-417
62-447
Alignment,Trimmers

Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration Models 62-309,-449	TRIMMERS ADJUSTED See Illustration Models 62-321,-451	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I.F.								
2nd I.F. Adj.	Range B	.1 mf.	456 KC	Grid of I.F. Tube	2nd I.F. (C28) & (C29)	2nd I.F. (C29) & (C30)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F. Adj.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C22) & (C23)	1st I.F. (C22) & (C23)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B								
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C14)	Oscillator Range B (C13)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	Ant. Range B (C4) Int. Range B (C8)	Ant. Range B (C4) Int. Range B (C8)	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C10)	600 KC (C15)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE C								
6350 KC	Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C13)	Oscillator Range C (C12)	Turn Rotor to Full Open	Adjust to Maximum Output
6000 KC	Range C	400 Ohm	6000 KC	Antenna Lead	Antenna Range C (C3) Int. Range C (C7)	Antenna Range C (C3) Int. Range C (C7)	Turn Rotor to Max. Output	Adjust to Maximum Output
2000 KC	Range C	400 Ohm	2000 KC	Antenna Lead	2000 KC (C15)	2000 KC (C14)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE D								
22,000 KC	Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C12)	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output
20,000 KC	Range D	400 Ohm	20,000 KC	Antenna Lead	Ant. Range D (C2) Int. Range D (C6)	Ant. Range D (C2) Int. Range D (C6)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
7000 KC	Range D	400 Ohm	7000 KC	Antenna Lead	7000 KC (C9)	7000 KC (C18)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B

Models 62-347,62-417,62-447

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I.F.							
2nd I.F.	Range B	.1 mf.	456 KC	Grid of I.F. Tube	2nd I.F. (C25) & (C26)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C19) & (C20)	Turn Rotor to Full Open	Adjust to Maximum Output
Range B							
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C12)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st Ant. Range B (C2) 2nd Ant. Range B (C4)	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C9)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B
Range D							
19800 KC	Range D	400 ohm	19800 KC	Antenna Lead	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output
16000 KC	Range D	400 ohm	16000 KC	Antenna Lead	Ant. Range D (C3)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B
6000 KC	Range D	400 ohm	6000 KC	Antenna Lead	6000 KC (C8)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the electric drive, loosen the two set screws in the hub of the film drum assembly pulley. Turn the film drum until it is at the 1500 KC mark on the dial and then tighten the two pulley set screws. (On later models, the film drum can be turned without loosening the set screws.)

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

Special Note on Calibration—Movie Dial Sets

If after following the above procedure, the red line on the screen does not intersect the proper call letters when a station is tuned in, proceed as follows:

(1) Tune in any station between 530 KC and approximately 900 KC on the dial. After the station is tuned in, adjust the position of the film drum, as explained above under Note A until the line on the crosses the call letters of the station tuned in. Modify this adjustment if necessary until all stations between *530 KC and approximately 900 KC* are tuned in with some part of their call letters touching the vertical line on the screen.

(2) Set the signal generator for exactly 1500 KC. Turn the tuning knob until the line on the screen is at the 1500 KC mark. Then adjust the oscillator B Range trimmer until the signal is tuned in to maximum output.

(3) Adjust the 1st and 2nd antenna Range B trimmers to maximum output at 1500 KC.

(4) Check the 600 KC adjustment for maximum output.

Calibration should now be substantially correct over the entire dial. If it is not, repeat the above procedure.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15.000 KC. The signal will then be heard at 15.000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15.000 less 912 KC, or 14.088 KC on the dial. It may be necessary to increase the input signal to hear the image.

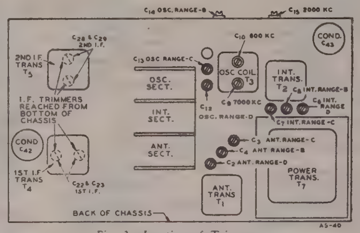


Fig. 3—Location of Trimmers
Models 62-309,62-449

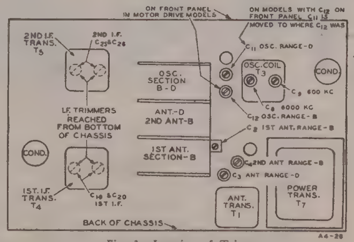


Fig. 3—Location of Trimmers
Models 62-347,62-417,62-447

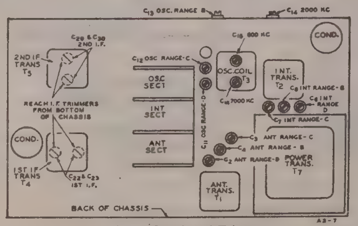
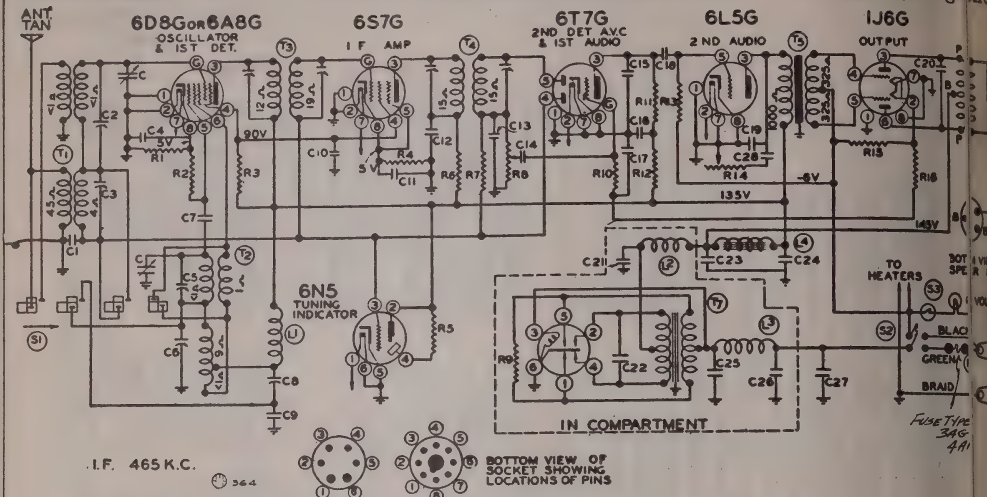


Fig. 3—Location of Trimmers
Models 62-321,62-451

MODELS 62-376,62-425
62-486

MONTGOMERY WARD & CO.

Schematic,Sock
Trimmers,Align

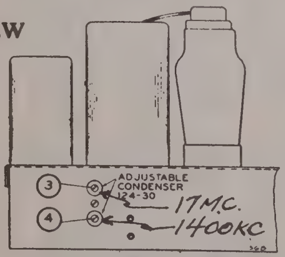


LIST OF REPAIR PARTS (Serial No. 7E607720 and up)

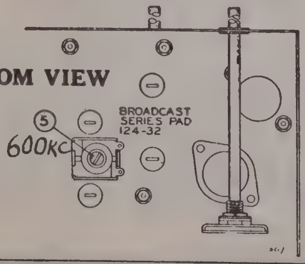
Part No.	Schematic Reference	Description	No. Used in Set
		CONDENSERS	
BE100-11	C14, C17	.01 x 400 Volt Tubular	2
BE100-14	C21	.1 x 200 Volt Tubular	1
BE100-20	C1, C4, C10, C11, C12, C16 C27	.1 x 200 Volt Tubular	7
BE100-25	C19, C20	.002 x 600 Volt Tubular	2
BE100-26	C18, C28	.02 x 400 Volt Tubular	2
BE100-34	C22	.005 x 1200 Volt Tubular	1
BE100-35	C25, C26	.5 x 200 Volt (Oval Type)	2
BE119-41	C23, C24	8-4 MFD. 200 W. V. Lytic Filter	1
BE124-32	C8	Series Padder Condenser	1
BE124-30	C5, C6 C2, C3	Dual Ceramic Padder Condenser	2
BE129-5	C13	.0001 Mica — Type MT — 20%	1
BE129-12	C15	.00025 Mica — Type MT — 20%	1
BE129-39	C7	.00005 Mica — Type MT — 20%	1
BE129-54	C9	.003 Mica — Type MW — 2½%	1
		RESISTORS	
BE130-12	R2	50M Ohm—1/3 Watt—20%—Carbon	1
BE130-19	R10, R16	1 Meg Ohm—1/3 Watt—20%—Carbon	2
BE130-20	R11, R12	100M Ohm—1/3 Watt—20%—Carbon	2
BE130-31	R4, R6	1500 Ohm—1/3 Watt—20%—Carbon	2
BE130-38	R7, R13	2 Megohm—1/3 Watt—20%—Carbon	2
BE130-54	R1	500 Ohm—1/3 Watt—20%—Carbon	1
BE130-84	R9	200 Ohm—1/3 Watt—20%—Carbon	1
BE130-149	R3	15M Ohm—1/3 Watt—20%—Carbon	1
BE130-158	R15	16 Ohm—1 Watt—5% Wire Wound	1
		COILS	
BE B-108-92B	T4	Output I. F. Coil Assembly complete with can	1
BE B-108-93B	T3	Input I. F. Coil Assembly complete with can	1
BE B-110-61	T2	Broadcast and Short-wave Oscillator Coil Assembly complete with can	1
BE B-111-77	T1	Broadcast and Short-wave Antenna Coil Assembly complete with can	1
		CHOKE COILS	
BE105-19	L3	"A" Choke Coil	1
BE B-105-30D	L4	Filter Choke (400 Ohms)	1
BE105-35	L1, L2	R. F. "B" Choke Coil	2
		TRANSFORMERS	
BE B-104-62C	T7	Power Transformer for Vibrator	1
BE B-105-36B	T5	Input Audio Transformer	1
		SPEAKER	
BE114-58	T6	Six inch P. M. Dynamic Speaker	1
		MISCELLANEOUS	
BE101-81	R8, S2	Volume Control and Switch (500M Ohm)	1
BE101-82	R14	Tone Control (100M Ohm)	1
BE107-105	(R5)	Cable and Socket Assembly complete with 250M Ohm Resistor	1

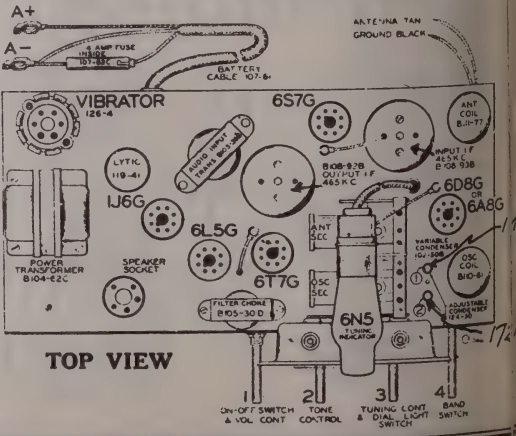
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

REAR VIEW



BOTTOM VIEW



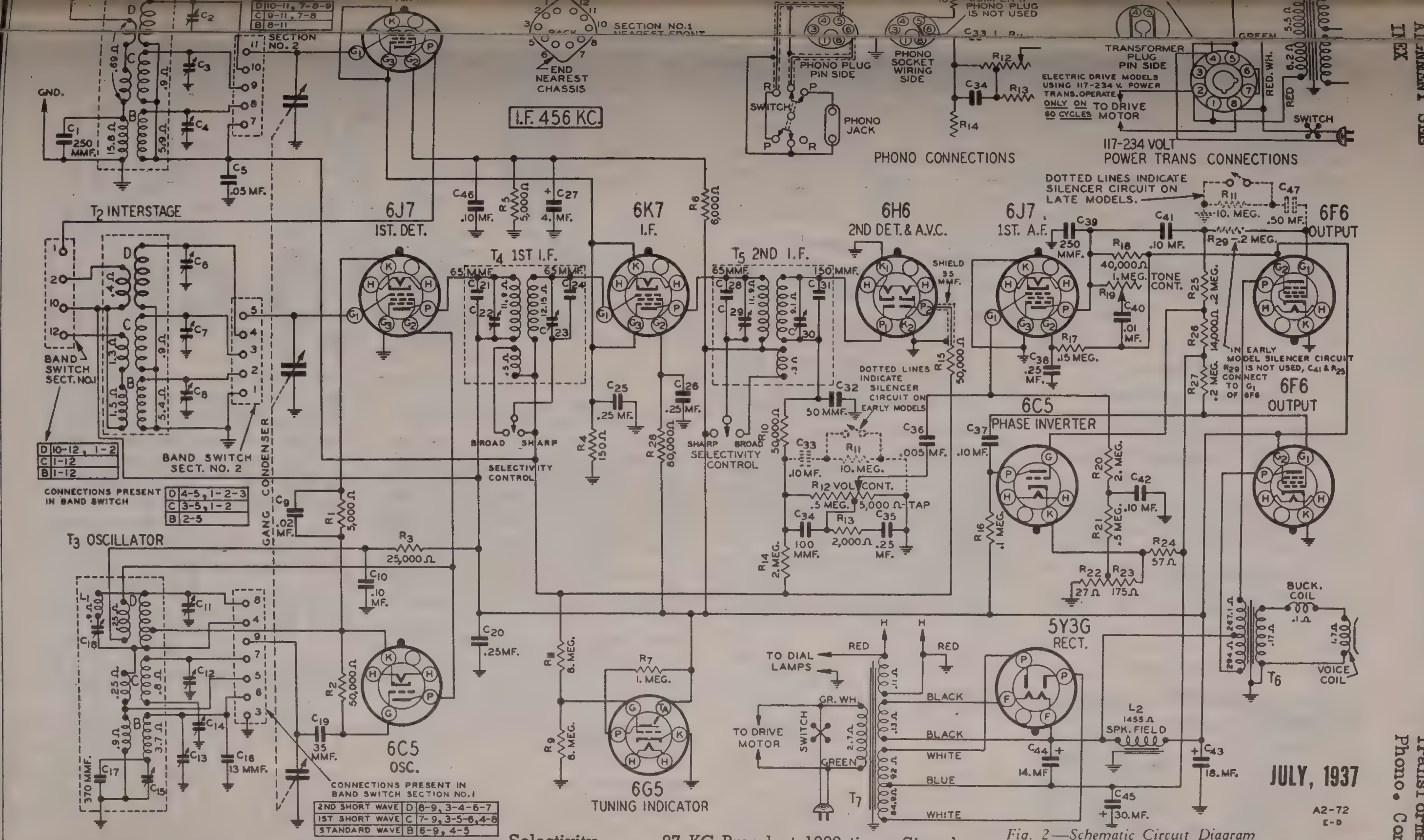


TOP VIEW

MODELS 62-321,62-451
Schematic,Sensitivity
Transformer Data
Phono. Conn.

MONTGOMERY WARD &, CO

F TUNER AND
A GNMENT SEE
I EX



JULY, 1937

A2-72
E-D

NOTE: RESISTANCE OF WINDINGS LESS THAN 0.1 Ω ARE NOT SHOWN

Fig. 2—Schematic Circuit Diagram

C Range ....1810 to 6350 KC
D Range ....6300 to 22000 KC

Sensitivity
B Range ....1.0 Microvolts Average
C Range ....1.0 Microvolts Average
D Range ....2.0 Microvolts Average

SPECIFICATIONS

Power Consumption - 100 Watts (At 117 volts 60 cycles)
138 Watts (Motor Operating)

Power Output - - - - - - 9.8 Watts Undistorted
12 Watts Maximum

Selectivity (Sharp) - - 27 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC.

Speaker - - - - - - - - - - - 10" Dynamic

Tuning Frequency Range
B Range .... 528 to 1830 KC.

MODELS 62-321,62-451
Circuit Data,Voltage
Socket,Coils,Notes

MONTGOMERY WARD & CO.

Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and interstage R.F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C, and D respectively.

The band switch completes connections to the coils in use. The band switch sections are designated in the schematic as section 1 and section 2.

The antenna transformer with tuned secondary feeds into a type 6K7 R.F. amplifier tube. The output of this tube is fed through the interstage R.F. transformer with tuned secondary into a 6J7 tube which functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

Referring to the 1st and 2nd I.F. transformers T4 and T5 in Fig. 2, it will be noted that there is a coupling winding shown below the primary of T4 and below the secondary of T5.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary in the case of T4 is connected in series with the secondary. In the case of T5, the coupling winding which is wound under the secondary is in series with the primary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A 6H6 tube functions as a diode 2nd detector. AVC voltage is applied to the control grid circuits of the R.F. and I.F. tubes.

Across the volume control resistor R12 is a filter composed of condensers C34 and C35 and resistor R13. At high volume settings, the filter is not effective. At low volume settings, the action of this filter results in an increase of high and low frequency amplitudes relative to the other rrequency amplitudes.

The output of the 2nd detector is applied to the 6J7 1st A. F. tube. The output of this tube is fed through resistance coupling into the 6F6 output tube shown nearest to it in the schematic.

A portion of the voltage developed across the output tube grid resistor is applied to the control grid of the 6C5 balancing exciter tube. This tube functions as a phase inverter and applies the audio voltage of proper phase and amplitude to the other 6F6 output tube. The two output tubes operate as a stage of Class A push-pull amplification. The balancing exciter tube thus replaces a push-pull input transformer. A dynamic reproducer is employed.

The power unit uses a 5Y3G full wave rectifier. A 6G5 tuning indicator tube is employed.

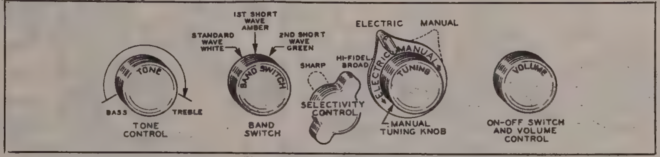


Fig. 1—Arrangement of Controls

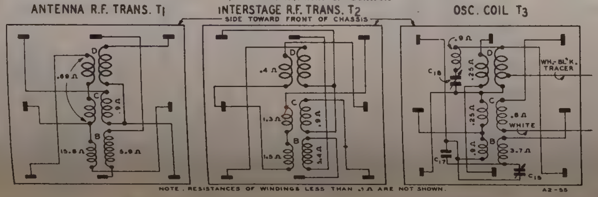


Fig. 6—Coil Terminal Arrangement and DC Resistance of Windings

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used.

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

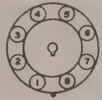


Fig. 4—Octal Tube Terminal Numbering (bottom of socket)

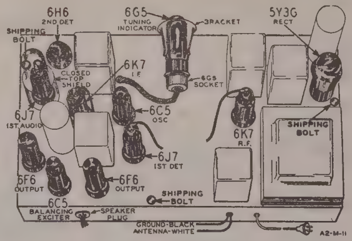


Fig. 5—Location of Tubes

117-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. *It is important that these sets be operated on a 60 cycle power supply only.*

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 cycle power supply. However, the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a 1⅛ inch round knockout on the back panel of the chassis which may be removed to permit installation of a special octal socket. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

Phonograph Connections

Phonograph connections are made as shown in Fig. 2. On the front panel of the chassis base is a round knockout 1⅛ inch in diameter. An octal base socket is mounted in this knockout opening and wired as illustrated.

A phono cable assembly may then be purchased On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack.

Dial and Drive Assembly

SEE INDEX

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter.

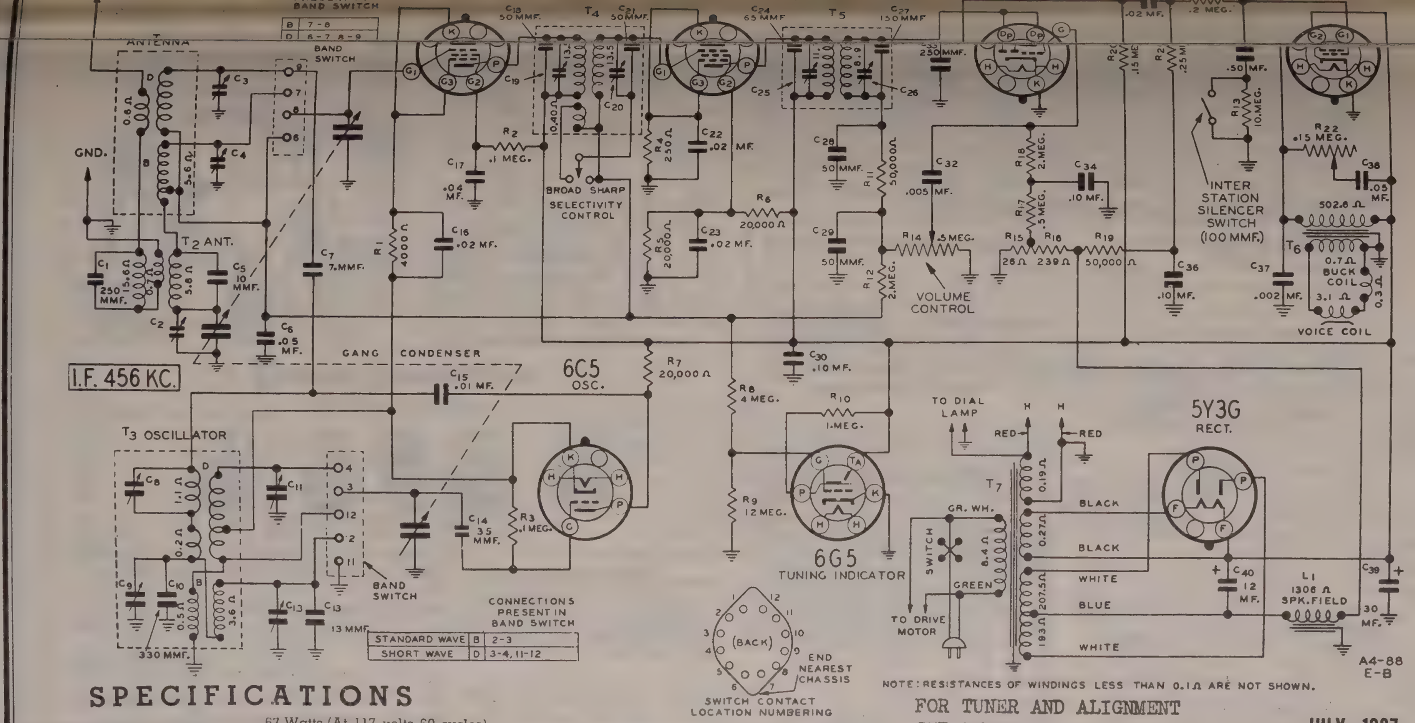
Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	R.F.	0	6.1(1)	250	105	2.5		6.1(1)	2.5
6J7	1st Det.	0	6.1(1)	250	125	0		6.1(1)	5.8
6C5	Osc.	0	6.1(1)	125(2)				6.1(1)	0
6K7	I.F.	0	6.1(1)	250	100	2.5		6.1(1)	2.5
6H6	2nd Det.—A.V.C.	0	6.1(1)					6.1(1)	0
6J7	1st A.F.	0	6.1(1)	110	120	0(3)		6.1(1)	0(3)
6C5	Balancing Exciter	0	6.1(1)	100				6.1(1)	18.5
6F6	Output	0	6.1(1)	330	250			6.1(1)	0(4)
5Y3G	Rectifier	0	4.8(5)		730(6)		730(6)		4.8(5)
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 250		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject [illegible]
(4) Bias (24 volts) as read [illegible] terminals 4 and 8.

MONTGOMERY WARD & CO.

MODELS 62-347,62-417,62-447
Schematic,Sensitivity
Transformer Data

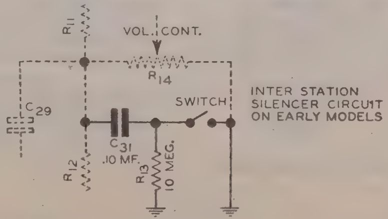


NOTE: RESISTANCES OF WINDINGS LESS THAN 0.1Ω ARE NOT SHOWN.

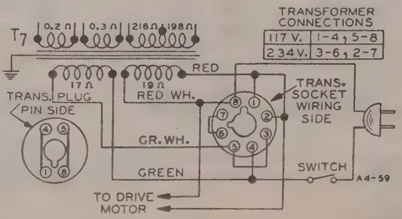
FOR TUNER AND ALIGNMENT SEE INDEX

JULY, 1937

Fig. 2 —Schematic Circuit Diagram



INTER STATION SILENCER CIRCUIT ON EARLY MODELS



SPECIFICATIONS

Power Consumption - -	67 Watts (At 117 volts 60 cycles) 105 Watts (Motor Operating)
Power Output - - - - - - -	2.5 Watts Undistorted 4.5 Watts Maximum
Selectivity (Sharp) - -	28 KC Broad at 1000 times Signal
Speaker - - - - - - - - - - - -	8" Dynamic

Tuning Frequency Range

B Range.. 528 to 1830 KC.

D Range..5750 to 19800 KC

Sensitivity

B Range..7 Microvolts Average

D Range..9 Microvolts Average

MODELS 62-347,62-417
62-447
Circuit Data,Voltage
Socket,Coils,Phono.

MONTGOMERY WARD & CO.

Circuit

This model is a two band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna coil assemblies and T3 is the oscillator coil assembly. The standard wave and short wave coils in each assembly are indicated by the letters B and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while for the D Range, a single tuned secondary is used.

A type 6J7 tube functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

Referring to Fig. 2, it will be noted that there is a coupling winding connected in series with the secondary of I.F. transformer T4. When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A type 6Q7 duo-diode triode functions as the second detector and a one stage audio amplifier. AVC voltage is applied to the 1st detector and I.F. tubes.

Resistance coupling is used between the 1st audio stage and the output stage which employs a type 6F6 ouput pentode tube. A dynamic reproducer is used.

The power unit uses a 5Y3G full wave rectifier. A 6G5 tuning indicator tube is employed.

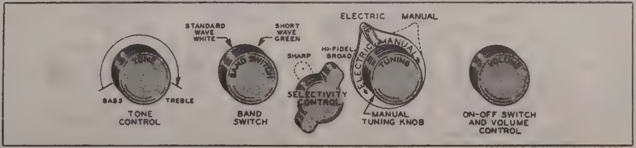


Fig. 1—Arrangement of Controls

General Service Data

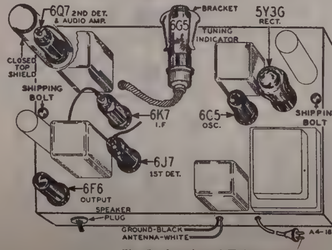


Fig. 5—Location of Tubes

Dial and Drive Assembly

SEE INDEX

Twenty-Five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used.

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

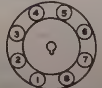


Fig. 6—Octal Tube Terminal Numbering (bottom of socket).

117-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. *It is important that these sets be operated on a 60 cycle power supply only.*

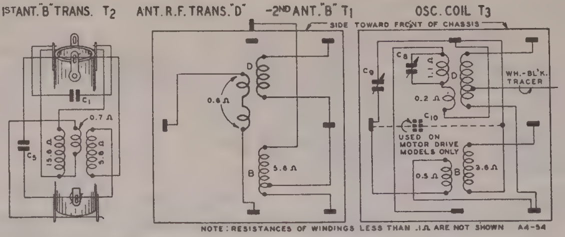

1ST ANT. "B" TRANS. T2
ANT. R.F. TRANS. "D" -2ND ANT. "B" T1
OSC. COIL T3
SIDE TOWARD FRONT OF CHASSIS
C1
C5
0.7 Ω
15.6 Ω
5.6 Ω
D
0.6 Ω
B
5.6 Ω
C8
C9
1.1 Ω
D
0.2 Ω
C10
WH.-BL'K. TRACER
USED ON MOTOR DRIVE MODELS ONLY
0.5 Ω
B
3.6 Ω
NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN
A4-54

Fig. 4—Coil Terminal Arrangement and D.C. Resistance of Windings

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 cycle power supply. However, the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a 1⅛ inch round knockout on the back panel of the chassis which may be removed to permit installation of a special octal socket. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

Phonograph Connections

Phonograph connections are made as shown in Fig. 7. On the side panel of the chassis base is a round knockout 1⅛ inch in diameter. An octal base socket is mounted in this knockout opening and wired as illustrated.

A phono cable assembly may then be purchased. On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack.

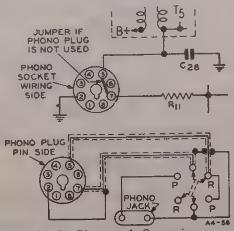


Fig. 7—Phonograph Connections

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter

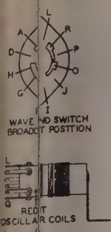
Antenna Shorted to Ground
Position of Band Switch: Standard Wave

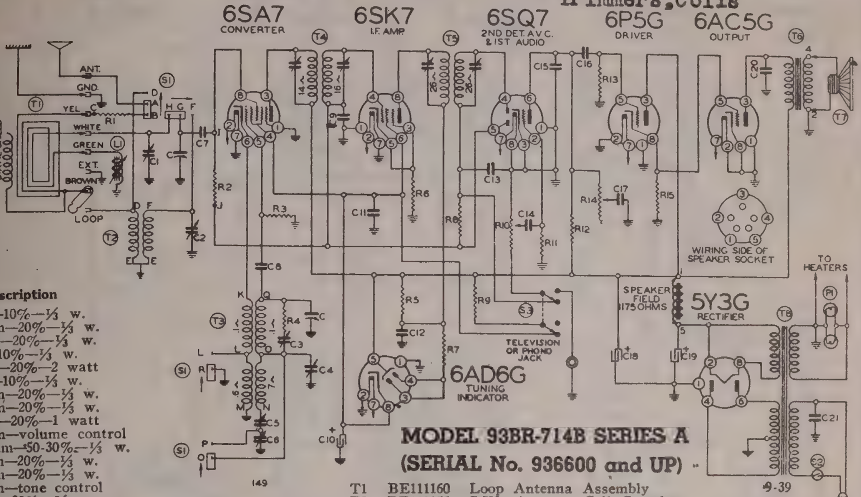
TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6J7	1st Det.	0	6.2(1)	230	145	9.5		6.2(1)	9.5
6K7	I.F.	0	6.2(1)	230	100	2.0		6.2(1)	2.0
6C5	Osc.	0	6.2(1)	140				6.2(1)	0
6Q7	1st Audio & 2nd Det.	0	6.2(1)	100				6.2(1)	0(2)
6F6	Power Amp.	0	6.2(1)	210	230			6.2(1)	0(3)
5Y3G	Rectifier	0	5.0(4)		630(5)		630(5)		5.0(4)
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 230		Cathode to Ground 0		Across Heater 6.2 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.5 volts) as read across resistor R15.
(4) A.C. voltage as read across heater terminals 2 and 8.
(5) A.C.

MONTGOMERY WARD & CO.

MODEL 93BR-714B, Series A
Schematic, Voltage, Socket
Trimmers, Coils





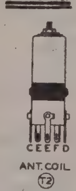
MODEL 93BR-714B SERIES A

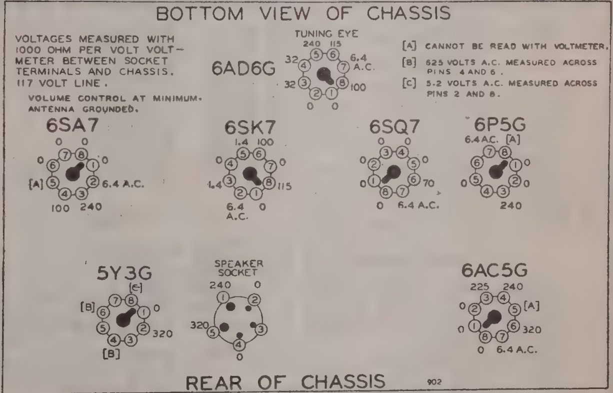
(SERIAL No. 936600 and UP)

T1	BE111160	Loop Antenna Assembly
T2	BE111155	S.W. Antenna Coil Complete
T3	BE110137	B.C. S.W. Oscillator Coil Complete
T4	BE108166	Input I.F. Coil—465 kc.
T5	BE108132B	Output I.F. Coil—465 kc.
T6	BE10590	Output Transformer
T7	BE114168	8" Dynamic Speaker (1175 Ohm Field)
T8	BE104139E	Power Transformer
P1	BE10794	2 6-8 volt pilot light T44
S1	BE12596	Band Switch
S2	BE12577B	AC Switch
S3	BE12570	Phone or Television—Radio Switch
L1	BE111153	Loop Adjusting Coil

Part N	Description
BE1307	400 ohm—10%—⅓ w.
BE1301	1 megohm—20%—⅓ w.
BE1302	20M ohm—20%—⅓ w.
BE1301	20 ohm—10%—⅓ w.
BE1305	12M ohm—20%—2 watt
BE1301	100 ohm—10%—⅓ w.
BE1301	1 megohm—20%—⅓ w.
BE1304	3 megohm—20%—⅓ w.
BE1301	15M ohm—20%—1 watt
BE1011	1 megohm—volume control
BE1302	15 megohm—50-30%—⅓ w.
BE1303	500M ohm—20%—⅓ w.
BE1301	1 megohm—20%—⅓ w.
BE1011	1 megohm—tone control
BE1301	25M ohm—20%—⅓ w.
BE1021	2 gang variable condenser
BE1241	B.C. Antenna Trimmer
BE1241	S.W. Antenna Trimmer
BE1247	S.W. Oscillator Trimmer
BE1247	B.C. Oscillator Trimmer
BE1241	B.C. Series Pad
BE1241	S.W. Series Pad
BE1292	.0005 mica—20%
BE1296	.00015 mica—20%
BE1009	.05 x 200 v.—25%
BE1198	5. mfd. x 300 v. lytic
BE1001	.1 x 400 v.—50-10%
BE1001	.1 x 400 v.—50-10%
BE1295	.0001 mica—20%
BE1007	.004 x 600 v.—25%
BE1292	.0005 mica—20%
BE1002	.02 x 400 v.—25%
BE1007	.004 x 600 v.—25%
BE1198	15 mfd. x 350 v. lytic
BE1198	10 mfd. x 450 v. lytic
BE1001	.006 x 600 v.—25%
BE1006	.02 x 600 v.—20%

d C6 one unit C3 and C4 in one unit
0, C18 and C19 in one unit

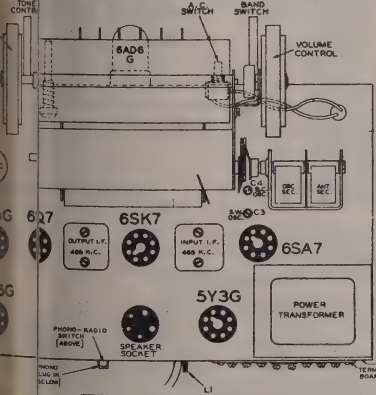



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS. 117 VOLT LINE.
VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 625 VOLTS A.C. MEASURED ACROSS PINS 4 AND 6.
[C] 5.2 VOLTS A.C. MEASURED ACROSS PINS 2 AND 8.

REAR OF CHASSIS

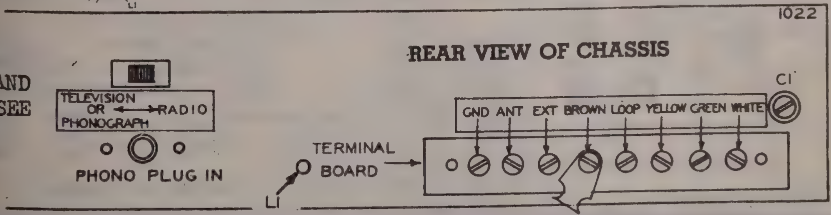


ANTENNA AND GROUND CONNECTIONS:

When an outside antenna is used connect the antenna to the binding screw on the rear of the chassis, marked "Ant." Connect the ground to the binding screw marked "Gnd." Move the connector bar from the terminal marked "Loop" and connect it to terminal marked "Ext."

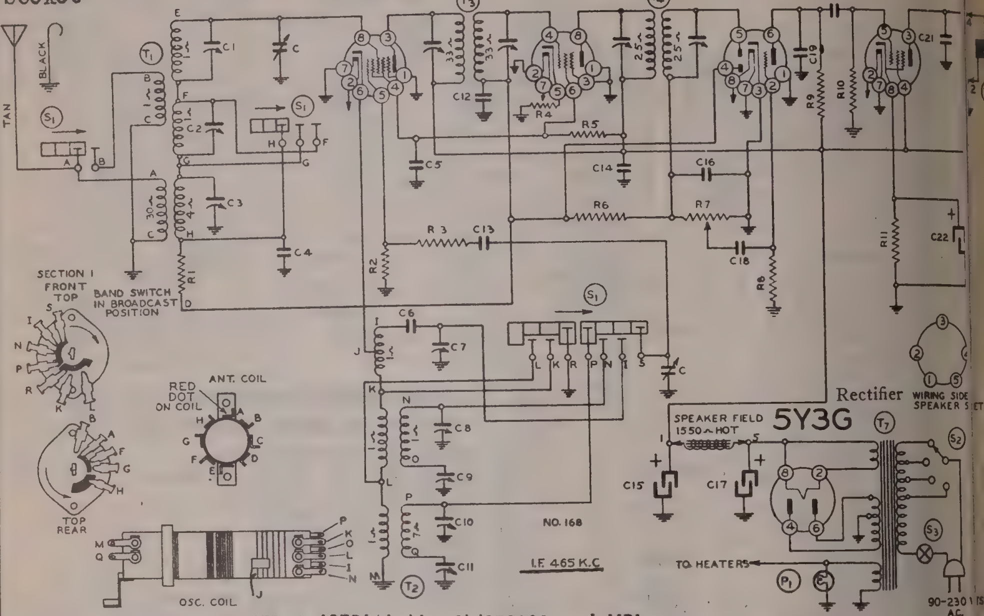
NOTE:—Make certain that the connector bar is connected to the terminal marked "Loop" if no outside antenna is used.

TU ER AND
GNM NT SEE
EX


REAR VIEW OF CHASSIS

MODEL 93BR-335A, Ser. A
Schematic, Voltage
Alignment, Trimmers
Socket

MONTGOMERY WARD & CO.

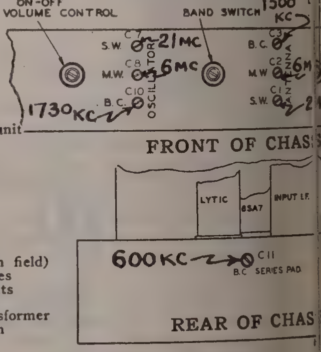


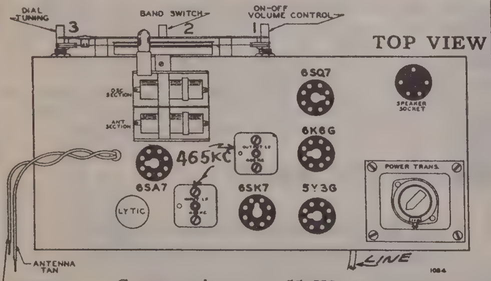
MODEL 93BR-335A, SERIES A (SERIAL No. 9M259100 and UP)

Ref. No.	Part No.	Description
		RESISTORS
R1	BE13011	250M ohm—⅓ w.
R2	BE130194	35M ohm—⅓ w.
R3	BE130299	10 ohm—⅓ w.
R4	BE130239	250 ohm—⅓ w.
R5	BE130242	12M ohm—1 watt
R6	BE1304	3 megohm—⅓ w.
R7	BE101208	1 megohm volume control
R8	BE130223	10 megohm—⅓ w.
R9	BE13011	250M ohm—⅓ w
R10	BE13019	1 megohm—⅓ w.
R11	BE13070	500 ohm—⅓ w.
		CONDENSERS
C	BE102124	Two Gang Variable Cond
C1	BE124124	S. W. Antenna Trimmer
C2	BE124124	M. W. Antenna Trimmer
C3	BE124124	B. C. Antenna Trimmer
C4	BE1009	.05 x 200 v.
C5	BE1001	.1 x 400 v.
C6	BE129153	.006—S. W. Padder (Set at Factory)
C7	BE124123	S. W. Oscillator Trimmer
C8	BE124123	M. W. Oscillator Trimmer
C9	BE129154	.0025 M. W. Padder
C10	BE124123	B. C. Oscillator Trimmer
C11	BE129155	B. C. Padder
C12	BE10026	.02 x 400 v.
C13	BE1295	.0001 Mica
C14	BE1001	.1 x 400 v.
C15	BE119103	40 mfd. lytic
C16	BE1295	.0001 Mica
C17	BE119103	10 mfd. lytic
C18	BE10025	.002 x 600 v
C19	BE1292	.0005 Mica
C20	BE10026	.02 x 400 v.
C21	BE10071	.004 x 600 v.
C22	BE119103	20 mfd. lytic x 25 w. v. C15, C17 and C22 in same unit
		PARTS
T1	BE111169	Antenna Coil
T2	BE110143	Oscillator Coil
T3	BE108169B	Input I. F.
T4	BE108170	Output I. F.
T5	BE10575	Output Transformer
T6	BE114176	6" Dynamic Speaker (1550 ohm field)
T7	BE104193	Power Transformer 40-60 cycles .. 90-230 volts
S1	BE125105	Band Switch
S2		Voltage Switch on Power Transformer
S3		Volume Control—On-Off switch
P1	BE10794	Pilot Light Bulb T-44

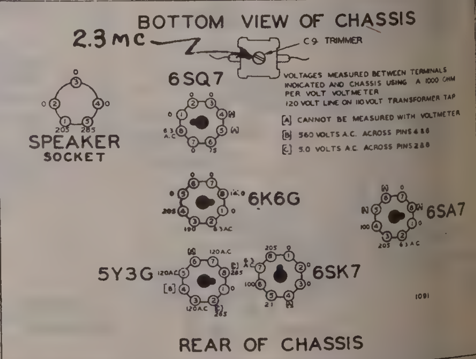
CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VI





Consumption..........55 Watts at 117 Volts
Output..........
..........1.5 Watts Undistorted, 3 Watts Maximum

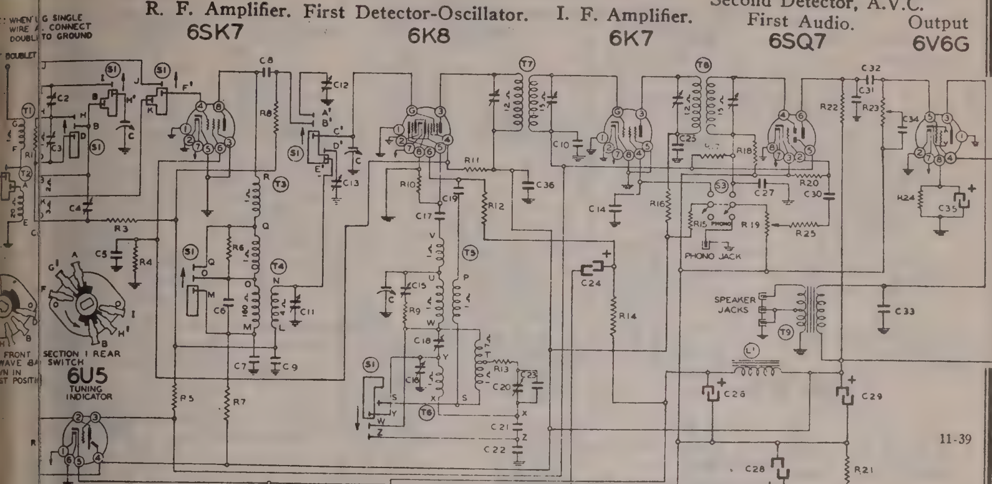


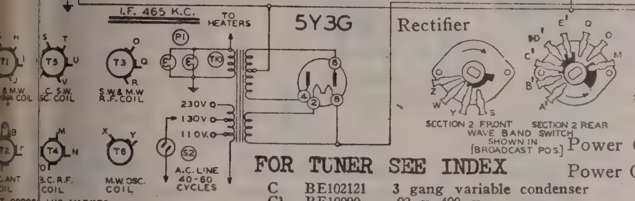
VOLTAGES MEASURED BETWEEN TERMINALS INDICATED AND CHASSIS USING A 1000 OHM PER VOLT VOLTMETER
120 VOLT LINE ON 110 VOLT TRANSFORMER TAP

[A] CANNOT BE MEASURED WITH VOLTMETER
[B] 560 VOLTS A.C. ACROSS PINS 4 & 6
[C] 5.0 VOLTS A.C. ACROSS PINS 2 & 8

MONTGOMERY WARD & CO.

MODEL 93BR-391A, Ser. A
Schematic, Voltage





MODEL 93BR-391A SERIES A

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

Power Consumption..........65 Watts at 117 Volts

Power Output ....4 Watts Undistorted, 6.5 Watt Maximum

FOR TUNER SEE INDEX

Part No.	Description
BE130	50M ohm—⅓ w.—10%
BE130	500M ohm—⅓ w.
BE130	100M ohm
BE130	50M ohm—⅓ w.
BE130	1000 ohm—⅓ w.
BE1302	25M ohm—⅓ w.
BE130	1000 ohm—⅓ w.
BE130	1 megohm—⅓ w.
BE130	200 ohm—⅓ w.
BE130	50M ohm—⅓ w.
BE1304	12M ohm—2 watt
BE130	10M ohm—⅓ w.
BE1309	10 ohm—⅓ w.
BE130	10M ohm—⅓ w.
BE130	100M ohm—⅓ w.
BE130	2M ohm—⅓ w.
BE130	3 megohm—⅓ w.
BE130	3 megohm—⅓ w.
BE1014	1 megohm volume control
BE1305	15 megohm—⅓ w.
BE1303	35 ohm—⅓ w.
BE130	200M ohm—⅓ w.
BE1016	150M ohm tone control
BE1307	250 ohm—1 watt
BE130	100M ohm—⅓ w.

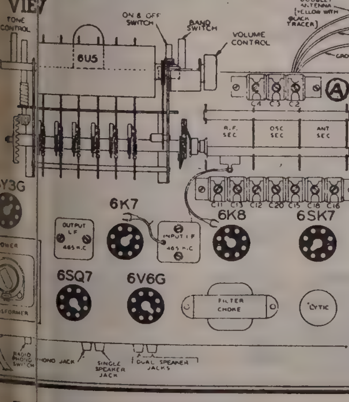
C	BE102121	3 gang variable condenser
C1	BE10090	.02 x 400 v.
C2	BE124118	S.W. Antenna Trimmer
C3	BE124118	M.W. Antenna Trimmer
C4	BE124118	B.C. Antenna Trimmer
C5	BE10013	.05 x 400 v.
C6	BE12938	.00005 mica
C7	BE10090	.02 x 400 v.
C8	BE10090	.02 x 400 v.
C9	BE10090	.02 x 400 v.
C10	BE1009	.05 x 200 v.
C11	BE124119	B.C. R.F. Trimmer
C12	BE124119	S.W. R.F. Trimmer
C13	BE124119	M.W. R.F. Trimmer
C14	BE10013	.05 x 400 v.
C15	BE124119	S.W. Oscillator Trimmer
C16	BE124119	M.W. Oscillator Trimmer
C17	BE12962	.00003 Mica
C18	BE124119	B.C. Oscillator Trimmer
C19	BE10025	.002 x 600 v.
C20	BE124119	B.C. Padding Condenser
C21	BE129149	.0028 Compression M.W. Pad
C22	BE129105	.0035 Compression S.W. Pad
C23	BE12959	.0003 mica
C24	BE11981	16 uf. lytic x 400 w. v.
C25	BE1001	.1 x 400 v.
C26	BE119100	30 uf. lytic x 450 w. v.
C27	BE1295	.0001 mica
C28	BE11991	40 uf. lytic x 25 w. v.

(SERIAL No. 9K188300 and UP)

C29	BE119100	30 uf. lytic x 450 w. v.
C30	BE10025	.002 x 600 v.
C31	BE12912	.00025 mica
C32	BE10013	.05 x 400 v.
C33	BE10097	.02 x 600 v.
C34	BE10078	.01 x 200 v.
C35	BE119100	40 uf. lytic—25 w. v.
C36	BE10013	.05 x 400 v.

C26, C29, and C35 in same unit

T1	BE111156	S.W. M.W. Ant. Coil
T2	BE111158	B.C. Antenna Coil
T3	BE10955	S.W. M.W. R.F. Coil
T4	BE10956	B.C. R.F. Coil
T5	BE110140	B.C. S.W. Osc. Coil
T6	BE110138	M.W. Oscillator Coil
T7	BE108165	1st I. F. Input Coil
T8	BE108119	2nd I. F. Output Coil
T9	BE10598	Output Transformer
T10	BE104181	Universal Transformer
	BE114179	8" P. M. Speaker
L1	BE10597B	"B" Filter Choke
S1	BE12595	Wave Band Switch
S2	BE12581	On & Off Switch
S3	BE12570	Radio Phono Switch
P1	BE10794	(2) Pilot Lights - T44

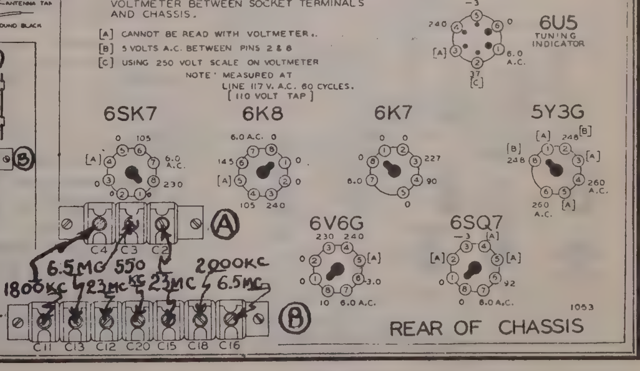


BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

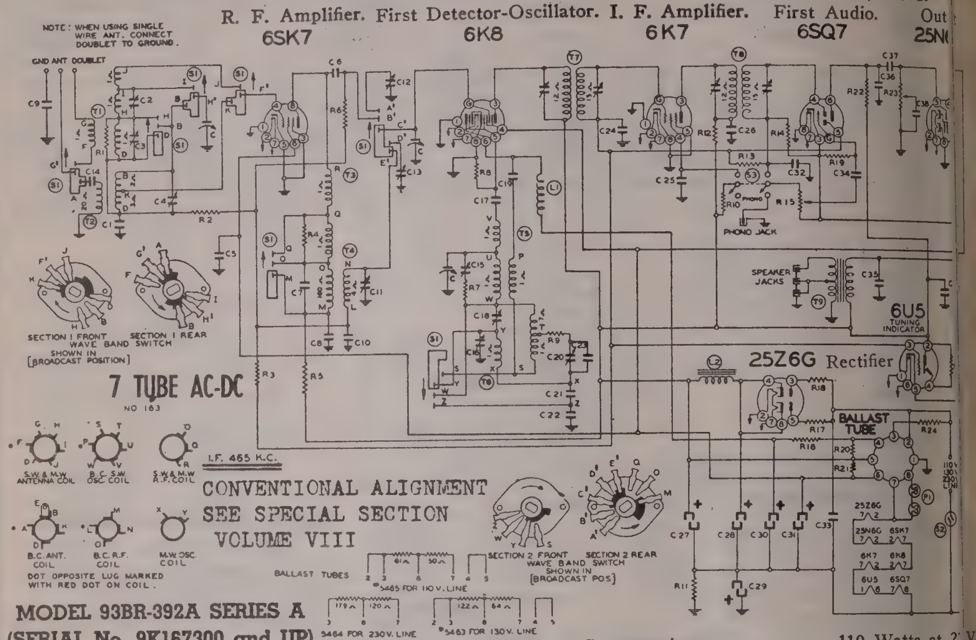
[A] CANNOT BE READ WITH VOLTMETER.
[B] 5 VOLTS A.C. BETWEEN PINS 2 & 8
[C] USING 250 VOLT SCALE ON VOLTMETER

NOTE: MEASURED AT LINE 117 V. A.C. 60 CYCLES. (110 VOLT TAP)



REAR OF CHASSIS

MONTGOMERY WARD & CO.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

MODEL 93BR-392A SERIES A
(SERIAL No. 9K167300 and UP)

11-39

Ref. No.	Part No.	Description
R1	BE13094	50M ohm—⅓ w.
R2	BE13020	100M ohm—⅓ w.
R3	BE13026	1000 ohm—⅓ w.
R4	BE130232	25M ohm—⅓ w.—10%
R5	BE13026	1000 ohm—⅓ w.
R6	BE13019	1 megohm—⅓ w.
R7	BE13097	200 ohm—⅓ w.—10%
R8	BE13012	50M ohm—⅓ w.
R9	BE130299	10 ohm—⅓ w.—10%
R10	BE13020	100M ohm—⅓ w.
R11	BE130197	20 ohm—⅓ w.—10%
R12	BE13023	2000 ohm—⅓ w.
R13	BE1304	3 megohm—⅓ w.
R14	BE1304	3 megohm—⅓ w.
R15	BE101184	1 megohm volume control
R16	BE13022	5000 ohm—⅓ w.
R17	BE130168	100 ohm—⅓ w.
R18	BE130168	100 ohm—⅓ w.—10%
R19	BE130225	15 megohm—⅓ w.
R20	BE130176	20M ohm—⅓ w.—10%
R21	BE130302	9M ohm—1.5 watt—10%
R22	BE1309	200M ohm—⅓ w.
R23	BE101207	1 megohm tone control
R24	BE10658	300 ohm—10%—50 watt
R25	BE13019	1 megohm—⅓ w.
C	BE102121	Three gang variable condenser
C1	BE10090-B	.02 x 400 v.
C2	BE124118	S.W. Antenna Trimmer
C3	BE124118	M.W. Antenna Trimmer
C4	BE124118	B.C. Antenna Trimmer
C5	BE10013	.05 x 400 v.
C6	BE10090	.02 x 400 v.
C7	BE12938	.00005 mica
C8	BE10090	.02 x 400 v.
C9	BE10026	.02 x 400 v.
C10	BE10090	.02 x 400 v.
C11	BE124119	B.C. R.R. Trimmer
C12	BE124119	S.W. R.F. Trimmer
C13	BE124119	M.W. R.F. Trimmer
C14	BE10026	.02 x 400 v.
C15	BE124119	S.W. Oscillator Trimmer
C16	BE124119	M.W. Oscillator Trimmer
C17	BE12962	.0003 mica
C18	BE124119	B.C. Oscillator Trimmer
C19	BE10025	.002 x 600 v.
C20	BE124119	B.C. Padding Condenser
C21	BE129149	.0028 Compression M.W. Pad
C22	BE129105	.0035 Compression S.W. Pad
C23	BE12959	.0003 mica
C24	BE1009	.05 x 200 v.
C25	BE10013	.05 x 400 v.
C26	BE1001	.1 x 400 v.
C27	BE11998	30 uf. lytic—300 w.v.
C28	BE11998	30 uf. lytic—300 w.v.
C29	BE11998	40 uf. lytic—25 w.v.
C30	BE11964	15 uf. lytic—400 w.v.
C31	BE11964	10 uf. lytic—350 w.v.
C32	BE1295	.0001 mica
C33	BE10013	.05 x 400 v.
C34	BE10025	.002 x 600 v.
C35	BE10026	.02 x 400 v.

Consumption..........110 Watts at 2

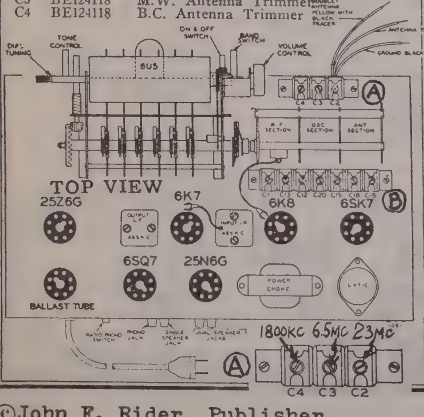
Output..........4 Watts Undistorted, 5 Watt M
(Measured with 230 Volt Line V

Ref. No.	Part No.	Description
C36	BE12912	.00025 mica
C37	BE10013	.05 x 400 v.
C38	BE10078	.01 x 200 v.
C39	BE10013	.05 x 400 v.

C2, C3 and C4 are in same unit.
C11, C12, C13, C15, C16, C18 and
in same unit.
C27, C28 and C29 in same unit.
C30 and C31 in same unit.

Ref. No.	Part No.	Description
T1	BE111156	S.W. M.W. Antenn
T2	BE111158	B.C. Antenna Coil
T3	BE10955	S.W. M.W. R.F. C
T4	BE10956	B.C. R.F. Coil
T5	BE110140	B.C. S.W. Oscillato
T6	BE110138	M.W. Oscillator Co
T7	BE108165	1st I. F. Input Coi
T8	BE108119	2nd I. F. Output C
T9	BE10598	Output Transformer
	BE114179	8" P.M. Speaker
L1	BE1234	R.F. Choke
L2	BE10597B	"B" Filter Choke
S1	BE12595	Wave Band Switch
S2	BE12581	On and Off Switch
S3	BE12570	Radio-Phono Switch
P1	BE10794	(2) Pilot Lights T-4

FOR TUNER SEE INDEX



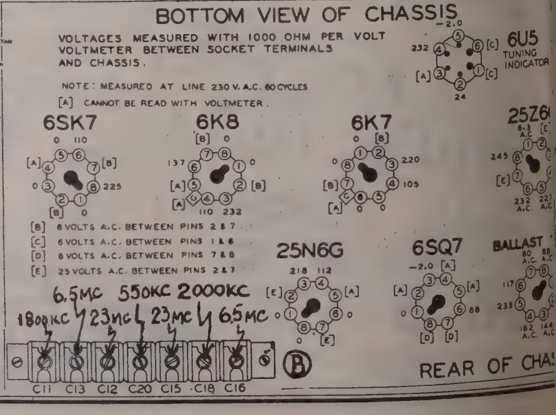
BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

NOTE: MEASURED AT LINE 230 V. A.C. 60 CYCLES

[A] CANNOT BE READ WITH VOLTMETER.

[B] 6 VOLTS A.C. BETWEEN PINS 2 & 7
[C] 6 VOLTS A.C. BETWEEN PINS 1 & 6
[D] 6 VOLTS A.C. BETWEEN PINS 7 & 8
[E] 25 VOLTS A.C. BETWEEN PINS 2 & 7

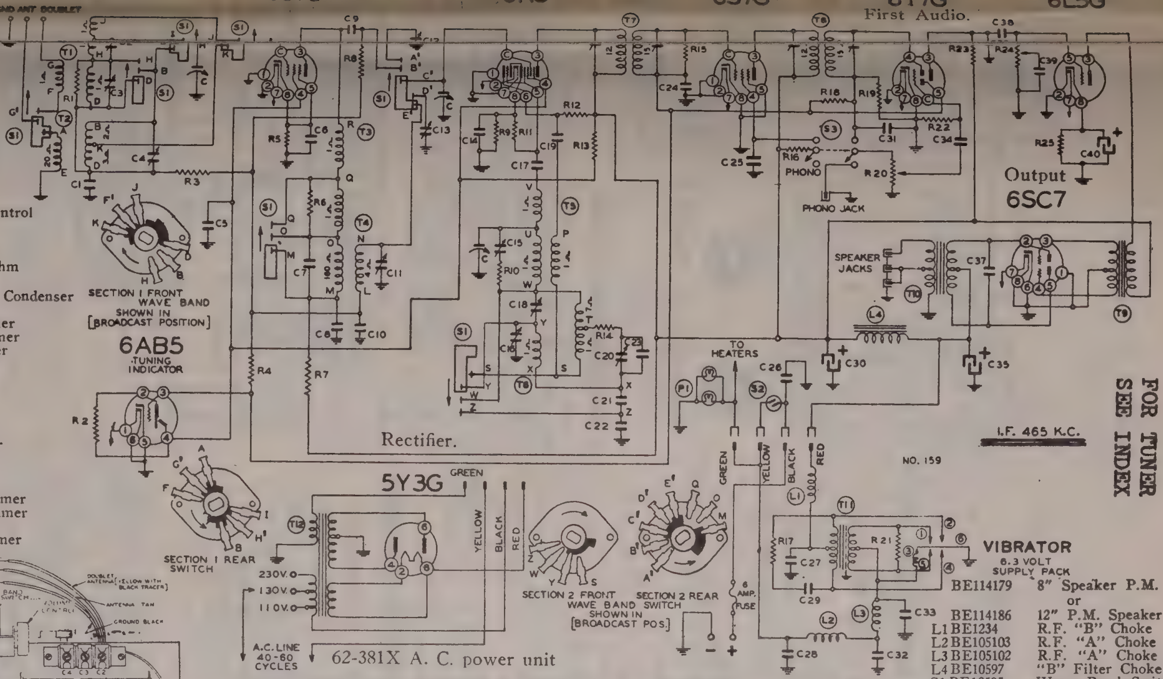


MONTGOMERY WARD & CO.

MODEL 93BR-393A, Ser. A
Serial 9K166700 up
Schematic, Socket
Trimmers

P.U. MODEL 62-381X

FOR TUNER
SEE INDEX



62-381X A. C. power unit

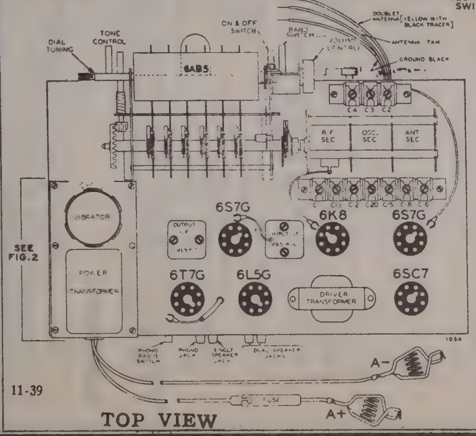
R3	BE13020	100M ohm—⅓ w.
R4	BE13026	1000 ohm—⅓ w.
R5	BE13070	500 ohm—⅓ w.
R7	BE13026	1000 ohm—⅓ w.
R8	BE13019	1 megohm—⅓ w.
R9	BE13083	300 ohm—⅓ w.
R10	BE13097	200 ohm—⅓ w.
R11	BE13012	50M ohm—⅓ w.
R12	BE13048	15M ohm—⅓ w.
R13	BE130245	10M ohm—1 watt
R14	BE130299	10 ohm—⅓ w.
R15	BE13019	1 megohm—⅓ w.
R16	BE13012	50M ohm—⅓ w.
R17	BE13064	3500 ohm—⅓ w.
R18	BE1304	3 megohm—⅓ w.
R19	BE1304	3 megohm—⅓ w.
R20	BE101184	1 megohm volume control
R21	BE13084	200 ohm—⅓ w.
R22	BE130257	5 megohm—⅓ w.
R23	BE1309	200M ohm
R24	BE101207	Tone Control—1 megohm
R25	BE130235	1500 ohm—⅓ w.
C	BE102121	Three Gang Variable Condenser
C1	BE10090	.02 x 400 v.
C2	BE124118	S.W. Antenna Trimmer
C3	BE124118	M.W. Antenna Trimmer
C4	BE124118	B.C. Antenna Trimmer
C5	BE10013	.05 x 400 v.
C6	BE1009	.05 x 200 v.
C7	BE12938	.00005 mica
C8	BE10090	.02 x 400 v.
C9	BE10090	.02 x 400 v.
C10	BE10090	.02 x 400 v.
C11	BE124119	B. C. R. F. Trimmer
C12	BE124119	S.W. R.F. Trimmer
C13	BE124119	M.W. R.F. Trimmer
C14	BE1009	.05 x 200 v.
C15	BE124119	S.W. Oscillator Trimmer
C16	BE124119	M.W. Oscillator Trimmer
C17	BE12962	.00003 mica
C18	BE124119	B.C. Oscillator Trimmer
C19	BE10025	.002 x 600 v.

	BE114179	8" Speaker P.M. or
	BE114186	12" P.M. Speaker
L1	BE1234	R.F. "B" Choke
L2	BE105103	R.F. "A" Choke
L3	BE105102	R.F. "A" Choke
L4	BE10597	"B" Filter Choke
S1	BE12595	Wave Band Switch
S2	BE12581	On-Off Switch
S3	BE12570	Radio Phono Switch
P1	BE10794	(2) Pilot Lights T-44

MODEL 93BR-393A, SERIES A (SERIAL No. 9K166700 and UP)

Power Consumption....3.8 Amps. at 6.3 Volts

Power Output..........2 Watts Undistorted, 3 Watts Maximum

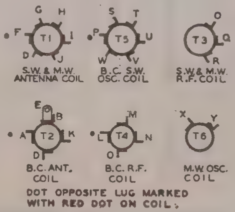


SEE FIG.2

11-39

TOP VIEW

C20	BE124119	B.C. Padding Cond.
C21	BE129149	.0028 Compression (M.W. Pad)
C22	BE129105	.0035 Compression (S.W. Pad)
C23	BE12959	.0003 mica
C24	BE1009	.05 x 200 v.
C25	BE10013	.05 x 400 v.
C26	BE10020	.1 x 200 v.
C27	BE10013	.05 x 400 v.
C28	BE10031	.5 x 120 v.
C29	BE100114	.006 x 1200 v., oil type
C30	BE11998	30 uf. lytic—300 w.v.
C31	BE1295	.0001 mica
C32	BE10031	.5 x 120 v.
C33	BE10031	.5 x 120 v.
C34	BE10025	.002 x 600 v.
C35	BE11998	30 uf. lytic—300 w.v.
C36	BE12912	.00025 mica
C37	BE10071	.004 x 600 v.
C38	BE10011	.01 x 400 v.
C39	BE10078	.01 x 200 v.
C40	BE11998	40 uf. lytic—25 w.v.



DOT OPPOSITE LUG MARKED
WITH RED DOT ON COIL.

C2, C3 and C4 are in same unit
C11, C12, C13, C15, C16, C18, and C20 are in same unit
C30, C35, and C40 are in same unit.

T1	BE111156	S.W.—M.W. Antenna Coil
T2	BE111158	B.C. Antenna Coil
T3	BE10955	S.W.—M.W. R.F. Coil
T4	BE10956	B.C.—R.F. Coil
T5	BE110140	B.C.—S.W. Oscillator Coil
T6	BE110138	M.W. Oscillator Coil
T7	BE108164	1st I.F. Coil—Input
T8	BE108119	2nd I.F. Coil—Output
T9	BE105101	Input Transformer
T10	BE10599	Output Transformer
T11	BE104180	Vibrator Transformer
T12	BE104179	Universal Transformer Power
	BE12616	Vibrator

MODEL 93BR-393A,Ser.A
Voltage,Alignment
Trimmers
S.P.U.Notes

MONTGOMERY WARD & CO.

ALIGNMENT FREQUENCIES

IF 465 KC
SHORT WAVE BAND 23 MC
  Align S.W. Osc.(C15), Ant.(C2), RF (C12)
MEDIUM WAVE BAND 6.5 MC
  Align M Osc.(C16), Ant.(C3), RF (C13)
BROADCAST BAND
  Align Osc.(C18) at 2000 KC.
  Align Ant.(C4),RF (C11) at 1800 KC.
  Align Osc. Series Pad (C20) at 550 KC.

THE ALIGNMENT IS CONVENTIONAL
SEE SPECIAL SECTION VOLUME VIII.

BATTERY AND POWER SUPPLY:

This radio obtains its power entirely from a six volt storage battery—no other batteries are required.

1. For 6 volt storage battery operation:
   (a) Connect the lead (containing the fuse receptacle) marked A positive (+) to the positive (+) post of the storage battery.
   (b) Connect the lead marked A negative (—) to the negative (—) post of the storage battery.
2. For 100-250 volts, 40/60 cycle operation; see Fig. 2.

Installing the Model 62-381X Power Unit

(For 100-250 Volt 40/60 Cycle A. C. Operation)

To install the Model 62-381X A.C. power unit proceed as follows:—

1. **Remove the chassis from the cabinet,** by removing the four chassis mounting bolts from the bottom of the cabinet.
2. Referring to Fig. 1, note that the **6-volt power unit** is fastened to the top of the radio chassis with **eight copper head screws,** (six on top of chassis, and two on rear flange of chassis).
3. Remove the eight copper head screws.
4. Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks. Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.
5. Place the model 62-381X A.C. power unit (see Fig. 2) on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.
   (a) The **red** lead should be plugged into the pin jack which is marked with a **red dot.**
   (b) The **green** lead connects to the pin jack which is marked with a **green dot.**
   (c) The **yellow** lead connects to the pin jack which is marked with a **yellow dot.**
   (d) The **black** lead connects to the pin jack which is marked with a **black dot.**
6. Mount the power unit to the chassis using the eight copper head screws.

IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly. Set the switch on the top of the power transformer to the proper voltage.

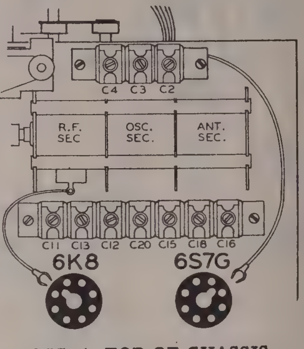


FIG. 5—TOP OF CHASSIS

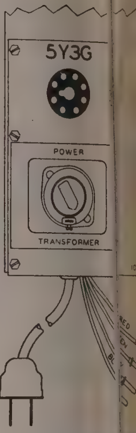


FIG. 2—MODEL 381
A. C. POWER IT

SERVICE NOTES:

Voltage taken from different points of circuit to chass ar measured with volume control at minimum, all tubes i their sockets and speaker connected, with a volt meter hav g resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM AC NG UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GRO ND LEADS SHOULD BE SHORT CIRCUITED WI LE MAKING MEASUREMENTS.

All voltages as indicated on the voltage chart are mea ed with a fully charged 6 volt storage battery or from 11 ol A. C. line if the Model 62-381X A. C. power unit is ins ed in place of the 6 volt power unit.

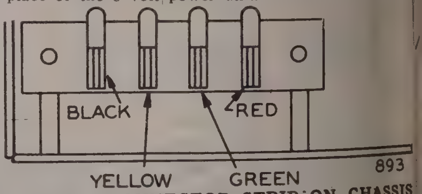
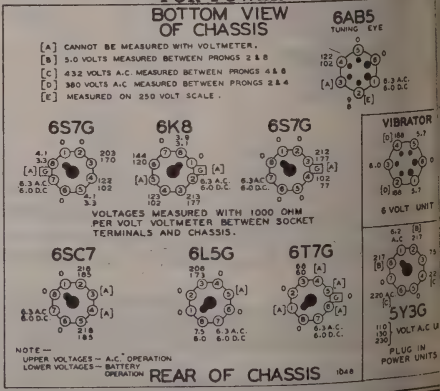


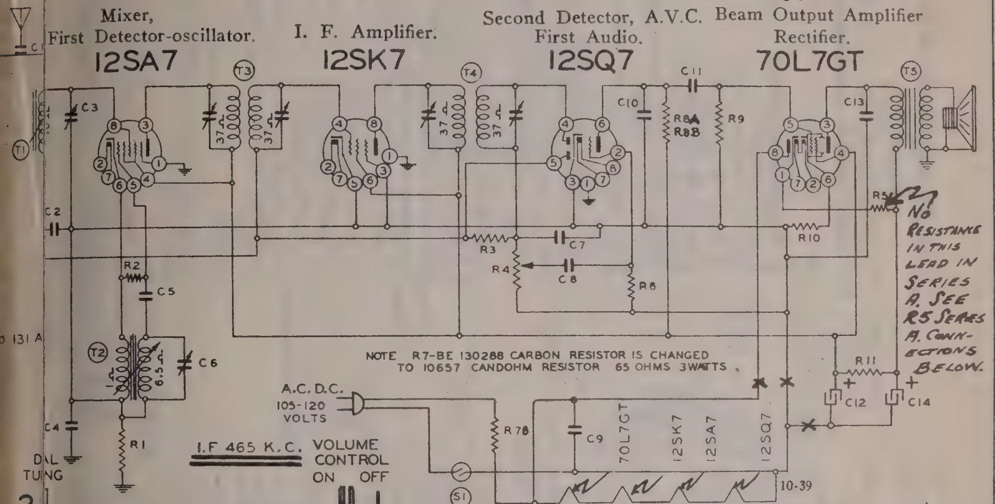
FIG. 3—CONNECTOR STRIP ON CHASSIS FOR POWER UNIT

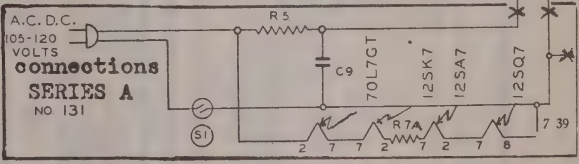

BOTTOM VIEW OF CHASSIS
[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] 5.0 VOLTS MEASURED BETWEEN PRONGS 2 & 8
[C] 432 VOLTS A.C. MEASURED BETWEEN PRONGS 4 & 6
[D] 380 VOLTS A.C MEASURED BETWEEN PRONGS 2 & 4
[E] MEASURED ON 250 VOLT SCALE.
6AB5
TUNING EYE
6S7G
6K8
6S7G
VIBRATOR
6 VOLT UNIT
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
6SC7
6L5G
6T7G
5Y3G
110 130 230 VOLT A.C U
PLUG IN POWER UNITS
NOTE—
UPPER VOLTAGES — A.C. OPERATION
LOWER VOLTAGES — BATTERY OPERATION
REAR OF CHASSIS
1048

MONTGOMERY WARD & CO.

MODELS 93BR-420A, 93BR-421A Series A; 93BR-420B, 93BR-421B, 93BR-423B, 93BR-424B 93BR-431B, Series B
Serial 813000 up, Ser. B
Schematic, Voltage, Socket Sensitivity, Trimmers

FOR ALIGNMENT
SEE INDEX


Mixer, First Detector-oscillator.
12SA7
I. F. Amplifier.
12SK7
Second Detector, A.V.C. First Audio.
12SQ7
Beam Output Amplifier Rectifier.
70L7GT
T1
T2
T3
T4
T5
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
R1
R2
R3
R4
R5
R6
R7B
R8A
R8B
R9
R10
R11
37
6.5
NO RESISTANCE IN THIS LEAD IN SERIES A. SEE R5 SERIES A. CONNECTIONS BELOW.
NOTE R7-BE 130288 CARBON RESISTOR IS CHANGED TO 10657 CANDOHM RESISTOR 65 OHMS 3WATTS
A.C. D.C. 105-120 VOLTS
I.F 465 K.C.
VOLUME CONTROL ON OFF
S1
70L7GT
12SK7
12SA7
12SQ7
7 2 7 2 7 2 7 P
10-39
DIAL TUNING



connections
SERIES A
NO. 131

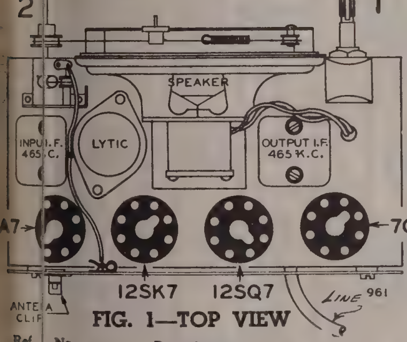
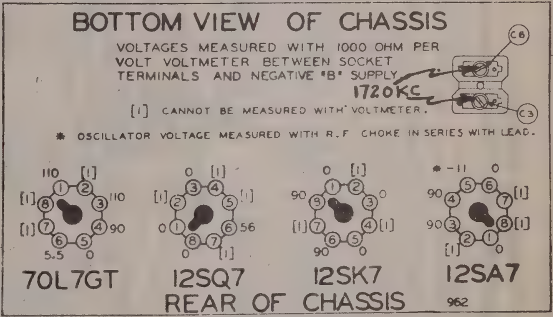


FIG. 1—TOP VIEW

Ref.	No.	Description
		RESISTORS
R1	E130100	150M ohm—⅓ w.
R2	E130176	20M ohm—⅓ w.
R3	E1304	3 megohm—⅓ w.
R4	E101188	Volume control (500M ohm)
R5	E130293	30 ohm—1 watt
R6	E130257	5 megohm—⅓ w.
R7A	E130288	50 ohm—1½ watt
R8A	E1302	75M ohm—⅓ w.
R7B	E10657	65 ohm—3 watt
R8B	F13011	250M ohm—⅓ w.
R9	E13011	250M ohm—⅓ w.
R10	E130166	150 ohm—⅓ w.
R11	E130279	1M ohm—1 watt
		CONDENSERS
C1	E131262	.00001 washer condenser (Ant. Clip on Back Plate)
C2	E1009	.05 x 200 v.
C3	E124100	Antenna Trimmer
C4	E10091	.15 x 400 v.
C5	E12939	.00005 mica
C6	E124100	Osc. Trimmer
C7	E12912	.00025 mica
C8	E10025	.002 x 600 v
C9	E10013	.05 x 400 v.
C10	E1292	.0005 mica
C11	E10011	.01 x 400 v.
C12	E11992	20 ufd. x 150 w. v. lytic
C13	E10011	.01 x 400 v.
C14	E11992	40 ufd. x 150 w. v. lytic

C3 and C6 in one unit
C12 and C14 in one unit


BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND NEGATIVE "B" SUPPLY
1720KC
C6
C3
[1] CANNOT BE MEASURED WITH VOLTMETER.
* OSCILLATOR VOLTAGE MEASURED WITH R.F CHOKE IN SERIES WITH LEAD.
110 [1] [1] 110 [1] 90 5.5 0
0 [1] [1] 0 56 0 [1]
0 [1] 90 0 [1] [1] 90 0
* -11 0 90 [1] 90 [1] [1] 0
70L7GT
12SQ7
12SK7
12SA7
REAR OF CHASSIS
962

BOTTOM VIEW

Power Consumption	35 Watts
Power Output	800 Milliwatts Undistorted
Sensitivity (for .05 Watts Output)	60 Microvolts Average
Selectivity	75 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range	540 to 1720 KC
Intermediate Frequency	465 KC
Speaker	4 in. P. M. Dynamic

MODEL 62-381 SPU
Installation Notes
MODELS 93BR420A,93BR421A
93BR420B,93BR421B,
93BR423B,93BR424B
93BR431B,Ser.A,B

MONTGOMERY WARD & CO.

MODELS 93BR461A,9 R46
MODEL 93BR714B
Alignment,Trimmer

ALIGNMENT PROCEDURE

Models No 93-BR-420B, 93BR-421B, 93BR-423B, 93BR-424B and 93BR-431B Models No. 93BR-420A and 93BR-421A

- Volume control—Maximum all adjustments.
- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

BAND	SIGNAL GENERATOR		Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
	Frequency Setting	Dummy Antenna					
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C6) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C3) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output (See Note "A"
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See Fig. 3)	Antenna	Check for tracking (See Note "B"

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

MODELS 93BR-461A,-462A.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

NOTE "A"—A 1 megohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer, (C3). The loop antenna must be disconnected from the chassis.

NOTE "B"—Remove the 1 megohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust trimmer (C2). (See note "C").

NOTE "C"—Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

BAND	SIGNAL GENERATOR		Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
	Frequency Setting	Dummy Antenna					
I. F. 93BR-461A ONLY	465 Kc.	.1 MFD.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Four trimmers on top (See Fig. 1)	Output and input I. F.	(See Note "A") Adjust to maximum output
I. F. 93BR-462A ONLY	465 Kc.	.1 MFD.	Grid of 1N5GT I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	(See Note "A") Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	(See Note "A") Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Trimmer (C3) front section of gang (See Fig. 4)	Oscillator	(See Note "A") Adjust to maximum output
	1400 Kc.		See Note "C"	Set dial at 1400 Kc.	Trimmer (C2) rear section of gang (See Fig. 4)	Antenna	(See Note "B") Adjust to maximum output

MODEL 93BR-714B (CAT.NO.62-721)

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

BAND	SIGNAL GENERATOR		Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
	Frequency Setting	Dummy Antenna						
I F.	465 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	18 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 18 Mc.	Trimmer C3	Short Wave oscillator	Adjust to maximum output
	18 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 18 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C6 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C4	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 540 Kc.	Trimmer C5 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1500 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1500 Kc.	Trimmer C1	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer L1	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 6SA7 tube and ground terminal when setting the Broadcast Band oscillator end frequencies. (1600 and 540 K.C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

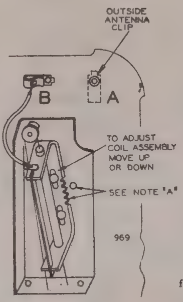


FIG. 4

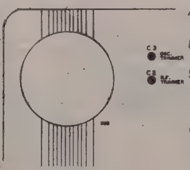


Fig. 4
MODELS 93BR-461A,-462A.

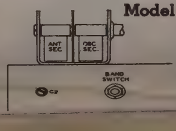


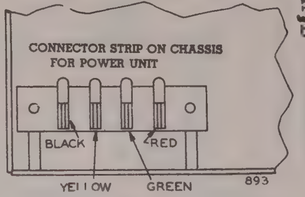
FIG. 4
FRONT VIEW

Installing the Model 62-381

Power Unit

(For 105-125 Volt 50/60 Cycle A. C. Operation)

MODEL 93BR-658A and 93BR-668A SERIES A



To install the Model 62-381 A.C. power unit proceed as follows:—

1. Remove the chassis from the cabinet, by removing the four chassis mounting bolts from the bottom of the cabinet.
2. Referring to Fig. 1, page 1, note that the 6-volt power unit is fastened to the top of the radio chassis with **eight copper head screws**, (six on top of chassis, and two on rear flange of chassis).
3. Remove the eight copper head screws.
4. Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks. Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.
5. Place the model 62-381 A.C. power unit on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.
   - (a) The **red lead** should be plugged into the pin jack which is marked with a **red dot**.
   - (b) The **green lead** connects to the pin jack which is marked with a **green dot**.
   - (c) The **yellow lead** connects to the pin jack which is marked with a **yellow dot**.
   - (d) The **black lead** connects to the pin jack which is marked with a **black dot**.
6. Mount the power unit to the chassis using the eight copper head screws.

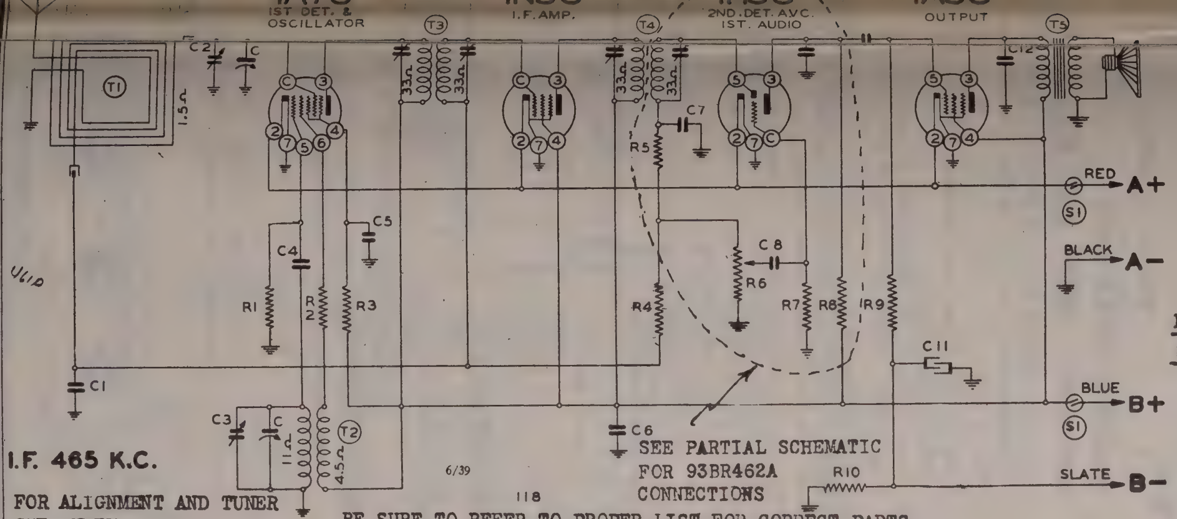
IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly.

Specifications

Model No. 93BR-714B

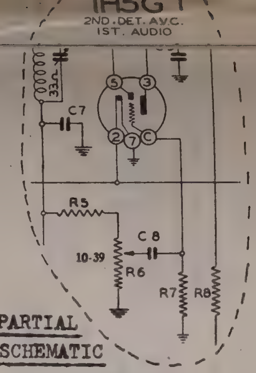
Power Consumption - - - - - - - - - 65 Watts
Power Output - - - - - - - 2.5 Watts Undistorted
Sensitivity (for .5 Watts Output) - -
Broadcast Band—30 Microvolts Average
Shortwave Band—50 Microvolts Average



I.F. 465 K.C.

FOR ALIGNMENT AND TUNER SEE INDEX

SEE PARTIAL SCHEMATIC FOR 93BR462A CONNECTIONS



PARTIAL SCHEMATIC

Showing 93BR462A connections. Note that the 93BR462A uses GT type tubes.

NOTE Circuit connections are the same in both sets except for differences above.

BE SURE TO REFER TO PROPER LIST FOR CORRECT PARTS

MODEL 93BR-462A (SERIAL No. 939800 and UP)

Ref. No.	Part No.	Description
		RESISTORS
R1	BE1309	200M ohm - ⅓ w. - 20%
R2	BE13018	4M ohm - ⅓ w. - 20%
R3	BE13012	50M ohm - ⅓ w. - 20%.
R4	BE1304	3 megohm - ⅓ w. - 20%
R5	BE13020	100M ohm - ⅓ w. - 20%
R6	BE101204	1 megohm - volume control
R7	BE130257	5. megohm - ⅓ w. 25%
R8	BE13037	750M ohm - ⅓ w. 20%
R9	BE13038	2 megohm - ⅓ w. - 20%
R10	BE13070	500 ohm - ⅓ w. - 10%
		CONDENSERS
C	BE102120	2 gang variable condenser
C1	BE1009	.05 x 200 v. - 25%
C2	BE124115	R. F. Trimmer on loop
C3		Oscillator Trimmer on Gang
C4	BE12921	.0002 mica - 20%
C5	BE1009	.05 x 200 v. - 25%
C6	BE1006	.25 x 200 v. - 20%
C7	BE1295	.0001 mica - 20%
C8	BE10012	.003 x 600 v. - 25%
C9	BE12912	.00025 mica - 20%
C10	BE10078	.01 x 200 v. - 25%
C11	BE11975	10 mfd. x 25 w. v. lytic
C12	BE10012	.003 x 600 v. - 25%
		PARTS
T1	BE111159	Loop Antenna Complete
T2	BE110139	Oscillator Coil
T3	BE108167	Input I. F. Coil
T4	BE108168	Output I. F. Coil
T5	BE105100	Output Transformer
T6	BE114183	4" P. M. Speaker
S1	BE12597	On-Off Switch No. 153

"A" Battery
1—1½ volt "A" Battery;
Article No. 62-5021.

"B" Batteries
2—45 volt "B" Batteries;
Article No. 62-4951.

MODEL 93BR-461A (SERIAL No. 759400 and UP)

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE1309	200M ohm—⅓ w. 20%
R2	BE13018	4M ohm—⅓ w. 20%
R3	BE130208	40M ohm—⅓ w. 20%
R4	BE13038	2 megohm—⅓ w. 20%
R5	BE13020	100M ohm—⅓ w. 20%
R6	BE101173	1 megohm volume control
R7	BE130257	5 megohm—⅓ w. 25%
R8	BE13037	750M ohm—⅓ w. 20%
R9	BE13038	2 megohm—⅓ w. 20%
R10	BE13070	500 ohm—⅓ w. 10%
		CONDENSERS
C	BE102108	2 gang variable condenser
C1	BE10022	.05 x 200 v. 25%
C2		R. F. Trimmer on Gang
C3		Oscillator Trimmer on Gang
C4	BE12912	.00025 mica—20%
C5	BE1009	.05 x 200 v. 25%
C6	BE1006	.25 x 200 v. 20%
C7	BE12912	.00025 Mica 20%
C8	BE10025	.002 x 600 v. 25%
C9	BE12912	.00025 Mica 20%
C10	BE10078	.01 x 200 v. 25%
C11	BE11975	10 mfd. x 25 w. v. lytic
C12	BE10025	.002 x 600 v. 25%
		PARTS
T1	BE111131	Loop Antenna Complete
T2	BE110121	B. C. Oscillator Coil
T3	BE108151	Input I. F. Coil
T4	BE108152	Output I. F. Coil
T5	BE114165	5" Speaker with output transformer
S1		D.P.S.T. On-off switch on volume control

2—45 Volt "B" Batteries; Catalog No. 4951.
1—1½ Volt "A" Battery; Catalog No. 5022.

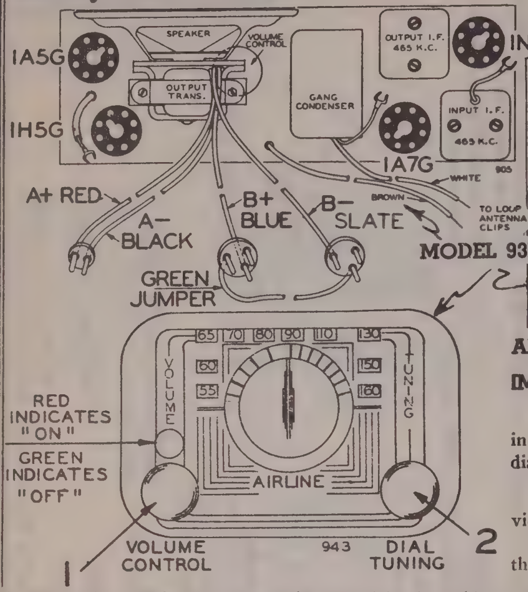
Specifications

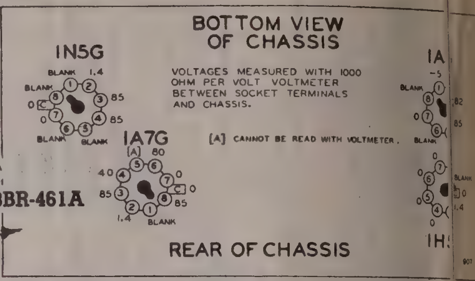
	Model No. 93BR-461A	Model No. 93BR-462A
Power Consumption	"A" Battery 200 MA; "B" Battery 8.15 MA.	"A" Battery 200 MA; "B" Battery 8 MA.
Power Output	100 Milliwatts, Undistorted	100 Milliwatts, Undistorted
Sensitivity (for .05 Watts)	60 Microvolts Average	75 Microvolts Average
Selectivity	52 Kc. Broad at 1000 Times Signal at 1000 Kc.	50 Kc. Broad at 1000 Times Signal at 1000 Kc.

MODEL 93BR-461A
Voltage,Trimmers
Battery Conn. Socket

MONTGOMERY WARD & CO.

MODEL 93BR
Voltage,Tr
Notes,Batt




BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
[A] CANNOT BE READ WITH VOLTMETER.
IN5G
BLANK 1.4
BLANK
0
85
85
BLANK
BLANK
1A7G
[A] 80
40
0
0
85
85
1.4
BLANK
REAR OF CHASSIS
1A
1H
907

ADJUSTING THE ANTENNA:

IMPORTANT: MODEL 93BR-462A

After the batteries have been installed and the radio in operation, tune in a weak station around 1400 Kc. dial.

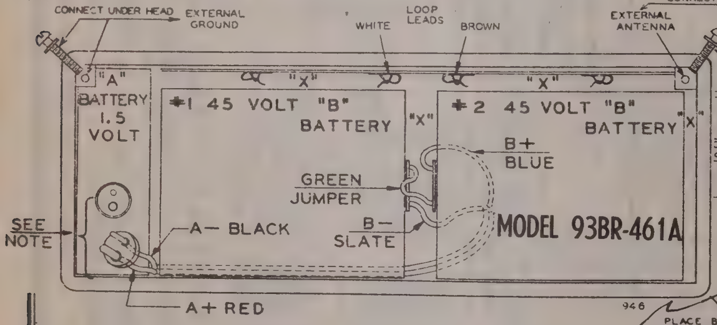
On the back of the cabinet a small adjustment screw vided, (see C2, Fig. 2).

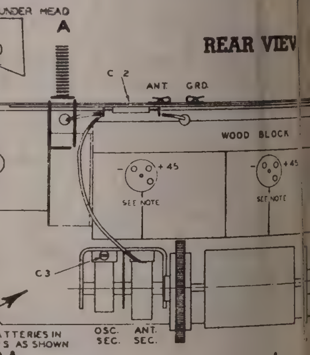
Very carefully turn this adjustment screw in or o the station is as clear and loud as it can be made.

This adjustment should be made in any case wheth radio is used with an outside antenna and ground or only the built-in loop antenna is used.

NEXT:—Tune in a station around 600 Kc. on the d adjust adjustment screw (See A, Fig. 2). Both these ments are very important for best reception.

NOTE: The "A" battery should be placed in the cabinet so that the plug-in socket on the top of the battery is nearer to the side of the cabinet which is faced down than to the side of the cabinet which is facing up. Also, the "A" battery should be pushed all the way into the cabinet so that it fits between the left end of the radio chassis and the side of the cabinet.

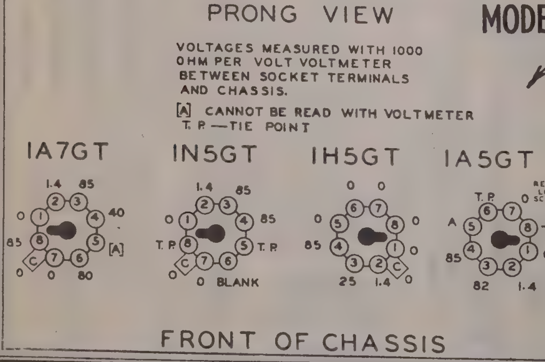


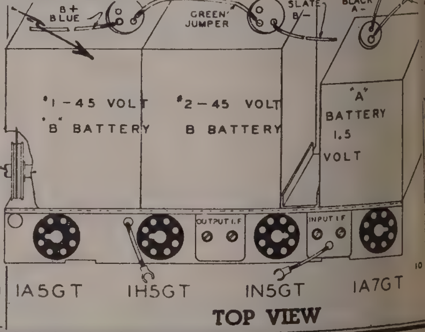


946

PLACE BATTERIES IN POSITIONS AS SHOWN

MODEL 93BR-462A

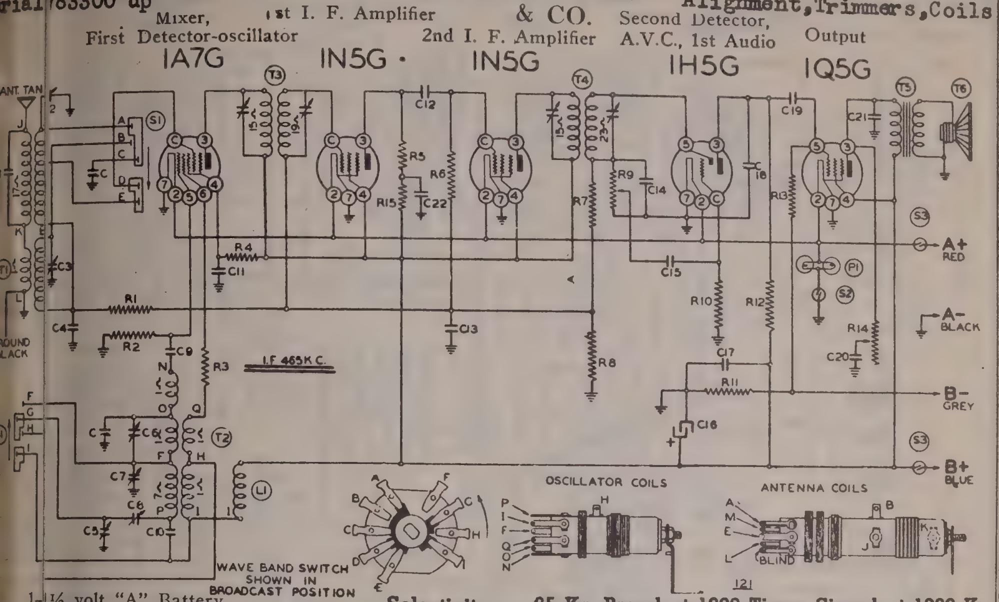




DELS 93BR-561A,93BR-563A
rial 783300 up

MONTGOMERY WARD & CO.

Schematic,Socket,Voltage
Alignment,Trimmers,Coils



1-1½ volt "A" Battery.
2-45 volt "B" Batteries.

Selectivity - -35 Kc. Broad at 1000 Times Signal at 1000 Kc.

Sensitivity (for .05 Watts)
- **Broadcast —10 Microvolts Average**
- **Short Wave—20 Microvolts Average**

ODEL 93BR-561A and 93BR-563A (SERIAL No. 783300 and UP)

Part N	Description
	RESISTORS
BE1302	100M ohm—⅓ w.
BE1309	200M ohm—⅓ w.
BE1305	100 ohm—⅓ w.
BE1301	50M ohm—⅓ w.
BE1302	5M ohm—⅓ w.
BE1302	100M ohm—⅓ w.
BE1304	3 megohm—⅓ w.
BE1304	3 megohm—⅓ w.
BE1011	1 megohm—volume control
BE1302	15 megohm—⅓ w.
BE1301	600 ohm—⅓ w.
BE1303	500M ohm—⅓ w.
BE1301	1 megohm—⅓ w.
BE1011	Tone Control
BE1301	10M ohm—⅓ w.
	CONDENSERS
BE1021 B	2 gang variable condenser
BE1291	.000125 mica
BE1248	B. C. Trimmer
BE1248	S. W. Trimmer
BE1009	.05 x 200 v.
BE1248	S. W. Pad
BE1248	S. W. Trimmer
BE1248	B. C. Trimmer
BE1248	B. C. Pad
BE1293	.00005 mica
BE1009	.05 x 200 v.

Ref. No.	Part No.	Description
C11	BE1009	.05 x 200 v.
C12	BE1292	.0005 mica
C13	BE1009	.05 x 200 v.
C14	BE12960	.00015 mica
C15	BE10012	.003 x 600 v.
C16	BE11986	8 mfd. lytic
C17	BE1006	.25 x 200 v.
C18	BE12921	.0002 mica
C19	BE10011	.01 x 400 v.
C20	BE10026	.02 x 400 v.
C21	BE10071	.004 x 600 v.
C22	BE10020	.1 x 200 v.

C2 and C3 in one unit. C6 and C7 in same unit.
C5 and C8 in one unit.

PARTS

Ref. No.	Part No.	Description
T1	BE111120	B. C.—S. W. Antenna Coil
T2	BE110118	B. C.—S. W. Osc. Coil
T3	BE108111G	Input I. F. Coil
T4	BE108112	Output I. F. Coil
T5	BE10569	Output Transformer
T6	BE114162R	6" P. M. Speaker (for 62-563)
T6	BE114169	8" P. M. (for 62-561)
S1	BE12579	Band Switch
S2	BE12581	Pushbutton Switch—Pilot
S3		Off-on switch on tone control
P1	BE107243	(2) 1.5 v. Pilot Lights
L1	BE1233	R. F. Choke Coil

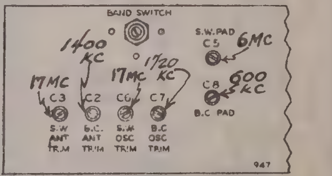
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

Consumption - - -

"A" Battery 300 MA; "B" Battery 11 MA.

Output - - - -

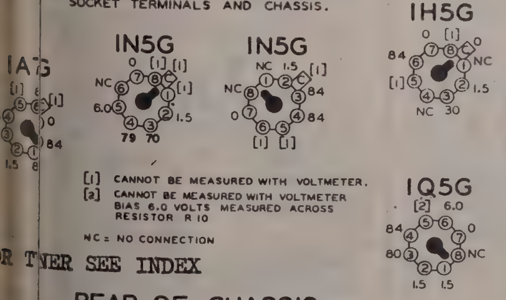
190 Milliwatts, Undistorted



TRIMMERS ON FRONT OF CHASSIS

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

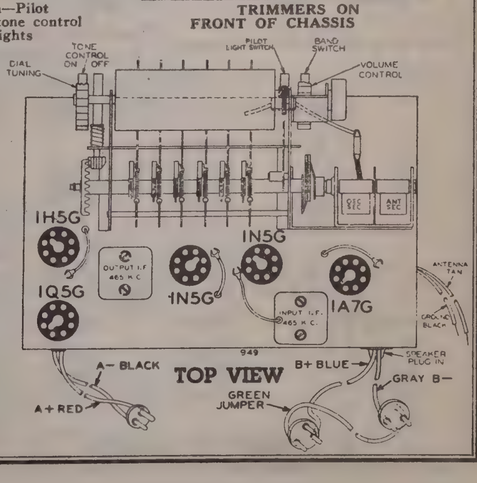


[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] CANNOT BE MEASURED WITH VOLTMETER BIAS 6.0 VOLTS MEASURED ACROSS RESISTOR R10

NC = NO CONNECTION

R T NER SEE INDEX

REAR OF CHASSIS

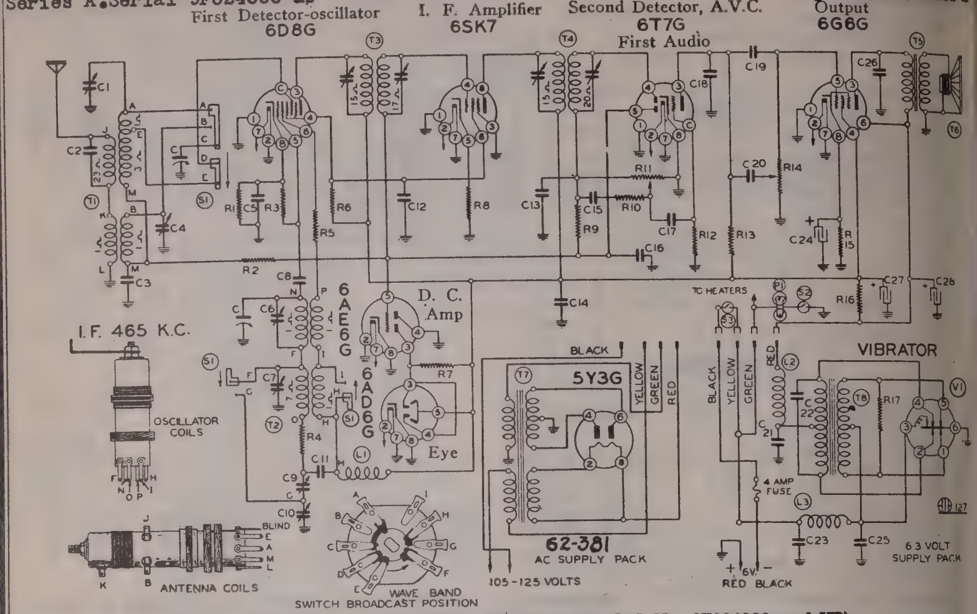


TOP VIEW

MODELS 93BR-658A,93BR-666A
Series A.Serial 9F824600 up

MONTGOMERY WARD & CO.

Schematic,Voltage,
Alignment,Trimmers

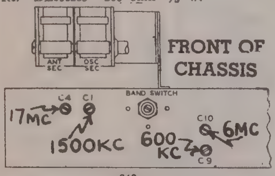


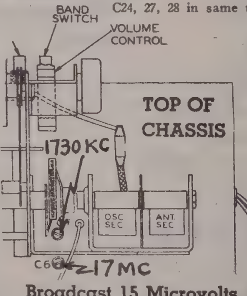
MODEL 93BR-658A and 93BR-666A SERIES A (SERIAL No. 9F824600 and UP)

Ref. No.	Part No.	Description
		RESISTORS
R1	BE13083	300 ohm—1/3 w.
R2	BE13020	100M ohm—1/3 w.
R3	BE13012	50M ohm—1/3 w.
R4	BE130286	20 ohm—1/3 w.
R5	BE130168	100 ohm—1/3 w.
R6	BE13048	15M ohm—1/3 w.
R7	BE13019	1 megohm—1/3 w.
R8	BE13097	200 ohm—1/3 w.
R9	BE1304	3 megohm—1/3 w.
R10	BE13012	50M ohm—1/3 w.
R11	BE101184	1 Megohm volume control
R12	BE130225	15 megohm—1/3 w.
R13	BE1305	300M ohm—1/3 w.
R14	BE101177	500M ohm tone control
R15	BE13070	500 ohm—1/3 w.
R16	BE130199	1500 ohm—1 watt
R17	BE130285	200 ohm—1/3 w.
		CONDENSERS
C	BE102106B	2 gang variable condenser
C1	BE12475	BC Antenna Trimmer
C2	BE129132	.000125 mica
C3	BE1009	.05 x 200
C4	BE12475	S. W. Antenna Trimmer
C5	BE10020	.1 x 200 v.
C6	BE12476	S. W. Oscillator Trimmer
C7	BE12476	B. C. Oscillator Trimmer
C8	BE12938	.00005 Mica
		C24, 27, 28 in same unit
C9	BE12488	B. C. Series Pad
C10	BE12488	S. W. Series Pad
C11	BE10020	.1 x 200 v.
C12	BE10020	.1 x 200 v.
C13	BE1295	.0001 Mica
C14	BE10020	.1 x 200 v.
C15	BE1295	.0001 mica
C16	BE10026	.02 x 400 v.
C17	BE10019	.006 x 600 v.
C18	BE1292	.0005 mica
C19	BE10026	.02 x 400 v.
C20	BE10019	.006 x 600 v.
C21	BE10020	.1 x 200 v.
C22	BE10068	.003 x 1400 v.
C23	BE10040	.5 x 120 v.
C24	BE11985	20 mfd.—25 w. v. lytic
C25	BE10040	.5 x 120 v.
C26	BE10019	.006 x 600 v.
C27	BE11985	30 mfd.—200 w. v. lytic
C28	BE11985	30 mfd.—200 w. v. lytic
T1	BE111121	Antenna Coil
T2	BE110117	Oscillator Coil
T3	BE108111-I	Input I. F.
T4	BE108112E	Output I. F.
T5	BE10569C	Output Transformer
T6	BE114162J	6 in. P.M. speaker—for model 91B
T6	BE114169	8 in. P.M. speaker—for model 93B
T7	BE104165	AC Power Transformer
T8	BE104164	Vibrator Transformer
V1	BE12616	Vibrator
L1	BE1233	R. F. Choke
L2	BE1233	R. F. Choke
L3	BE10568	"A" Choke
S1	BE12579	Wave Band Switch
S2	BE12581	Pilot Light Switch
S3		Off-on switch on tone control
P1	BE10789	Pilot light 6.3 v.—150 ma.—T-40

CONVENTIONAL ALIGN
SEE SPECIAL SECTI
VOLUME VIII

FOR TUNER
SEE INDEX



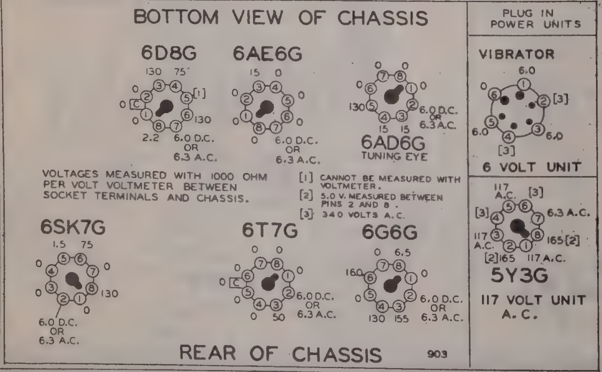


Sensitivity (for .05 Watts Output) - **Broadcast 15 Microvolts Average**
Shortwave 30 Microvolts Average

Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC

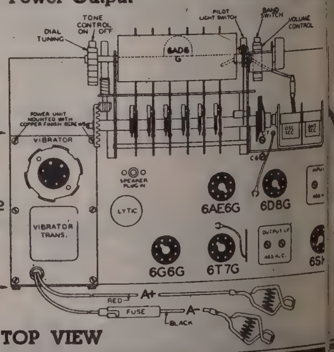
Power Consumption 2.5 Amp. at 6.3

Power Output .6 Watts Undis



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 5.0 V. MEASURED BETWEEN PINS 2 AND 8.
[3] 340 VOLTS A.C.



MONTGOMERY WARD & CO.

MODELS 93BR-659A,93BR-660A
Serial 9F806900 up
Schematic,Voltage,Socket

RESISTORS

R	BE130100	150M ohm—⅓ w.
R1	BE1304	3 megohm—⅓ w.
R2	BE13023	2M ohm—⅓ w.
R4	BE13056	100 ohm—⅓ w.
R5	BE13012	50M ohm—⅓ w.
R6	BE130149	15M ohm—⅓ w.
R7	BE13020	100M ohm—⅓ w.
R8	BE1304	3 megohm—⅓ w.
R9	BE130149	15M ohm—⅓ w.
R10	BE13012	50M ohm—⅓ w.
R11	BE101180	1 megohm—volume control
R12	BE130225	15 megohm—⅓ w.
R13	BE1303	500M ohm—⅓ w.
R14	BE13019	1 megohm—⅓ w.
R15	BE130222	350 ohm—⅓ w.
R16	BE101179	1 megohm tone control

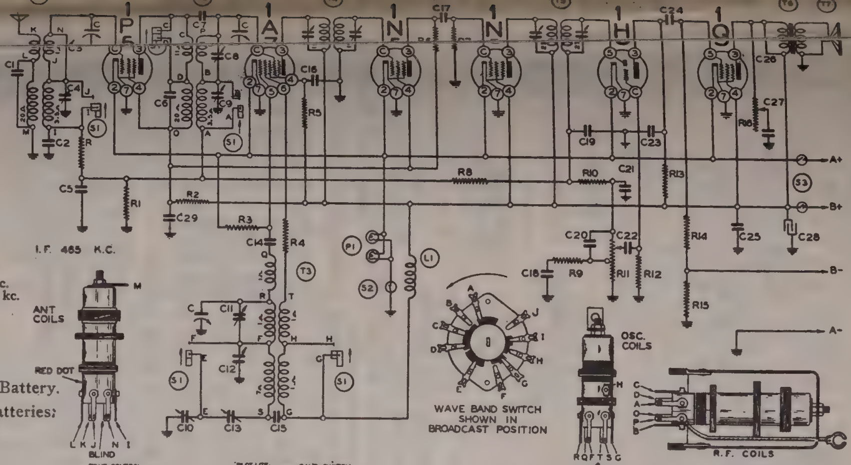
CONDENSERS

C	BE102112	3 gang variable condenser
C1	BE1295	.0001 mica condenser
C2	BE10026	.02 x 400 v.
C3	BE12496	Dual Trimmer (S.W. Ant.)
C4	BE12496	Dual Trimmer (B.C. Ant.)
C5	BE1009	.05 x 200 v.
C6	BE1295	.0001 mica
C7	BE129143	.000005 ceramicon
C8	BE12495	Dual Trimmer (S.W. R.F.)
C9	BE12495	Dual Trimmer (B.C. R.F.)
C10	BE12493	Dual Compression Trimmer —S. W. Series Pad
C12	BE12494	Dual Trimmer (B.C. Osc.)
C13	BE12493	Dual Compression Trimmer B. C. Series Pad
C14	BE12939	.00005 mica
C15	BE1009	.05 x 200 v.
C17	BE1292	.0005 mica
C18	BE10011	.01 x 400 v.
C19	BE12939	.00005 mica
C20	BE12960	.00015 mica
C21	BE12939	.00005 mica
C22	BE10012	.003 x 600 v.
C23	BE1295	.0001 mica
C24	BE10011	.01 x 400 v.
C25	BE1006	.25 x 200 v.
C26	BE10071	.004 x 600 v.
C27	BE10026	.02 x 400 v.
C28	BE11986	8 mfd. lytic—150 w. v.
C29	BE1006	.25 x 200 v.
S1	BE12580	Band Switch
S2	BE12581	Pilot Light Switch
S3		On-off switch on tone control
T1	BE111133	B.C.—S.W. Antenna Coil
T2	BE10951	B.C.—S.W. R.F. Coil
T3	BE110123	B.C. S.W. Oscillator Coil
T4	BE108111J	Input I.F. Transformer—465 kc.
T5	BE108132	Output I.F. Transformer—465 kc.
T6	BE10592	Output Transformer
T7	BE114173	6" speaker—For 93BR-659A
T7	BE114169	8" speaker—For 93BR-660A
L1	BE1233	R.F. Choke Coil
P1	BE107243	Pilot Light—1.35 v.

The type and function of each tube is as follows.

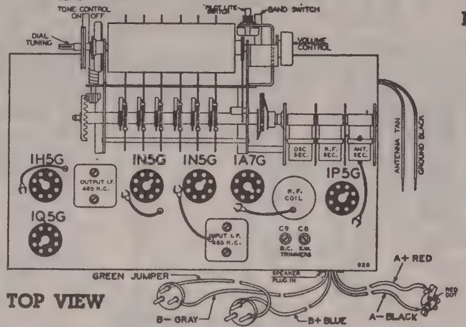
- 1—Type 1P5G R. F. Amplifier.
- 1—Type 1A7G Mixer, First Detector-oscillator.
- 1—Type 1N5G Remote Cut-Off Pentode, 1st I. F. Amplifier (465 K.C.).
- 1—Type 1N5G Remote Cut-Off Pentode, 2nd I. F. Amplifier (465 K.C.).
- 1—Type 1H5G Second Detector, A.V.C., 1st Audio.
- 1—Type 1Q5G Output Amplifier.

1—1½ volt "A" Battery.
2—45 volt "B" Batteries;



MODELS 93BR-659A and 93BR-660A 122
(SERIAL No. 9F806900 and UP)

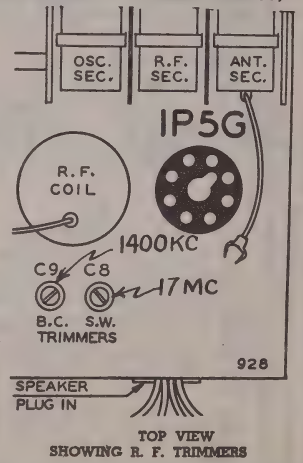
FOR TUNER SEE INDEX



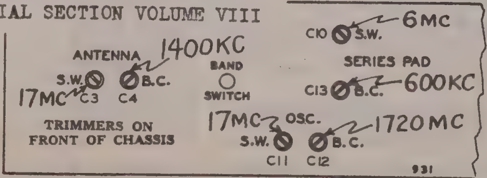
TOP VIEW

7-39

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

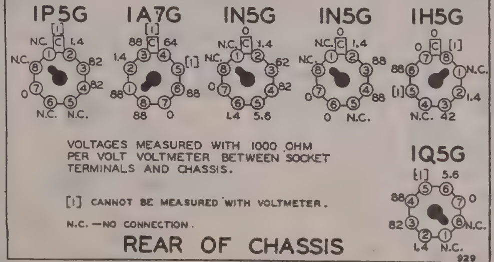


TOP VIEW
SHOWING R. F. TRIMMERS



TRIMMERS ON
FRONT OF CHASSIS

BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.

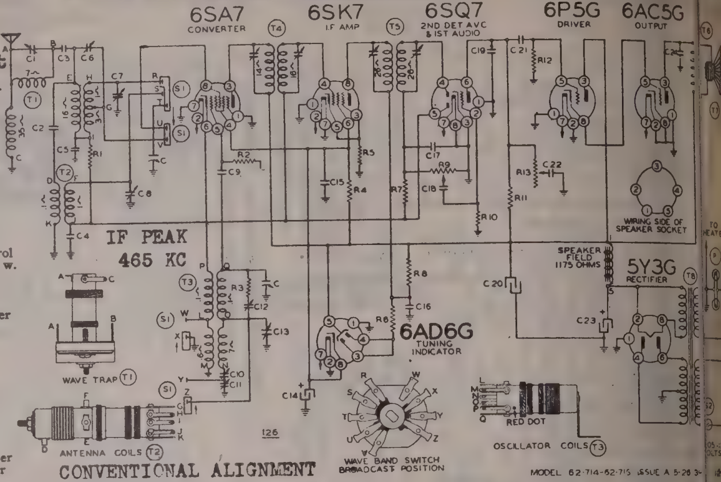
N.C.—NO CONNECTION.

REAR OF CHASSIS

Power Consumption - - -	"A" Battery 350 MA; "B" Battery 15 MA.
Power Output - - - - - - - - - - -	190 Milliwatts, Undistorted
Sensitivity (for .05 Watts) -	Broadcast Band—6 Microvolts Average Short Wave Band—15 Microvolts Average
Selectivity - - -	35 Kc. Broad at 1000 Times Signal at 1000 Kc.

MODELS 93BR-714A, 93BR-716A
Serial 939200 and up
93BR-715A, Ser.A
Serial 786400 and up
Schematic, Voltage, Socket

MONTGOMERY WARD & CO.



MODEL 93BR-714A, 93BR-716A SERIES A (SERIAL No. 939200 and UP)

No.	Part No.	Description
R1	BE13011	250M ohm—⅓ w.
R2	BE13021	20M ohm—20%—⅓ w.
R3	BE130197	20 ohm—10%—⅓ w.
R4	BE130144	15M ohm—20%—1 watt
R5	BE130168	100 ohm—10%—⅓ w.
R6	BE130110	1 megohm—10%—1/10 w.
R7	BE1304	3 megohm—20%—⅓ w.
R8	BE13055	12M ohm—20%—2 watt
R9	BE101185	1 megohm—volume control
R10	BE130225	15 megohm—50—30%—⅓ w.
R11	BE1303	500M ohm—20%—⅓ w.
R12	BE13019	1 megohm—20%—⅓ w.
R13	BE101183	1 megohm—tone control
C	BE102114	2 gang variable condenser
C1	BE12467	Wave Trap Trimmer
C2	BE129140	.00016 mica—5%
C3	BE10011	.01 x 400 volt—25%
C4	BE1009	.05 x 200 volt—25%
C5	BE129131	.002775 mica—3%
C6	BE12468	Image Trimmer
C7	BE12475	B. C. Antenna Trimmer
C8	BE12475	S. W. Antenna Trimmer
C9	BE12960	.00015 Mica—20%
C10	BE12487	B. C. Series Pad
C11	BE12487	S. W. Series Pad
C12	BE12476	S. W. Oscillator Trimmer
C13	BE12476	B. C. Oscillator Trimmer
C14	BE11984	5. mfd. x 300 v. lytic
C15	BE1001	.1 x 400 v. 50—10%
C16	BE1001	.1 x 400 v. 50—10%
C17	BE1295	.0001 mica—20%
C18	BE10071	.004 x 600 v.—25%
C19	BE1292	.0005 mica—20%
C20	BE11984	15 mfd. x 350 v. lytic
C21	BE10026	.02 x 400 v.—25%
C22	BE10071	.004 x 600 v.—25%
C23	BE11984	10 mfd. x 450 v. lytic
C24	BE10019	.006 x 600 v.—25%

C7 and C8 in one unit. C10 and C11 in one unit. C12 and C13 in one unit. C14, C20, and C23 in one unit.

No.	Part No.	Description
T1	BE108146	Wave Trap
T2	BE111122	Antenna Coil Complete
T3	BE110115	Oscillator Coil Complete
T4	BE108111H	Input I. F. Coil—465 kc.
T5.	BE108132B	Output I. F. Coil—465 kc.
T6	BE10590	Output Transformer
T7	BE114168	8" Dynamic Speaker (1175 Ohm Field)
T8	BE104139D	Power Transformer
P1	BE10794	6-8 volt pilot light T44
S1	BE12584	Band Switch
S2	BE12577	AC Switch

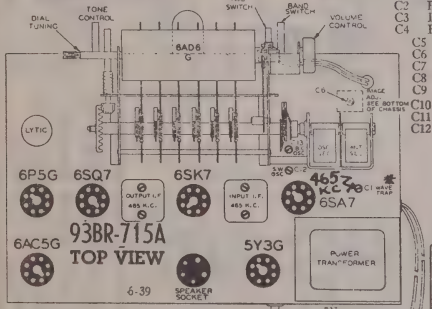
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

NOTE:-Refer to proper parts list for correct parts.

FOR TUNER SEE INDEX

Power Consumption 65

Output 2.5 Watts Undi

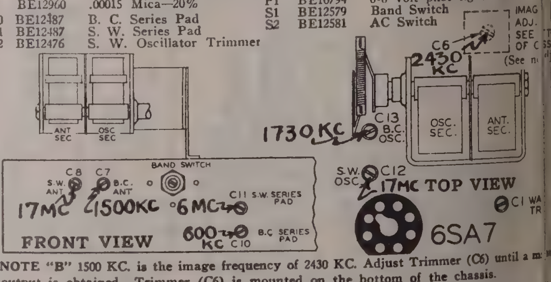


MODEL 93BR-715A SERIES A (SERIAL No. 786400 and UP)

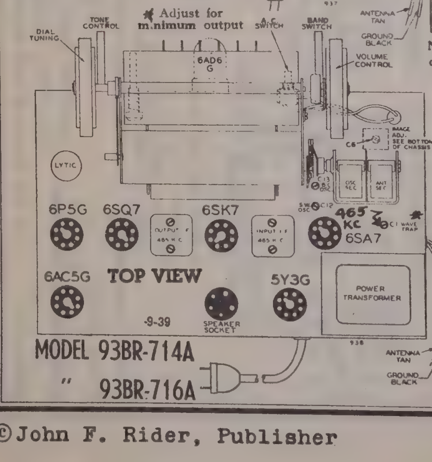
Ref. No.	Part No.	Description
R1	BE13011	250M ohm—20%—⅓ w.
R2	BE13021	20M ohm—20%—⅓ w.
R3	BE130197	20 ohm—10%—⅓ w.
R4	BE130144	15M ohm—20%—1 watt
R5	BE130168	100 ohm—10%—⅓ w.
R6	BE130110	1 megohm—10%—1/10 w.
R7	BE1304	3 megohm—20%—⅓ w.
R8	BE13055	12M ohm—20%—2 watt
R9	BE101184	1 megohm—volume control
R10	BE130225	15 megohm—50—30%—⅓ w.
R11	BE1303	500M ohm—20%—⅓ w.
R12	BE13019	1 megohm—20%—⅓ w.
R13	BE101176	1 megohm—tone control
C	BE102106B	2 gang variable condenser
C1	BE12467	Wave Trap Trimmer
C2	BE129140	.00016 mica—5%
C3	BE10011	.01 x 400 volt—25%
C4	BE1009	.05 x 200 volt—25%
C5	BE129131	.002775 mica—3%
C6	BE12468	Image Trimmer
C7	BE12475	B. C. Antenna Trimmer
C8	BE12475	S. W. Antenna Trimmer
C9	BE12960	.00015 Mica—20%
C10	BE12487	B. C. Series Pad
C11	BE12487	S. W. Series Pad
C12	BE12476	S. W. Oscillator Trimmer
C13	BE12476	B. C. Oscillator Trimmer
C14	BE11984	5. mfd. x 300 v. lytic
C15	BE1001	.1 x 400 v. 50—10%
C16	BE1001	.1 x 400 v. 50—10%
C17	BE1295	.0001 mica—20%
C18	BE10071	.004 x 600 v.—25%
C19	BE1292	.0005 mica—20%
C20	BE11984	15 mfd. x 350 v. lytic
C21	BE10026	.02 x 400 v.—25%
C22	BE10071	.004 x 600 v.—25%
C23	BE11984	10 mfd. x 450 v. lytic
C24	BE10019	.006 x 600 v.—25%

C7 and C8 in one unit. C10 and C11 in one unit. C12 and C13 in one unit. C14, C20, and C23 in one unit.

Ref. No.	Part No.	Description
T1	BE108146	Wave Trap
T2	BE111122	Antenna Coil Complete
T3	BE110115	Oscillator Coil Complete
T4	BE108111H	Input I. F. Coil—465 kc.
T5	BE108132B	Output I. F. Coil—465 kc.
T6	BE10590	Output Transformer
T7	BE114161	6" Dynamic Speaker (1175 O
T8	BE104139D	Power Transformer
P1	BE10794	6-8 volt pilot light T44
S1	BE12579	Band Switch
S2	BE12581	AC Switch

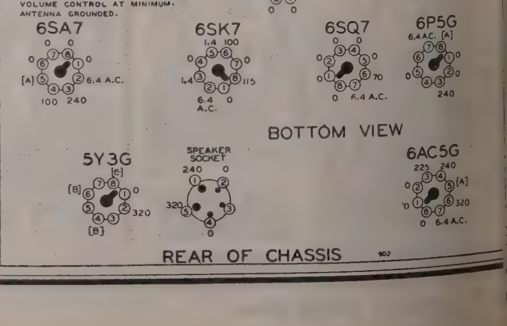


NOTE "B" 1500 KC. is the image frequency of 2430 KC. Adjust Trimmer (C6) until a m output is obtained. Trimmer (C6) is mounted on the bottom of the chassis.



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS. 117 VOLT LINE.
VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.

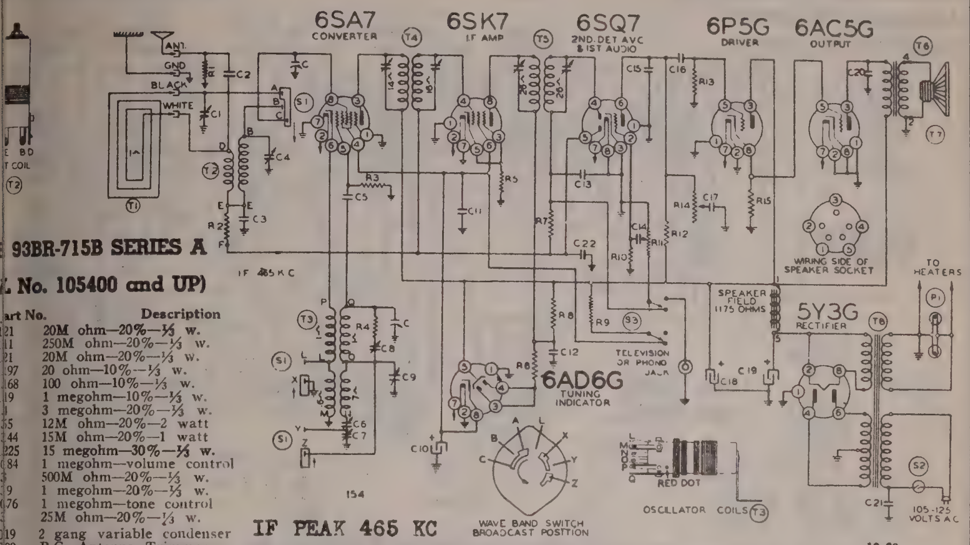
[A] CANNOT BE READ WITH VOLTME
[B] 625 VOLTS A.C MEASURED ACRO PINS 4 AND 6
[C] 5.2 VOLTS A.C MEASURED ACRO PINS 2 AND 8.



ODEL 93BR-715B,Series A
Serie 105400 up
Schem tic,Voltage,Socket

MONTGOMERY WARD & CO.

Trimmers,Alignment
Sensitivity,Coils



MODE 93BR-715B SERIES A
SERI L No. 105400 and UP)

f. No.	art No.	Description
	BE121	20M ohm—20%—⅓ w.
	BE111	250M ohm—20%—⅓ w.
	BE121	20M ohm—20%—⅓ w.
	BE197	20 ohm—10%—⅓ w.
	BE168	100 ohm—10%—⅓ w.
	BE119	1 megohm—10%—⅓ w.
	BE1	3 megohm—20%—⅓ w.
	BE155	12M ohm—20%—2 watt
	BE144	15M ohm—20%—1 watt
0	BE1225	15 megohm—30%—⅓ w.
1	BE1084	1 megohm—volume control
2	BE13	500M ohm—20%—⅓ w.
3	BE139	1 megohm—20%—⅓ w.
4	BE1076	1 megohm—tone control
5	BE13	25M ohm—20%—⅓ w.
	BE1019	2 gang variable condenser
	BE1209	B.C. Antenna Trimmer
	BE105	.002 x 600 v.—25%
	BE124	.003 mica—3%
	BE1209	S.W. Antenna Trimmer
	BE120	.00015 mica—20%
	BE1220	B.C. Series Pad
	BE1250	S.W. Series Pad
	BE125	S.W. Oscillator Trimmer
	BE125	B.C. Oscillator Trimmer
	BE11	5. mfd. x 300 v. lytic
	BE10	.1 x 400 v.—10%
	BE10	.1 x 400 v.—10%
	BE12	.0001 mica—20%
	BE10	.004 x 600 v.—25%
	BE12	.0005 mica—20%
	BE10	.02 x 400 v.—25%
	BE10	.004 x 600 v.—25%
	BE11	15 mfd. x 350 v. lytic
	BE11	10 mfd. x 450 v. lytic
	BE10	.006 x 600 v.—25%
	BE10	.02 x 600 v.—Bakelite
	BE10	.05 x 200 v.—25%
		C8 and C9 in one unit
		C10, C18 and C19 in one unit
	BE116	B.C. Loop Assembly
	BE117	S.W. Antenna Coil Complete
	BE111	Oscillator Coil Complete
	BE106	Input I.F. Coil—465 kc.
	BE102B	Output I.F. Coil—465 kc.
	BE10	Output Transformer
	BE111	6" Dynamic Speaker
	BE109E	Power Transformer
	BE10	2 6-8 volt pilot light T44
	BE122	Band Switch
	BE12	AC Switch
	BE12	Phono or Television-Radio Switch

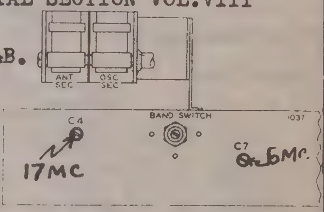
IF PEAK 465 KC

10-39

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL.VIII

SEE ALSO NOTES

ALIGNMENT PROCEDURE MODEL 93BR-714B.

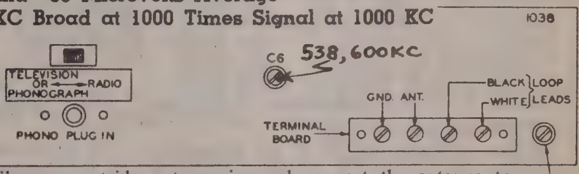


Power Consumption - - - 65 Watts

Power Output - 2.5 Watts Undistorted

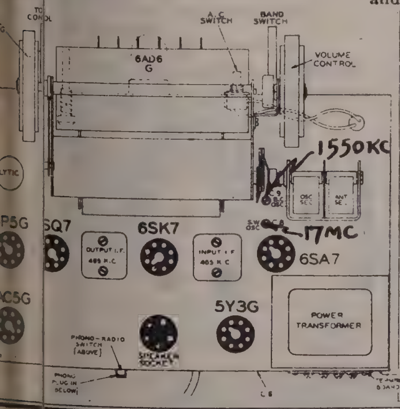
Sensitivity (for .5 Watts Output)
Broadcast Band —30 Microvolts Average
Shortwave Band—50 Microvolts Average

Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC

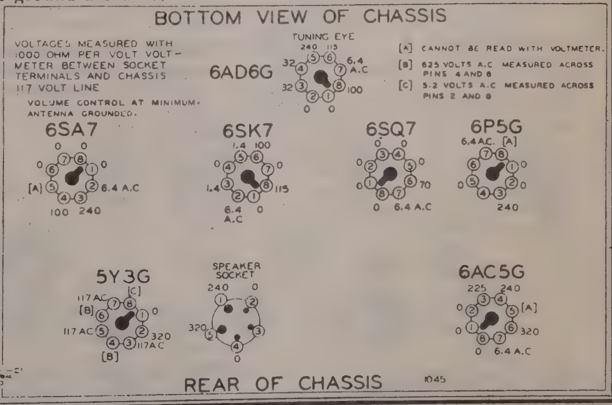


FOR TUNER SEE INDEX

When an outside antenna is used connect the antenna to the binding screw on the rear of the chassis, marked "Ant." Connect the ground to the binding screw marked "Gnd." Do not disconnect the loop antenna when an outside antenna and ground are used.



BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS 117 VOLT LINE

VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.

[A] CANNOT BE READ WITH VOLTMETER.

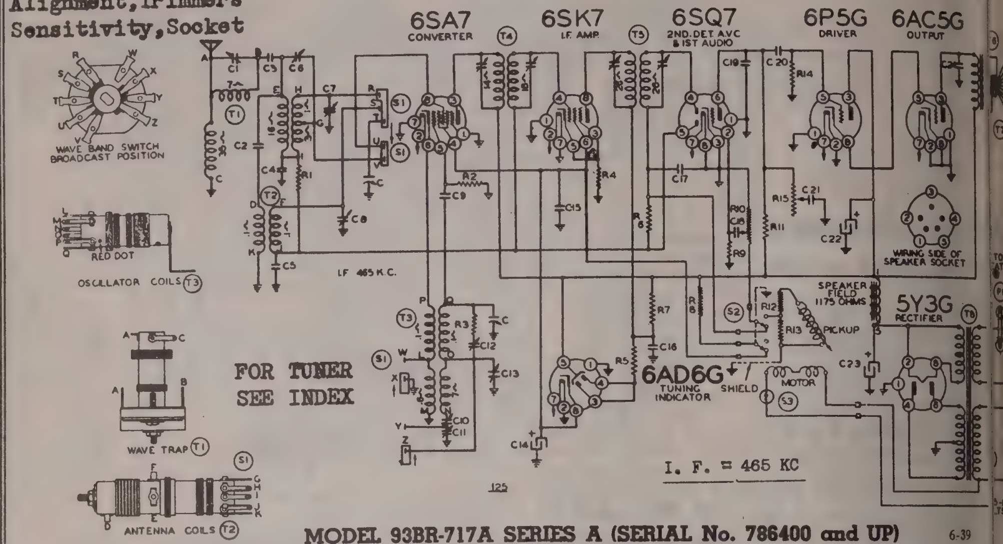
[B] 625 VOLTS A.C MEASURED ACROSS PINS 4 AND 6

[C] 5.2 VOLTS A.C MEASURED ACROSS PINS 2 AND 8

REAR OF CHASSIS

MODEL 93BR-717A, Series A
Serial 786400 up
Schematic, Voltage, Coils
Alignment, Trimmers
Sensitivity, Socket

MONTGOMERY WARD & CO.



FOR TUNER SEE INDEX

MODEL 93BR-717A SERIES A (SERIAL No. 786400 and UP)

6-39

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

Power Consumption - - - - - - - 115 Watts

Power Output - - - - - 2.5 Watts Undistorted

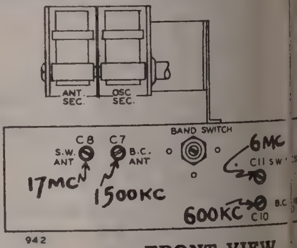
Sensitivity (for .5 Watts Output) - -
Broadcast Band—30 Microvolts Av
Shortwave Band—50 Microvolts Av

Selectivity - 45 KC Broad at
1000 Times Signal at 1000

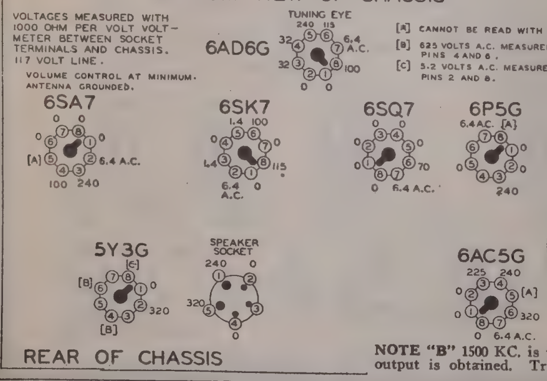
Ref. No.	Part No.	Description
R1	BE13011	250M ohm—20%—⅓ w.
R2	BE13021	20M ohm—20%—⅓ w.
R3	BE130197	20 ohm—10%—⅓ w.
R4	BE130168	100 ohm—10%—⅓ w.
R5	BE130110	1 megohm—10%—1/10 w.
R6	BE1304	3 megohm—20%—⅓ w.
R7	BE13055	12M ohm—20%—2 watt
R8	BE130144	15M ohm—20%—1 watt
R9	BE130225	15 megohm—50—30%—⅓ w.
R10	BE101184	1 megohm—volume control
R11	BE1303	500M ohm—20%—⅓ w.
R12	BE130268	350M ohm—20%—⅓ w.
R13	BE130100	150M ohm—20%—⅓ w.
R14	BE13019	1 megohm—20%—⅓ w.
R15	BE101176	1 megohm—Tone control
C	BE102106B	2 gang variable condenser
C1	BE12467	Wave Trap Trimmer
C2	BE129140	.00016 mica—5%
C3	BE10011	.01 x 400 volt—25%
C4	BE129131	.002775 mica—3%
C5	BE1009	.05 x 200 volt—25%
C6	BE12468	Image Trimmer
C7	BE12475	B. C. Antenna Trimmer
C8	BE12475	S. W. Antenna Trimmer
C9	BE12960	.00015 Mica—20%
C10	BE12487	B. C. Series Pad
C11	BE12487	S. W. Series Pad
C12	BE12476	S. W. Oscillator Trimmer
C13	BE12476	B. C. Oscillator Trimmer
C14	BE11984	5. mfd. x 300 v. lytic
C15	BE1001	.1 x 400 v. 50—10%
C16	BE1001	.1 x 400 v. 50—10%
C17	BE12939	.00005 Mica—20%
C18	BE10071	.004 x 600 v.—25%
C19	BE1292	.0005 mica—20%
C20	BE10026	.02 x 400 v.—25%
C21	BE10071	.004 x 600 v.—25%
C22	BE11984	15 mfd. x 350 v. lytic
C23	BE11984	10 mfd. x 450 v. lytic
C24	BE10019	.006 x 600 v.—25%

C7 and C8 in one unit. C10 and C11 in one unit. C12 and C13 in one unit. C14, C22, and C23 in one unit.

Ref. No.	Part No.	Description
T1	BE108146	Wave Trap
T2	BE111122	Antenna Coil Complete
T3	BE110115	Oscillator Coil Complete
T4	BE108111H	Input I. F. Coil—465 kc.
T5	BE108132B	Output I. F. Coil—465 kc.
T6	BE10590	Output Transformer
T7	BE114161	6" Dynamic Speaker (1175 Ohm Field)
T8	BE104139D	Power Transformer
P1	BE10794	6-8 volt pilot light T44
S1	BE12579	Band Switch
S2	BE12570B	Phono-Radio Switch
S3	BE12588	Motor switch
S4	BE12581	A. C. Switch



BOTTOM VIEW OF CHASSIS

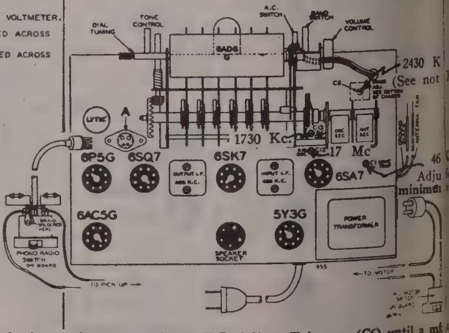


VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS. 117 VOLT LINE.

VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 625 VOLTS A.C. MEASURED ACROSS PINS 4 AND 6.
[C] 5.2 VOLTS A.C. MEASURED ACROSS PINS 2 AND 8.

FRONT VIEW

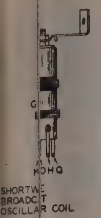


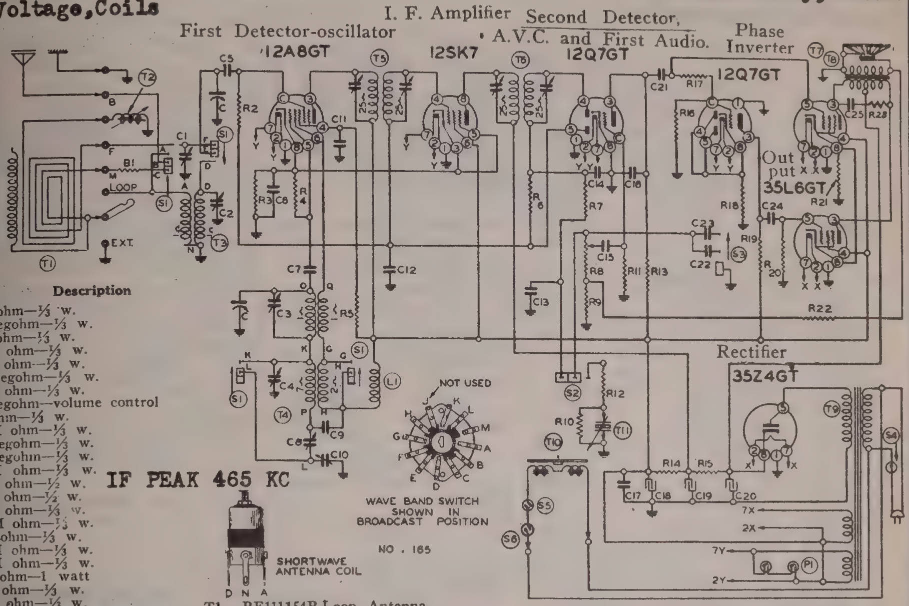
NOTE "B" 1500 KC. is the image frequency of 2430 KC. Adjust Trimmer (C6) until a mi output is obtained. Trimmer (C6) is mounted on the bottom of the chassis.

ODE 93BR-719A, Series A
eri 9L228300 up
che tic, Voltage, Coils

MONTGOMERY WARD & CO.

Alignment, Trimmers
Sensitivity, Socket





	Par No.	Description
	BE179	400 ohm—⅓ w.
	BE119	1 megohm—⅓ w.
	BE1168	100 ohm—⅓ w.
	BE112	50M ohm—⅓ w.
	BE1149	15M ohm—⅓ w.
	BE170	3 megohm—⅓ w.
	BE112	50M ohm—⅓ w.
	BE1202	1 megohm—volume control
	BE1276	10 ohm—⅓ w.
0	BE15	300M ohm—⅓ w.
1	BE1257	5 megohm—⅓ w.
2	BE14	3 megohm—⅓ w.
3	BE19	200M ohm—⅓ w.
4	BE1294	1200 ohm—½ w.
5	BE1294	1200 ohm—½ w.
6	BE1236	30M ohm—⅓ w.
7	BE1102	500M ohm—⅓ w.
8	BE122	5M ohm—⅓ w.
9	BE19	200M ohm—⅓ w.
0	BE1102	500M ohm—⅓ w.
1	BE1296	200 ohm—1 watt
2	BE1168	100 ohm—⅓ w.
3	BE194	50M ohm—⅓ w.
	BE1119	2 gang variable condenser
	BE111	B.C. Adj. Trimmer (Antenna)
	BE111	S.W. Adj. Trimmer (Antenna)
	BE112	S.W. Adj. Trimmer (Oscillator)
	BE112	B.C. Adj. Trimmer (Oscillator)
	BE12	.0005 mica
	BE104	.5 x 100 v.
	BE139	.00005 mica
	BE1213	B.C. Series Pad
	BE10	.05 x 200 v.
0	BE1213	S.W. Series Pad
1	BE120	.1 x 200 v.
2	BE10	.05 x 200 v.
3	BE12	.0001 mica
4	BE12	.0001 mica
5	BE105	.002 x 600 v.
6	BE12	.0005 mica
7	BE120	.1 x 200 v.
8	BE1101	20 mfd. lytic
9	BE1101	20 mfd. lytic
0	BE1101	40 mfd. lytic
1	BE106	.02 x 400 v.
2	BE18	.0006 mica
3	BE1112	.001 x 200 v.
4	BE106	.02 x 400 v.
5	BE10	.1 x 400 v.

IF PEAK 465 KC

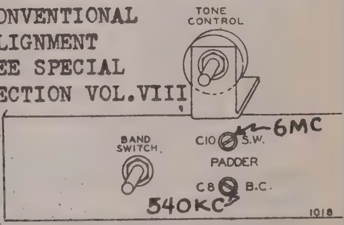
FOR TUNER SEE INDEX

T1	BE111154B	Loop Antenna
T2	BE111153	Loop Adjusting Coil
T3	BE111151	S.W. Antenna Coil
T4	BE110135	B.C. S.W. Oscillator Coil
T5	BE108163	Input I.F.—465 kc.
T6	BE108173	Output I.F.—465 kc.
T7	BE114178B	10" P.M. Dynamic Speaker
T8	BE10596	Output Transformer
T9	BE104175	Power Transformer
T10	BE104194	Phono Motor Complete
T11	BE114120	Phono Pickup Arm Complete
S1	BE12594	Band Switch
S2	BE125101	Phono Radio Switch
S3	BE12598	Tone Switch
		Off-on switch on volume control
S5	BE12588	AC Motor Switch
S6	BE104195	Automatic stop switch
L1	BE1233	R.F. "B" Choke
P1	BE10794	2 6-8 v. pilot lights

C1 and C2 in same unit
C8 and C10 in same unit
C18, C19 and C20 in same unit
C3 and C4 in same unit

MODEL 93BR-719A SERIES A (SERIAL No. 9L228300 and UP)

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION VOL.VIII



Selectivity - 50 KC Broad at 1000 Times Signal at 1000 KC

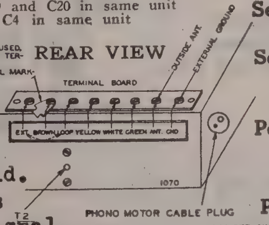
Sensitivity (for .5 Watts Output)
Broadcast Band —45 Microvolts Average
Shortwave Band—50 Microvolts Average

Power Consumption
(Radio Chassis Only) 55 Watts
(Radio Chassis and Phono Motor) 80 Watts

Power Output 3 Watts Undistorted

WHEN OUTSIDE ANTENNA IS USED, MOVE CONNECTOR BAR FROM TERMINAL MARKED "LOOP" AND CONNECT IT TO TERMINAL MARKED "EXT."

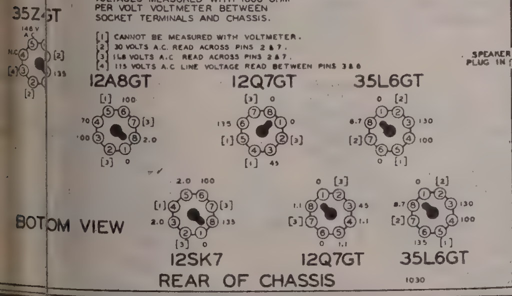
"A" PHONO OR TELEVISION SOUND SOCKET

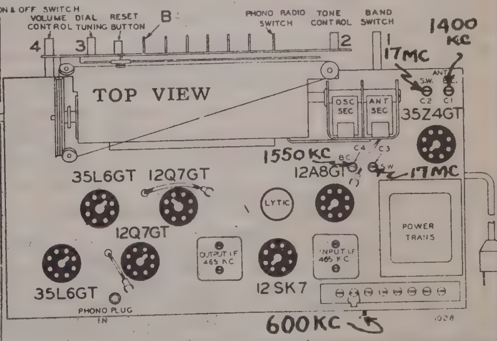


ALI NMENT NOTE
S.W. Signal to ANT&GND.
B.C. .. ..12A8GT Grid.
LOOP (C1,T2) with chassis
moun ed, loop connected. signal
to A T & GND . Jumper connected to EXT.

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 30 VOLTS A.C. READ ACROSS PINS 2 & 7.
[3] 11.8 VOLTS A.C. READ ACROSS PINS 2 & 7.
[4] 115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 3 & 6

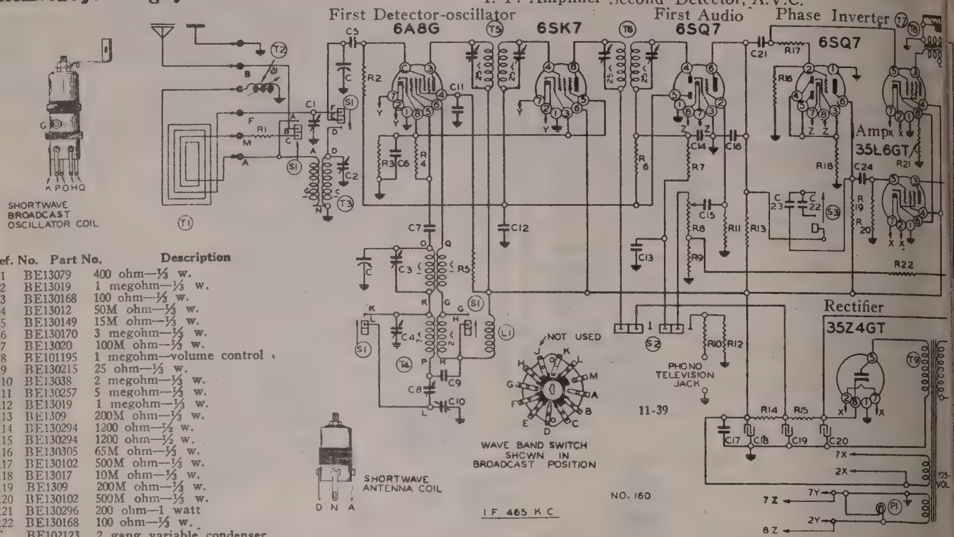




MODEL 93BR-720A,Series A
Serial 9L221400 up
Schematic,Voltage,Coils

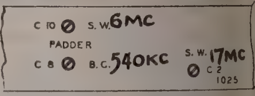
MONTGOMERY WARD & CO.

Alignment,Tri
Sensitivity,S



Ref. No.	Part No.	Description
R1	BE13079	400 ohm—⅓ w.
R2	BE13019	1 megohm—⅓ w.
R3	BE130168	100 ohm—⅓ w.
R4	BE13012	50M ohm—⅓ w.
R5	BE130149	15M ohm—⅓ w.
R6	BE130170	3 megohm—⅓ w.
R7	BE13020	100M ohm—⅓ w.
R8	BE101195	1 megohm—volume control
R9	BE130215	25 ohm—⅓ w.
R10	BE13038	2 megohm—⅓ w.
R11	BE130257	5 megohm—⅓ w.
R12	BE13019	1 megohm—⅓ w.
R13	BE1309	200M ohm—⅓ w.
R14	BE130294	1200 ohm—½ w.
R15	BE130294	1200 ohm—½ w.
R16	BE130305	65M ohm—⅓ w.
R17	BE130102	500M ohm—⅓ w.
R18	BE13017	10M ohm—⅓ w.
R19	BE1309	200M ohm—⅓ w.
R20	BE130102	500M ohm—⅓ w.
R21	BE130296	200 ohm—1 watt
R22	BE130168	100 ohm—⅓ w.
C	BE102123	2 gang variable condenser
C1	BE124117	B. C. Adj. Trimmer (Antenna)
C2	BE124116	S. W. Adj. Trimmer (Antenna)
C3	BE124112	S W. Adj. Trimmer (Oscillator)
C4	BE124112	B. C. Adj. Trimmer (Oscillator)
C5	BE1292	.0005 mica
C6	BE100104	.5 x 100 v.
C7	BE12939	.00005 mica
C8	BE124113	B. C. Series Pad
C9	BE1009	.05 x 200 v.
C10	BE124113	S. W. Series Pad
C11	BE10020	.1 x 200 v.
C12	BE1009	.05 x 200 v.
C13	BE12939	.00005 Mica
C14	BE12939	.00005 Mica
C15	BE10025	.002 x 600 v.
C16	BE1292	.0005 Mica
C17	BE10020	.1 x 200 v.
C18	BE119101	20 mfd. lytic x 200 v.
C19	BE119101	20 mfd. lytic x 200 v.
C20	BE119101	40 mfd. lytic x 200 v.
C21	BE10026	.02 x 400 v.
C22	BE10071	.004 x 600 v.
C23	BE10071	.004 x 600 v.
C24	BE10026	.02 x 400 v.
		C8 and C10 in same unit.
		C3 and C4 in same unit.
		C18, C19 and C20 in same unit.
T1	BE111157	Loop Antenna
T2	BE111153	Loop Adjusting Coil
T3	BE111163	S.W. Antenna Coil
T4	BE110135	B.C. S.W. Oscillator Coil
T5	BE108163C	Input I.F. - 465 kc.
T6	BE108163D	Output I.F. - 465 kc.
T7	BE114182	6" P.M. Speaker
T8	BE10596	Output Transformer
T9	BE104184	Power Transformer
S1	BE125100	Band Switch
S2	BE12570	Phono Radio Switch
S3	BE12599	Tone Switch
S4	BE	Off-on switch on volume control.
L1	BE1233	R.F. Choke
P1	BE10794	6-8 v. pilot light T-44

MODEL 93BR-720A SERIES
(SERIAL No. 9L221400 and U



FRONT OF CHASSIS

Power Consumption - - - - - - - - **55 Watts**

Power Output - - - - - - - - **3 Watts Undistorted**

Sensitivity (for .5 Watts Output) - -

Broadcast Band —35 Microvolts Average

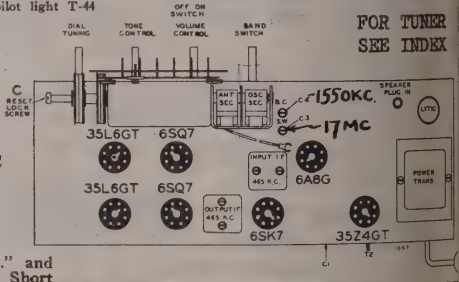
Shortwave Band—52 Microvolts Average

Selectivity - 46 KC Broad at 1000 Times Signal at 1000 KC

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

FOR TUNER SEE INDEX



BOTTOM VIEW OF CHASSIS

ALIGNMENT NOTES:-

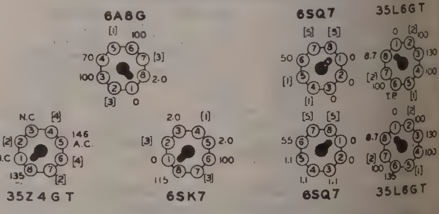
NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6A8G tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1550 and 540 K.C.). The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals.

When an outside antenna is used connect the antenna to the binding screw on the rear of the chassis, marked "Ant." Connect the ground to the binding screw marked "Gnd." Do not disconnect the loop antenna when an outside antenna and ground are used.

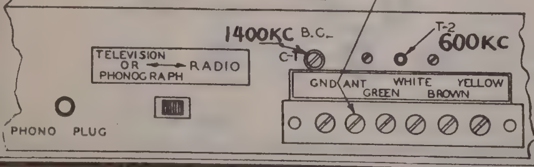
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS

[1] CANNOT BE MEASURED WITH VOLTMETER
[2] 30 VOLTS A C READ ACROSS PINS 2 & 7
[3] 5.9 VOLTS A C. READ ACROSS PINS 2 & 7
[4] 115 VOLTS A C LINE VOLTAGE READ BETWEEN PINS 4 & 6
N C — NO CONNECTION
T.P. — TIE POINT
[5] 5.9 VOLTS A.C. READ ACROSS PINS 7 & 8.



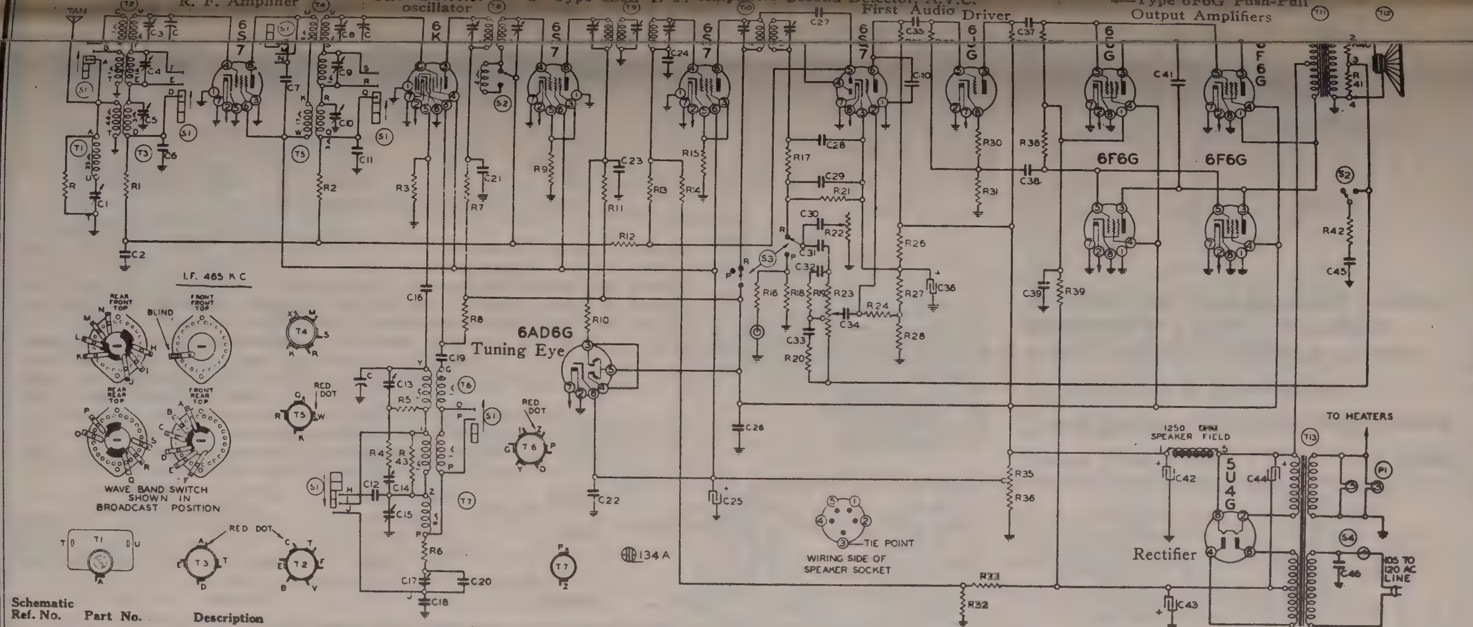
REAR OF CHASSIS

REAR VIEW OF CHASSIS



MODEL 93BR-1201A, Series A
Serial 9F826400 up
Schematic,

MONTGOMERY WARD & CO.



Schematic Ref. No.	Part No.	Description
R	BE13082	10M ohm—⅓ w.
R1	BE13020	100M ohm—⅓ w.
R2	BE13011	250M ohm—⅓ w.
R3	BE13012	50M ohm—⅓ w.
R4	BE130240	30 ohm—⅓ w.
R5	BE130174	50 ohm—⅓ w.
R6	BE130197	20 ohm—⅓ w.
R7	BE13043	2500 ohm—⅓ w.
R8	BE130196	30M ohm—1 watt
R9	BE13097	200 ohm—⅓ watt
R10	BE13019	1 megohm—⅓ w.
R11	BE130219	20M ohm—1 watt
R12	BE13019	1 megohm—⅓ w.
R13	BE1303	500M ohm—⅓ w.
R14	BE1303	500M ohm—⅓ w.
R15	BE130294	1200 ohm—⅓ w.
R16	BE13011	250M ohm—⅓ w.
R17	BE13066	75M ohm—⅓ w.
R18	BE13011	250M ohm—⅓ w.
R19	BE130103	100M ohm—⅓ w.
R20	BE13076	30M ohm—⅓ w.
R21	BE130292	125M ohm—⅓ w.
R22	BE101182	50M ohm tone control
R23	BE101181	1 megohm volume control
R24	BE13019	1 megohm—⅓ w.
R25	BE13011	250M ohm—⅓ w.
R26	BE130291	50M ohm—1 watt
R27	BE130270	180 ohm—⅓ w.
R28	BE13071	4M ohm—⅓ w.
R29	BE1303	500M ohm—⅓ w.
R30	BE130218	5M ohm—⅓ w.
R31	BE130103	100M ohm—⅓ w.
R32	BE10655	20 ohm resistor strip—½ watt
R33	BE10655	125 ohm—resistor strip—5 watt
R34	BE130103	100M ohm—⅓ w.
R35	BE10656	3M ohm resistor strip 7½ w.
R36	BE10656	3300 resistor strip—3½ w.
R37	BE130103	100M ohm—⅓ w.
R38	BE130103	100M ohm—⅓ w.
R39	BE130290	300M ohm—⅓ w.
R40	BE13079	400 ohm—⅓ w.
R41	BE130168	100 ohm—⅓ w.
R42	BE130174	50 ohm—⅓ w.
R43	BE13048	15M ohm—⅓ w.
R32 and R33 in same unit		
R35 and R36 in same unit		
C	BE102111	3 gang variable condenser
C1	BE12499	Wave trap—adj. condenser
C2	BE1009	.05 x 200 v.
C3	BE12497	SW Antenna Trimmer
C4	BE12497	MW Antenna Trimmer
C5	BE12497	BC Antenna Trimmer
C6	BE10096	.02 x 200 v.
C7	BE12972	.0004 mica
C8	BE12498	SW—R. F. Trimmer
C9	BE12498	M.W.—R.F. Trimmer
C10	BE12498	B.C.—R.F. Trimmer
C11	BE10093	.05 x 200 v.
C12	BE129144	.00395 mica comp. type
C13	BE12498	S.W. Oscillator trimmer
C14	BE12498	M.W. Oscillator trimmer
C15	BE12498	B.C. Oscillator trimmer
C16	BE12939	.00005 mica
C17	BE12498	B.C. Series Pad adjustable
C18	BE129129	.0025 mica
C19	BE10025	.002 x 600 v.
C20	BE129104	.00045 mica
C21	BE1001	.1 x 400 v.
C22	BE1001	.1 x 400 v.
C23	BE1001	.1 x 400 v.
C24	BE10026	.02 x 400 v.
C25	BE11989	10 mfd. lytic—350 w. v.
C26	BE1001	.1 x 400 v.
C27	BE129145	.00001 ceramicon
C28	BE1295	.0001 mica
C29	BE1295	.0001 mica
C30	BE10019	.006 x 600 v.
C31	BE10022	.05 x 200 v.
C32	BE1295	.0001 mica
C33	BE10011	.01 x 400 v.
C34	BE10022	.05 x 200 v.
C35	BE10013	.05 x 400 v.
C36	BE11989	20 mfd.—25 w.v. lytic
C37	BE1001	.1 x 400 v.
C38	BE1001	.1 x 400 v.
C39	BE10048	.25 x 200 v.
C40	BE1295	.0001 mica
C41	BE10073	.008 x 1200 v.
C42	BE10310B	30 mfd.—450 w.v. lytic
C43	BE11991	40 mfd.—25 w.v. lytic
C44	BE10310C	30 mfd.—450 w.v. lytic
C45	BE100108	.5 x 100 v.
C46	BE10061	.02 x 600 v.—Bakelite
C25 and C36 in same unit		

6-39

MODEL 93BR-1201A SERIES A
(SERIAL No. 9F826400 and UP)

PARTS

T1	BE108159	Wave Trap Coil
T2	BE111135	S.W.—M.W. Antenna Coils
T3	BE111134	B.C.—Antenna Coil
T4	BE10953	S.W.—M.W. R.F. Coil
T5	BE10952	B.C.—R.F. Coil
T6	BE110124	S.W.—M.W. Osc. Coil
T7	BE110125	B.C. Oscillator Coil
T8	BE108154	Input I.F.—465 kc.
T9	BE108155	Interstage I.F.—465 kc.
T10	BE108156	Output I.F.—465 kc.
T11	BE10593	Output Transformer
T12	BE114167	12" Dynamic Speaker
T13	BE104166	Power Transformer
S1	BE12582	Band Switch
S2		Hi-Fi Switch on tone control
S3	BE12570	Radio-Phono Switch
S4	BE12577B	Off-on AC Switch
P1	BE10794	2—6-8 v. pilot lights T44

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7 (2nd I.F.)	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	(See Note "A") Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SK7 (1st I.F.)	Broadcast	Rotor full open (Plates out of mesh)	Three trimmers on top (See Fig. 1)	Interstage I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	21 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 21 Mc.	Trimmer (C13) (See Fig. 3)	Short Wave oscillator	(See Note "B") Adjust to maximum output
	21 Mc.	400 ohms	Antenna lead	Short Wave	Dial Set at 21 Mc.	Trimmers (C3 & C8) (See Fig. 3)	Short Wave antenna & R. F.	Adjust to maximum output
MIDDLE WAVE BAND	6 Mc.	400 ohms	Antenna lead	Middle Wave	Set Dial at 6 Mc.	Trimmer (C14) (See Fig. 3)	Middle Wave oscillator	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Middle Wave	Dial Set at 6 Mc.	Trimmers (C4) (C9) (See Fig. 3)	Middle Wave antenna and R. F.	Adjust to maximum output
	2.3 Mc.	400 ohms	Antenna lead	Middle Wave	Set Dial at 2.3 Mc.	Trimmer (C12) (See Bottom of Chassis)	Middle Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C15) (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmers (C5) (C10) (See Fig. 3)	Broadcast antenna and R. F.	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C17) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "D")
	465 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 3)	I. F. Wave Trap	Adjust for minimum output (See Note "E")

NOTE "A" I.F. Alignment as given is for use with output meter. For oscilloscope alignment; connect oscilloscope between ground and high side of 125M ohm diode load resistor on output I.F. Make same adjustments as above except readjust input I.F. trimmers in broad position for uniform expansion.

NOTE "B" Make certain that the 21MC signal and not the image has been tuned in by noting that the image falls near 20MC. on the dial scale.

NOTE "C" The middle wave oscillator series padder condenser is mounted on the bottom of the chassis at the rear of the bandswitch. When adjusting this trimmer turn the dial back and forth slightly (rock) and adjust until the peak of greatest intensity is obtained.

NOTE "D" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "E" After adjusting wavetrap trimmer (C1), go over 1730 Kc, 1500 Kc and 600 Kc adjustments again.

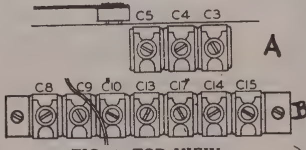


FIG. 3—TOP VIEW

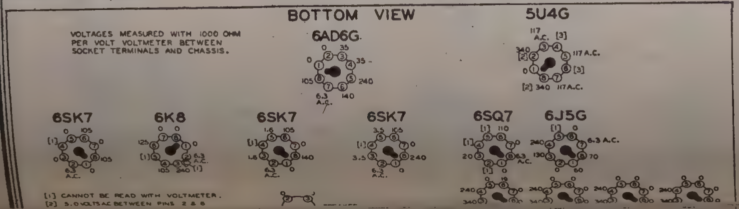
FOR TUNER
SEE INDEX

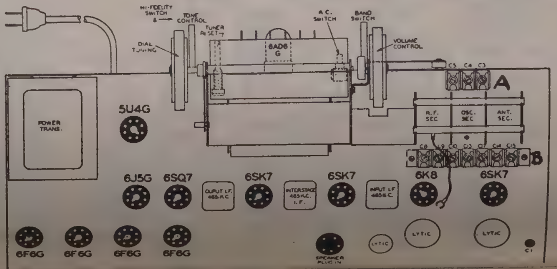
Power Consumption - - - - 165 Watts

Power Output - - 21 Watts Undistorted

Sensitivity (for .5 Watts Output) - -

Broadcast Band—4 Microvolts Average
Middle Band—6 Microvolts Average
Shortwave Band—10 Microvolts Average

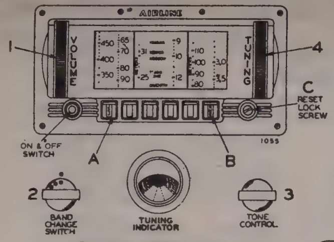

BOTTOM VIEW
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
6AD6G
5U4G
117 A.C.
117 A.C.
340
[2] 340 117A.C.
6SK7
6K8
6SK7
6SK7
6SQ7
6J5G
6.3 A.C.
[1] CANNOT BE READ WITH VOLTMETER.
[2] 5.0 VOLTS AC BETWEEN PINS 2 & 8



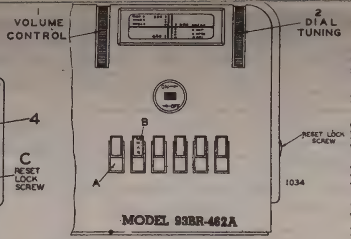
MONTGOMERY WARD & CO.

MODELS 93BR-391A, 93BR-392A, 93BR-393A, 93BR-462A, 93BR-561A 93BR-658A, 93BR-659A, 93BR-714A,B 93BR-715B, 93BR-717A, 93BR-719A 93BR-720A, 93BR-1201A Tuner Data

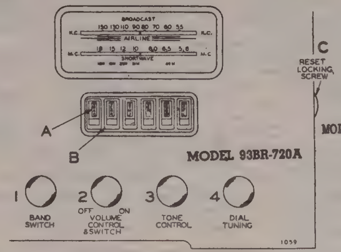
MODELS:-93BR-391A,-392A,-393A,-462A,-561A,-563A,-658A,-666A,-659A,-660A,-714A,-716A, 93BR-714B (CAT.NO.62-721), 93BR-715A,-715B(CAT. NO.62-722),-717A,-720A,-1201A.



TYPICAL FRONT VIEW
FOR MANY MODELS
SEE PROCEDURE



MODEL 93BR-462A



MODEL 93BR-720A

FIG. 2—FRONT VIEW

IMPORTANT—Read carefully before setting the automatic push buttons:

There are six push buttons by means of which six stations may be selected, (See "A" Fig. 2). Make a list of local stations or stations you tune in regularly; any number up to and including six.

On the front of each automatic push button an opening is provided for inserting the call letter tabs, (See "B" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic push buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW, PROCEED AS FOLLOWS:

Unlock the Tuner Mechanism.

(NOTE:—The automatic tuner mechanism is locked **tight** when radio is shipped from the factory.)

1. Remove the snap-in button from the dial escutcheon plate on the front panel of the radio **(see "C," Reset Lock Screw, Fig. 2).** If the snap-in button will not come out easily using your fingers, pry it off with a screwdriver or a knife, being careful not to mar the finish on the escutcheon plate.
2. **Unlock the tuner mechanism** by inserting a screwdriver through the hole in the panel. **Press in** and **loosen the locking screw** by turning it **to the left as far** as it will turn **without forcing.**
   You will note that as the locking screw is turned it will turn easily until the dial reaches its stop and then a slight amount of force will be required to **actually start unlocking** the tuner mechanism. Beyond this point, the locking screw will turn quite easily again until the tuner mechanism is **completely unlocked.** At this point do not force the locking screw any further. The tuner mechanism is now **unlocked.**

SETTING PUSH BUTTONS

1. **Press in all the way** any one of the automatic tuner pushbuttons. **Holding it in firmly,** tune in by means of the Dial Tuning Control, No. 4, the station indicated on the station call letter tab on this push button. Move the Dial Tuning Control very slowly up and down **(while still holding the automatic tuner push button in firmly),** noting the width of the shadow on the screen of the cathode-ray tuning eye. Minimum width on the tuning eye indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.
2. Press in another tuner push button. **Holding it in firmly,** carefully tune in the station indicated on the call letter tab on this push button.
3. Follow this procedure until you have selected all of your favorite stations.

(NOTE:—If the dial mechanism works hard or has a tendency to slip when setting up a station for one of the push buttons, it is due to the tuner mechanism **not being unlocked all the way.** Loosen the reset locking screw. The Dial Tuning Control **should turn the dial drum freely with a push button pushed in.)**

LOCKING THE TUNER MECHANISM:

1. **To lock the tuner mechanism** insert a screwdriver through the hole in the escutcheon panel and press in and turn the **reset locking screw** to the **right** until it cannot be turned any further **without forcing it.**
2. This will lock the tuner mechanism and all the stations that have been set up on the push buttons will be locked in place for automatic tuning.

Press in any one of the push buttons and—YOUR FAVORITE STATION IS SELECTED.

MODEL:- 93BR-719A Procedure for Setting the Automatic Pushbuttons

1. Make a list of six stations you tune in regularly. There are six pushbuttons on the front of the radio by means of which six stations may be tuned automatically (See "B," Fig. 3.)

2. Punch out the call letters of the stations you have selected from the set of station call letter tabs supplied.

On the front of each automatic tuner button an opening is provided for inserting the call letter tabs, (see "A," Fig. 3).

Insert the call letter tabs in the rectangular openings in each of the automatic tuner pushbuttons. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

3. Stations may be set up in any sequence desired.

NOW, PROCEED AS FOLLOWS:

1. Pull the "Reset" button **all the way out** (see control No. 6, Fig. 3), and rotate the button to the left (counter-clockwise) until it cannot be turned any further.

You will note that as the button is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually **start unlocking** the tuner mechanism. Beyond this point the button will turn quite easily again until the tuner mechanism is **completely unlocked.** At this point do not force the button any further. The tuner mechanism is now **unlocked.**

(NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Push in **all the way** any one of the pushbuttons and at the same time **push in firmly** on the dial tuning knob. Both the **dial tuning knob** and the **pushbutton** should be **pushed hard** enough to make them **stay latched in.**

You may find it necessary to rotate the dial tuning knob slightly when pushing it in to make certain that the gears mesh properly.

3. **Both the pushbutton and the Dial Tuning Knob are now latched in. Do not hold the pushbutton in by hand while tuning in a station.** Tune in by means of the dial tuning knob the station indicated on the station call letter tab on the pushbutton which is latched in. Turn the dial tuning knob very slowly back and forth until the station is clearest. The station will then be accurately tuned in.

4. Push in **all the way** another pushbutton, at the same time push the dial tuning knob in so that **both the pushbutton** and the **dial tuning knob** are **latched in together.** Tune in the station indicated on the call letter tab on this pushbutton.

5. Follow this procedure until you have tuned in all of your favorite stations.

6. Pull the "Reset" button **all the way out** and rotate the button to the **right** (clockwise) until it cannot be turned any further. This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place.

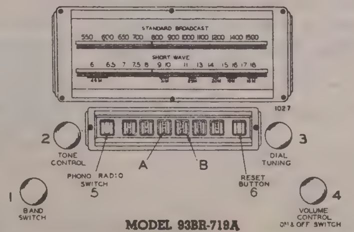
CHANGING STATIONS:

If you should desire to change any station you selected to another, pull the "Reset" button all the way **out** and rotate the button to the left (counter-clockwise) and unlock the tuner mechanism. Select the new station as explained.

(NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner pushbuttons, it is due to the tuner mechanism not being unlocked all the way. Pull the "Reset" button out all the way and rotate the button to the left (counter-clockwise) until it will turn no further. The dial mechanism should work freely with a tuner pushbutton latched-in.

After you have selected the new station, pull the "Reset" button all the way out and rotate the button to the **right** (clockwise) to lock the tuner mechanism. Be sure the button is turned until it will turn no further.

The automatic tuner buttons are now set up for quick tuning.



MODEL 93BR-719A

FIG. 3.

MODEL 93WG-510
Drive Cord Data
MODELS 93WG1103,93WG1104
Alignment,Trimmers

MONTGOMERY WARD & CO

MODELS 04WG-725,93W 382,
93WG754,93WG800,93W 801
93WG1000
Tuner Data

MODELS 93WG-1103 and 93WG-1104 ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C23) & (C24) 1st I.F. (C20) & (C21)
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note A
RANGE C 5400 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11).
5000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C7)
RANGE B 1600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1400 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note B	Ant. Range B (C4) Int. Range B (C8)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A

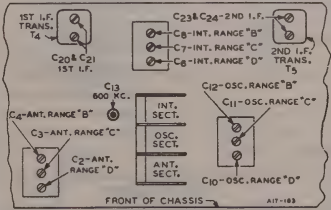
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1400 KC mark, and tighten the clamps.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.



Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram.

Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

Procedure for Setting the Station Buttons

FOR MODELS 93WG-382, 04WG-725, 93WG-754,-755, 93WG-800,801,805 (LOOP MODELS)
93WG-801,802,805, 93WG-1000,1001 and 93WG-1000,1001 (LOOP MODELS)

Selecting the Stations to be Set

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers increase from left to right.

Setting a Station Button

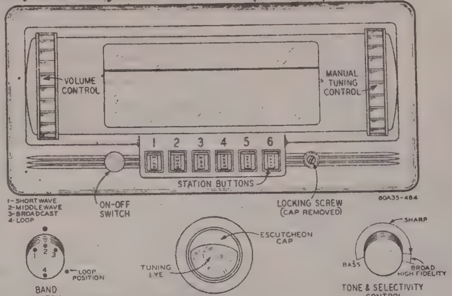
Turn the manual tuning control so that the dial moves toward 1700 KC until the stop is reached.

At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon —See illustration. Pull off this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handled screwdriver, unlock the mechanism by turning this screw in a counter-clockwise direction several turns.

TO SET STATIONS ACCURATELY, DO NOT JAR THE RADIO OR BUTTONS WHILE THE MECHANISM IS UNLOCKED.

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning control using the tuning eye as a guide.



TYPICAL FRONT VIEW

With one hand, hold the manual tuning control to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way in*. It is better to start with button No. 1.

Hold *this* button all the way in. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning control a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way in.*

Release the button slowly after the station is tuned in.

CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered.

Carefully tune in the second station on your list. Then hold the tuning control and push the second button slowly and firmly all the way in. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning control so that the dial moves toward 1700 KC until the stop is reached. Then, with a SMALL HANDLED screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

Remove the correct station call letter tabs from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press the tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons.

MODEL 93WG-510

Drive Cord Replacement

Remove dial lamp socket and bracket from dial mounting plate.

Remove tension spring from pulley. Double new drive cord and knot both ends to same loop on tension spring. There should be a distance of 13 inches between knot and looped end of cord.

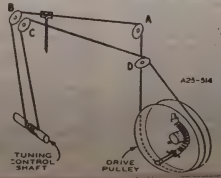
Secure other end of spring to hook on pulley. Thread looped end of cord, starting from inside of drive pulley, through hole in rim of drive pulley.

Turn gang condenser to completely closed position. Remove any twists in doubled cord. Pass one portion of cord over pulleys A and B as shown in illustration. Then wind 3½ turns counter-clockwise (from rear of chassis) around tuning control shaft—See illustration.

Loop ½ turn around bottom half of drive pulley. Continue cord over pulley D. Pull remaining portion of cord and place over pulley C.

Dial Pointer Attachment—Tune in a station of known frequency. Set the pointer at this frequency on the dial scale and secure pointer to cord—See illustration.

MODEL 93WG-510



Caution

The metal chassis is connected to one side of the line through a .25 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid

MONTGOMERY WARD & CO.

MODEL 93WG-382
Schematic,Voltage
Sensitivity,Coils
Socket

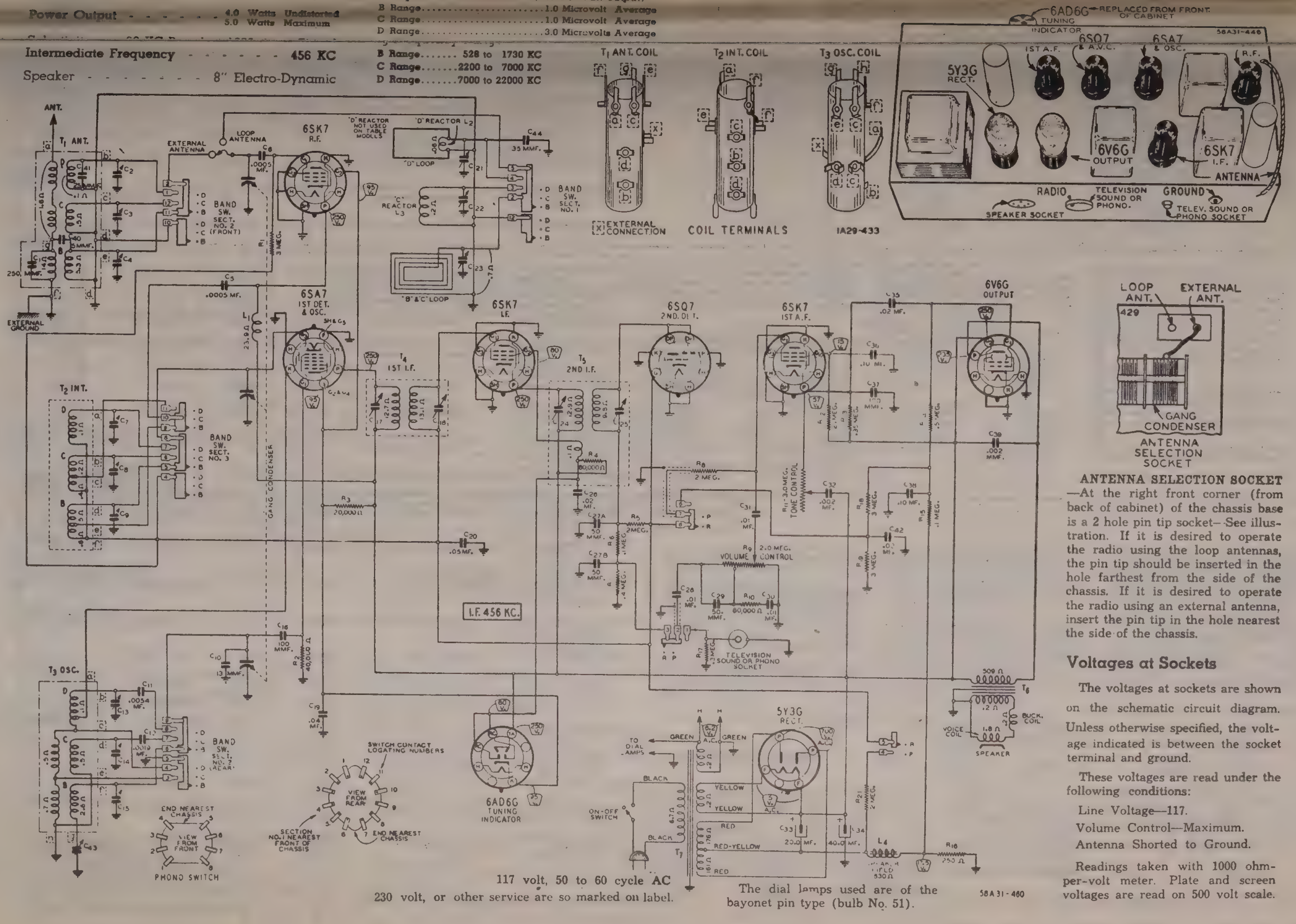
Power Output - - - - - - - 4.0 Watts Undistorted
5.0 Watts Maximum

B Range........................1.0 Microvolt Average
C Range........................1.0 Microvolt Average
D Range........................3.0 Microvolts Average

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 8" Electro-Dynamic

B Range....... 528 to 1730 KC
C Range.......2200 to 7000 KC
D Range.......7000 to 22000 KC



ANTENNA SELECTION SOCKET—At the right front corner (from back of cabinet) of the chassis base is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

117 volt, 50 to 60 cycle AC
230 volt, or other service are so marked on label.

The dial lamps used are of the bayonet pin type (bulb No. 51).

MODEL 04WG-725
MODEL 93WG-382
MODELS 93WG754,93WG755
Alignment,Trimmers

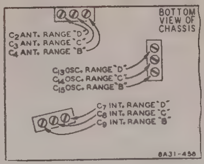
MONTGOMERY WARD & CO.

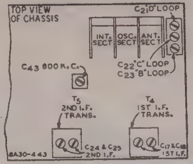
Volume Control—Maximum All Adjustments.

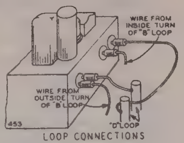
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

MODEL 93WG-382 SIGNAL GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C24) & (C25)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C43) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C






WIRE FROM INSIDE TURN OF "B" LOOP
WIRE FROM OUTSIDE TURN OF "B" LOOP
"D" LOOP
453
LOOP CONNECTIONS

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

NOTE B—If the indicator is not at 1500 KC, it will be necessary to re-calibrate. Loosen the set screw on the dial hub near the volume control drum. Hold the tuning control drum stationary and at the same time turn the dial drum the necessary amount in the required direction. Retighten the set screw.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

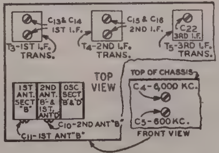
NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on page one.

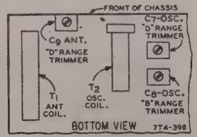
NOTE E—Console models only—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

MODEL 93WG-754 93WG-755

I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C13) & (C14) 2nd I.F. (C15) & (C16) 3rd I.F. (C22)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	1st Ant. Range B (C11) 2nd Ant. Range B (C10)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note A
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
16,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C9) Rock Rotor—See Note A
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C4) Rock Rotor—See Note A




FRONT OF CHASSIS
C9 ANT. "D" RANGE TRIMMER
C7-OSC. "D" RANGE TRIMMER
C8-OSC. "B" RANGE TRIMMER
T1 ANT COIL.
T2 OSC. COIL.
BOTTOM VIEW
7T4-396

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

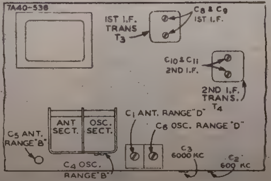
After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CALIBRATION—Chassis should be in cabinet. If it is necessary to recalibrate the radio, loosen the set screw on the dial hub near the volume control drum. Tune in a signal of known frequency. Hold the tuning control drum stationary and at the same time turn the dial drum the necessary amount in the required direction. If the radio detunes as the dial drum is turned, loosen the set screw a slight additional amount and recalibrate. Retighten the set screw,

MODEL 04WG-725

I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C8) & (C9) 2nd I.F. (C10) & (C11)
RANGE B					
1550 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C4)
1400 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C5)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C2) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C6)
17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C3) Rock Rotor—See Note B
LOOP RANGE B					
1400 KC See Note C	None See Note C		B Range	[illegible]	[illegible]



Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the

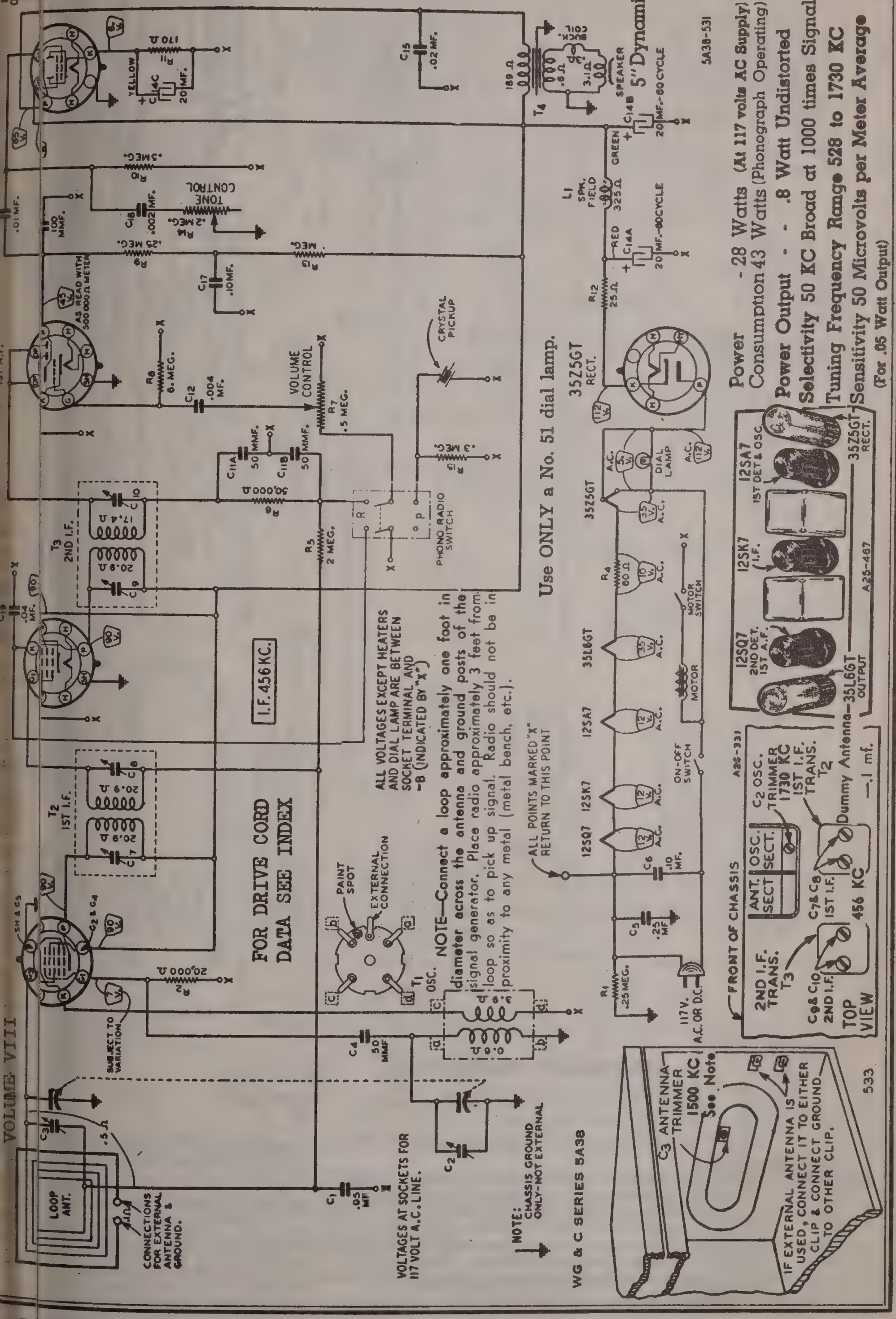
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Reinstall set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal which is much weaker will be heard at 15,000 less 912 KC, or 14,088 KC on the dial

MONTGOMERY WARD & CO.

MODEL 93WG-510
Schematic,Voltage



Power Consumption - 28 Watts (At 117 volts AC Supply)
43 Watts (Phonograph Operating)

Power Output - - .8 Watt Undistorted

Selectivity 50 KC Broad at 1000 times Signal

Tuning Frequency Range 528 to 1730 KC

Sensitivity 50 Microvolts per Meter Average
(For .05 Watt Output)

FOR DRIVE CORD DATA SEE INDEX

ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP ARE BETWEEN SOCKET TERMINAL AND -B (INDICATED BY "X")

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

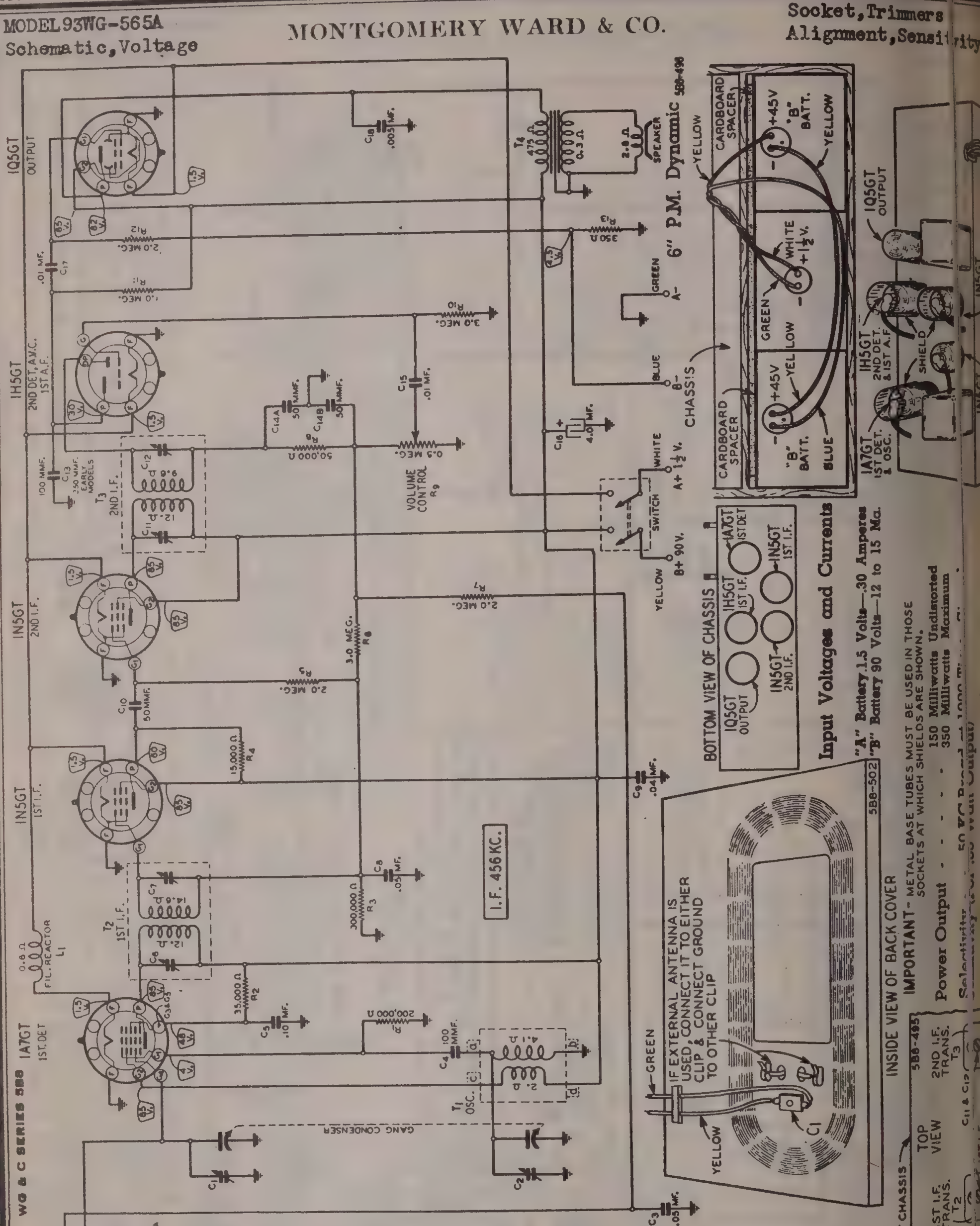
ALL POINTS MARKED "X" RETURN TO THIS POINT

Use ONLY a No. 51 dial lamp.

MODEL 93WG-565A
Schematic, Voltage

MONTGOMERY WARD & CO.

Socket, Trimmers
Alignment, Sensitivity

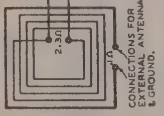


Input Voltages and Currents

"A" Battery 1.5 Volts—.30 Amperes
"B" Battery 90 Volts—12 to 15 Ma.

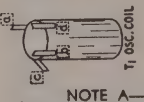
IMPORTANT- METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

Power Output - - - - 150 Milliwatts Undistorted
350 Milliwatts Maximum



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.



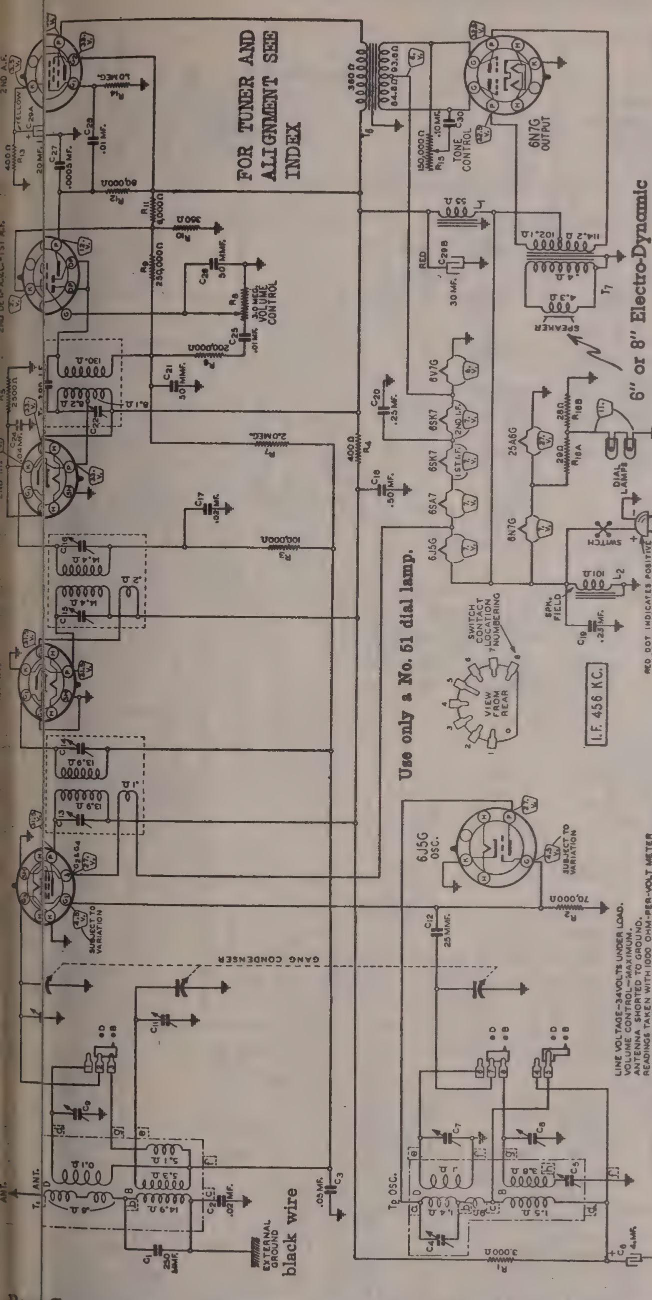
SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA.	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1500 KC	None—See Note A		Turn rotor to max. output	Antenna (C1)

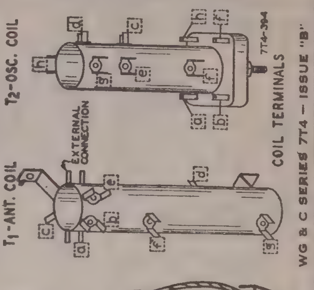
NOTE A—Chassis must be in cabinet. Con loop approximately one foot in diameter across the na and ground posts of the signal generator. The the cabinet must be in place. Place radio approxi 3 feet from loop so as to pick up signal. Radio not be in proximity to any metal (metal bench,

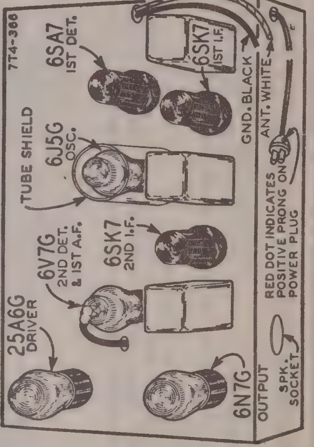
CALIBRATION (For models with pointer in fr dial scale)—To obtain dial scale calibration, tune 800 KC signal. The pointer should be at the 8C mark on the dial. If it is not, hold the pulley at the of the dial, loosen the pointer screw, set the poin the 800 KC mark, and retighten the pointer screw.

MONTGOMERY WARD & CO.

MODELS 93WG-754,93WG-755
Schematic,Voltage,Coils
Sensitivity,Socket


FOR TUNER AND ALIGNMENT SEE INDEX
Use only a No. 51 dial lamp.
6" or 8" Electro-Dynamic
I.F. 456 KC.
6N7G OUTPUT
6J5G OSC.
TONE CONTROL
VOLUME CONTROL
SPEAKER
DIAL LAMPS
SWITCH
SPK. FIELD
GANG CONDENSER
EXTERNAL GROUND
black wire
ANT.
SUBJECT TO VARIATION
SWITCH CONTACT LOCATION NUMBERING
VIEW FROM REAR
RED DOT INDICATES POSITIVE PRONG ON POWER PLUG.
LINE VOLTAGE—34VOLTS UNDER LOAD.
VOLUME CONTROL—MAXIMUM.
ANTENNA SHORTED TO GROUND.
READINGS TAKEN WITH 1000 OHM-PER-VOLT METER
PLATE & SCREEN VOLTAGES ARE READ ON 300 V. SCALE.
7T4-366





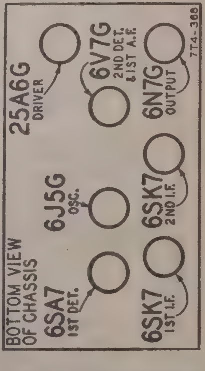
CAUTION

The metal chassis is connected to one side of the line—See Schematic Circuit Diagram.

32 Volt Power Supply

This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The radio may not be satisfactory on plants which do not use storage batteries.

The power consumption of this radio is 57.6 watts. When first turned on, the power consumption is higher for a few seconds until the tubes heat.



Pow Consumption - 1.60 Amperes at 36 Volts DC

Pow Output - - - - - - .17 Watt Undistorted
.40 Watt Maximum

Sele ivity - - 30 KC Broad at 1000 times Signal

Sen ivity (For .05 watt output)
B ange .... 528 to 1730 KC ..6.0 Microvolts Average
D ange ....5750 to 18300 KC ..8.0 Microvolts Average

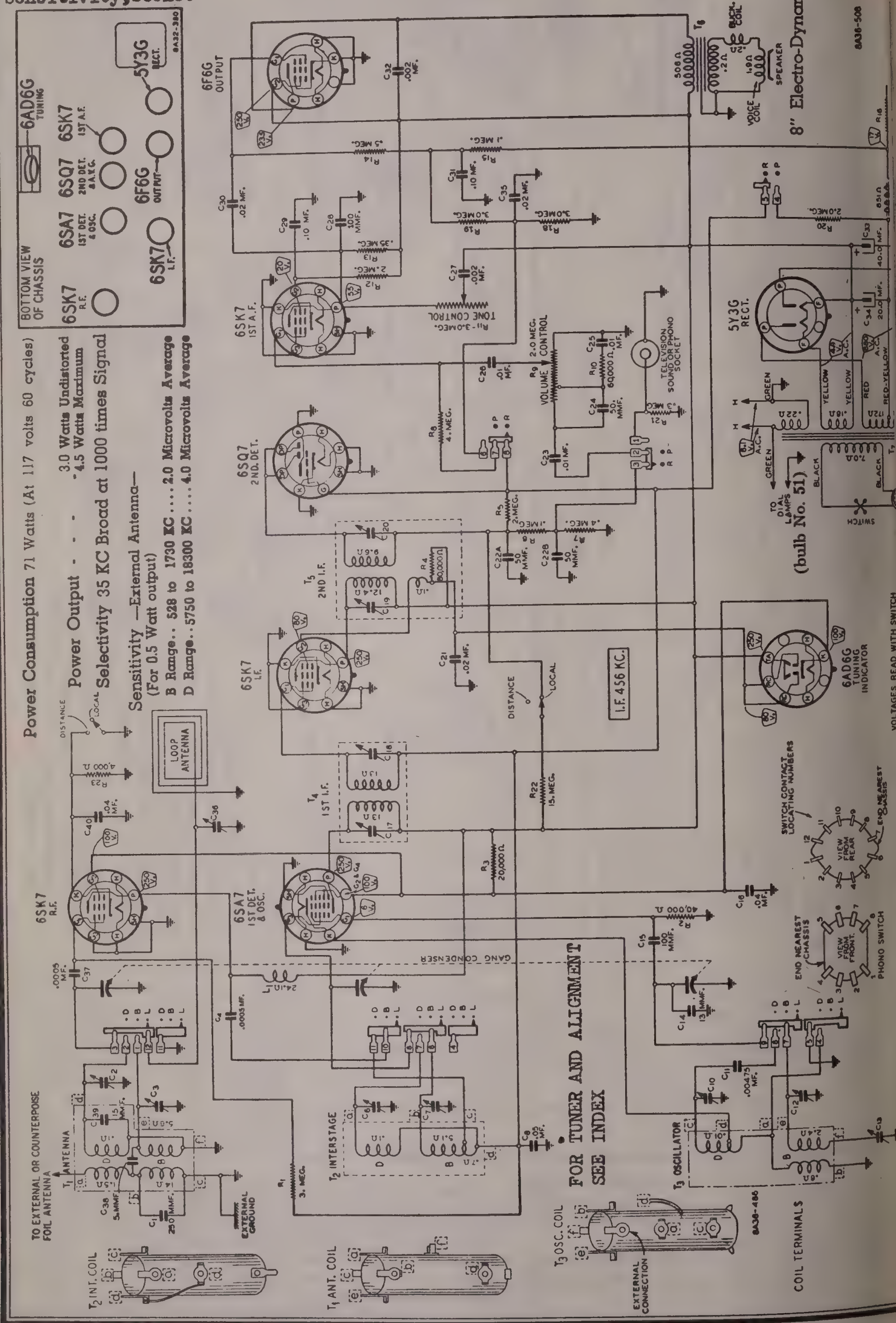
Line Voltage Range

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. If the line voltage is higher than 42, it will be necessary to use a series resistor to cut it down. If the voltage varies, a variable resistor may be required.

MODELS 93WG-800,93WG-801
(With Loop)

Schematic,Voltage,Coils
Sensitivity,Socket

MONTGOMERY WARD & CO.



Power Consumption 71 Watts (At 117 volts 60 cycles)

Power Output - - - 3.0 Watts Undistorted
4.5 Watts Maximum

Selectivity 35 KC Broad at 1000 times Signal

Sensitivity —External Antenna—
(For 0.5 Watt output)
B Range.. 528 to 1730 KC....2.0 Microvolts Average
D Range..5750 to 18300 KC....4.0 Microvolts Average

8" Electro-Dynamic

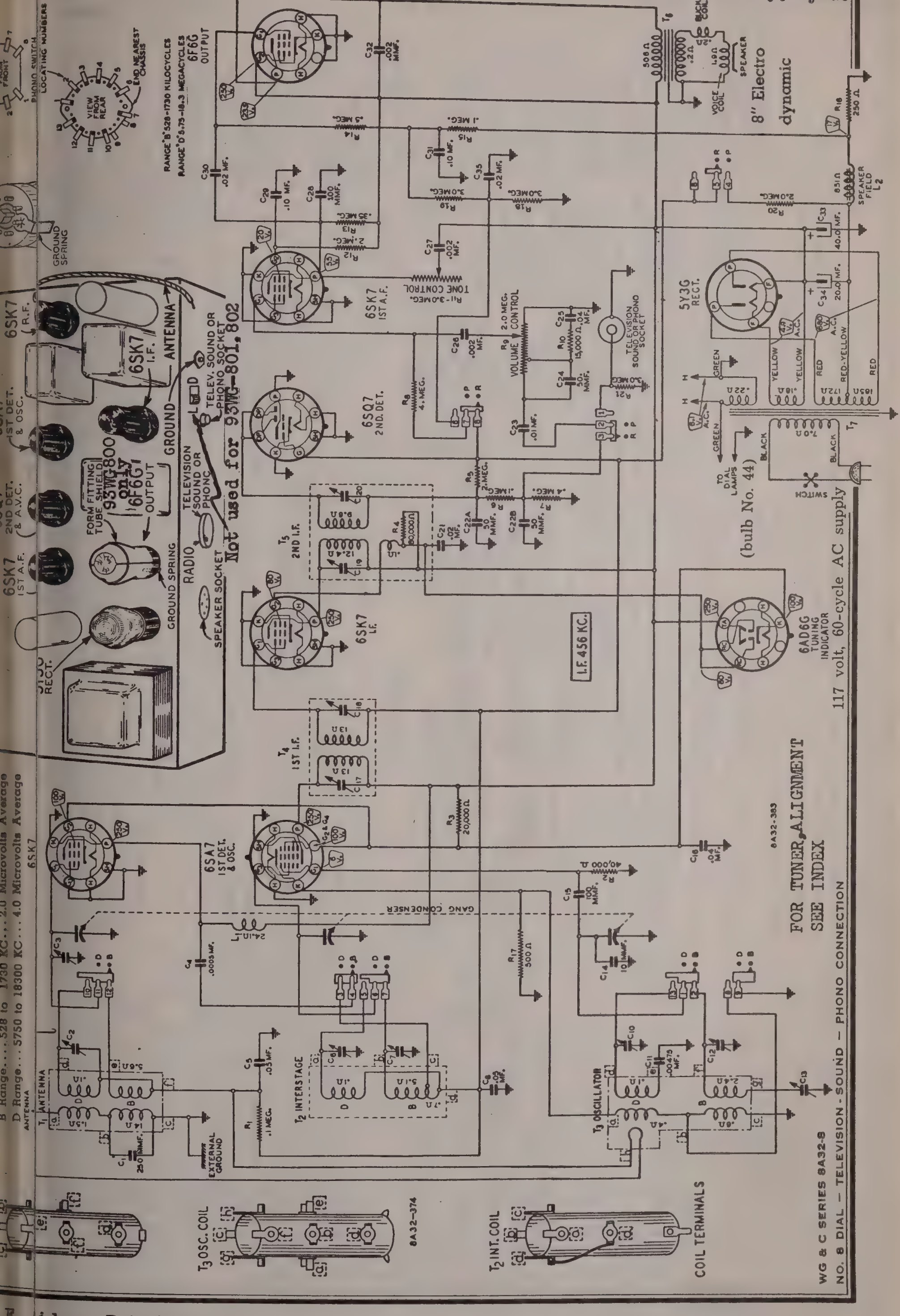
(bulb No. 51)

FOR TUNER AND ALIGNMENT SEE INDEX

VOLTAGES READ WITH SWITCH

MONTGOMERY WARD & CO.

MODELS 93WG-801,93WG-802
Schematic,Voltage,Coils
Socket,Sensitivity,Layout



FOR TUNER ALIGNMENT SEE INDEX

WG & C SERIES 8A32-8
NO. 8 DIAL – TELEVISION - SOUND – PHONO CONNECTION

MODELS 93WG-754,93WG-755
MODEL 93WG-800
Drive Cord Replacement

MONTGOMERY WARD & CO.

MODELS 93WG-800,93WG-01
93WG-802,93WG-05
MODELS 93WG-1000,93WG100
Alignment,Trimmers

ALIGNMENT PROCEDURE MODELS 93WG-800,-801,-802,-805, (EARLY and LOOP MODELS)

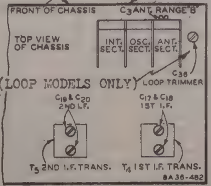
Volume Control—Maximum All Adjustments.

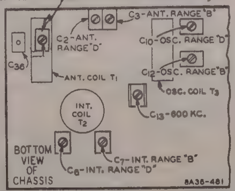
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

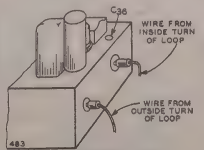
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

SIGNAL GENERATOR					
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C19) & (C20)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	*Set Indicator to 1500 KC– See Note AT Turn Rotor to Max. Output	Ant. Range B (C3) Int. Range B (C7)
600 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
18,300 KC	Antenna Lead	400 Ohm	D Range	Keep Rotor at Full Open Position	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note A
LOOP RANGE B (LOOP MODELS ONLY)					
1500 KC See Note B	None See Note B		Loop	Turn Rotor to Max. Output	See Note C Loop Trimmer (C36)

LOCATION OF C2 and C3 ON 93WG-801,-802 and -805 (EARLY MODELS)







LOOP CONNECTIONS

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

93WG-801,-802,- 805.

NOTE AT— If the indicator is not at 1500 KC, it will be necessary to re-calibrate. Loosen the screw—See illustration ⊕. Lift the tuning control drum upward so that the gears disengage and rotate the drum assembly the necessary amount in the required direction. Re-engage the gears and retighten the screw.

NOTE B—Reinstall set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet.

NOTE C (CONSOLE MODELS)—Turn knob of loop until output is maximum.

CALIBRATION—Chassis should be in cabinet. If it is necessary to recalibrate the radio, loosen the set screw on the dial hub near the volume control drum. Tune in a signal of known frequency. Hold the tuning control drum stationary and at the same time turn the dial drum the necessary amount in the required direction. If the radio detunes as the dial drum is turned, loosen the set screw a slight additional amount and recalibrate. Retighten the set screw.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

ALIGNMENT PROCEDURE 93WG-1000,-1001 (EARLY AND LOOP MODELS)

Volume Control—Maximum All Adjustments.

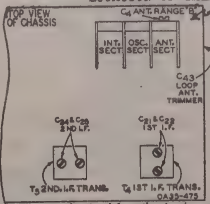
Selectivity Control—Sharp Position All Adjustments.

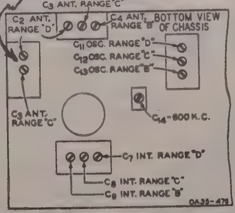
Connect Radio Chassis to Ground Post of Signal Generator with a short Heavy Lead.

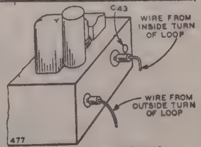
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

SIGNAL GENERATOR					
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st I.F Tube	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C24) & (C25)
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C21) & (C22)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Full Open	Oscillator Range B (C13)
1500 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Max. Output	600 KC (C14) Rock Rotor—See Note B
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C12)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C11)
22,000 KC	Antenna Lead	400 Ohm	D Range	Keep rotor at full open position	Ant. Range D (C2) Int. Range D (C7)
LOOP RANGE B (LOOP MODELS ONLY)					
1500 KC See Note C	None See Note C		Loop	Turn Rotor to Max. Output	See Note D Loop Trimmer (C43)

LOCATION OF TRIMMERS C2,C3,C4, ON EARLY MODELS.







LOOP CONNECTIONS

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

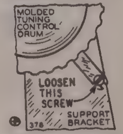
NOTE A—If the indicator is not at 1500 KC, it will be necessary to re-calibrate. Loosen the screw—See illustration ⊕. Lift the tuning control drum upward so that the gears disengage and rotate the drum assembly the necessary amount in the required direction. Re-engage the gears and retighten the screw.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet.

Note D (CONSOLE MODELS)—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.



Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

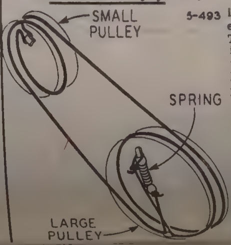
Local-Distance Switch—Distance position.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

Drive Cord Replacement

MODELS 93WG-754,5,-800.



Use a new drive cord approximately 27 inches in length. Tie one end of drive cord to tension spring. Thread the other end of cord, starting from inside of large pulley, through hole in groove of pulley. Do not secure spring to hook on pulley.

Turn gang condenser to completely closed position.

Rotate tuning control drum so that hole in groove of small pulley is on top. Wind cord 1½ turns clockwise (from tuning control side of chassis) around small drive pulley. Turn should start at right side (from front of chassis) of pulley groove and progress toward the left. Thread cord through hole in groove

Thread cord back through same hole, leaving a small loop below the pulley rim. Secure loop to hook on pulley—See illustration. Pull cord tight.

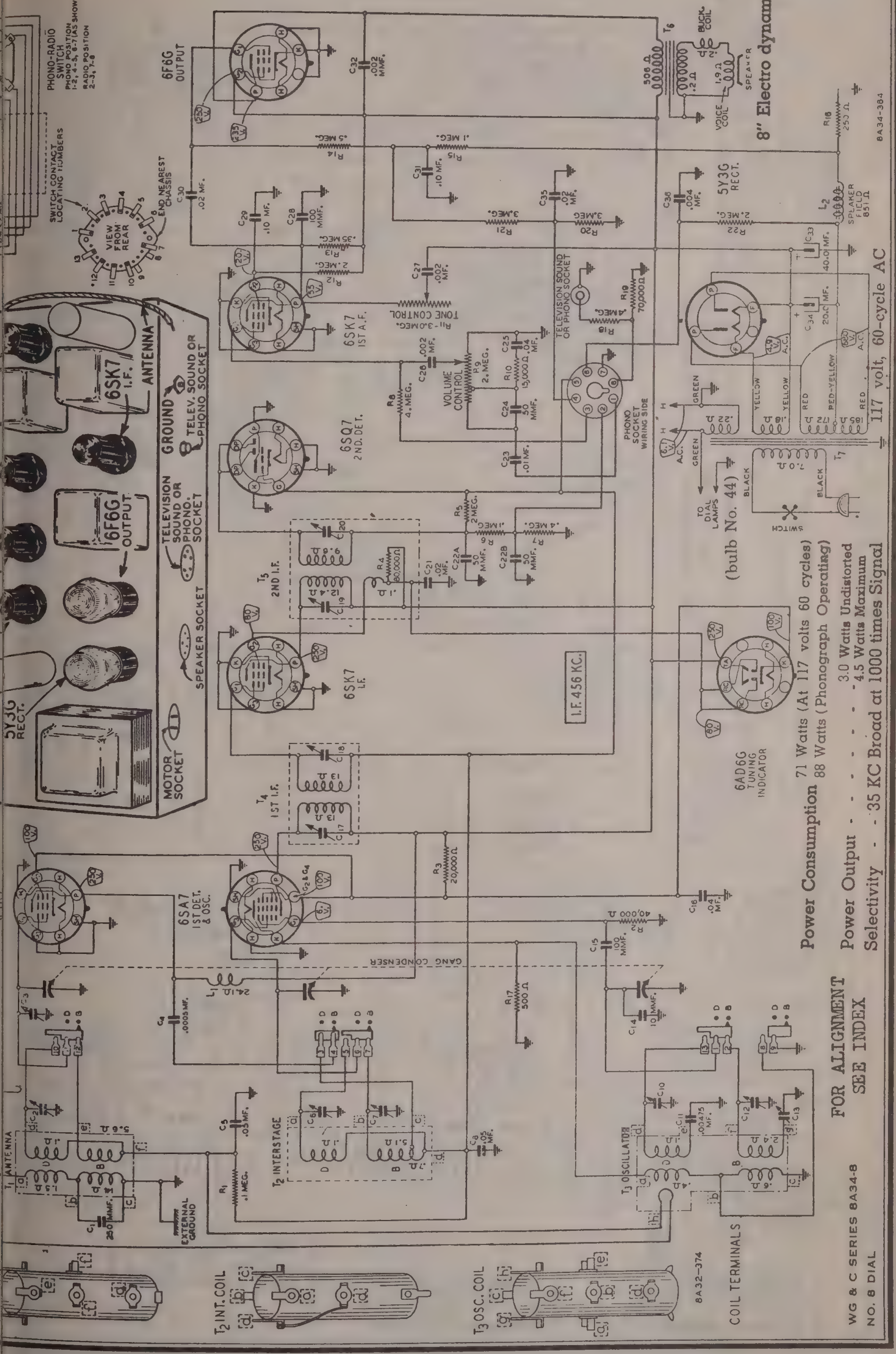
Wind cord one turn clockwise (from tuning control side of chassis) around large drive pulley. This turn should start at left side (from front of chassis) of pulley groove and progress toward the right.

Rotate large pulley until hole in groove is on top. Pass cord through hole. Tie a knot with a small loop at free end of cord. Secure loop to hook on pulley. Stretch spring and secure free end to same hook.

MONTGOMERY WARD & CO.

MODEL 93WG-805
Schematic, Voltage, Coils
Sensitivity, Layout

D Range....5750 to 18300 KC ..4.0 Microvolts Average



8" Electro dynamic

117 volt, 60-cycle AC

(bulb No. 44)

Power Consumption 71 Watts (At 117 volts 60 cycles)
88 Watts (Phonograph Operating)

Power Output - - - - - 3.0 Watts Undistorted
- 4.5 Watts Maximum

Selectivity - - 35 KC Broad at 1000 times Signal

FOR ALIGNMENT
SEE INDEX

WG & C SERIES 8A34-8
NO. 8 DIAL

MODEL 93WG-805(With Loop)
Schematic,Voltage,Coils
Sensitivity,Socket

MONTGOMERY WARD & CO.

Power Consumption 71 Watts (At 117 volts 60 cycles)
88 Watts (Phonograph Operating)

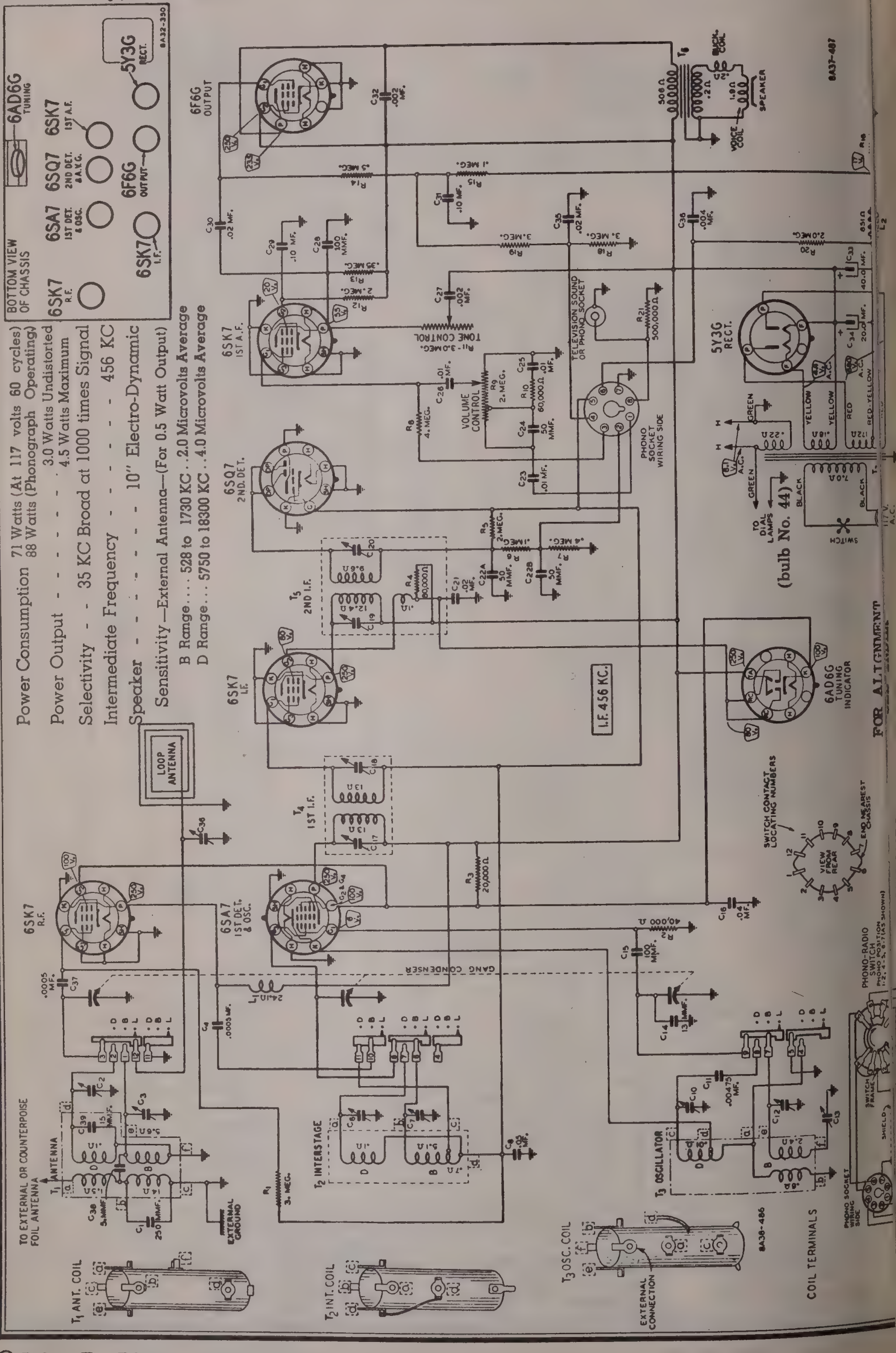
Power Output - - - - - - 3.0 Watts Undistorted
4.5 Watts Maximum

Selectivity - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - 10" Electro-Dynamic

Sensitivity—External Antenna—(For 0.5 Watt Output)
B Range.... 528 to 1730 KC . . 2.0 Microvolts Average
D Range . . 5750 to 18300 KC . . 4.0 Microvolts Average



MONTGOMERY WARD & CO.

MODELS 93WG-1000, 93WG-1001
Schematic, Voltage, Coils
Sensitivity, Socket

SPECIFICATIONS

Power Consumption - 98 Watts (At 117 volts 60 cycles)

8 Watts Maximum

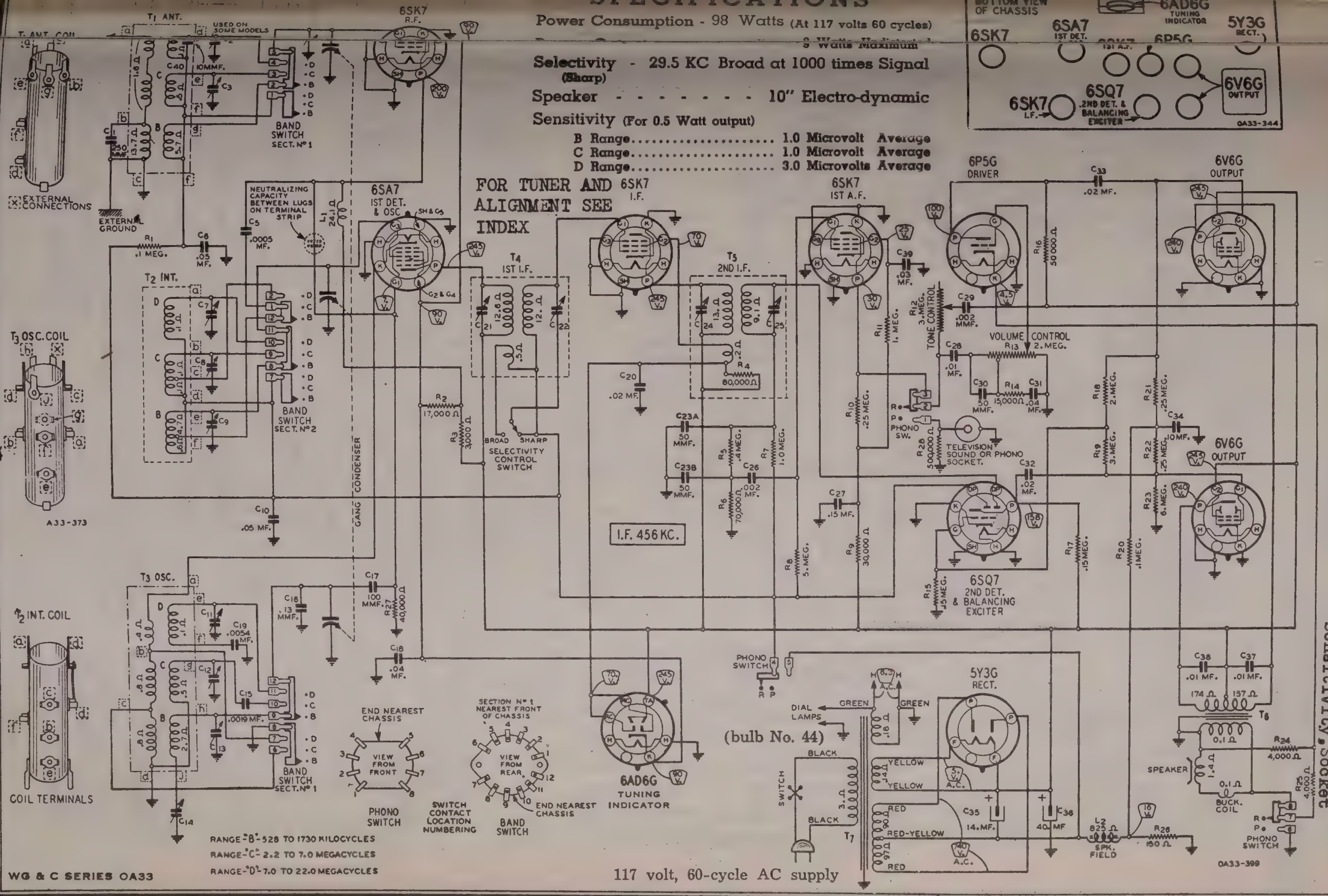
Selectivity (Sharp) - 29.5 KC Broad at 1000 times Signal

Speaker - - - - - - - 10" Electro-dynamic

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

FOR TUNER AND ALIGNMENT SEE INDEX



MODELS 93WG-1000,93WG-1001
(With Loop)
Schematic,Voltage,Coils
Sensitivity,Socket

MONTGOMERY WARD & CO.

SPECIFICATIONS

Power Consumption - 98 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 8 Watts Undistorted
9 Watts Maximum

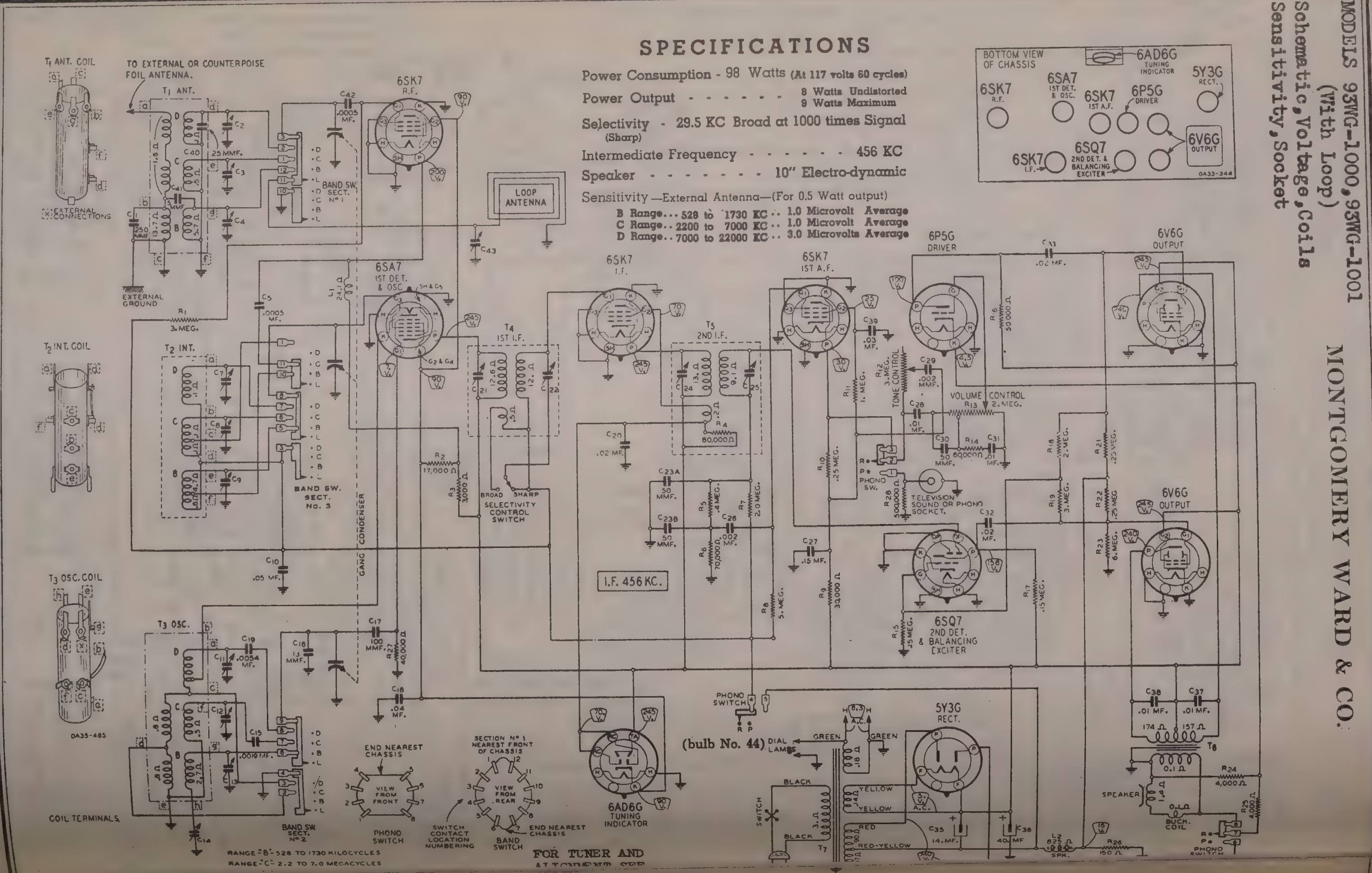
Selectivity - 29.5 KC Broad at 1000 times Signal
(Sharp)

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 10" Electro-dynamic

Sensitivity —External Antenna—(For 0.5 Watt output)

B Range... 528 to 1730 KC	1.0 Microvolt	Average
C Range.. 2200 to 7000 KC	1.0 Microvolt	Average
D Range.. 7000 to 22000 KC	3.0 Microvolts	Average



MONTGOMERY WARD & CO.

MODELS 93WG-1103,93WG-1104
Schematic,Voltage,Coils
Socket,Sensitivity
Drive Cord Replacement

Drive Cord Replacement

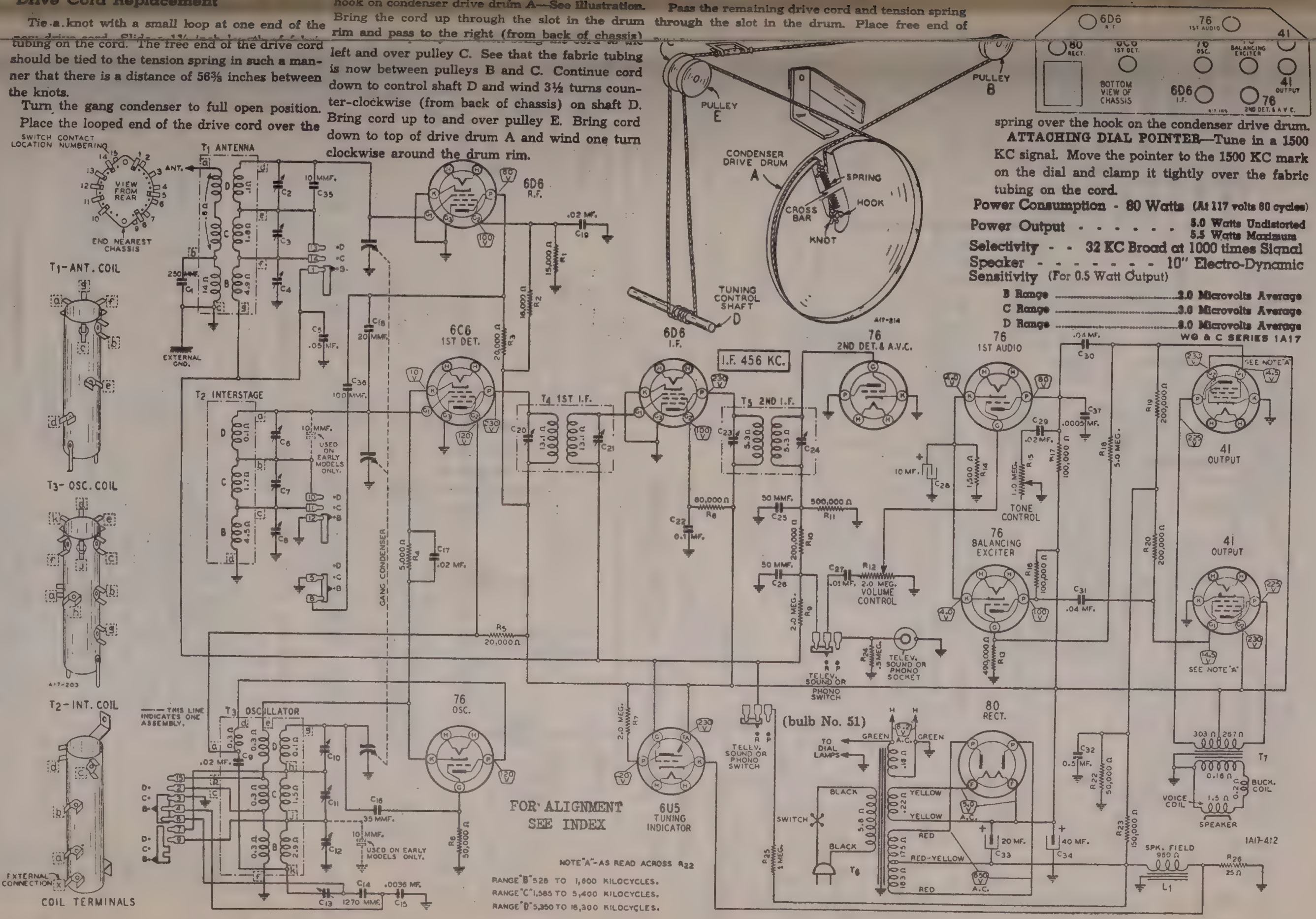
Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. The free end of the drive cord should be tied to the tension spring in such a manner that there is a distance of 56⅜ inches between the knots.

Turn the gang condenser to full open position. Place the looped end of the drive cord over the hook on condenser drive drum A—See illustration. Bring the cord up through the slot in the drum rim and pass to the right (from back of chassis) [illegible] bring the cord to the left and over pulley C. See that the fabric tubing is now between pulleys B and C. Continue cord down to control shaft D and wind 3½ turns counter-clockwise (from back of chassis) on shaft D. Bring cord up to and over pulley E. Bring cord down to top of drive drum A and wind one turn clockwise around the drum rim.

Pass the remaining drive cord and tension spring through the slot in the drum. Place free end of [illegible] spring over the hook on the condenser drive drum.

ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

Power Consumption - 80 Watts (At 117 volts 60 cycles)
Power Output - - - - - - 5.0 Watts Undistorted
5.5 Watts Maximum
Selectivity - - 32 KC Broad at 1000 times Signal
Speaker - - - - - - - - 10" Electro-Dynamic
Sensitivity (For 0.5 Watt Output)
B Range .... 2.0 Microvolts Average
C Range .... 3.0 Microvolts Average
D Range .... 8.0 Microvolts Average
WG & C SERIES 1A17

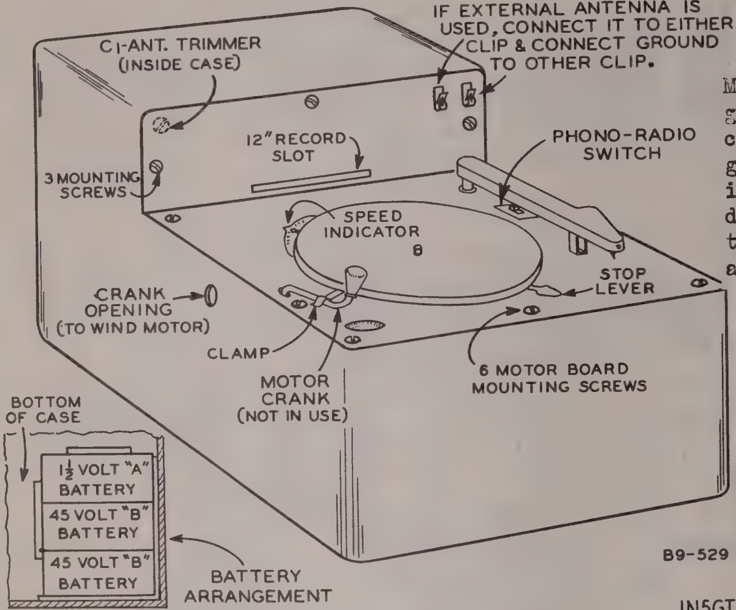


MODEL 93WG-2208
Schematic,Chassis
Parts

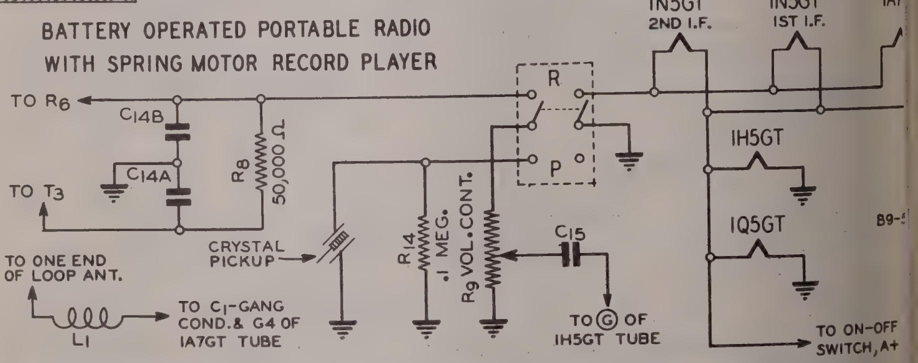
MONTGOMERY WARD & CO.

MODEL 93WG-2208 co is
of receiver Model WG
565A and the recor pl
er shown here. See nd
for data on receiv .

Most of the infor ti
given for 93WG-56 i
correct for this ho
graph combinatio Th
information that s
different is give on
this page with ch ge
and additions.



BATTERY OPERATED PORTABLE RADIO
WITH SPRING MOTOR RECORD PLAYER



PARTS USED ON MODEL 93WG-565A ARE USED ON THIS MODEL EXCEPT AS FOLLOWS

The following NEW PARTS not shown on MODEL 93WG-565A ARE USED

Bin No.	Part No.	Code	Description
	2A161		Radio-Phono Switch..
	4X351		Escutcheon for Phono-Radio Switch..............................
	17A131	C1	1-12 mmf. Trimmer Condenser....................................
	14A115		2 Section Gang Condenser complete with Tuning Control Shaft........
	A85104	R14	100,000 Ohm 0.2 Watt Carbon Resistor...........................
	28A3		Needle Cup..
	28A7		Cover for Needle Cup..
	9A1218		Loading Coil for Loop Antenna...................................

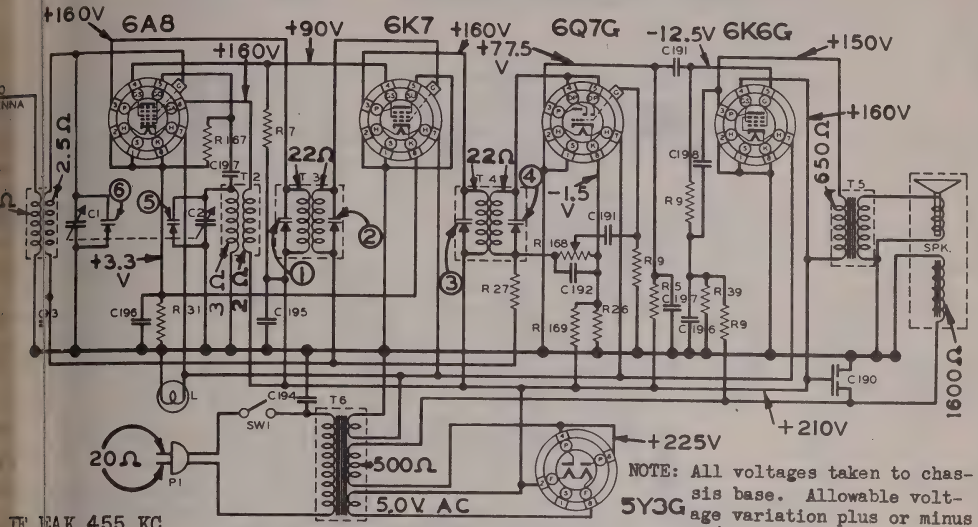
The following parts shown on MODEL 93WG-565A ARE NOT USED

Bin No.	Part No.	Code	Description
	9A1191		Loop Antenna Assembly...
	4A139		Fibre Strip (Loop Antenna Leads)................................
	17A110	C1	2.5-35 mmf. Loop Antenna Trimmer Condenser......................
	14A114		2 Section Gang Condenser complete with Tuning Control Shaft........

Prices Subject to Change Without Notice.

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 71
Chassis RE-43
Schematic,Voltage
Alignment,Sensitivity



NOTE: All voltages taken to chassis base. Allowable voltage variation plus or minus 20% from values shown.

IF]EAK 455 KC

BALANCING INSTRUCTIONS

ation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adj. Padder No.	Dial Setting	Sens.
1.	* 6A8 Grid	455	1,2,3 & 4	550 kc	75 mv.
2.	Ant. Lead Through 200 uuf.	1720	5	1720 kc	
3.	Ant. Lead Through 200 uuf.	1400	6	1400 kc	30 mv.

* I.F. Sensitivity should be 150 microvolts minimum for 200 milliwatts output

ESISTORS

No.	Part No.	Description	Price
5	17-2070	500,000 ohms 1/4 watt	.20
7	17-2072	20,000 ohms 1/2 watt	.20
9	17-2080	1,000,000 ohms 1/4 watt	.20
27	17-4788	2,000,000 ohms 1/4 watt	.20
31	17-2066	260 ohms 1/2 watt	.20
39	17-14051	300,000 ohms 1/4 watt	.20
167	17-14281	60,000 ohms 1/4 watt	.20
168	17-16166	500,000 ohms volume control	.75
169	17-14282	150,000 ohms 1/4 watt	.20
26	17-4781	600 ohms 1/4 watt	.20

ONDENSE

No.	Part No.	Description	Price
1 & 2	17-16147	Tuning condenser	3.00
19	17-14271	10-10 mfd. 300 v.d.c.	1.50
19	17-14272	.01 mfd. 400 v.d.c.	.35
19	17-14273	.00025 mfd. 600 v.d.c.	.25
19	17-14274	.05 mfd. 200 v.d.c.	.30
19	17-14275	.01 mfd. 400 v.d.c.	.40
19	17-14276	.05 mfd. 400 v.d.c.	.35
19	17-14277	.1 mfd. 200 v.d.w.	.35
19	17-14278	.0001 mfd. 600 v.d.c.	.25
19	17-14279	.005 mfd. 400 v.d.c.	.30

ISCELLAOUS

No.	Description	Price
13905	Dial light bulb(Mazda #44)	.15
15791E	Line cord and plug assembly	.40
16133	Speaker Assembly	4.00
15926A	Volume control and switch	1.00

COILS AND TRANSFORMERS

Ref. No.	Part No.	Description	Price
T1	00-16141	Antenna Coil	.75
T2	00-16142	Oscillator coil	.50
T3	00-16161	First I.F. Transformer	1.50
T4	00-16162	Second I.F. Transformer	1.50
T5	00-16160	Output transformer	1.50
T6	00-16140	Power transformer	3.00

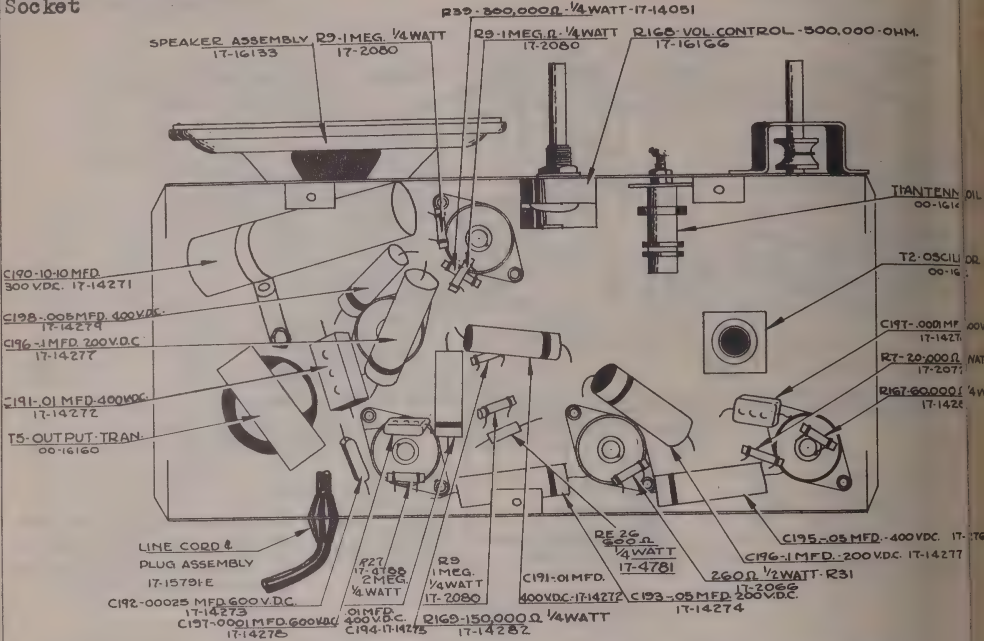
ELECTRICAL and MECHANICAL SPECIFICATIONS

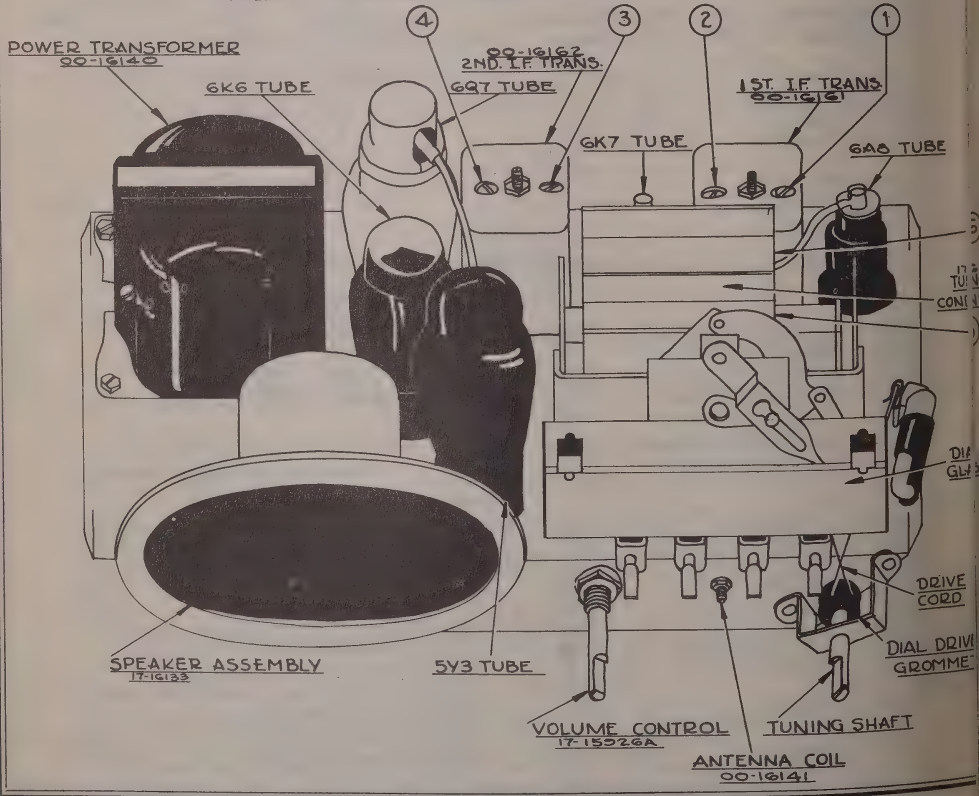
TUBES: 6A8--1st Detector Oscillator
6K7--I.F. Amplifier
6Q7G--2nd Detector, A.V.C. Audio Amplifier
6K6G--Power output Amplifier
5Y3G--Rectifier

Dial Light: Mazda #44
Frequency Range: 1725 to 540 K.C.
Power Output: 1.8 watts
Speaker: 5" Electro Dynamic,3 ohm voice coil
1600 ohms field.
Voltage & Frequency: 117 V. 60 cycles AC only
Watts Power Consumption: 45 Watts
Sensitivity: 50 microvolts for 200 milliwatts output
Approved by: Underwriters
Licensed under: R.C.A. and Hazeltine patents
Chassis Dimensions: Width 10 3/4"; height 6 3/4"; depth 6 3/4"
Cabinet dimensions: Width 11 1/2"; height 8"; depth 6 1/4"
Mechanical Push-button Tuning: 4 push-buttons

MODEL 71
Chassis RE-43
Chassis, Trimmers
Socket

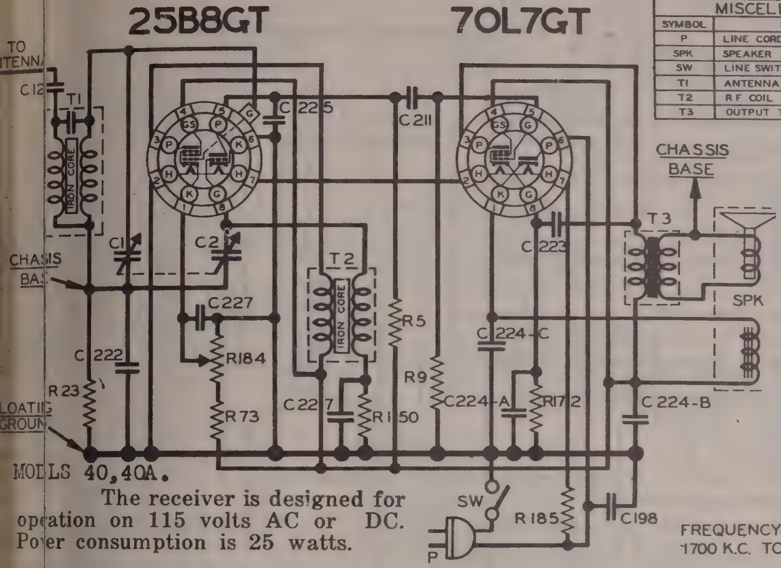
NOBLITT-SPARKS INDUSTRIES, INC.


R39-300,000Ω-¼WATT-17-14051
SPEAKER ASSEMBLY 17-16133
R9-1MEG. ¼WATT 17-2080
R9-1MEG.Ω-¼WATT 17-2080
R168-VOL.CONTROL-500,000-OHM. 17-16166
T1ANTENN OIL 00-1614
T2-OSCILL OR 00-16
C197-.0001MF 00V 17-1427
R7-20,000Ω WAT 17-2077
R167-60,000 ¼W 17-1428
C190-10-10 MFD. 300 V.DC. 17-14271
C198-.005MFD. 400V.DC. 17-14279
C196-.1MFD. 200V.D.C 17-14277
C191-.01 MFD-400VDC. 17-14272
T5-OUTPUT-TRAN. 00-16160
LINE CORD & PLUG ASSEMBLY 17-15791-E
C192-00025 MFD.600V.D.C. 17-14273
C197-0001MFD.600VDC 17-14278
R27 17-4788 2MEG. ¼WATT
.01MFD. 400V.D.C. C194-17-14275
R9 1MEG. ¼WATT 17-2080
R169-150,000Ω ¼WATT 17-14282
C191-.01MFD. 400V.D.C.-17-14272
RE26 600Ω ¼WATT 17-4781
C193-.05MFD. 200V.D.C. 17-14274
260Ω ½WATT-R31 17-2066
C196-.1MFD.-200V.D.C. 17-14277
C195-.05MFD.-400VDC. 17-276



NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 40,40A
MODELS 402,402A
Ch.RE-55
Schematics



MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
P	LINE CORD & PLUG ASSEMBLY	17-16336
SPK	SPEAKER ASSEMBLY	17-16314
SW	LINE SWITCH	17-14320
T1	ANTENNA COIL	00-16315
T2	R F COIL	00-16316
T3	OUTPUT TRANSFORMER	00-16317

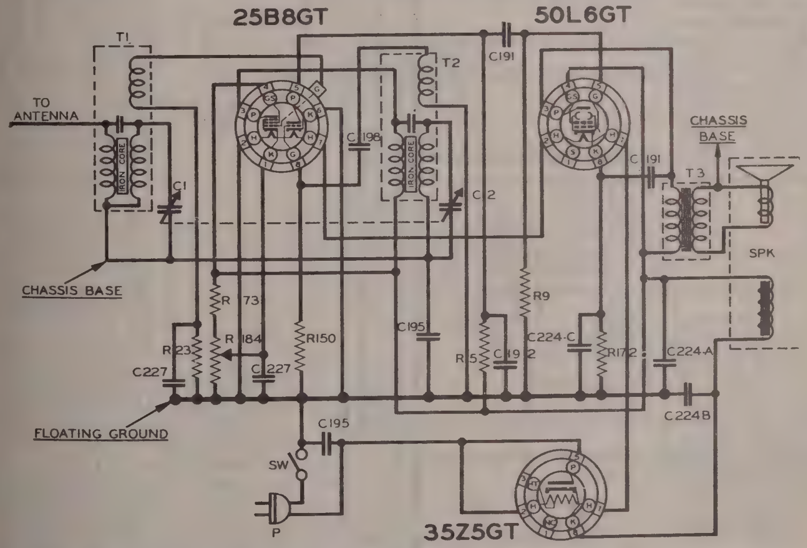
RESISTORS			
R	OHM	W	PART NO.
5	500K	1/4	17-2070
9	1M	1/4	17-2080
23	250K	1/4	17-3011
73	30K	1/4	17-[illegible]276
150	5M	1/4	17-14242
172	100	1/4	17-14289
184	10K	V.C.	17-14320
185	170	3	17-14324

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16318
2	VARIABLE		
120	.001	400	17-4288
198	.005	400	17-14279
211	.01	200	17-14306
222	.2	400	17-14317
223	.002	400	17-14318
224A	10 MFD.	15	17-14319
224B	10 MFD.	150	
224C	20 MFD.	150	
225	.0005	600	17-14321
227	.05	200	17-14323

FREQUENCY RANGE
1700 K.C. TO 540 K.C.

MODELS 40,40A.

The receiver is designed for operation on 115 volts AC or DC. Power consumption is 25 watts.



RESISTORS		
OHM	W	RT NO.
500K	1/4	-2070
1M	1/4	-2080
250K	1/4	-3011
30K	1/4	-4276
5M	1/4	-14242
100	1/4	-14289
10K	V.C.	-14320

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16318
2	VARIABLE		
191	.01	400	17-14272
192	.00025	600	17-14273
195	.05	400	17-14278
198	.005	400	17-14279
224A	10 MFD.	150	17-14319
224B	20 MFD.	150	
224C	20 MFD.	25	
227	.05	200	17-14323

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
P	LINE CORD & PLUG ASSEMBLY	17-16336
SPK	SPEAKER ASSEMBLY	17-16489
SW	LINE SWITCH	17-14320
T1	ANTENNA COIL	00-16508
T2	R.F. COIL	00-16509
T3	OUTPUT TRANSFORMER	00-16510

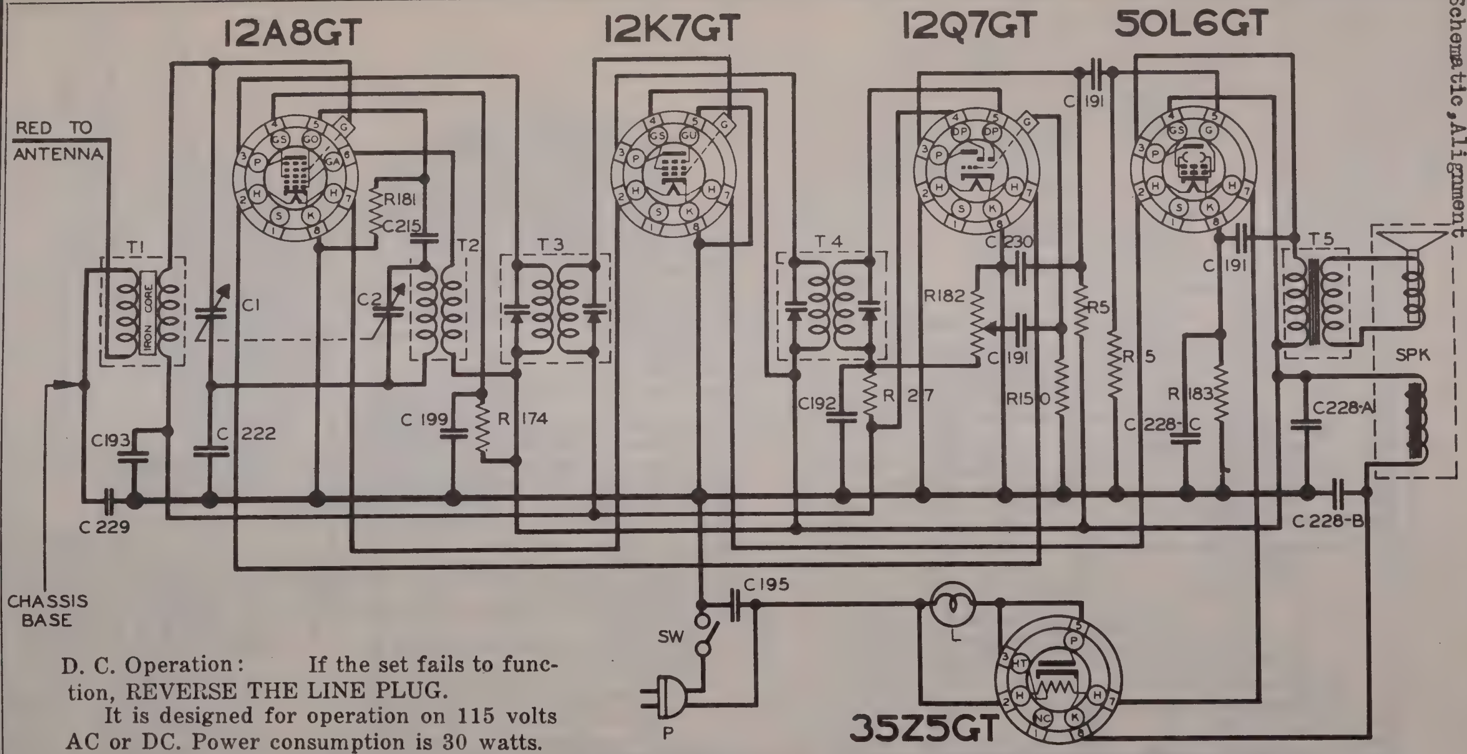
FREQUENCY RANGE
1700 K.C. TO 540 K.C.

NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.

MODELS 402,402A CHASSIS RE-55.

The receiver is designed for operation on 115 volts AC or DC. Power consumption is 25 watts.

NOBLITT-SPARKS INDUSTRIES, INC.



D. C. Operation: If the set fails to function, REVERSE THE LINE PLUG.

It is designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

RESISTORS				
R	OHM	W	PART NO.	
5	500K	1/4	17-2070	
27	2M	1/4	17-4788	
150	5M	1/4	17-14242	
174	20K	1/4	17-14291	
181	100K	1/4	17-14303	
182	1M	V.C.	17-14315	
183	150	1/4	17-14316	

CONDENSERS				
C	CAPACITY	VOLT	PART NO.	
1	TWO-GANG		17-16326	
2	VARIABLE			
191	.01	400	17-14272	
192	.00025	600	17-14273	
193	.05	200	17-14274	
195	.05	400	17-14276	
199	.02	200	17-14283	
215	.0001	600	17-14310	
222	.2	400	17-14317	
228A	10 MFD.	150	17-14326	
228B	20 MFD.	150		
228C	20 MFD.	25		

TRANSFORMERS			
T	TYPE	PART NO.	
1	ANTENNA COIL	00-16320	
2	OSCILLATOR COIL	00-16321	
3	FIRST I.F. COIL	00-16322	
4	SECOND I.F. COIL	00-16323	
5	OUTPUT TRANS.	00-16324	

MISCELLANEOUS UNITS			
SYMBOL	DESCRIPTION	PART NO.	
L	DIAL LIGHT BULB - MAZDA NO. 51	17-13904	
P	LINE CORD & PLUG ASSEMBLY	17-16371	
SPK	SPEAKER ASSEMBLY	17-16314-A	
SW	LINE SWITCH	17-14315	

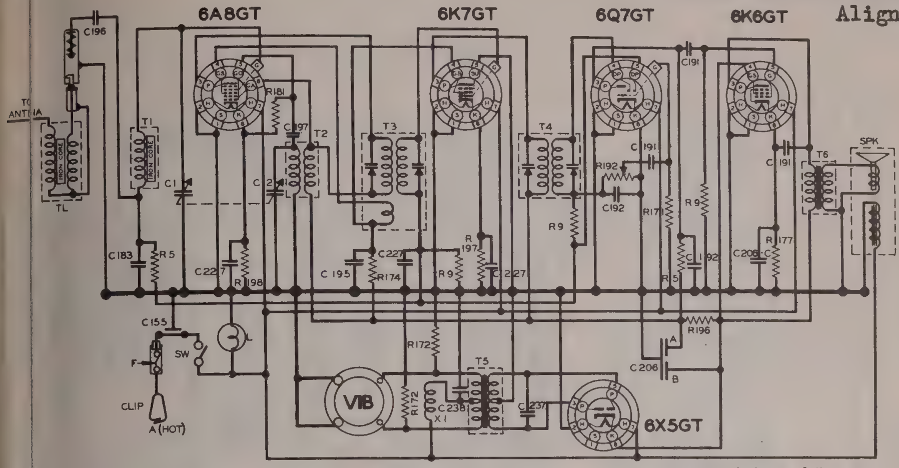
I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.

NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

MODEL 502,502A CHASSIS RE-48.

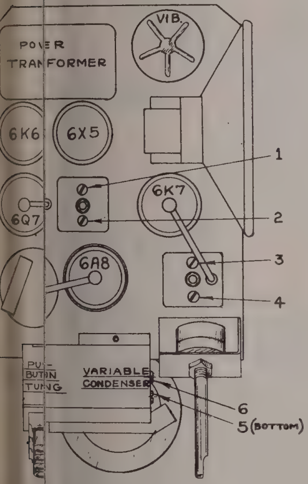
odel 610
uner Data

MODELS 510,Chassis RE-54
NOBLITT-SPARKS INDUSTRIES, INC.610,Chassis RE-58
Schematic,Socket,Trimmers
Alignment



IF PEAK 455 KC
FREQUENCY RANGE 1575 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

ARVIN CAR RADIO
CHASSIS RE 54, RE 58.



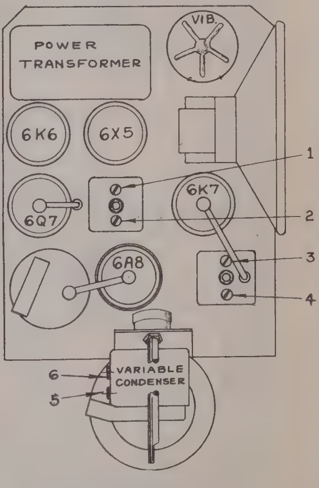
MODEL 610

RESISTORS				
R	OHMS	W	PART NO.	
5	500K	1/4	17-2070	
9	1M	1/4	17-2080	
171	15M	1/4	17-14288	
172	100	1/4	17-14289	
174	20K	1/4	17-14291	
177	850	1/4	17-14296	
181	100K	1/4	17-14303	
192	1M	V.C	17-16422	
198	500	1	17-14340	
197	800	1/4	17 14342	
196	400	1/4	17-14343	

CONDENSERS				
C	CAPACITY	VOLT	PART NO.	
1	TWO-GANG		17-16421	
2	VARIABLE			
155	.0002	200	17-14217	
237	.005	1200	17-14345	
206A	10 MFD.	300	17-14297	
206B	10 MFD	300		
206C	20 MFD	25		
191	.01	400	17-14272	
192	.00025	600	17-14273	
183	.003	600	17-14294	
195	.05	400	17-14276	
196	.1	200	17-14277	
197	.0001	600	17-14278	
238	.5	150	17-14346	
227	.05	200	17-14323	

CHOKES & TRANSFORMERS			
T-X	TYPE	PART NO	
1	ANTENNA COIL	00-16441	
2	OSCILLATOR COIL	00-16442	
3	FIRST I F COIL	00-16443	
4	SECOND I F COIL	00-16444	
5	POWER TRANS	00-16446	
6	OUTPUT TRANS.	00-16445	
X	CHOKE		
1	SUPPRESSION CHOKE	29-16457	

MISCELLANEOUS UNITS			
SYMBOL	DESCRIPTION	PART NO	
F	FUSE - 20 AMP	17-2228	
L	DIAL LIGHT BULB - MAZDA NO.44	17-13905	
SPK	SPEAKER ASSEMBLY	17-16456	
SW	POWER SWITCH	17-16422	
TL	TRANSMISSION LINE	00-16456	
VIB	VIBRATOR	17-14747	



MODEL 510

Model 610 PUSH BUTTON ADJUSTMENT:

Any button may be set to any station desired. First, tune the desired station by means of the thumb wheel. Second, turn the push button counter-clockwise two full turns. Then press this button the full length of its stroke, and while pressed tighten the button again by turning it clockwise. The button may now be released. To check the correct setting for this button, turn the thumb wheel to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.

BALANCING INSTRUCTIONS:

All sensitivities given for ½ watt output = 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455	1, 2, 3 & 4	550 KC	50 uv
2	Ant. Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10 uv

MODELS 510,610
MODEL 710
MODEL 810

NOBLITT-SPARKS INDUSTRIES, INC.

Antenna Data, Noise Elimination

IMPORTANT-SEE NOTE BELOW.

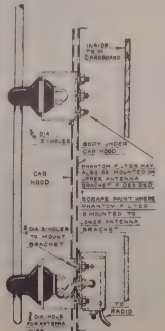
DESCRIPTION:

The Arvin Model 510 is a five-tube single unit Car Radio Receiver. This receiver is designed to mount under the lower edge of the instrument panel on all makes of cars.

Tuning is accomplished by rotating the calibrated thumb wheel on the lower front of the radio. Directly above the thumb wheel is located the volume control knob which also serves as the On-Off switch.

ANTENNA:

Arvin Antennas A25, A26, A27 and A28 are recommended for use with the Model 510 Arvin Car Radio. If either the A25 or A26 antenna is selected the installation of the Phantom Filter to the antenna should be made as illustrated in Figure 1. If a side cowl type (A27 or A28) is selected the installation should be made as shown in Figure 2. Each antenna package has included in it detailed information as to the size and location of mounting holes.



INSIDE TRIM CARDBOARD
3/16 DIA 3-HOLES
BODY UNDER CAR HOOD
CAR HOOD
PHANTOM FILTER MAY ALSO BE MOUNTED ON UPPER ANTENNA BRACKET IF DESIRED
SCRAPE PAINT WHERE PHANTOM FILTER IS MOUNTED TO LOWER ANTENNA BRACKET
3/16 DIA 3-HOLES TO MOUNT BRACKET
TO RADIO
3/8 DIA HOLE FOR ANTENNA WIRE

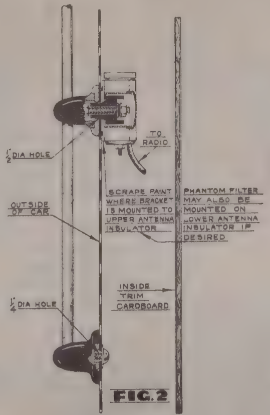
FIG. 1

INSTALLATION:

This receiver may be installed by securing it to the instrument panel of the car with the screws supplied in the hardware package. The rear end of the radio is supported by a perforated mounting bracket which may be bent to fit any installation requirement.

Illustrations in Figure 3 are representative of an average installation. Precaution should be taken, however, that the radio, when installed, does not interfere with the operation of the brake, clutch, cowl vent or emergency brake lever, and ample room for future installation for an Arvin Hot Water Heater should be allowed.

Ford V8 automobiles built in 1938 and 1939 require a special installation which is illustrated in Figure 4. The necessary spacer for this installation is included in the packing list. In installations other than the Ford V8 this spacer may be found useful in spacing away from the lip of the instrument panel one side of the radio (where the lip of the instrument panel is not horizontal). In this case the spacer may be cut to the proper length with a hack saw. The spacer may also be cut into two equal lengths and used to space the entire front portion of the radio down from the lip of the instrument panel in order to avoid a projection of some sort such as a toggle switch.



1/2 DIA HOLE
TO RADIO
OUTSIDE OF CAR
SCRAPE PAINT WHERE BRACKET IS MOUNTED TO UPPER ANTENNA INSULATOR
PHANTOM FILTER MAY ALSO BE MOUNTED ON LOWER ANTENNA INSULATOR IF DESIRED
INSIDE TRIM CARDBOARD
1/4 DIA HOLE

FIG. 2

The two front mounting bolts are 1¼ inches long to permit the Ford V8 installation shown in Figure 4. For other installations such as shown in Figure 3 these bolts may be cut down to ¾ inches if desired to facilitate installation.

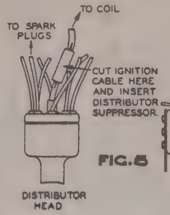
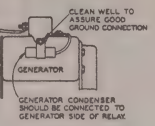
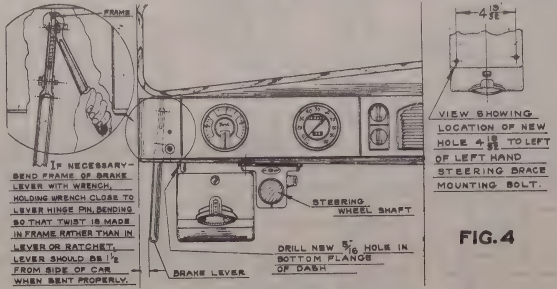


FIG. 5



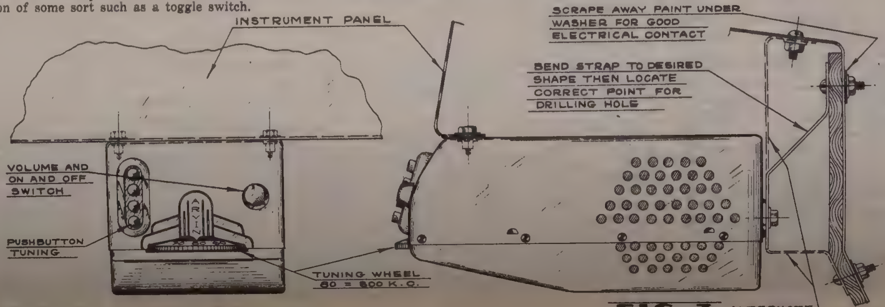
CLEAN WELL TO ASSURE GOOD GROUND CONNECTION
GENERATOR
GENERATOR CONDENSER SHOULD BE CONNECTED TO GENERATOR SIDE OF RELAY.

FIG. 6



FRAME
IF NECESSARY-BEND FRAME OF BRAKE LEVER WITH WRENCH, HOLDING WRENCH CLOSE TO LEVER HINGE PIN, BENDING SO THAT TWIST IS MADE IN FRAME RATHER THAN IN LEVER OR RATCHET. LEVER SHOULD BE 1½ FROM SIDE OF CAR WHEN BENT PROPERLY.
BRAKE LEVER
STEERING WHEEL SHAFT
DRILL NEW 5/16 HOLE IN BOTTOM FLANGE OF DASH
4 13/32
VIEW SHOWING LOCATION OF NEW HOLE 4 13/32 TO LEFT OF LEFT HAND STEERING BRACE MOUNTING BOLT.

FIG. 4



INSTRUMENT PANEL
VOLUME AND ON AND OFF SWITCH
PUSHBUTTON TUNING
ARVIN
TUNING WHEEL 60 = 600 K.C.
SCRAPE AWAY PAINT UNDER WASHER FOR GOOD ELECTRICAL CONTACT
BEND STRAP TO DESIRED SHAPE THEN LOCATE CORRECT POINT FOR DRILLING HOLE
ALTERNATE

FIG. 3

MOTOR INTERFERENCE ELIMINATION:

(See Fig. 5 & 6)

If after following the installation instructions in detail objectionable motor noise is encountered the following interference elimination procedure should be followed.

A standard distributor suppressor must be installed in series with the center high tension coil lead as close to the distributor as possible. This suppressor is not used with Ford V8 automobiles.

The generator condenser should be installed on the car generator as illustrated and the ammeter condenser should be connected between the ammeter or ignition switch terminal and the grounded metal instrument panel.

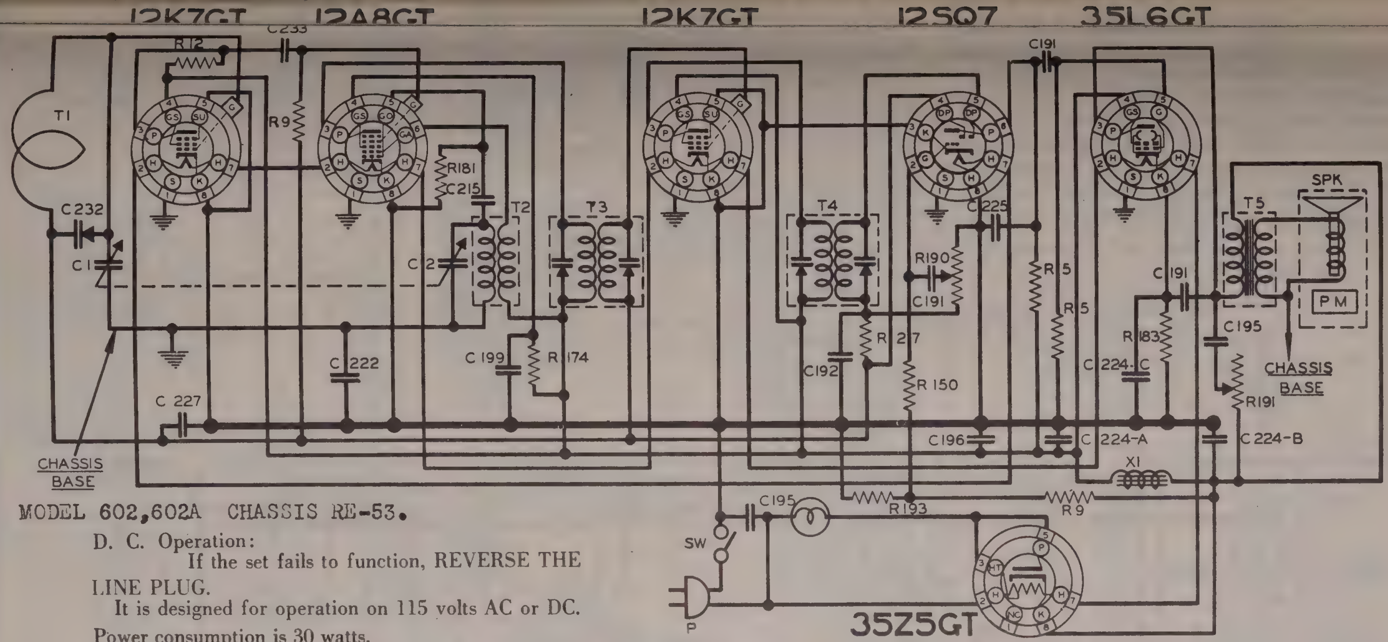
This interference elimination material can be obtained from your local Arvin Jobber.

The "A" lead from the receiver should be connected to the ammeter terminal of the car or to some other convenient point such as the ignition switch terminal in the Ford V8.

NOTE;-This data also applies to the
PUSH BUTTON MODEL 610 CHASSIS RE-58. ANTENNA DATA ALSO APPLIES TO MODELS 710 810

NOBLITT-SPARKS INDUSTRIES, INC

MODELS 602,602A
Chassis RE-53
Schematic,Alignment



MODEL 602,602A CHASSIS RE-53.

D. C. Operation:
If the set fails to function, REVERSE THE LINE PLUG.

It is designed for operation on 115 volts AC or DC.

Power consumption is 30 watts.

RESISTORS

R	OHM	W	PART NO
5	500K	1/4	17-2070
9	1M	1/4	17-2080
12	10K	1/4	17-4275
27	2M	1/4	17-4788
150	5M	1/4	17-14242
174	20K	1/4	17-14291
181	100K	1/4	17-14303
183	150	1/4	17-14316
190	1M	V.C.	17-14333
191	100K	T.C.	17-14334
193	2K	1/4	17-14337

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16411
2	VARIABLE		
191	.01	400	17-14272
192	.00025	600	17-14273
195	.05	400	17-14276
196	.1	200	17-14277
199	.02	200	17-14283
215	.0001	600	17-14310
222	.2	400	17-14317
224A	10 MFD.	150	17-14319
224B	20 MFD.	150	
224C	10 MFD.	15	
225	.0005	600	17-14321
227	.05	200	17-14323
232	2-20 UUF	PAD	17-14335
233	.000035	600	17-14336

TRANSFORMERS & CHOKES

T	TRANSFORMER	PART NO.
1	ANTENNA LOOP	17-16426
2	OSCILLATOR COIL	00-16404
3	FIRST I.F. COIL	00-16405
4	SECOND I.F. COIL	00-16406
5	OUTPUT TRANS.	00-16470
X	CHOKE	
1	IRON CORE CHOKE	00-16424

MISCELLANEOUS UNITS

SYMBOL	MISCELLANEOUS UNITS	PART NO.
L	DIAL LIGHT BULB - MAZDA 47	17-16378
P	LINE CORD & PLUG ASSEMBLY	17-16336
SPK	PERMANENT MAGNET SPEAKER	17-16408
SW	LINE SWITCH (SEE VOLUME CONTROL)	17-14333

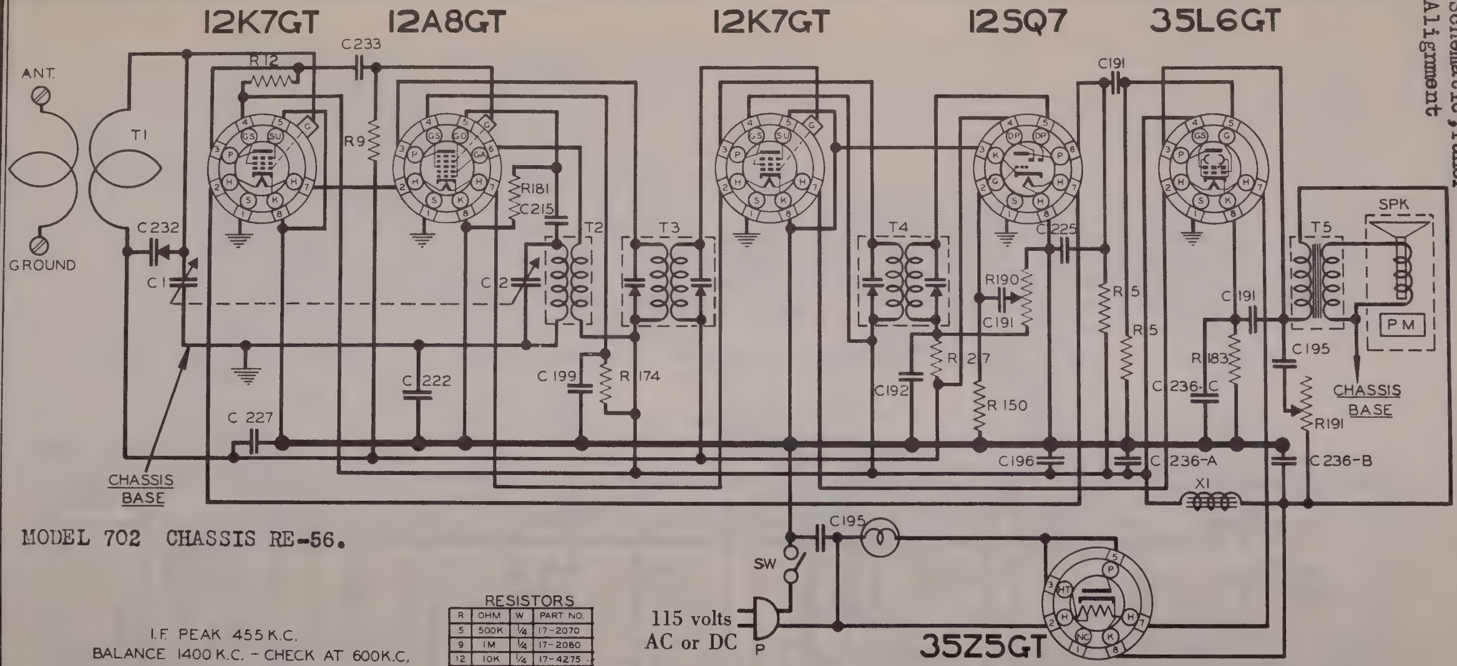
I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.

NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

Part No. 29-3278

MODEL 702
Chassis RE-56
Schematic, Tuner
Alignment

NOBLITT-SPARKS INDUSTRIES, INC.



MODEL 702 CHASSIS RE-56.

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.

Power consumption is 30 watts.

RESISTORS

R	OHM	W	PART NO.
5	500K	1/4	17-2070
9	1M	1/4	17-2080
12	10K	1/4	17-4275
27	2M	1/4	17-4788
150	5M	1/4	17-14242
174	20K	1/4	17-14291
181	100K	1/4	17-14303
183	150	1/4	17-14316
190	1M	V.C	17-16521
191	100K	T.C.	17-16520

MISCELLANEOUS UNITS

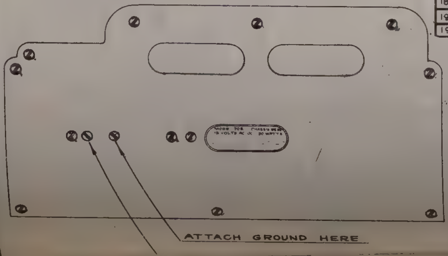
SYMBOL	MISCELLANEOUS UNITS	PART NO.
L	DIAL LIGHT BULB - MAZDA 47	17-16378
P	LINE CORD & PLUG ASSEMBLY	17-16336
SPK	PERMANENT MAGNET SPEAKER	17-16516
SW	LINE SWITCH (SEE VOLUME CONTROL)	17-16521

CONDENSERS

C	CAPACITY	VOLT	PART NO.	
1	TWO-GANG		17-16513	
2	VARIABLE			
191	.01	400	17-14272	
192	.00025	600	17-14273	
195	.05	400	17-14276	
196	.1	200	17-14277	
199	.02	200	17-14283	
215	.0001	500	17-14310	
222	.2	400	17-14317	
236A	20 MFD.	150	17-14344	
236B	40 MFD.	150		
236C	20 MFD.	25		
225	.0005	600	17-14321	

TRANSFORMERS & CHOKES

T	TRANSFORMER	PART NO.
1	ANTENNA LOOP	00-16530
2	OSCILLATOR COIL	00-16404
3	FIRST I.F. COIL	00-16531
4	SECOND I.F. COIL	00-16532
5	OUTPUT TRANS.	00-16533

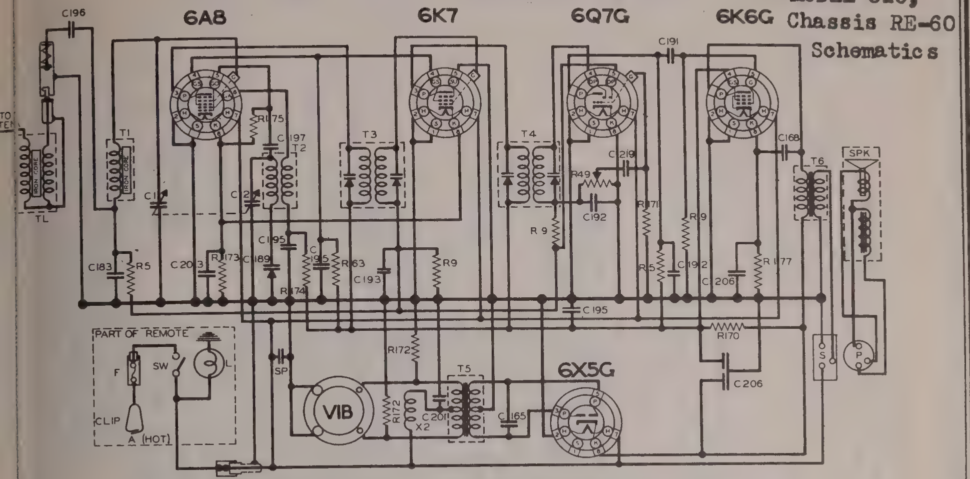


Push Button Adjustment:

Any button may be set up for any station desired. First, tune in the desired station by means of the manual tuning control. Second, turn the push button counter-clockwise two full turns. Then depress this button the full length of its stroke, and while depressed, tighten the button again by turning it clockwise. The button may now be released. To check the correct setting for this button, turn the manual control to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence [illegible] remaining buttons may be set to other stations in a like manner.

MODEL 710,
Chassis RE-59
MODEL 810,
Chassis RE-60
Schematics

NOBLITT-SPARKS INDUSTRIES, INC.
ARVIN CAR RADIO CHASSIS RE59



ARVIN MODEL 710 CAR RADIO

RESISTORS			
R	OHMS	W	PART NO
5	500K	¼	17 2070
9	1M	¼	17-2080
49	500K	VC	17-14536
63	25K	¼	17-14091
170	800	1	17-14287
171	15M	¼	17-14288
172	100	¼	17-14289
173	200	¼	17-14290
174	20K	¼	17-14291
175	40K	¼	17-14292
177	650	¼	17-14296

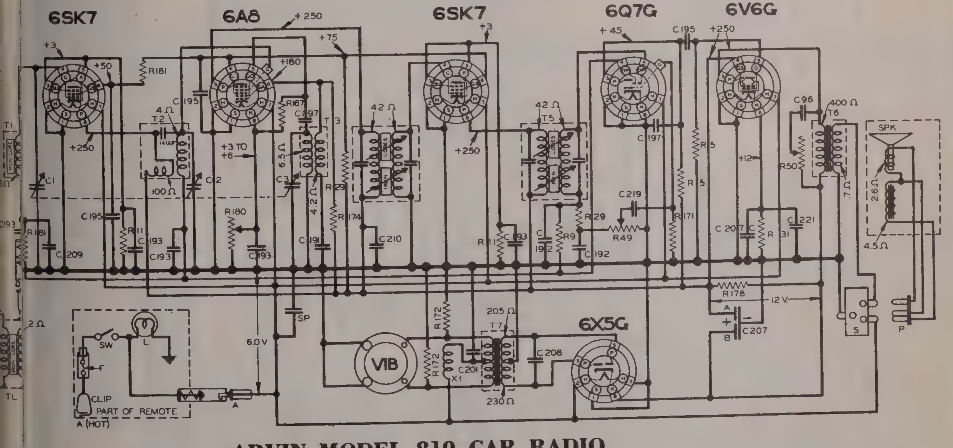
CONDENSERS			
C	CAPACITY	VOLT	PART NO
1	TWO-GANG		29-16254
2	VARIABLE		
165	.005	1200	17-14230
183	.003	600	17-14294
189	.0005	PAD	17-14266
191	.01	400	17-14272
192	.00025	600	17-14273
193	.05	200	17-14274
195	.05	400	17-14276
196	1	200	17-14277
197	.0001	600	17-14278
219	.003	200	17-14312
201	.5	150	17-14285
203	2	200	17-16242
206	10-10MFD.	300	17-14297
206	20MFD.	15	
168	.002	400	17-14234

CHOKES & TRANSFORMERS		
T-X	TYPE	PART NO
1	ANTENNA COIL	00-16219
2	OSCILLATOR COIL	00-16220
3	FIRST I F COIL	00-16283
4	SECOND I F COIL	00-16284
5	POWER TRANS.	00-16285
6	OUTPUT TRANS	00-16266
X	CHOKES	
2	SUPPRESSION CHOKE	29-13459

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
F	FUSE - 20 AMP	17-2228
L	DIAL LIGHT BULB - MAZDA NO 51	17-13904
P	SPEAKER PLUG	17-4760
S	SPEAKER SOCKET	17-15631
SPK	SPEAKER ASSEMBLY	17-16517
SW	POWER SWITCH	———
TL	TRANSMISSION LINE	00-6233
SP	SPARK PLATE	———
VIB	VIBRATOR	17-14747

I.F. PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

ARVIN CAR RADIO CHASSIS RE-60



ARVIN MODEL 810 CAR RADIO

NOTE - ALL VOLTAGES GIVEN
FOR "A" INPUT OF 6 VOLTS.
ALLOW ± 10% ON ALL
VOLTAGES & RESISTANCES
OF WINDING.

RESISTORS.			
R	OHMS	W	PART NO
5	500K	¼	7 2070
9	1M	¼	17-2080
11	2K	¼	17-4202
29	50K	¼	17 2080
31	200	½	17 2088
49	500K	V.C.	17 14536
50	100K	T.C.	17-14503
167	80K	¼	17-14281
171	15M	¼	17-14288
174	20K	¼	17 142[illegible]
178	1200	1	7-14286
172	100	¼	17 14289
180	2000	VAR	17 14302
181	100K	¼	17-14303

CONDENSERS			
C	CAPACITY	VOLT	PART NO
1	THREE-		17-15726
2	GANG		
3	VARIABLE		
96	.05	600	7-14121
10-	.01	200	17-4206
19	.01	400	7-14272
192	.00025	600	7 14273
193	.05	200	17 4274
19[illegible]	.05	400	17 14276
97	.0001	600	17 14278
201	.5	.50	17-142[illegible]
20 A	10 MFD	400	17-14299
20 B	10 MFD	400	
207C	20MFD	25	
208	.005	600	17-14300
209	.001/25	600	17-14305
210	1	400	17 14304
221	.0002	600	17-14314
219	.003	200	17-14312

CHOKES & TRANSFORMERS		
T X	TYPE	PART NO
T	TRANSFORMERS	
1	ANTENNA COIL	00-16300
2	R F COIL	00-16301
3	OSCILLATOR COIL	00-16302
4	FIRST I F COIL	00-16303
5	SECOND I F COIL	00-16304
6	OUTPUT TRANS	00-16305
7	POWER TRANS	00-6306
X	CHOKES	
1	SUPPRESSION CHOKE	29-16308

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
F	FUSE 20 AMP	17-2228
L	DIAL LIGHT BULB - MAZDA NO. 51	17-13904
P	SPEAKER PLUG	17-4760
S	SPEAKER SOCKET	17-15631
SPK	SPEAKER ASSEMBLY	17-16310
SW	POWER SWITCH	
SP	SPARK PLATE	
TL	TRANSMISSION LINE	00-16307
VIB	VIBRATOR	17-14747

INTERMEDIATE FREQUENCY 170 K.C
FREQUENCY RANGE 1570 TO 540 K.C
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

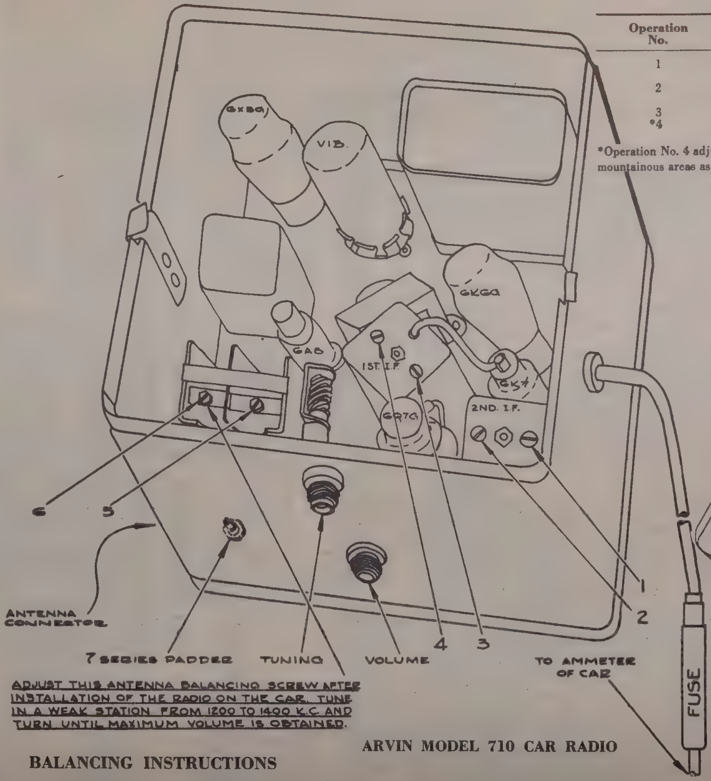
NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN MODEL 810 CAR RADIO

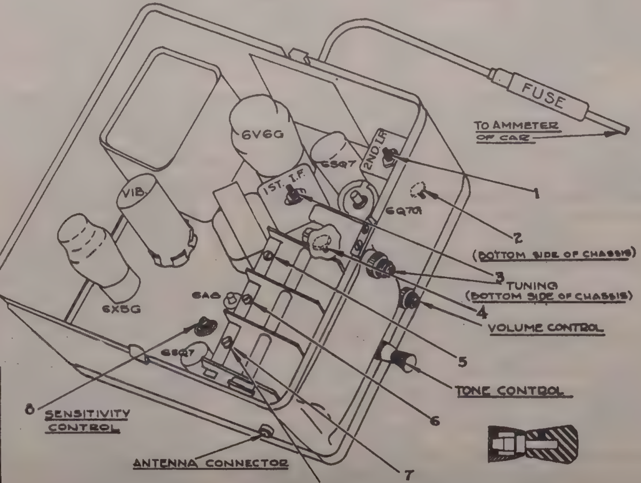
All sensitivities given for 1 watt output equals 1.73 V. across speaker Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	170 kc	1, 2, 3 & 4	Condenser Closed	700 uv
2	Ant. Coupler Through 20 uuf	1570 kc	5	Condenser Open	......
3	Through 20 uuf	1400 kc	6 & 7	1400 kc	5 uv
*4	Through 20 uuf	600 kc	8	600 kc	3.5 uv

*Operation No. 4 adjusts bias on 6A8 to obtain 5 uv sensitivity; for metropolitan areas this sensitivity may be set as low as 10 uv. and in mountainous areas as high as 1 uv. to secure the most satisfactory reception.



ADJUST THIS ANTENNA BALANCING SCREW AFTER INSTALLATION OF THE RADIO ON THE CAR. TUNE IN A WEAK STATION FROM 1200 TO 1400 K.C. AND TURN UNTIL MAXIMUM VOLUME IS OBTAINED.



ADJUST THIS ANTENNA BALANCING SCREW AFTER INSTALLATION OF THE RADIO ON THE CAR. TUNE IN A WEAK STATION FROM 1200 TO 1400 K.C. AND TURN UNTIL MAXIMUM VOLUME IS OBTAINED.

ARVIN MODEL 710 CAR RADIO

BALANCING INSTRUCTIONS

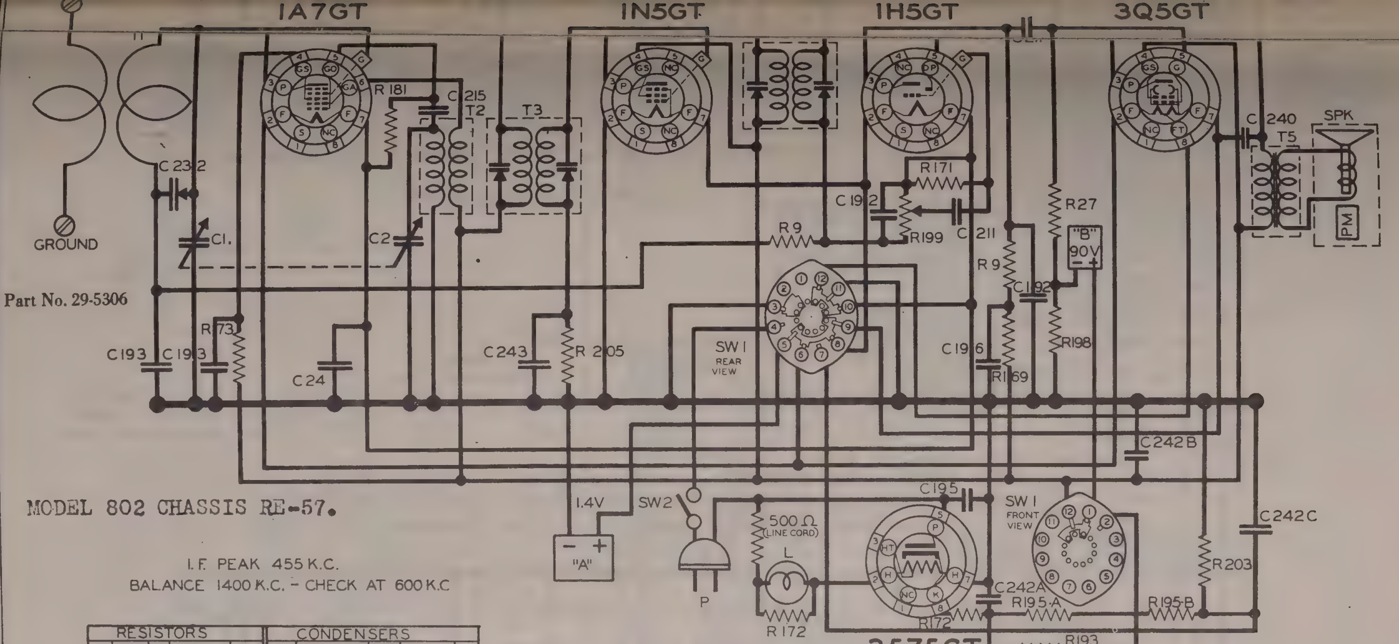
All sensitivities given for ½ watt output equals 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455 kc	1, 2, 3 & 4	550 kc	50 uv
2	Ant. Coupler Through 20 uuf	1400 kc	5	1400 kc	
3	Through 20 uuf	1400 k			10 uv

FOR ANTENNA DATA

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 802
Chassis RE-57
Schematic,



MODEL 802 CHASSIS RE-57.

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C

RESISTORS				
R	OHM	W	PART NO.	
9	1M	¼	17-2080	
27	2M	¼	17-4788	
73	30K	¼	17-4276	
169	150K	¼	17-14282	
171	15M	¼	17-14288	
172	100	¼	17-14289	
181	100K	¼	17-14303	
195A	460	2¾	17-14351	
195B	1500	5¼		
198	400	¼	17-14343	
199	1M	V.C.	17-14350	
203	450	¼	17-14354	
193	2K	¼	17-14337	
205	3M	¼	17-14356	

CONDENSERS				
C	CAPACITY	VOLT	PART NO.	
1	TWO-GANG		17-16411	
2	VARIABLE			
192	.00025	600	17-14273	
193	.05	200	17-14274	
195	.05	400	17-14276	
196	.1	200	17-14277	
211	.01	200	17-14306	
215	.0001	600	17-14310	
24	.5	200	17-14040A	
232	2-20 UUF	PAD	17-14335	
240	.003	400	.7-14348	
242A	40	150	17-14353	
242B	20	150		
242C	100	25		
243	.002	200	17-14357	

TRANSFORMERS			
T	TYPE	PART NO.	
1	ANTENNA LOOP	17-16551	
2	OSCILLATOR COIL	00-16404	
3	FIRST I.F.	00-16578	
4	SECOND I.F. COIL	00-16579	
5	OUTPUT TRANS	00-16566	

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
A	1.5 VOLT "A" BATTERY	17-16563
B	TWO 45 VOLT "B" BATTERIES	17-16562
L	DIAL LIGHT BULB - MAZDA 47	17-16378
P	LINE CORD & PLUG ASSEMBLY	17-16492
SPK	SPEAKER ASSEMBLY - 5" PERMANENT MAGNET	17-16502
SW1	AC DC - BATTERY SWITCH	17-16584
SW2	VOLUME CONTROL & LINE SWITCH	17-14350

NOTE - CHANGE OVER SWITCH SHOWN IN BATTERY OPERATION POSITION.

The Arvin Model 802 is a five-tube Portable Radio Receiver designed to receive its operating power from either the self contained batteries in the receiver or a 115 volt AC or DC circuit.

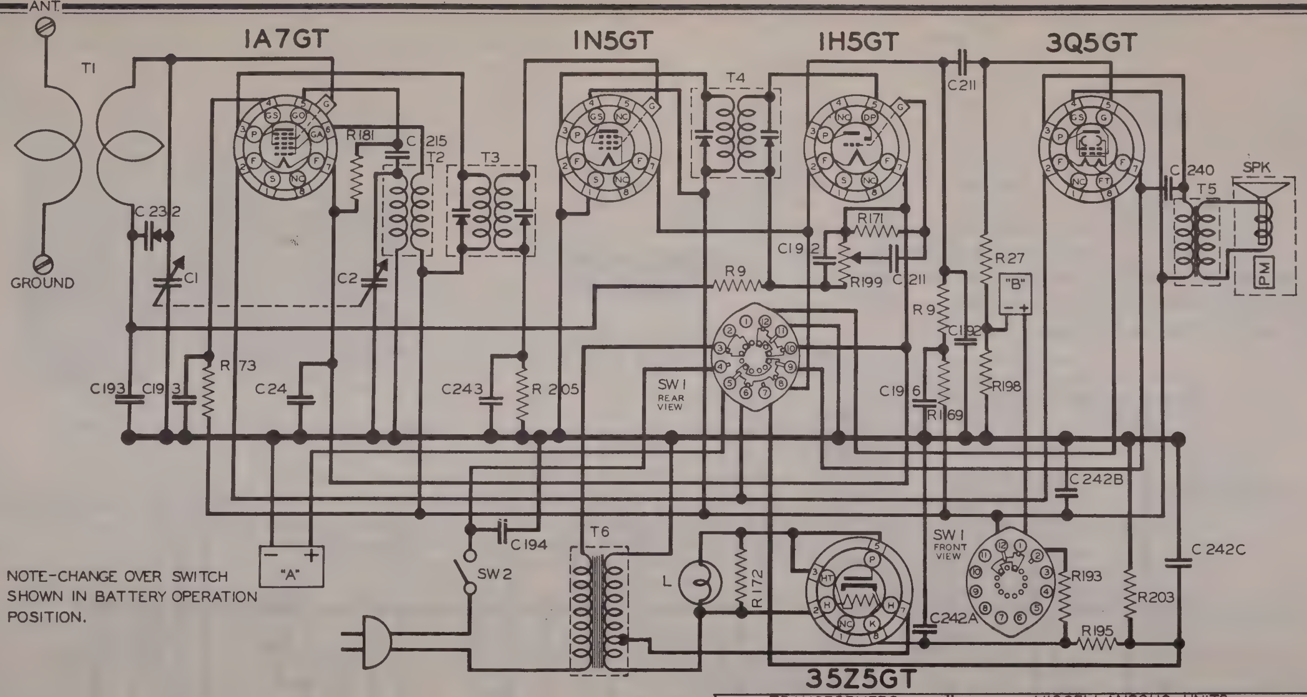
BALANCING INSTRUCTIONS

All sensitivities given for 50 milliwatts output = .4 volts across Voice Coil.

Operation No.	Connect Bal. Oscillator to	Balance Oscillator Frequency	Adjust	Dial Setting
1	1A7 Grid	455 kc	1st & 2nd I. F. Trimmers	550 kc
2	Ant Post Through 20 uuf	1400 kc	Osc. Trimmer	1400 kc
3	Ant Post Through 20 uuf	1400 kc	Ant Trimmer	1400 kc

MODEL 803
Chassis RE-63
Schematic,Alignment

NOBLITT-SPARKS INDUSTRIES, INC.



NOTE-CHANGE OVER SWITCH SHOWN IN BATTERY OPERATION POSITION.

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC., COLUMBUS, INDIANA.

TRANSFORMERS			
T	TYPE	PART NO	
1	ANTENNA LOOP	17-16551	
2	OSCILLATOR COIL	00-16404	
3	FIRST I.F. COIL	00-16578	
4	SECOND I.F COIL	00-16579	
5	OUTPUT TRANS.	00-16615	
6	POWER TRANS.	00-16606	

MISCELLANEOUS UNITS			
SYMBOL	DESCRIPTION	PART NO.	
A	1.5 VOLT "A" BATTERY	17-16563	
B	TWO 45 VOLT "B" BATTERIES	17-16562	
L	DIAL LIGHT BULB - MAZDA 47	17-16378	
P	LINE CORD & PLUG ASSEMBLY	17-16623	
SPK	SPEAKER ASSEMBLY - 5" P.M.	17-16613	
SW1	AC-DC BATTERY SWITCH	17-16564	
SW2	VOLUME CONTROL & LINE SWITCH	17-14350	

RESISTORS				
R	OHM	W	PART NO.	
9	1M	1/4	17-2080	
27	2M	1/4	17-4788	
73	30K	1/4	17-4276	
169	150K	1/4	17-14282	
171	15M	1/4	17-14288	
172	100	1/4	17-14289	
181	100K	1/4	17-14303	
193	2K	1/4	17-14337	
195	1960	8	17-14351	
198	400	1/4	17-14343	
203	450	1/4	17-14354	

CONDENSERS				
C	CAPACITY	VOLT	PART NO.	
1	TWO-GANG		17-16549	
2	VARIABLE			
24	.5	200	17-14040A	
192	.00025	600	17-14273	
193	.05	200	17-14274	
194	.01	400	17-14275	
196	.1	200	17-14277	
211	.01	200	17-14306	
215	.0001	600	17-14310	
232	2-20 [illegible]	PAD	17-1433[illegible]	
242A	40 MFD	150		

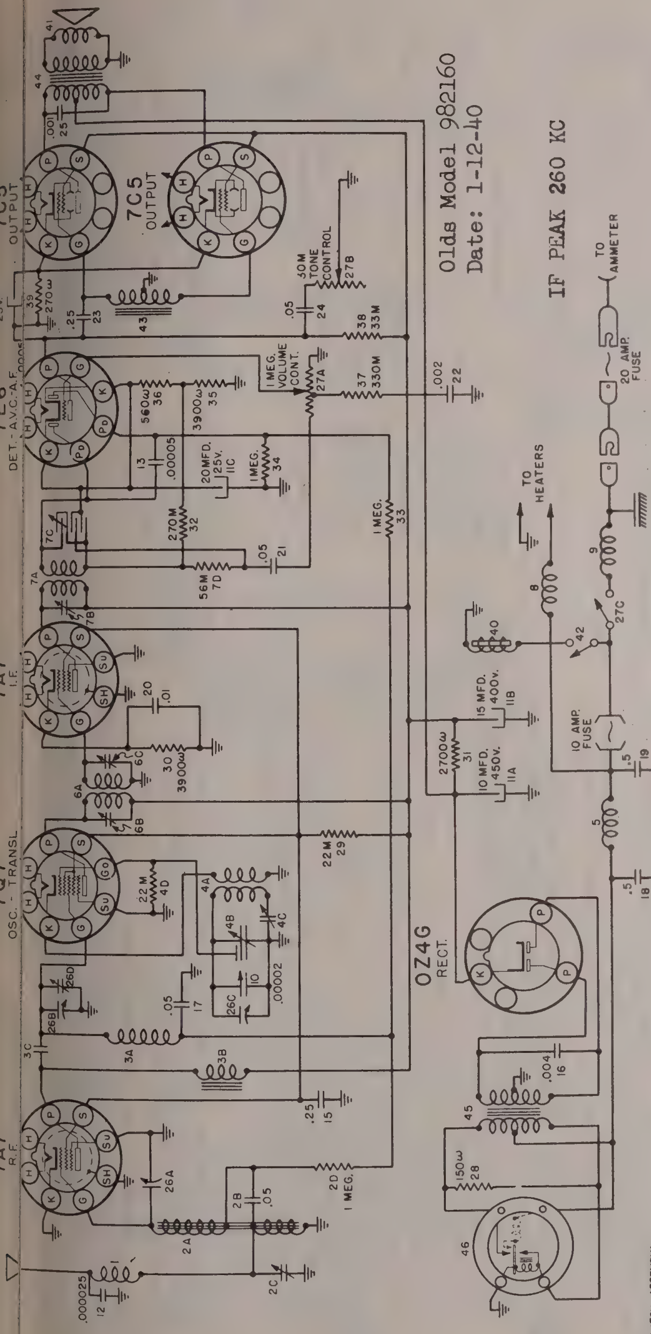
BALANCING INSTRUCTIONS

All sensitivities given for 50 milliwatts output = .4 volts across Voice Coil.

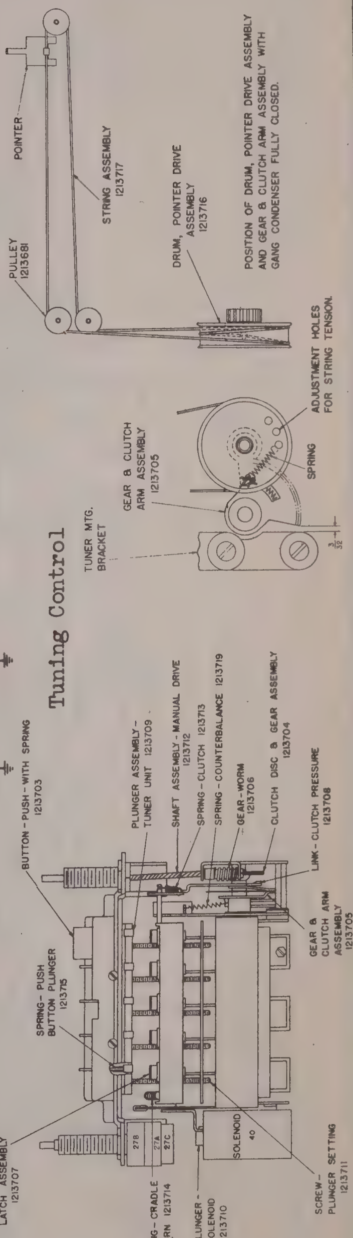
Operation No.	Connect Bal. Oscillator to	Balance Oscillator Frequency	Adjust	Dial Setting
1	1A7 Grid	455 kc	1st & 2nd I. F. Trimmers	550 kc
2	Ant Post	1400 kc	Osc. Trimmer	1400 k

OLDSMOBILE DIV.—GEN. MOTORS

MODEL 982160
Schematic
Tuning Cont.Assembly



Tuning Control


POINTER
PULLEY 1213681
STRING ASSEMBLY 1213717
DRUM, POINTER DRIVE ASSEMBLY 1213716
POSITION OF DRUM, POINTER DRIVE ASSEMBLY AND GEAR & CLUTCH ARM ASSEMBLY WITH GANG CONDENSER FULLY CLOSED.
ADJUSTMENT HOLES FOR STRING TENSION.
SPRING
GEAR & CLUTCH ARM ASSEMBLY 1213705
TUNER MTG. BRACKET
3/32
BUTTON-PUSH-WITH SPRING 1213703
PLUNGER ASSEMBLY-TUNER UNIT 1213709
SHAFT ASSEMBLY-MANUAL DRIVE 1213712
SPRING-CLUTCH 1213713
SPRING-COUNTERBALANCE 1213719
GEAR-WORM 1213706
CLUTCH DISC & GEAR ASSEMBLY 1213704
LINK-CLUTCH PRESSURE 1213708
GEAR & CLUTCH ARM ASSEMBLY 1213705
SPRING-PUSH BUTTON PLUNGER 1213715
LATCH ASSEMBLY 1213707
SPRING-CRADLE RETURN 1213714
PLUNGER-SOLENOID 1213710
SOLENOID 40
SCREW-PLUNGER SETTING 1213711

MODEL 982160
Alignment, Trimmers
Chassis, Voltage

OLDSMOBILE DIV —GEN. MOTORS

CIRCUIT ALIGNMENT

1. IF (a) Turn volume control to the maximum position.
(b) Connect the signal lead of the test oscillator to terminal X which is the grid prong of the 7Q7 tube through a .1 mfd. condenser.
(c) Connect the ground lead of the test oscillator to the chassis frame.
(d) Connect the output meter across the speaker voice coil at the terminal board mounted on the speaker.
(e) Set the test oscillator to exactly 260 kilocycles.
(f) Adjust trimmers "A", "B", "C" and "D" on the I-F transformers for maximum output.

2. 1520 KC (a) Leave the test oscillator leads connected as for aligning the I-F circuits.
(b) Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
(c) Set the test oscillator to 1520 kilocycles.
(d) Adjust the condenser "F" (Fig. 2) for maximum output. (It is very important that this frequency be set accurately as a slightly improper setting will cause the receiver to be out of track over the high frequency end of the dial).

3. 540 KC (a) Leave the test oscillator leads connected the same as before.
(b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.
(c) Set the test oscillator to 540 kilocycles.
(d) Adjust the oscillator padding condenser "G" (Fig. 2) for maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.).

4. 1400 KC. (a) Remove the signal lead of the test oscillator from the grid terminal of the 7Q7 tube (Terminal marked X, Fig. 2) and connect to the antenna receptacle of the receiver THROUGH a .00007 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00007 mfd. mica condenser be used when aligning the antenna stage of this receiver in order that the circuit can be made to track properly.)
(b) Set the test oscillator to 1400 kilocycles.
(c) Turn the condenser rotor plates until this frequency is tuned in with maximum output.
(d) Adjust the R-F parallel trimmer "E" (Fig. 2) on the gang condenser and the antenna compensating condenser "H".

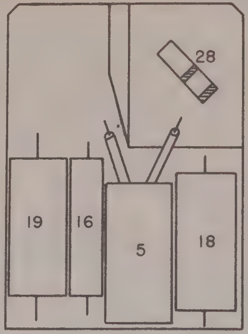
5 600 KC (a) Set the test oscillator at 600 K.C.
(b) Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.
(c) Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser "G" (Fig. 2) while rocking the variable condenser gang tuning shaft back and forth through the signal.
(d) This operation should be continued until no further increase in output can be obtained.

6. Adjusting Receiver to Car Antenna.

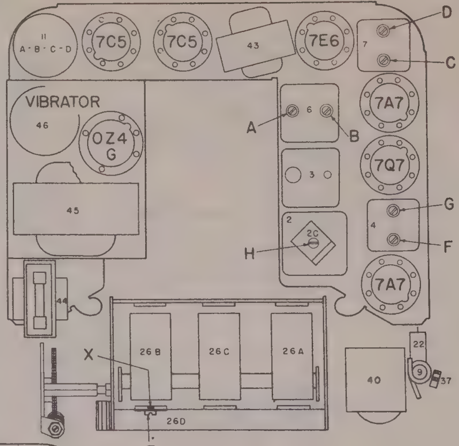
When the receiver leaves the factory the antenna circuit is closely aligned to match the capacity of the car antenna. However, due to variations in antenna capacity, it will be necessary with set installed in car, to adjust the antenna trimmer to match the car antenna. This should be done as follows:

(a) Make sure antenna lead is connected properly.
(b) Be sure the antenna is fully extended (all the way out).
(c) Turn set on and tune in a very weak station between 120 and 150 (near 150). Adjust the antenna trimmer "F" for maximum volume. Do not disturb the oscillator or the R-F trimmers in making this adjustment.

NOTE: If the entire alignment procedure has been accomplished accurately, the receiver should be very nearly uniformly sensitive over the entire frequency range.

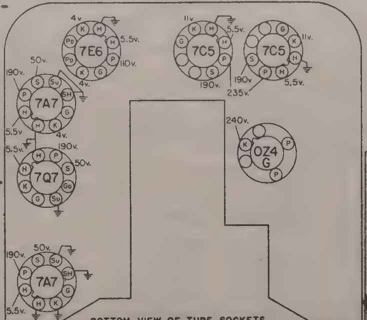


Bottom of Power Pack



Chassis Parts Layout - Top

Olds Model 982160
Date: 1-12-40

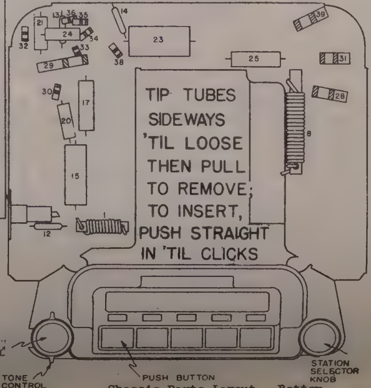


BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.5 AMPERES. "B" SUPPLY DRAIN APPROXIMATELY 50 M.A.

RADIO DATA

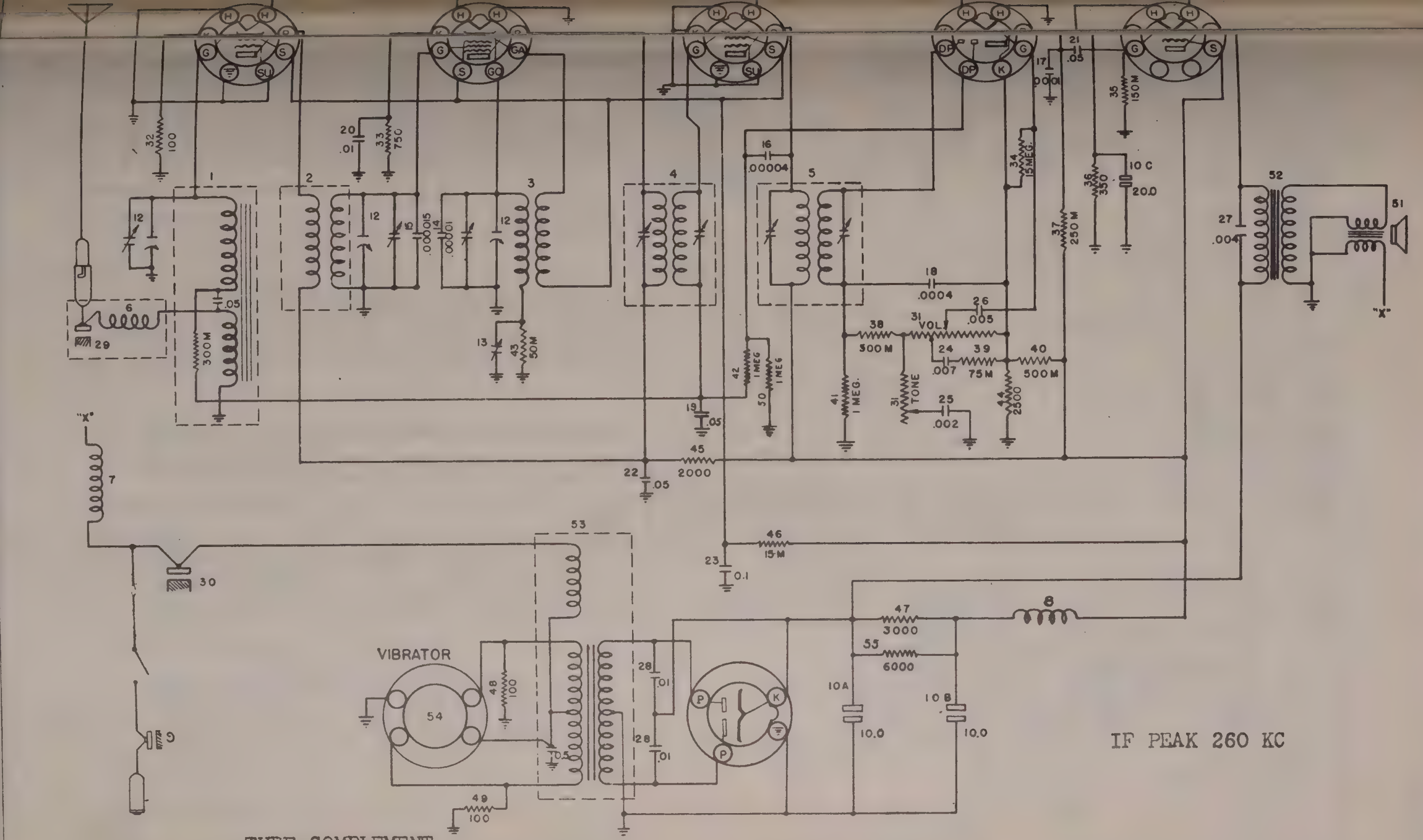
MODEL NUMBER - 982160
SERIAL NUMBER - 580 C001 & UP
TUBE COMPLEMENT - 7A7, 7Q7, 7A7, 7E6, 7C5, 7C5, 0Z4G
BATTERY CURRENT - 6.5 AMPERES
B + VOLTS - 240
I.F. K.C. - 260
R.F. K.C. - 1520 - 540
VIBRATOR TYPE NON SYNCHRONOUS
YEAR - 1940



Chassis Parts Layout - Bottom

MODEL 982161
Schematic

OLDSMOBILE DIV.—GEN. MOTORS



TUBE COMPLEMENT

Type	Function	Type	Function
7A7	R-F Amplifier	7B6	Detector AVC 1st Audio
7B8	Oscillator Modulator	7C5	Audio Power Output
7A7	I-F Amplifier	OZ4	Rectifier

Olds Model 982161
Date: 1-12-40

MODEL 982161
Alignment,Trimmers
Chassis,Voltage

OLDSMOBILE DIV.—GEN. MOTORS

CIRCUIT ALIGNMENT

An accurately calibrated test oscillator or signal generator and an output meter must be used to align the receiver circuits correctly. To make all alignment adjustments, the back cover must be removed. All trimmers except the oscillator series trimmer are readily accessible (See "A", "B", "C", "D", "F", Fig. 2). The oscillator series trimmer ("J2" Fig. 3) is adjusted through a hole in the side of the case.

1. I-F Alignment at 260 Kilocycles.

   (a) Connect an output meter across the speaker field coil, leaving speaker connected.
   (b) Connect the signal load of the test oscillator to the gang condenser terminal to which condenser No. 15 is connected (Fig. 2).
   (c) With the test oscillator set at exactly 260 K.C. adjust the I-F trimmers "A", "B", "C", and "D" until a maximum output is obtained. Re-check alignment several times with oscillator output signal low as possible for suitable output readings.

2. Alignment at 1560 Kilocycles.

   (a) Connect the test lead of the test oscillator to the receiver antenna connection through a .00005 mfd. condenser.
   (b) Turn the rotor plates of the gang condenser all the way out against the high frequency stop.
   (c) Set the test oscillator to 1560 K.C.
   (d) Adjust the oscillator trimmer "E" (Fig. 2)until a maximum output is obtained.

3. Alignment at 1400 Kilocycles.

   (a) Leave the test oscillator leads connected the same as for alignment at 1560 Kilocycles. Set the test oscillator frequency at 1400 kilocycles.
   (b) Tune the set to this signal.
   (c) Adjust the R-F trimmer "H" and the antenna trimmer "F" (Fig. 2) for maximum output.

4. Alignment at 600 Kilocycles.

   (a) Leave the test oscillator leads connected the same as for alignment at 1400 K.C. Set the test oscillator frequency at 600 K.C.
   (b) Tune set to this signal.
   (c) Adjust the oscillator series trimmer "J" (Fig. 3) through the side of the case for maximum output, while rocking the tuning dial back and forth through the signal.

5. Realignment at 1560 and 1400 Kilocycles.

Repeat alignment of R-F and antenna sections of the gang condenser as outlined under paragraphs 2 and 3.

6. Adjusting Receiver to Car Antenna.

When the receiver leaves the factory the antenna circuit is closely aligned to match the capacity of the car antenna. However, due to variations in antenna capacity, it will be necessary with set installed in car, to adjust the antenna trimmer to match the car antenna. This should be done as follows:

   (a) Make sure antenna lead is connected properly.
   (b) Be sure the antenna is fully extended (all the way out).
   (c) Turn set on and tune in a very weak station between 120 and 150 (near 150). Adjust the antenna trimmer "F" for maximum volume. Do not disturb the oscillator or the R-F trimmers in making this adjustment.

Olds Model 982161
Date: 1-12-40

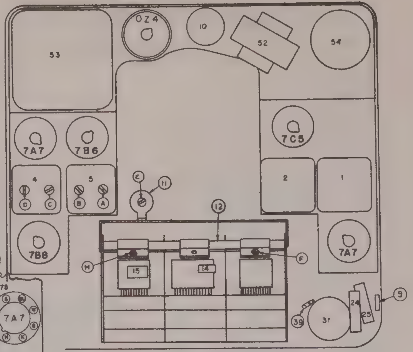


Fig. 2 Chassis Parts Layout - Top

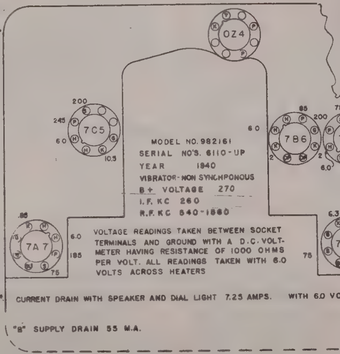
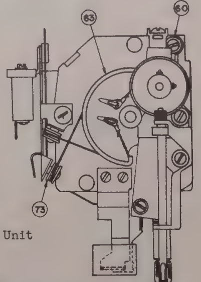
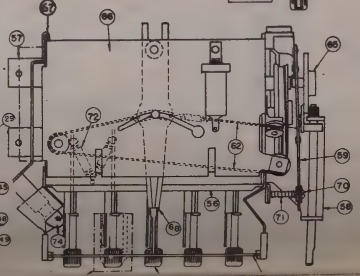
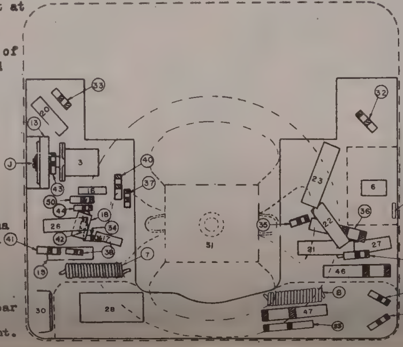


Fig. 4 Chassis Tube Voltage Chart



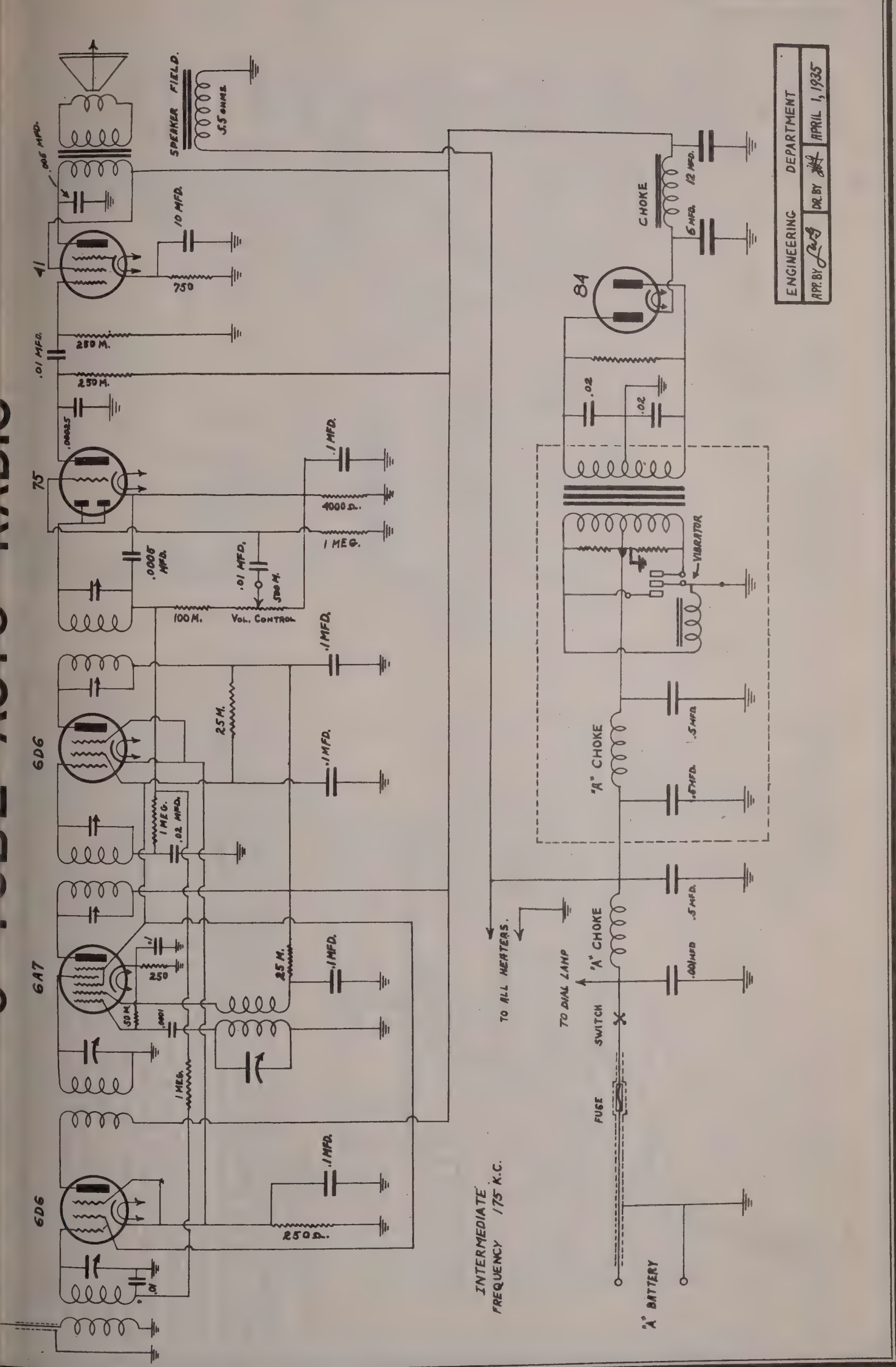
Tuning Control Unit





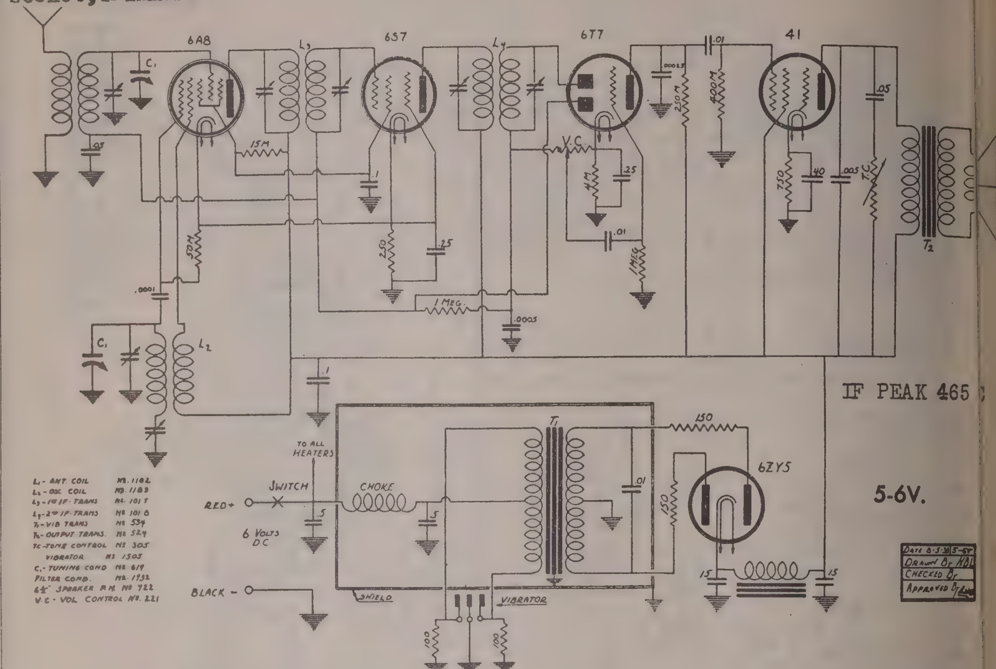
PACIFIC RADIO CORP.

MODEL 102, Early
Schematic

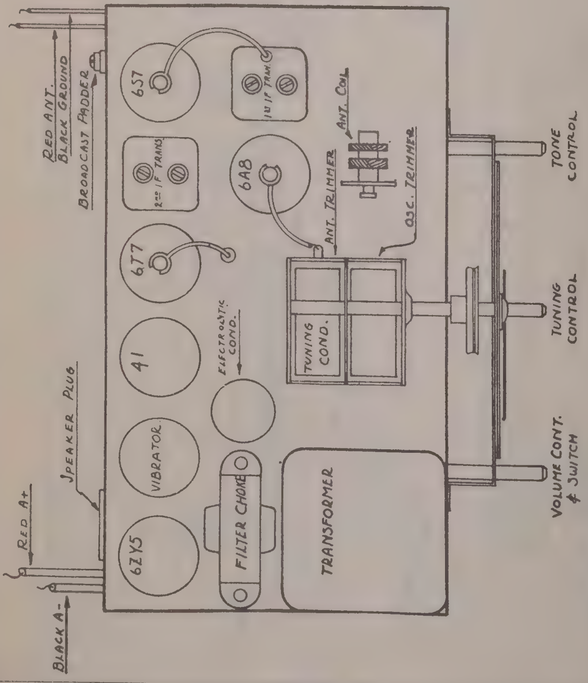


MODEL 301
Schematic, Alignment
Socket, Trimmers

PACIFIC RADIO CORP.



MODEL 301



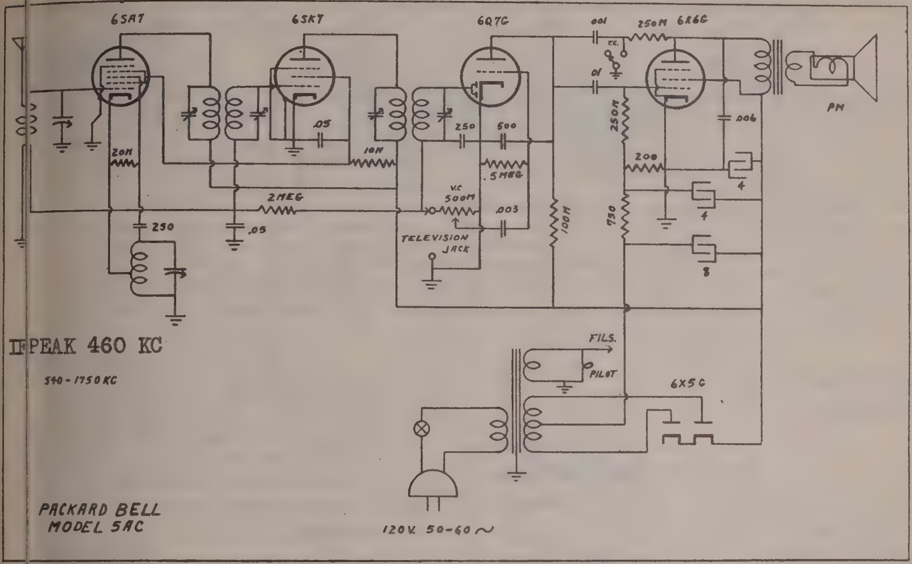
ALIGNMENT DATA

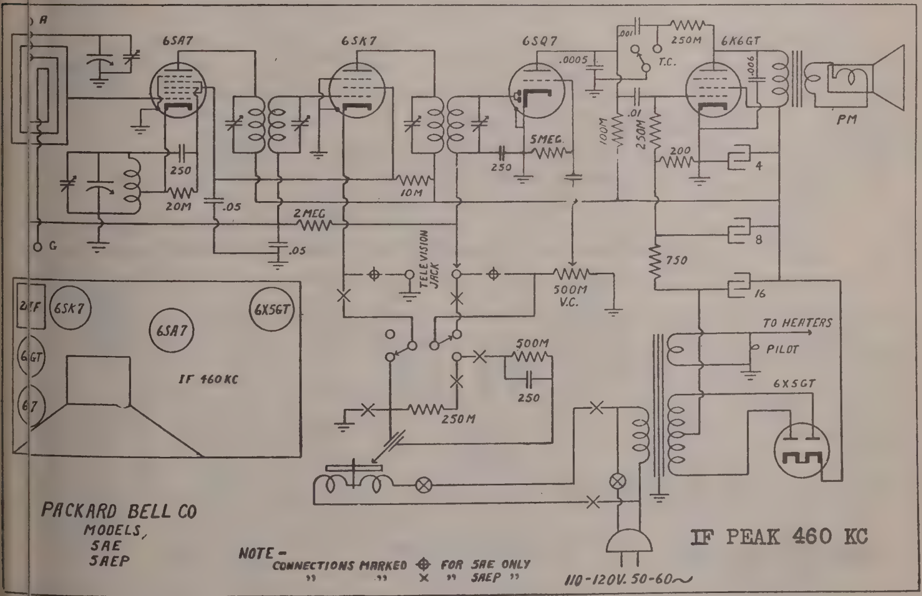
INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Reset the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC

PACKARD BELL CO.

MODEL 5AC
Schematic
MODELS 5AE,5AEP
Schematic,Socket

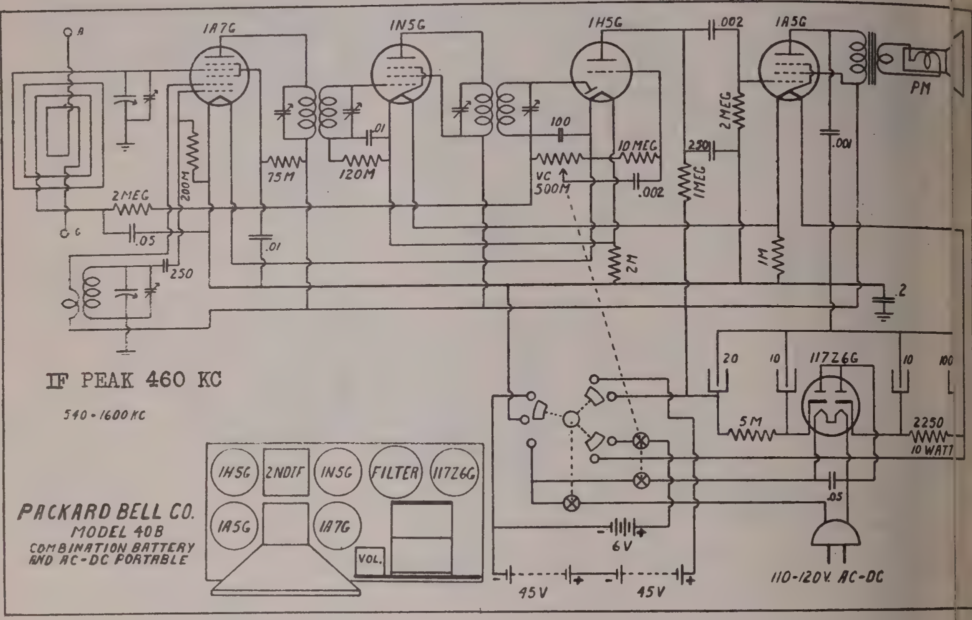


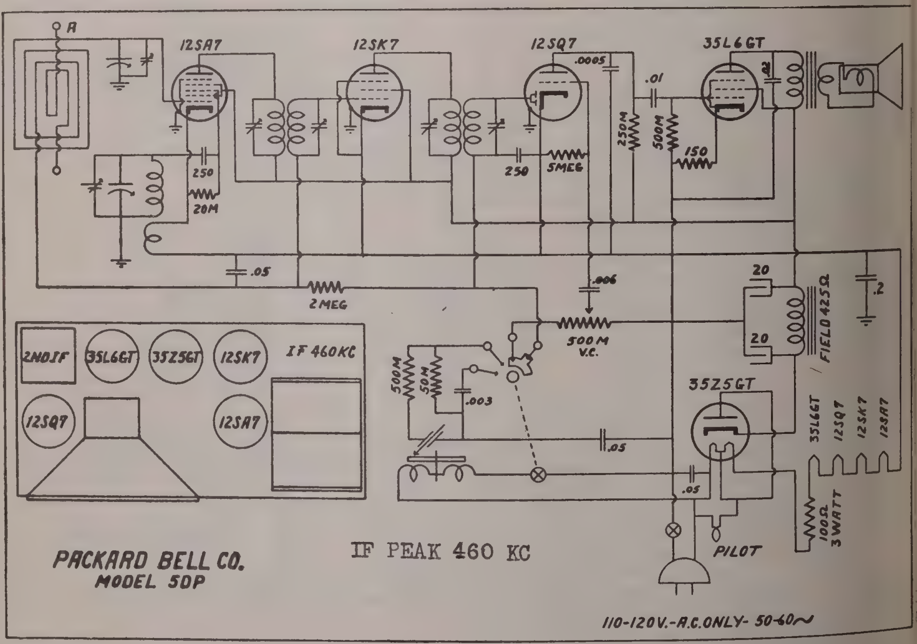


NOTE - CONNECTIONS MARKED ⊕ FOR 5AE ONLY
" " × " 5AEP "

MODEL 40B
MODEL 50P
Schematics, Socket

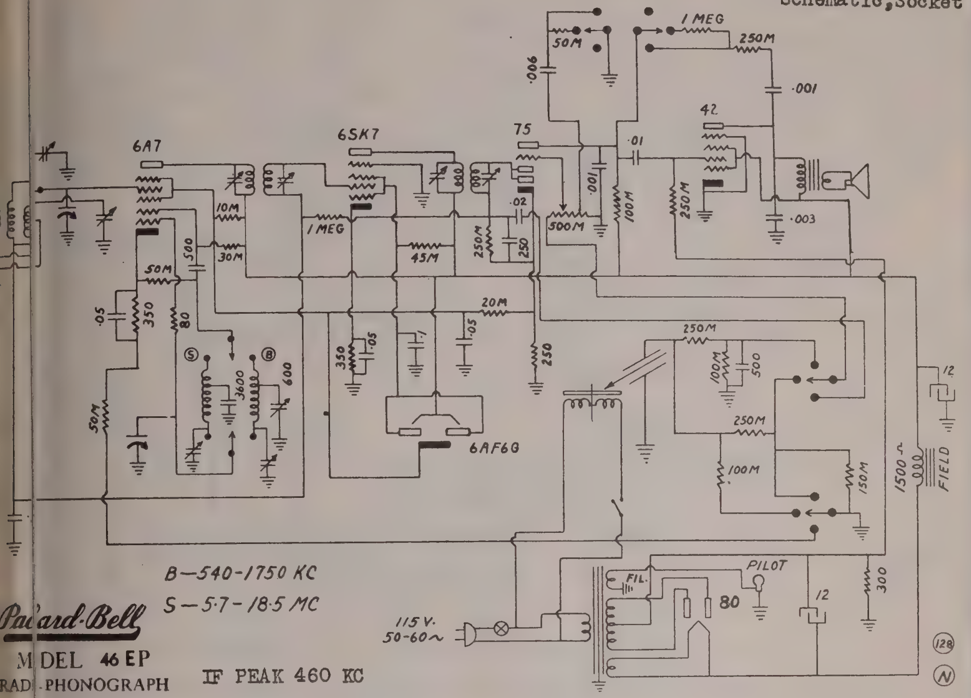
PACKARD BELL CO.





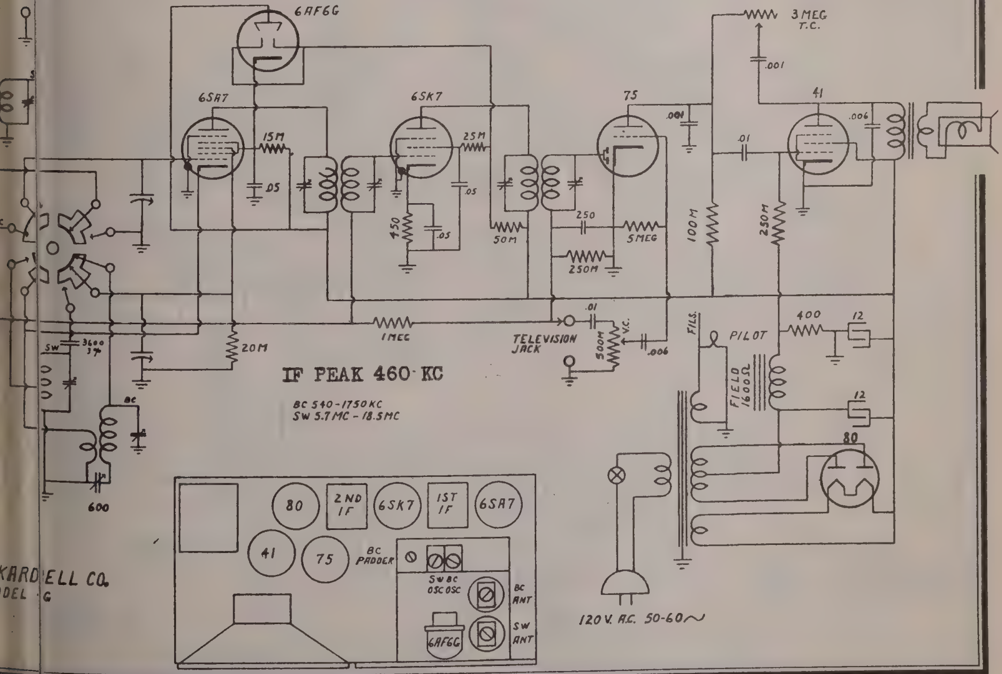
PACKARD BELL CO.

MODEL 46EP
Schematic
MODEL 46G
Schematic,Socket



Pa ard·Bell
M DEL 46 EP
RAD -PHONOGRAPH

IF PEAK 460 KC

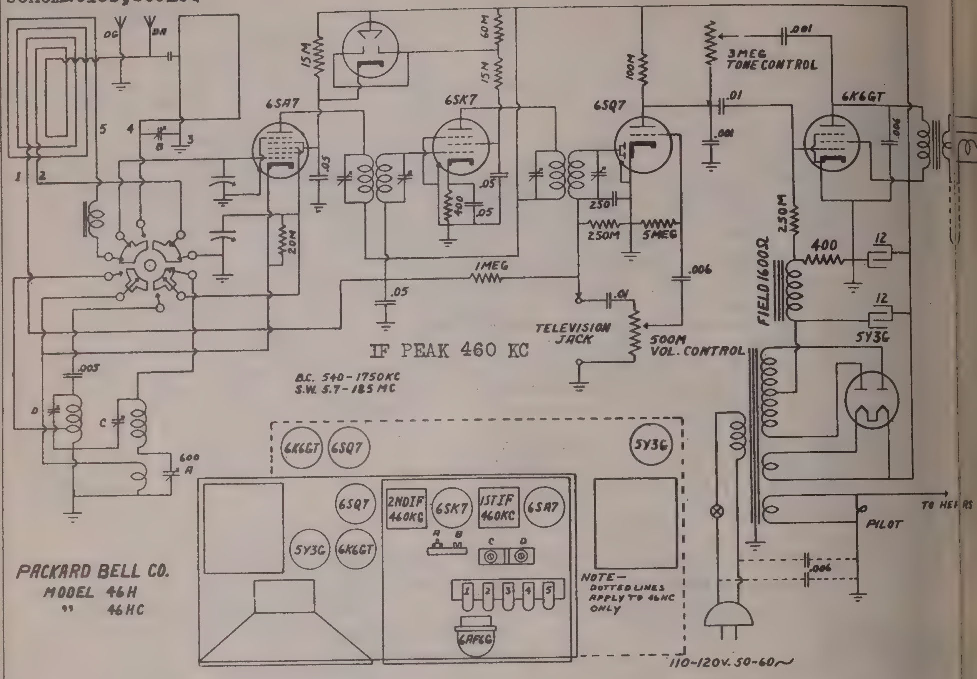


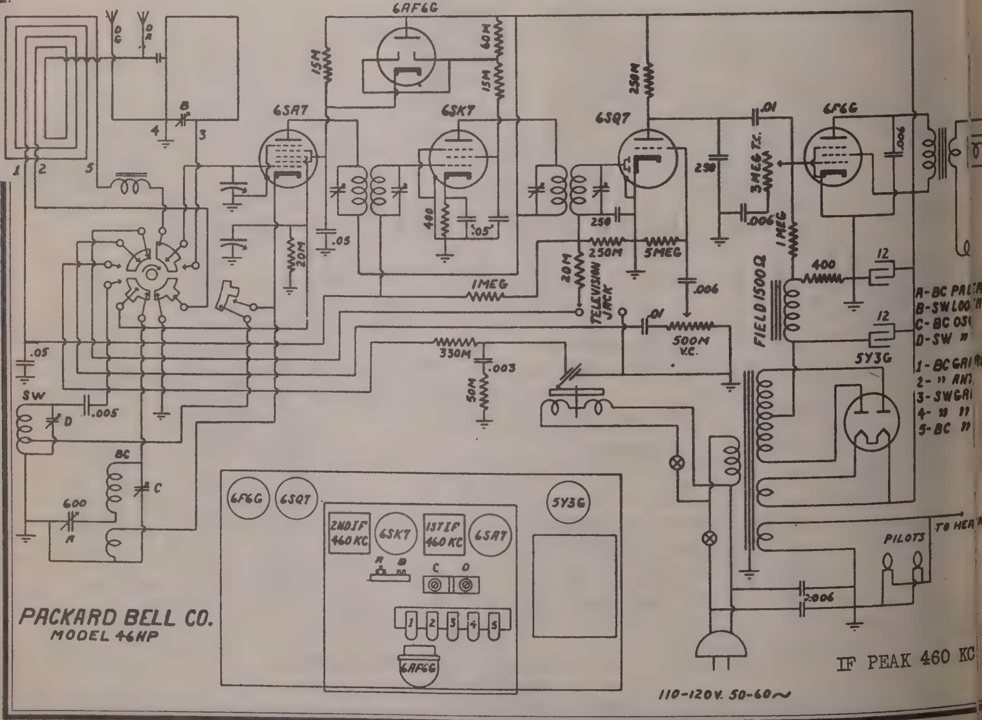
IF PEAK 460 KC

KARD ELL CO.
DEL G

MODELS 46H, 46HC
MODEL 46HP
Schematics, Socket

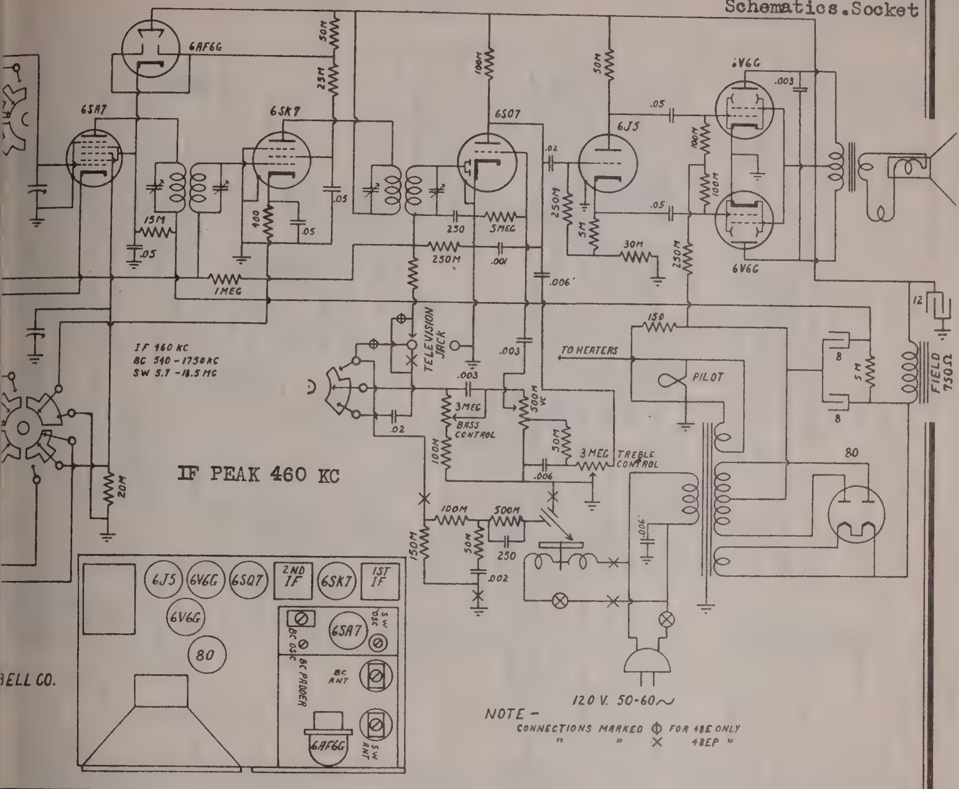
PACKARD BELL CO.

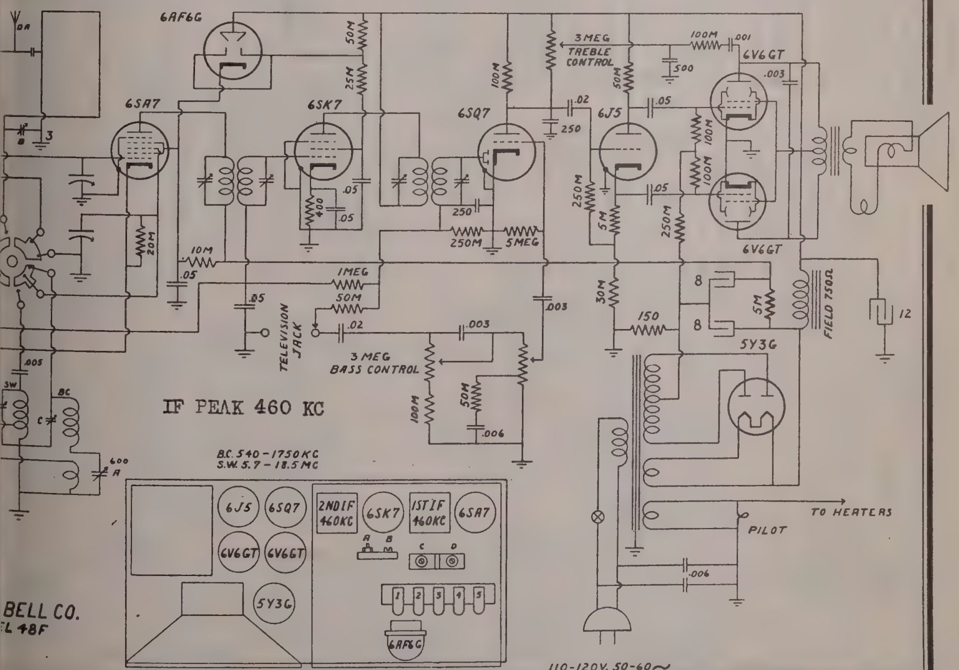




MODELS 48E,48EP
MODEL 48F
Schematics.Socket

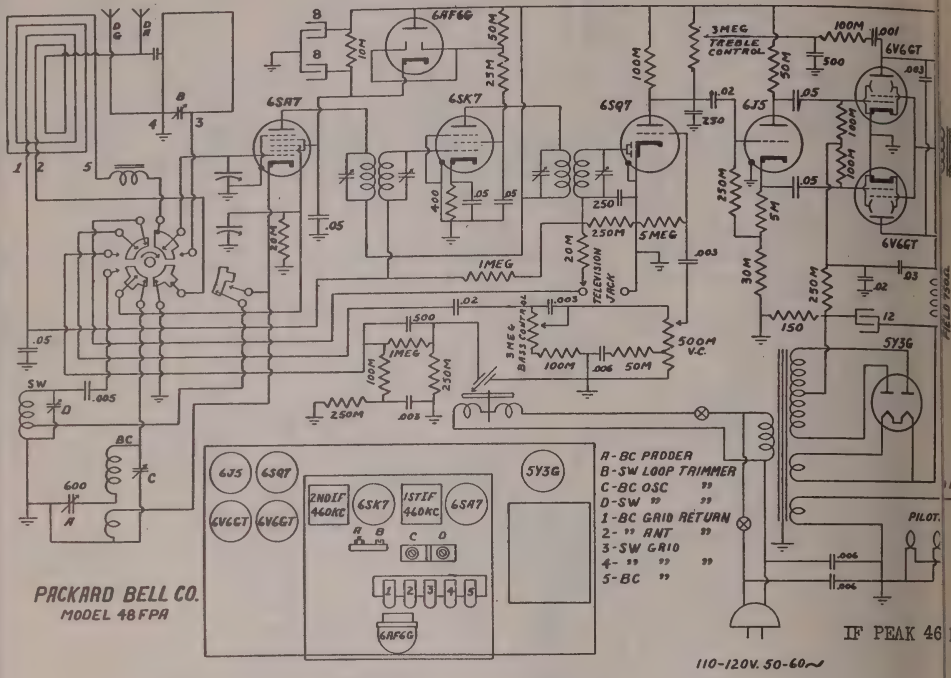
PACKARD BELL CO.



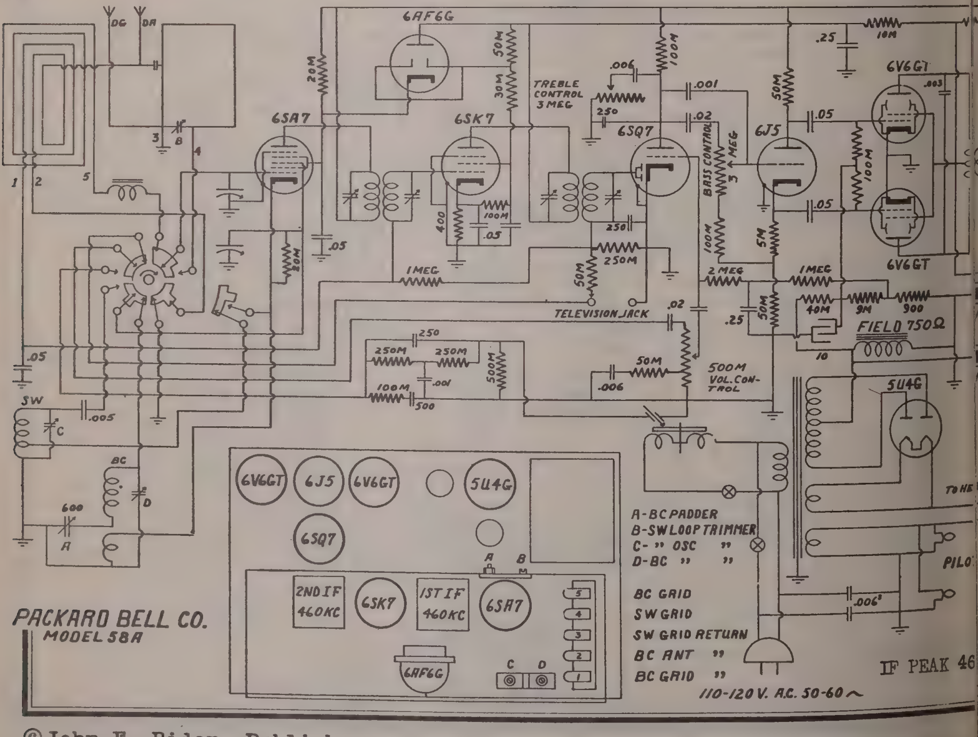


MODEL 48FPA
MODEL 58A
Schematics,Socket

PACKARD BELL CO.

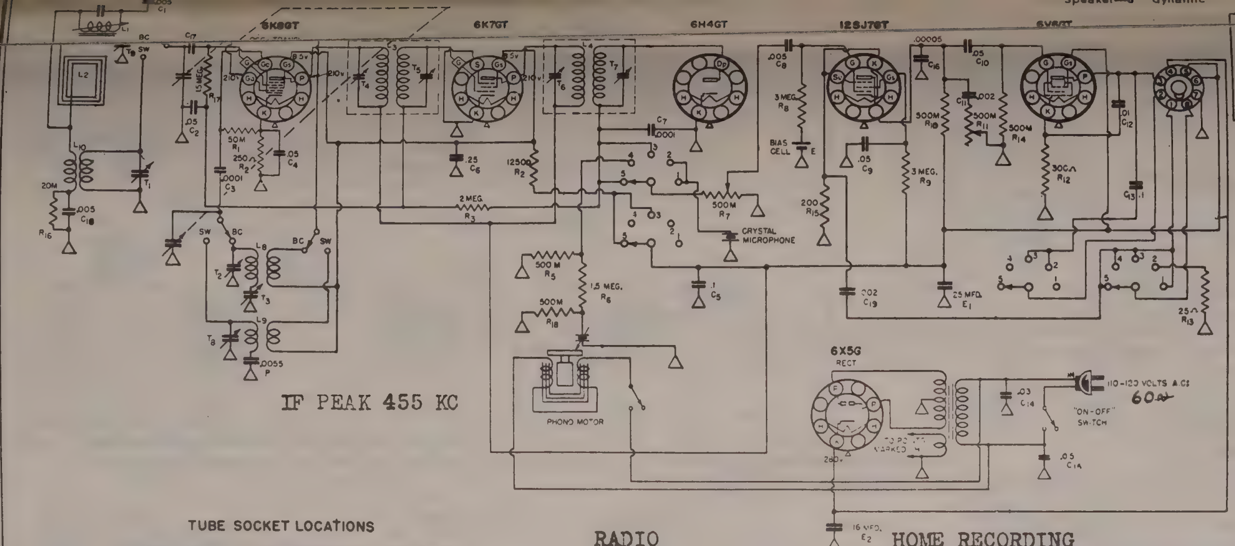


IF PEAK 46

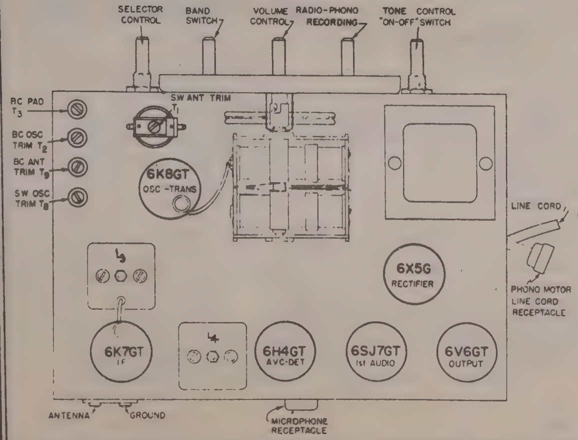


IF PEAK 46

PATHE



TUBE SOCKET LOCATIONS



RADIO

HOME RECORDING

To record radio programs set "PhonoRadio Switch" so that number "5" is opposite brass marker above the knob. Set volume control for loud and clear reception. Then set switch so that number "3" is opposite the marker and record the program. Do not allow needle to cut disc when it reaches the inner label. Do not allow the fine threads which form to collect under the needle, brush lightly with a soft cloth or brush towards the center of the disc.

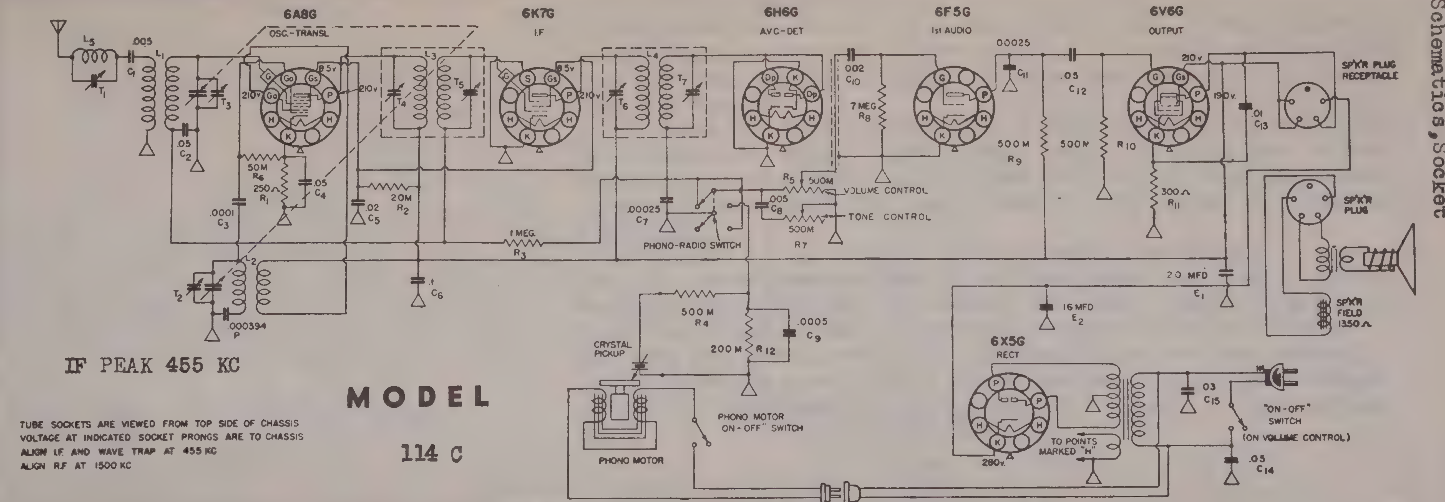
MICROPHONE

For microphone recording set switch so that number 1 is opposite marker and test for operation. Then turn switch so that number "2" is opposite the marker. Turn volume control fully to the right. In speaking use normal voice with microphone at least six inches from the mouth.

NOTE:-Be sure needle is firmly in place and that the flat side points towards the rear of the cabinet. Check that the small pin projects through one of the three holes on the blank to prevent the disc from slipping.

MODEL 23X
MODEL 114C
Schematics, Socket

PATHE



IF PEAK 455 KC

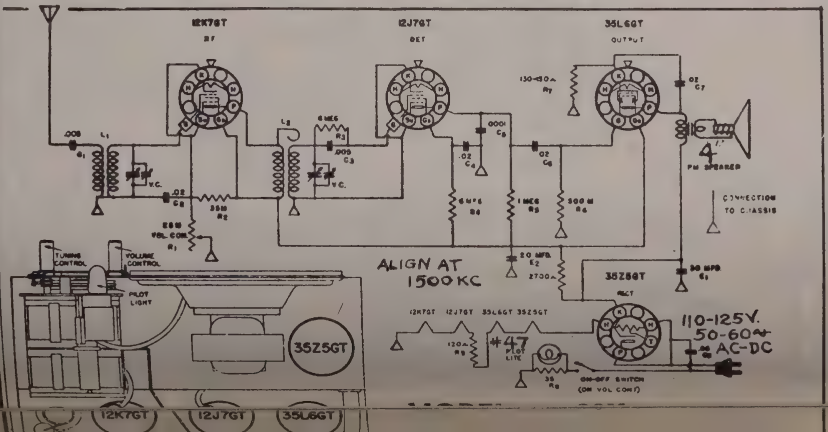
MODEL

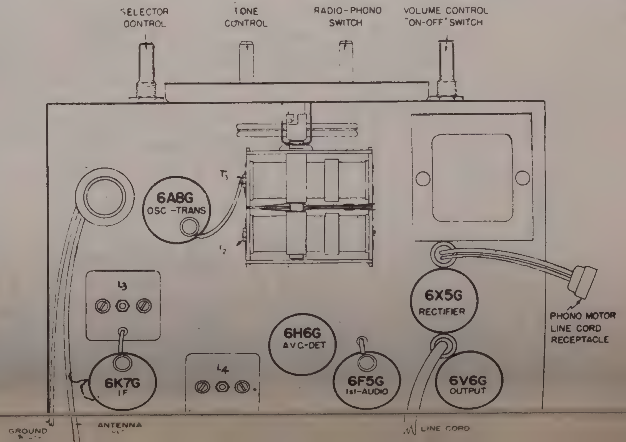
114 C

TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS
ALIGN I.F. AND WAVE TRAP AT 455 KC
ALIGN R.F. AT 1500 KC

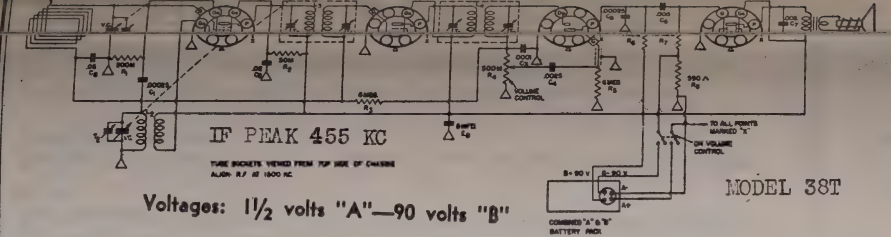
The receiver is designed for operation from 115 volt alternating current, 25-60 cycle (AC) supply lines. The proper frequency (cycles) is specified on the label at the rear of the chassis.

8" Electro Dynamic Speaker





PATHE

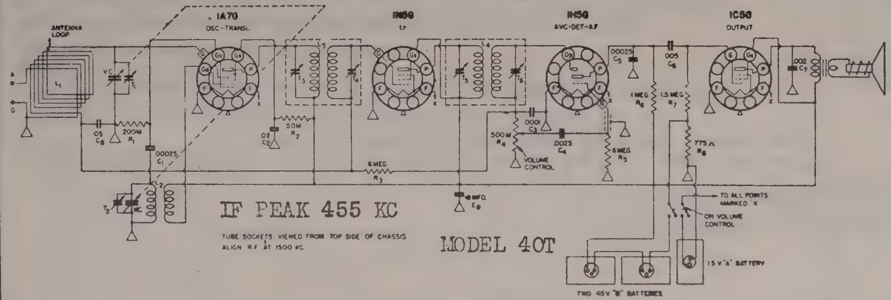


IF PEAK 455 KC

TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN RF AT 1500 KC

MODEL 38T

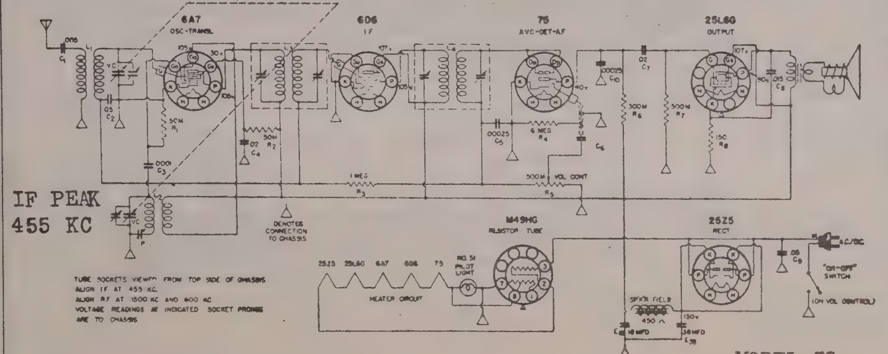
Voltages: 1½ volts "A"—90 volts "B"



IF PEAK 455 KC

TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN RF AT 1500 KC

MODEL 40T



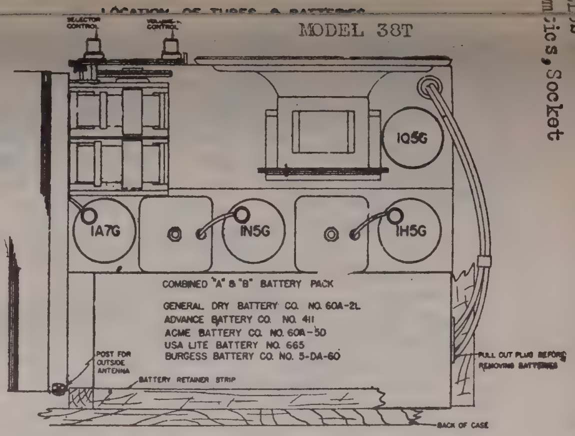
IF PEAK
455 KC

TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN IF AT 455 KC
ALIGN RF AT 1500 KC AND 600 KC
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS

Use no ground.

MODEL 52

MODEL 38T

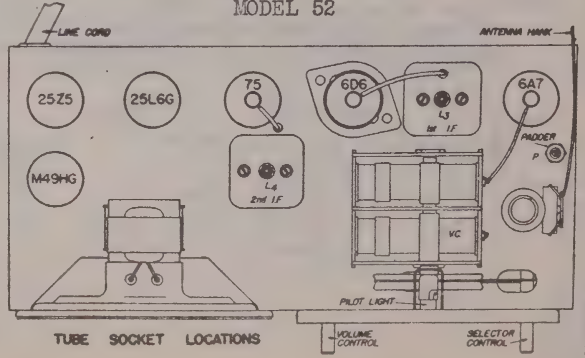


GENERAL DRY BATTERY CO. NO. 60A-2L
ADVANCE BATTERY CO. NO. 411
ACME BATTERY CO. NO. 60A-50
USA LITE BATTERY NO. 665
BURGESS BATTERY CO. NO. 5-DA-60

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

110 to 125 volts 50-60 cycles AC or DC

MODEL 52

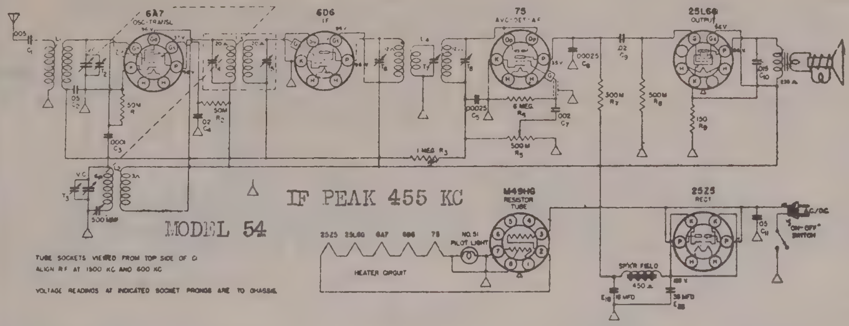


TUBE SOCKET LOCATIONS

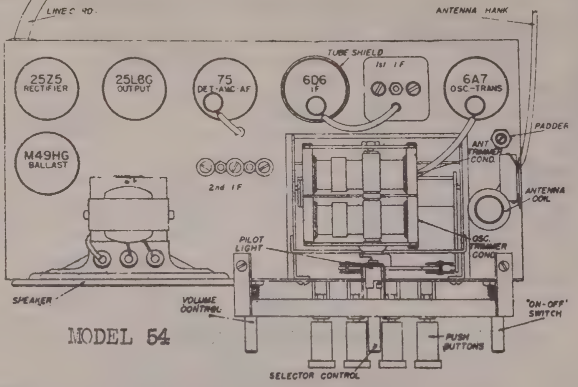
MODEL 54
Schematic, Socket
Alignment, Trimmers
Tuner

PATHE

MODEL 40T
Socket, Trimme



IF PEAK 455 KC



MODEL 54

MODEL 54

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

AUTOMATIC TUNING: There are four push buttons on the front panel which can be set so that by simply pushing the button marked with a station's call letters, any of four different stations may be received.

Allow the receiver to warm up for 20 minutes before making the station adjustments.

Decide on the station you wish to receive.

Tune to this station as accurately as possible with the selector knob.

Next, push in this button as far as possible, being careful not to disturb the station setting on the dial.

Turn this push button knob about one turn to the left, or until it starts to unscrew easily.

Holding the button at the "IN" position, screw the push button knob to the right until it is tight.

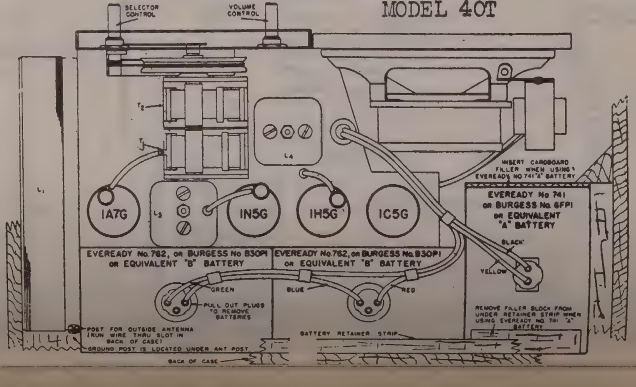
Cut out name of station from list supplied and insert in face of button.

Insert celluloid disk.

set in a similar manner.

LOCATION OF TUBES & BATTERIES

MODEL 40T


SELECTOR CONTROL
VOLUME CONTROL
1A7G
1N5G
1H5G
1C5G
INSERT CARDBOARD FILLER WHEN USING EVEREADY NO 741 "A" BATTERY
EVEREADY No 741 or BURGESS No. 6FPI or EQUIVALENT "A" BATTERY
EVEREADY No. 762, or BURGESS No B30PI or EQUIVALENT "B" BATTERY
EVEREADY No. 762, or BURGESS No. B30PI or EQUIVALENT "B" BATTERY
BLACK
YELLOW
GREEN
BLUE
RED
PULL OUT PLUGS TO REMOVE BATTERIES
REMOVE FILLER BLOCK FROM UNDER RETAINER STRIP WHEN USING EVEREADY NO. 741 "A" BATTERY
BATTERY RETAINER STRIP
POST FOR OUTSIDE ANTENNA (RUN WIRE THRU SLOT IN BACK OF CASE)
GROUND POST IS LOCATED UNDER ANT POST
BACK OF CASE

PHILCO RADIO & TELEV. CORP.

MODEL L
Record Changer Instructions

OPERATING INSTRUCTIONS

The Model "L" Record Changer plays seven 12" or eight 10" Records automatically. The last record remains on the turntable and repeats as long as the Record Changer is in operation.

Records may be repeated as often as desired by raising the record removing arm at A Fig. 1 to the upright position.

To reject a record and play the next record below it, pull the latch lever at L Fig. 1 forward.

To adjust the record removing arm to handle 10" records set the record removing arm change lever at D Fig. 1 opposite the number 10 stamped on the base plate. For 12" records set the lever opposite the number 12.

To adjust the pickup to play 10" records, push the pickup stop at K Fig. 1 back. (Away from the pickup needle). For 12" records pull the stop forward (toward the needle) as far as it will go.

Some units are equipped with two speed motors, and others with 78 RPM motors. When the two speed motor is used change from one speed to the other by simply moving lever at F Fig. 1 to position desired.

To start motor, throw switch at N Fig. 1 on the "on" position.

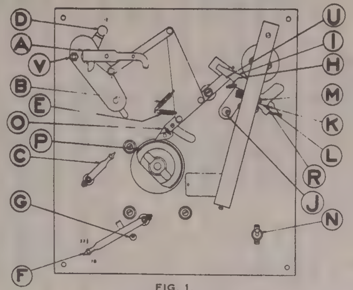


FIG. 1.

MOTOR SPEED

The motor speed is adjusted by means of a lever at C Fig. 1 which is mounted under the turntable. The direction of swing to fast or slow is indicated by the legends F and S on the base plate.

33-1/3 RPM — 78 RPM SHIFT
(Two-speed motors only)

Move the speed change lever at F Fig. 1 as far as it will go in the direction of swing indicated by the legends 33-1/3 and 78 on the base plate.

If adjustment of the speed change lever is required for any reason, proceed as follows: First loosen the screw which clamps the lever to the motor shaft. This shaft is provided with a screw-driver slot in the end. Next, using a screw driver, turn this shaft in a clockwise direction until you feel it strike the stop. The motor is now in the 33-1/3 RPM position. Now set the lever against the lug provided in the base plate and opposite the legend 33-1/3 and tighten the clamp screw. This places the lever in the correct position on the motor shaft. The final step is the adjustment of the eccentric bushing at G Fig. 1 which limits the throw of the lever. First loosen the screw which holds the eccentric bushing. Next, throw the speed changer lever to its farthest 78 RPM position, (using care that the lever does not slip on the motor shaft). Then turn the eccentric bushing around until it touches the side of the lever, and tighten it in place with the screw provided.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at O Fig. 1 to drop in front of, and be actuated by the cam at P Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at U Fig. 1 latches properly in the notch in the lift lever at I Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at J Fig. 1. Now run the Record Changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at H Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at E Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT — Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1¾" from the edge of the hole in the center of the record.

MOTOR LUBRICATION

The motor installed in the Record Changer is governor controlled, with all gearing enclosed, and leaves the factory lubricated for proper operation. For maximum satisfaction, lubricate the motor at regular intervals with SAE No. 10 oil. Please do not use any other grade of oil.

The governor disc engages with a ring of hard felt. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately a year under normal conditions. It may be necessary, however, if the motor shows a tendency to chatter or waiver, to apply a drop or two of oil to this felt ring.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at S Fig. 2 engaging the serrated block on the trip lever at T Fig. 2. There must be a minimum of 1/32" play between the end of the pin and (3/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

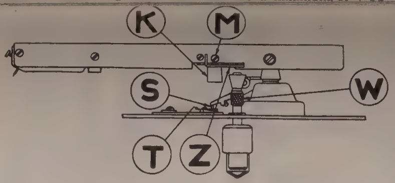


FIG. NO. 2

The oval head pivot screw at R Fig. 1 serves as a pivot for the lift lever at I Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at O Fig. 1 is not dropping in far enough to engage the cam at P Fig. 1, then check the tension of the trip spring at B Fig. 1.

RECORD REMOVING MECHANISM

The Record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at Q Fig. 3. Next stop the motor in such a position that the latch bar at O Fig. 1 can swing by and clear the cam at P Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at L Fig. 1 first, it will be found possible to swing the record removing finger at Y Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at Q Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at V Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

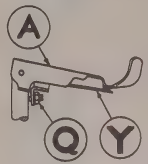


FIG. NO. 3

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

If the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at W Fig. 2.

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at M Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at M Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at Z Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at K Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at X Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

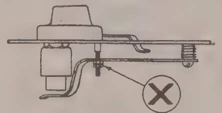
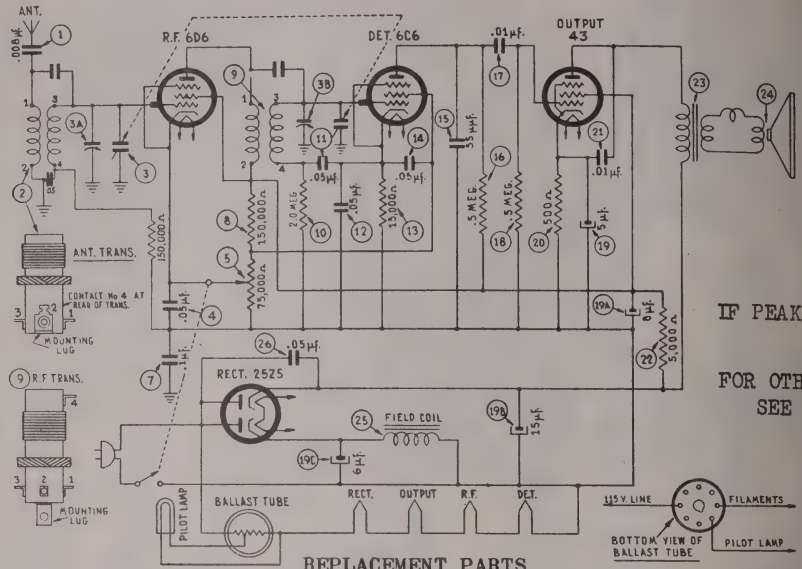


FIG. NO. 4

MODEL TH-1
Schematic
Alignment

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 K

FOR OTHER DAT
SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-1

Schem. No.	*Description*	*Philco Part No.*	*Schem. No.*	*Description*	*Philco Part No.*
1	Condenser (.006 mfd. 200 V)	32104	23	Output Transformer	4318
2	Ant. Transformer	40168	24	Speaker	6010
3	Tuning Condenser	33110	25	Field Coil	Part of Spkr. Unit
4	Condenser .05 mfd. 200 V)	32100	26	Condenser .05 mfd. 400 V.	3301
5	Volume Control	49115		Clip (Drive Cord)	2056
6	Resistor 150,000 ohms	47100		Dial (Scale)	1600T
7	Condenser .1 mdf. 200V	32117		Dial Window	1400
8	Resistor 150,000 ohms	47100		Drive Cord Assembly	9032
9	R.F. Transformer	40169		Drive Pulley & Screw	2102
10	Resistor 150,000 ohms	47100		Knob Assembly	1300
11	Condenser .05 mfd. 200 V.	32100		Pointer	2037
12	Condenser .05 mfd. 200 V.	32100		Socket 25Z5	1803
13	Resistor 15,000 ohms	47154		Socket 6D6	1800
14	Condenser .05 mfd. 200 V.	32100		Socket 6C6	1801
15	Condenser 55 mmfd.	30115		Socket 43	1802
16	Resistor .5 megohm	47101		Socket K55B	1804
17	Condenser .01 mfd. 200 V.	32102		Socket Assembly (Pilot Lamp)	9000
18	Resistor .5 megohm	47101		Shaft (Tuning Drive)	2101
19	Electrolytic Condenser	31116		Spring (Drive Cord)	2303
20	Resistor 500 ohms	47155		Speaker Cone	
21	Condenser .01 mfd. 400 V.	32103		Washer "C" Type Drive Shaft	2302
22	Resistor 5000 ohms	47105			

ALIGNMENT OF THE COMPENSATORS

In order to align the R.F. circuit of the receiver, an output meter, and signal generator will be required. With these instruments, the compensators should be adjusted as given below.

1. Connect an output meter to the plate and cathode terminals of the 43 tube.

2. The signal generator output lead is now connected to the aerial wire of the receiver through a 100 mmfd. condenser and the generator ground to a good ground connection. Then, turn the volume control to a full volume position.

3. Adjust the dial pointer as follows: Turn the tuning condenser to maximum capacity position. With the condenser in this position, the dial pointer should be ½ inch below the 550 K.C. mark of the dial and horizontal with the chassis.

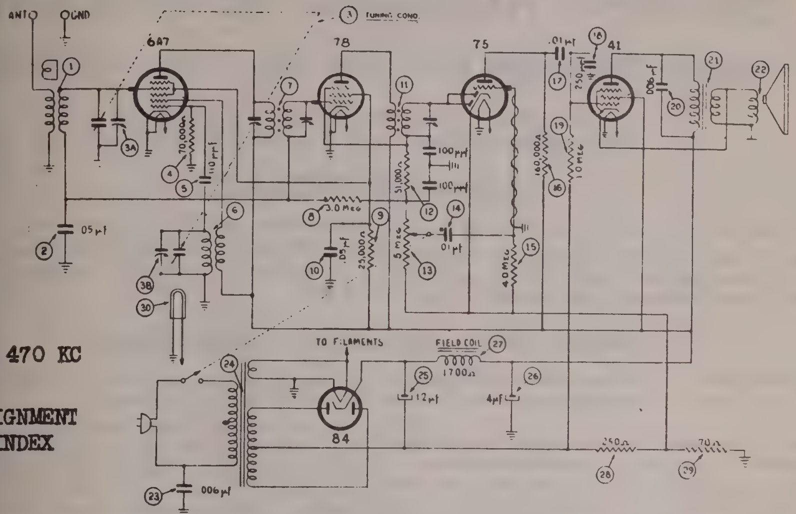
4. Set the signal generator and receiver dial for 1500 K.C. and adjust padders 3A and 3B for maximum reading on the output meter.

MODEL TH-1 is a 5 tube receiver designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts and covers a frequency range of 540 to 1720 kilocycles.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions. In remote localities where signal strength is weak, a regular outdoor aerial is recommended, such Philco aerial Part No. 40-6383. For hotels and apartment house installations, Philco Utility Aer Part No. 40-6384 should be used.

PHILCO RADIO & TELEV. CORP.

MODEL TH-3
Schematic



IF PEAK 470 KC

F R ALIGNMENT
SEE INDEX

ODE TH-3 is a 5 tube superheterodyne receiver covering a frequency range from 540 to 1720 kilo- an designed for operation on 115 volts alternating current (A.C.). The tubes used in this are ndicated on the schematic diagram shown below.

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-3

1.	*Description*	*Philco Part No.*	*Schem. No.*	*Description*	*Philco Part No.*
	nte a Transformer	32-2583	23	Condenser (.006 mf. molded)	30-4423
	Cond ser (.05 mf. tubular)	30-4519	24	Power Transformer	32-7979
	Tuni Condenser	31-2335	25	Electrolytic Condenser (12 mf.)	30-2327
	Resi or (70,000 ohms, ½ watt)	33-370339	26	Electrolytic Condenser (4 mf.)	30-2328
	Cond ser (110 mmf. mica)	30-1031	27	Field Coil..........Part of Speaker	36-1461
	Osci ator Transformer	32-3021	28	Resistor (250 ohms, ½ watt)	33-125339
	st F. Transformer	32-3120	29	Resistor (70 ohms, ½ watt)	33-070339
	Resi or (3.0 meg., ½ watt)	33-530339	30	Pilot Lamp	34-2064
	Resi or (25,000 ohms, ½ watt)	33-325339		Baffle & Silk Assembly	40-6430
	Cond ser (.05 mf. tubular)	30-4444		Bezel Throat	28-5474
	nd F. Transformer	32-2674		Bezel Window	27-5409
	esi or (51,000 ohms, ½ watt)	33-351339		Cone Assembly (For Speaker 36-1461-1	36-4114
	Volu Control	33-5254		Cone Assembly (For Speaker 36-1461-2	36-4095
	ond ser (.01 mf. tubular)	30-4479		Dial & Scale Assembly	31-2351
	esi or (4.0 meg., ½ watt)	33-540339		Drive Cord 10 9/16"	27-8411
	esi or (160,000 ohms, ½ watt)	33-416339		Drive Drum	28-6662
	ond ser (.01 mf. tubular)	30-4169		Drive Shaft	56-6016
	ond ser (250 mmf. mica)	30-1032		Knob Assembly	27-4632
	esi or (1.0 meg., ½ watt)	33-510339		Pointer	28-5408
	ond ser (.006 mf. tubular)	30-4467		Power Cord	L-2778
	utpu Transformer			Socket (5 prong)	27-6035
	Fo Speaker 36-1461-1	32-8046		Socket (6 prong)	27-6036
	Fo Speaker 36-1461-2	32-8040		Socket (7 prong)	27-6037
	peak r Cone and Voice Coil	See next column		Speaker	36-1461
	ssem ly............Part of Speaker	36-1461			

MODELS TH-3,TH-4,TP-4,
TH-5,TP-5,TP-10,TP-11
TP-12
Alignment Instructions

PHILCO RADIO & TELEV. CORP.

GENERAL ALIGNING INSTRUCTIONS

Models TH-3, TH-4, TP-4, TH-5, TP-5, TP-10, TP-11, TP-12

The same general procedure is followed in aligning the compensating condensers in any of the above listed models.

EQUIPMENT REQUIRED

Signal Generator Philco Model 077 or 177 should be used.

Aligning Indicator Philco Model 027 and Model 028 circuit testers which contain an audio output meter and vacuum tube voltmeter. Either of the vacuum tube voltmeter or the audio ouput meters may be used as an aligning indicator and re connected as given under "Connecting Aligning Instrume ".

Tools: Fibre handle aligning screw driver, Philco Part o. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Audio Output Meter: If an aligning indicator of this type is used, connect it to the plate and screen terminals of the output tube.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections:

Attach the negative terminal of the voltmeter to any point in the circuit where the A.V.C. voltage can be obtained. Connect the positive terminal to the ground connection of the receiver. In AC-DC sets the positive (+) terminal of the vacuum tube voltmeter should be connected to (B—) of the receiver. (Cathode 7C6.)

For aligning receivers with loktal type tubes, an aligning adaptor, Philco Part No. 45-2767 may be used with the vacuum tube voltmeter. To use the adaptor, remove the second detector tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltm r to the black wire of the adaptor.

Signal Generator: When adjusting the I.F. padders, e high side of the signal generator is connected through a 4 mfd. condenser to the antenna section of the tuning cond ser. Connect the ground or low side of the generator to e chassis. It may be necessary when adjusting AC-DC mo s to reverse the power plug to eliminate hum.

The R.F. and oscillator padders are aligned with the h side of the signal generator connected to the antenna of e receiver through a 100 mmfd. condenser.

After connecting the aligning instruments, adjust the c pensators on all models in the order as shown in the tab tion below. The first and second I.F. transformers in ll models are located on the top and bottom sections of e chassis respectively. The antenna and oscillator padders e located on the tuning condenser.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	470 K. C.	540 K C. Tuning Cond. closed	Vol. Max.	1st & 2nd I.F.	Push in manual butto on push button model
2	Ant. Ter.	1700 K. C.	1700 K. C.	Vol. Max.	"Osc"	Note A and B
3	Ant. Ter.	1500 K. C.	1500 K. C.	Vol. Max.	"Ant"	Note B

NOTE A — DIAL CALIBRATION: With the exception of Models TP-10 and TP-11 the dial pointers are adjusted by closing the tuning condenser (plates fully meshed) and setting the pointers on the dot below 55 on the dial.

NOTE B—The alignment procedure for the I.F. padders in Models TP-10 and TP-11 is the same as that given above. The antenna and oscillator padders of these models, however, are adjusted as follows:

1. Turn the tuning condenser to the extreme high frequency position (all plates out of mesh).
2. Insert a .004" gauge between the stationary and rotor plates of the oscillator condenser. If the gauge is not handy, a piece of bond writing paper can be used. After inserting gauge, turn rotor toward the low frequency end so that the gauge will be held in position.
3. Set signal generator at 1720 K.C. and tune oscillator padder for maximum reading on the output meter.
4. Remove gauge and set signal generator to 1500 K.C. a tune tuning condenser for maximum reading on this s nal, then adjust the antenna padder for maximum outp
5. Place set in cabinet so that the tuning arm on the tuni condenser engages the dial on the cabinet. After placi receiver in the cabinet and it is found that the dial dc not track properly with station signals, the dial can calibrated as follows: Set the signal generator to a lo frequency signal (600 K.C.) and tune receiver until si nal shows maximum reading on the output meter. T dial is then set to this signal by inserting a 6-32 Philli screw driver to the adjustment screw on the tuning co denser pulley. Loosen screw and slightly turn dial that it reads 600 K.C. then retighten screw. When doi this, however, precaution should be taken so that tl tuning condenser is not disturbed while dial is beir adjusted and screw is being tightened or loosened.

PHILCO RADIO & TELEV. CORP.

MODEL RP-3,Wireless
Record Player
Schematic, Data

Receiver. No connections are required between the Wireless Record Player and the Radio. The sound from the record is converted into a radio signal (540 K.C.) and broadcasted to the aerial of the radio set.

This model is equipped with a semi-automatic cystal pickup mechanism which will play either ten inch or twelve inch records. The pickup mechanism automatically places the pickup on the record when the lid of the cabinet is closed. Records can also be repeated by simply opening and closing the lid.

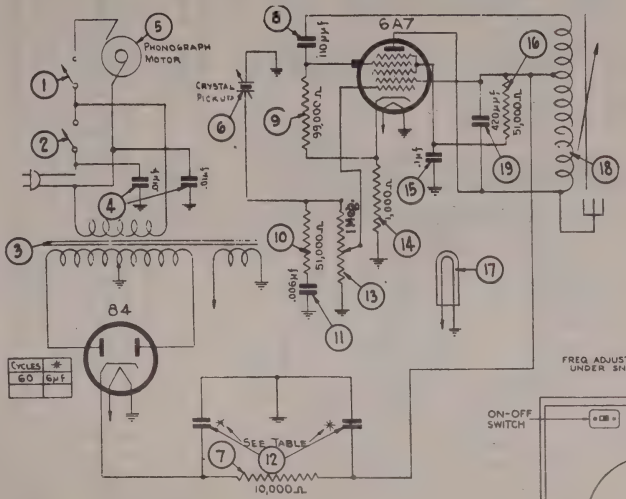
The player is operated from a 115 Volt, 60 cycle A.C. power supply. A volume control is also provided for adjusting the output of the player.

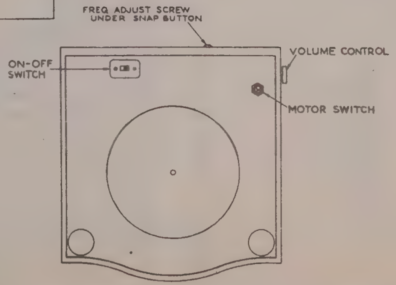
CHANGING OPERATING FREQUENCY

When the Record Player leaves the factory it is adjusted to operate at approximately 540 K.C. If interference from broadcasting stations is encountered, the frequency of the unit can be changed to any other frequency between 530 K.C. and 580 K.C. by removing snap button and adjusting small screw indicated in Diagram. Turning screw clockwise lowers the frequency, counter-clockwise raises the frequency. *This adjustment is best made while the unit is in operation.*

No definite rule can be established for the relative location of the record player to a radio; individual trial will establish the best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

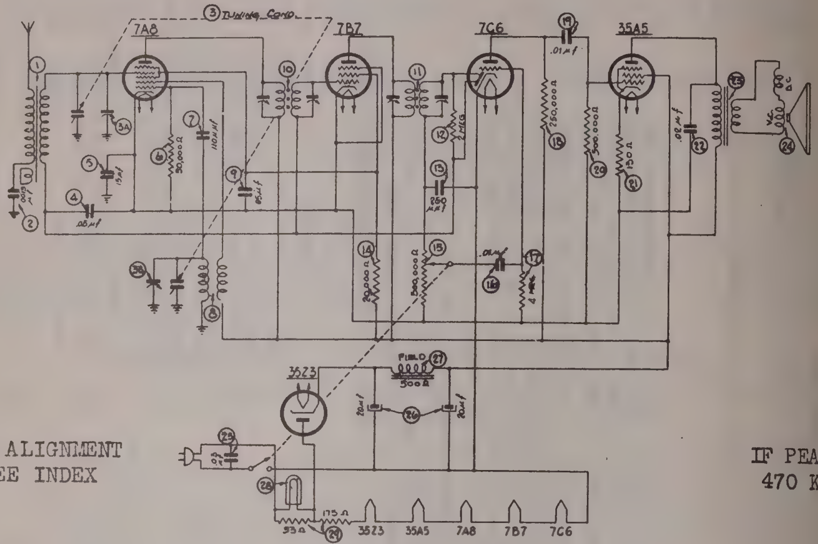
If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In some cases it may be advisable to use the same receptacle for record player and radio.





MODEL RP-3 WIRELESS RECORD PLAYER

Schem. No.	Description	Philco Part No.
1	Motor Switch	42-1503
2	Master Switch	42-1406-2
3	Power Transformer	32-8043
4	Line Condenser (.01 mf.-01 mf., 600 v.)	3903-DG
5	Motor	35-2021
6	Crystal Pickup	35-2028
	Crystal Cartridge	415-1027
7	Filter Resistor (10,000 ohms., ½ watt)	33-310344
8	Oscillator Grid Cond. (110 mmf.)	30-1031
9	Oscillator Grid Resistor (99,000 ohms., ½ watt)	33-399344
10	Comp. Resistor (51,000 ohms., ½ watt)	33-351344
11	Comp. Condenser (.006 mf., 200 v.)	30-4467
12	Electrolytic Condenser (6 mf.-6 mf., 150 v.)	30-2388
13	Volume Control	33-5322
14	Cathode Bias Resistor (1,000 ohms., ½ watt)	33-210344
15	Screen By-Pass (.1 mf., 200 v.)	30-4499-S
16	Screen Resistor (51,000 ohms., ½ watt)	33-351344
17	Pilot Light (6-8 v., .250 amp.)	34-2210
18	Oscillator Coil	32-3232
19	Oscillator Condenser (420 mmf.)	30-1116



FOR ALIGNMENT
SEE INDEX

IF PEAK
470 KC

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-4

Schem. No.	*Description*	*Philco Part No.*
1	Antenna Transformer	32-3151
2	Tubular Condenser(.0015 mf.,200v.)	30-4555S
3	Tuning Condenser	31-2354
4	Tubular Condenser (.05 mf., 400v.)	30-4519S
5	Tubular Condenser (.15 mf., 400v.)	30-4505S
6	Resistor (50,000 ohms, 1/3 watt)	33-350244
7	Mica Condenser (110 mmf.)	30-1031
8	Oscillator Transformer	32-3152
9	Tubular Condenser (.05 mf., 400v.)	30-4519S
10	1st I.F. Transformer	32-3149
11	2nd I.F. Transformer	32-3150
12	Resistor (2 meg., 1/3 watt)	33-520244
13	Mica Condenser (250 mmf.)	30-1032
14	Resistor (20,000 ohms, 1/3 watt)	33-320244
15	Volume Control 500,000 ohms)	33-5306
16	Tubular Condenser (.01 mf., 200v.)	30-4479S
17	Resistor (4 meg., 1/3 watt)	33-540244
18	Resistor (250,000 ohms, 1/3 watt)	33-425244
19	Tubular Condenser (.01 mf., 400v.)	30-4572S
20	Resistor (500,000 ohms, 1/3 watt)	33-450244
21	Resistor (130 ohms, ½ watt)	33-113336

Schem. No.	*Description*	*Philco Part No.*
22	Tubular Condenser (.02 mf., 400v.)	30 516
23	Output Transformer	
	For Speaker 36-1469-1	32 047
	For Speaker 36-1469-9	32 044
24	Speaker	36 469
25	Tubular Condenser (.03 mf., 400v.)	30 449
26	Electrolytic Condenser(20-20mf,150v)	30 382
27	Field Coil -- Part of Speaker No..	36 469
28	Pilot Lamp	34 068
29	Line Resistor	33 367
	Cone Assembly (for Speaker 36-1469-1	36 115
	Cone Assembly (for Speaker 36-1469-9	36 113
	Drive Cord Assy	31 358
	Drive Shaft Assy	31 355
	Pilot Lamp Socket	38-325
	Pointer	27-391
	Power Cord	L-99
	Scale	27-553
	Socket	27-130
	Spring (Drive Cord)	28-54
	Speaker Assy	36-69

MODEL TH-4T

Description	Philco Part No.
Cardboard Back	27-9511
Dial Window	27-5472
Grille Cloth	44-1287
Knob Assy	27-4809

MODEL TH-4T IVORY

Description	Philco Part No.
Cardboard Back	27-545
Knob Assembly	27-10

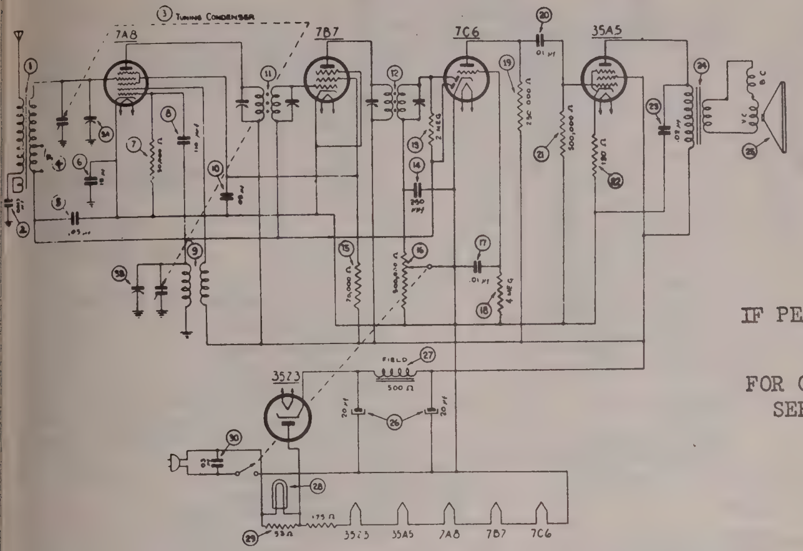
MODEL TH-4 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 172 ki cycles and designed for operation on either alternating current (A.C.) or direct current (D.) volts.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditio however in apartment houses, hotels, or steel re-inforced buildings, the Philco Utility Aeri P No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficie time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The sa pr cedure should be observed on A.C. power supplies when a slight hum is heard with the volume turn lo

PHILCO RADIO & TELEV. CORP.

MODELS TP-4,TP4-I
Schematic,Notes



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-4

che No.	*Description*	*Philco Part No.*	*Schem. No.*	*Description*	*Philco Part No.*
1	ntenna Transformer	32-3164		For Speaker 36-1469-9	32-8044
2	ubular Condenser (.0015 mf., 200V)	30-4555S	25	Cone Assembly	
3	uning Condenser	31-2354		For Speaker 36-1469-1	36-4115
4	witch	42-1406		For Speaker 36-1469-9	36-4113
5	ubular Condenser (.05 mf., 200V.)	30-4519S	26	Tubular Condenser (.03 mf., 400V.)	30-4449S
6	ubular Condenser (.15 mf., 400V.)	30-4505S	27	Electrolytic Condenser	
7	esistor (50,000 ohms, 1/3 watt)	33-350244		(20-20 mf., 150V.)	30-2382
8	ica Condenser (110 mmf.)	30-1031	28	Field Coil	
9	scillator Transformer	32-3152		Part of Speaker, Part No	36-1469
0	ubular Condenser (.05 mf., 200V.)	30-4519S	29	Pilot Lamp	34-2068
1	st I.F. Transformer	32-3149	30	Line Resistor	33-3367
2	nd I.F. Transformer	32-3150		Cardboard Back	27-9511
3	esistor (2 meg., 1/3 watt)	33-520244		Dial Window	27-5472
4	ica Condenser (250 mmf.)	30-1032		Drive Cord Assembly	31-2358
5	esistor (20,000 ohms, 1/3 watt)	33-320244		Drive Shaft Assembly	31-2355
6	olume Control (500,000 ohms)	33-5306		Drive Drum	28-6662
7	ubular Condenser (.01 mf., 200V.)	30-4479S		Grille Cloth	44-1287
8	esistor (4 meg., 1/3 watt)	33-540244		Knob Assembly	27-4809
9	esistor (250,000 ohms, 1/3 watt)	33-425244		Pointer	27-4891
0	ubular Condenser (.01 mf., 400V.)	30-4572S		Scale	27-5556
1	esistor (500,000 ohms, 1/3 watt)	33-450244		Sockets	27-6130
2	esistor (130 ohms, 1/2 watt)	33-113336		Speaker	36-1469
3	ubular Condenser (.02 mf., 400V.)	30-4516S		Spring (Drive Cord)	28-8954
4	utput Transformer				
	For Speaker 36-1469-1	32-8047			

TP-4 IVORY

ard Back	27-9545	Knob Assembly	27-4810

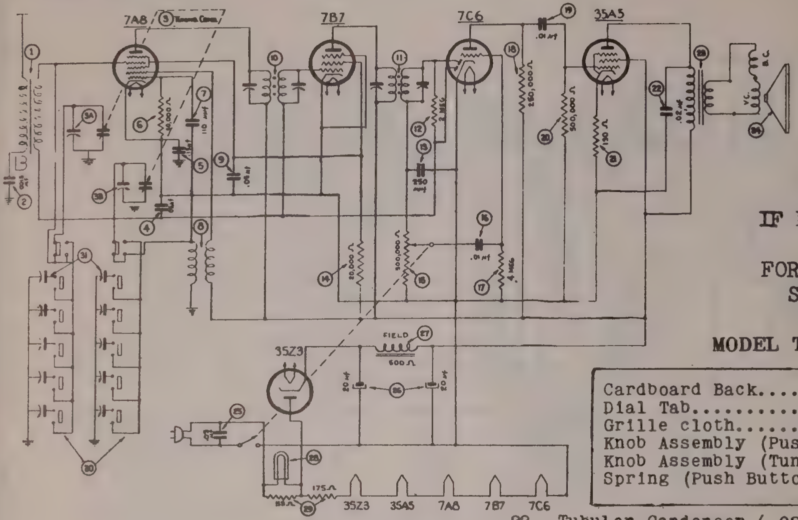
MODELS TP-4 and TP-4-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from to 1720 kilocycles on the broadcast band and a frequency range from 2.3 to 2.5 megacycles (M.C.) the police band. This model is designed to operate on either alternating (A.C.) or direct current C.) 115 volts. These models are identical with the exception of cabinets.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; even in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 638 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure uld be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TH-5, TH-5T
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MODEL TH-5T IVORY

Cardboard Back................	27-93
Dial Tab......................	27-55
Grille cloth..................	44-12
Knob Assembly (Push Button)....	27-48
Knob Assembly (Tuning & Volume)	27-48
Spring (Push Button Knobs).....	28-56

REPLACEMENT PARTS

Schem. No.	*Description*	*Philco Part No.*
1	Antenna Transformer.............	32-3166
2	Tubular Condenser (.0015 mf.,200v)	30-4555S
3	Tuning Condenser................	31-2365
4	Tubular Condenser (.05 mf.,200v.)	30-4519S
5	Tubular Condenser (.15 mf.,400v.)	30-4505S
6	Resistor (50,000 ohms, 1/3 watt)	33-350244
7	Mica Condenser (110 mmf.).......	30-1031
8	Oscillator Transformer..........	32-3167
9	Tubular Condenser (.05 mf.,200v)	30-4519S
10	1st I.F. Transformer............	32-3149
11	2nd I.F. Transformer............	32-3150
12	Resistor (2 meg., 1/3 watt).....	33-520244
13	Mica Condenser (250 mmf.).......	30-1032
14	Resistor (20,000 ohms, 1/3 watt)	33-320244
15	Volume Control (500,000 ohms)...	33-5306
16	Tubular Condenser (.01 mf., 200v)	30-4479S
17	Resistor (4 meg. 1/3 watt)......	33-540244
18	Resistor (250,000 ohms, 1/3 watt)	33-425244
19	Tubular Condenser (.01 mf.,400v)	30-4572S
20	Resistor (500,000 ohms, 1/3 watt)	33-450244
21	Resistor (130 ohms, 1/2 watt)...	33-113336
22	Tubular Condenser (.02 mf.,400v)	30-46S
23	Output Transformer	
	For Speaker 36-1469-1.........	32-817
	For Speaker 36-1469-9.........	32-814
24	Speaker........................	36-149
25	Tubular Condenser (.03 mf., 400v.).	30-449S
26	Electrolytic Condenser	
	(20-20 mf., 150 v).............	30-212
27	Field Coil-Part of Speaker, PartNo..	36-149
28	Pilot Lamp.....................	34-203
29	Line Resistor..................	33-337
30	Push-Button Switch.............	42-145
31	Padding Condenser Strip........	31-623
	Cone Assembly (for Speaker 36-1469-1	36-435
	Cone Assembly (for Speaker 36-1469-9	36-433
	Cardboard Back.................	27-934
	Dial Window....................	27-543
	Drive Cord Assy................	31-231
	Drive Shaft Assy...............	31-235
	Grille cloth...................	44-121
	Knob Assembly (Push Button)........	27-483
	Knob Assembly (Tuning, Volume).....	27-481
	Padder Strip (Tuning Unit).........	31-623
	Pilot Lamp socket assembly.........	38-98
	Pointer........................	27-48
	Power Cord.....................	L-319
	Push Button Switch.............	42-14
	Scale..........................	27-55
	Sockets........................	27-61
	Spring (Drive Cord)............	28-89

MODEL TH-5 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 1720 k cycles and designed for operation on either alternating current (A.C.) or direct current (D.C.) volts.

This model is equipped with 6 electric push-buttons for automatically selecting stations in dition to dial tuning. Five push-buttons are used for the stations and one push button for selec dial tuning. The push-buttons cover a frequency range as follows:

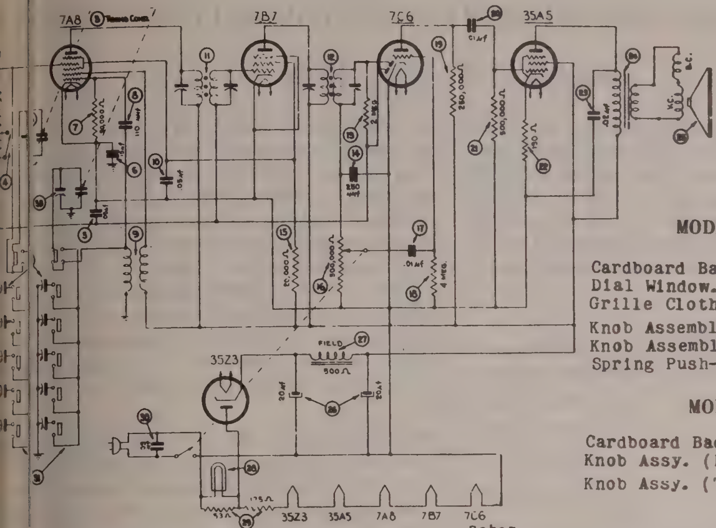
Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant. Osc.	1	540 to 1030 kilocycles	7 8	Ant. Osc.	4	900 to 1470 kilocycles
3 4	Ant. Osc.	2	650 to 1100 kilocycles	9 10	Ant. Osc.	5	1160 to 1600 kilocycles
5 6	Ant. Osc.	3	740 to 1240 kilocycles			6	Manual

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditi however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and suffic time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same cedure should be observed on A.C. power supplies when a slight hum is heard with the volume tu low.

PHILCO RADIO & TELEV. CORP.

**MODELS TP-5, TP-5-I
TP-5T
Schematic, Tuner**



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MODEL TP-5T WALNUT

Cardboard Back	27-9314
Dial Window	27-5472
Grille Cloth	44-1288
Knob Assembly	27-4809
Knob Assembly (Push Button)	27-4823
Spring Push-Button Knob	28-5686

MODEL TP-5T IVORY

Cardboard Back	27-9328
Knob Assy. (Push Button)	27-4830
Knob Assy. (Tuning, Volume)	27-4810

REPLACEMENT PARTS

Description	Philco Part No.
Ar enna Transformer	32-3168
Tu ular Condenser (.0015 mf., 200V)	30-4555S
Tu ing Condenser	31-2365
Sw tch	42-1406
Tu ular Condenser (.05 mf., 200V)	30-4519S
Tu ular Condenser (.15 mf., 400V)	30-4505S
Re istor (50,000 ohms, 1/3 watt)	33-350244
Mi a Condenser (110 mmf.)	30-1031
Os illator Transformer	32-3167
Tu ular Condenser (.05 mf., 200V)	30-4519S
1s I.F. Transformer	32-3149
2n I.F. Transformer	32-3150
Re istor (2 meg. 1/3 watt)	33-520244
Mi a Condenser (250 mmf.)	30-1032
Re istor (20,000 ohms, 1/3 watt)	33-320244
Vo ume Control (500,000 ohms)	33-5306
Tu ular Condenser (.01 mf., 200V)	30-4479S
Re istor (4 meg., 1/3 watt)	33-540244
Re istor (250,000 ohms, 1/3 watt)	33-425244
Tu ular Condenser (.01 mf., 400V)	30-4572S
Re istor (500,000 ohms, 1/3 watt)	33-450244
Re istor (130 ohms, 1/2 watt)	33-113336

MODEL TP-5

Schem. No.	Description	Philco Part No.
23	Tubular Condenser (.02 mf., 400V)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Electrolytic Condenser (20-20 mf., 150V.)	30-2382
27	Field Coil -- Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.03 mfd. 400V.)	30-4449S
31	Push-Button Switch	42-1485
32	Padding Condenser Strip	31-6293
	Drive Cord Assembly	31-2358
	Drive Shaft Assembly	31-2355
	Drive Drum	28-6662
	Padder Strip	31-6293
	Pointer	27-4891
	Power Cord	L-3199
	Push-Button Switch	42-1485
	Scale	27-5553
	Sockets	27-6130
	Spring (Drive Cord)	28-8954
	Speaker	36-1469

MODE S TP-5 and TP-5-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from
o 1 0 kilocycles on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band.
mode is designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts.
mo ls are identical with the exception of cabinets.

The et is equipped with 6 electric push-buttons for automatically selecting stations in addition
al ning. Five push-buttons are used for the stations and one push-button for selecting dial
g. he push-buttons cover a frequency range as follows:

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant. Osc.	1	540 to 1030 kilocycles	7 8	Ant. Osc.	4	900 to 1470 kilocycles
3 4	Ant. Osc.	2	650 to 1100 kilocycles	9 10	Ant. Osc.	5	1160 to 1600 kilocycles
5 6	Ant. Osc.	3	740 to 1240 kilocycles			6	Manual

An door aerial 20 feet in length is attached to the receiver for average receiving conditions;
er apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No.
84 recommended.

NOT : If no sound is heard after connecting the receiver to the power supply and sufficient time
een allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure
d b observed on A.C. power supplies when a slight hum is heard with the volume turned low.

SETTING AND OPERATING ELECTRIC PUSH BUTTON TUNING

Models TP-5, TP-11, TH-5

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place the call letters in the windows above the buttons, making sure that each respective button covers the frequency of the station for which it is to be used. The frequency of the popular stations in your vicinity may be found by consulting any station list. The frequency range of the buttons is as follows:—

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant Osc	1	540 to 1030 kilocycles
3 4	Ant Osc	2	650 to 1100 kilocycles
5 6	Ant Osc	3	740 to 1240 kilocycles
7 8	Ant Osc	4	900 to 1470 kilocycles
9 10	Ant Osc	5	1160 to 1600 kilocycles
		6	Dial

The left-hand button looking at the front of the cabinet corresponds to the two right-hand screws looking at the rear and covers the lowest frequency range.

With the "Manual" button depressed, tune in the station whose call letters appear above the left-hand button. Then depressing the left-hand button, tune in this station by rotating the "OSC" screw of No. 1 pair (at the right end o he unit looking at the rear of the chassis). Turn the ew slowly and listen carefully or the station may be passed h-out noticing it. After the "OSC" screw has been adjuste or maximum volume, the corresponding "ANT" screw shou be adjusted for maximum. For some stations, it may be n sary to re-adjust the "OSC" screw after the "ANT" s w has been set. Switching from the "Manual" to the auton ic push button will enable you to make sure you have the co ct station tuned in. When the first station has been set, the s e procedure should be followed for the remaining buttons, st tuning in the desired station by means of the "Manual" n-trol.

To tune the receiver with the "Push-Buttons," simply p s in the button which is under the call letters of the des d station. Your station will be received instantly. The vol e of the program may be controlled with the manual vol e control.

While the above procedure is satisfactory in setting up p h buttons for stations, a very accurate adjustment can be tained with a vacuum tube voltmeter.

Model 39- 8

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose.
(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.
(3) Philco Fiber Handle Screw Driver, Part No. 45-2610 and Fiber Wrench, Part No. 3164.

OUTPUT METER:

The Philco 027 Output Meter is connected to the p e and screen terminals of the type 43 tube and adju d for the 0 to 30 A.V.C. scale. After connecting e output meter, adjust the compensators in the orde s shown in the tabulation below. Locations of the pensators are shown on Fig. 2. If the output me r pointer goes off scale when adjusting the compensat s, reduce the strength of the signal from the generat .

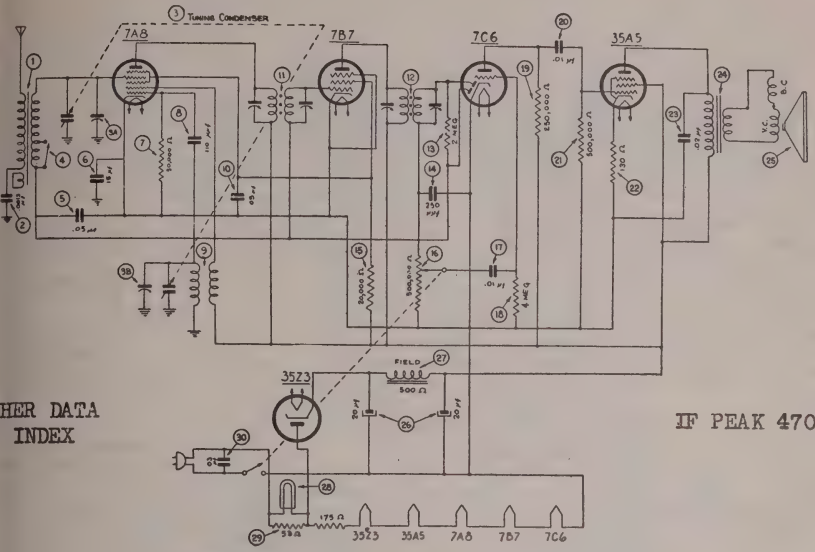
Signal Generator				Receiver			
Operation In Order	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in order	Special Instructio
1	6A7 Grid Cap	.1 mf.	470 K.C.	580 K.C.	Vol.Cont. Max.	12A, 10B, 10A	Adjust for max. output
2	Ant. Lead	100 mf.	1550 K.C.	1550 K.C.	Vol.Cont. Max.	2B, 2A	Adjust for max. output Note A, B.

NOTE A--The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B--DIAL CALIBRATION: With the tuning condenser "maximum capacity" position (plates fully meshed), se the dial pointer between the two horizontal lines the low frequency end of the scale (550 K.C.).

PHILCO RADIO & TELEV. CORP.

MODEL TP-10
Schematic
Notes



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IF PEAK 470 KC

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-10

em.	*Description*	*Philco Part No.*	*Schem. No.*	*Description*	*Philco Part No.*
	Ante a Transformer	32-3164		For Speaker 36-1469-9	32-8044
	Tubu r Condenser (.0015 mf.,200V)	30-4555S	25	Cone Assembly	
	Tuni Condenser	31-2354		For Speaker 36-1469-1	36-4115
	Swit	42-1406		For Speaker 36-1469-9	36-4113
	Tubu r Condenser (.05 mf., 200V)	30-4519S	26	Electrolytic Condenser	
	Tubu r Condenser (.15 mf., 400V)	30-4505S		(20-20 mf., 150 V.)	30-2382
	Resi or (50,000 ohms, 1/3 watt).	33-350244	27	Field Coil....Part of Speaker No.	36-1469
	Mica ondenser (110 mmf.)	30-1031	28	Pilot Lamp	34-2068
	Osci ator Transformer	32-3152	29	Line Resistor	33-3367
	Tubu r Condenser (.05 mf., 200V)	30-4519S	30	Tubular Condenser (.03 mf., 400V)	30-4449S
	1st F. Transformer	32-3149		Cabinet	10367-A
	2nd F. Transformer	32-3150		Cardboard Back	27-9320
	Resi or (2 meg., 1/3 watt)	33-520244		Disc Feet	27-9337
	Mica ondenser (250 mmf.)	30-1032		Drive Cord Assembly	31-2358
	Resi or (20,000 ohms, 1/3 watt).	33-320244		Drive Drum	56-6033
	Volu Control (500,000 ohms)	33-5306		Driving Arm (Pointer Drive)	56-1376
	Tubu r Condenser (.01 mf.,200V).	30-4479S		Drive Shaft Assy	31-2355
	Resi or (4 meg., 1/3 watt)	33-540244		Grille Silk & Gasket	40-6452
	Resi or (250,000 ohms, 1/3 watt)	33-425244		Knob Assembly	27-4815
	Tubu r Condenser (.01 mf., 400V)	30-4572S		Pilot Lamp Socket Assembly	38-9828
	Resi or (500,000 ohms, 1/3 watt)	33-450244		Power Cord	L-3199
	Resi or (130 ohms, 1/2 watt)	33-113336		Rubber Tubing (Driving Arm)	27-9334
	Tubu r Condenser (.02 mf., 400V)	30-4516S		Sockets	27-6130
	Outp Transformer			Speaker Assembly	36-1469
	F Speaker 36-1469-1	32-8047		Spring	28-8751

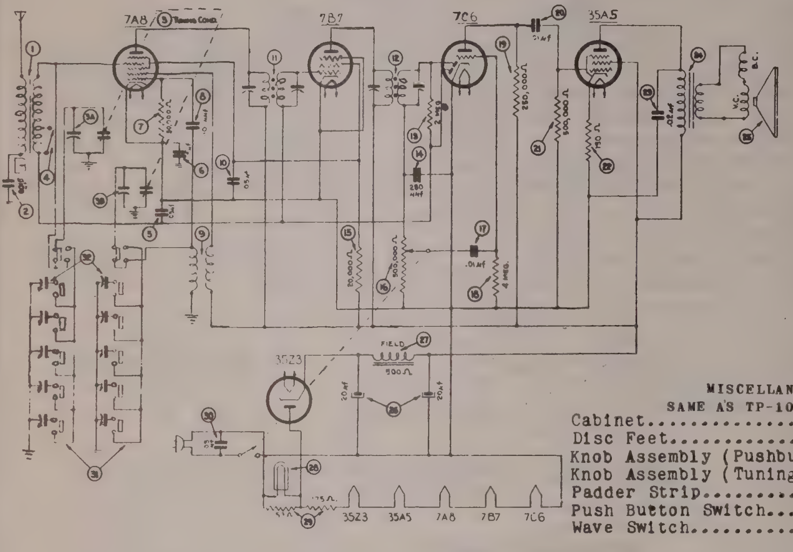
MODEL P-10 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to kiloc les (K.C.) on the broadcast band and 2.3 to 2.5 megacycles (M.C.) on the police band. model s designed for operation on either alternating current (A.C.) or direct current (D.C.) olts. The receiver is assembled in a streamlined, 2 toned plastic cabinet.

An in or aerail 20 feet in length is attached to the receiver for average receiving conditions; er in partment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part 0-638 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient has b n allowed for the tubes to heat, reverse the electric plug in the outlet. The same pro- e sho d be observed on A.C. power supplies when a slight hum is heard with the volume turned

MODEL TP-11
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 K

FOR OTHER DAT
SEE INDEX

MISCELLANEOUS PARTS
SAME AS TP-10 WITH EXCEPTION

Cabinet............................	108-
Disc Feet..........................	2733
Knob Assembly (Pushbutton).........	2782
Knob Assembly (Tuning).............	2781
Padder Strip.......................	3129
Push Button Switch.................	4248
Wave Switch........................	4240

REPLACEMENT PARTS

Schem. No.	*Description*	*Philco Part No.*
1	Antenna Transformer............	32-3168
2	Tubular Condenser (.0015 mf., 200V	30-4555S
3	Tuning Condenser...............	31-2365
4	Switch.........................	42-1406
5	Tubular Condenser (.05 mf., 200V)	30-4519S
6	Tubular Condenser (.15 mf., 400V)	30-4605S
7	Resistor (50,000 ohms, 1/3 watt).	33-350244
8	Mica Condenser (110 mmf.).......	30-1031
9	Oscillator Trnsformer...........	32-3167
10	Tubular Condenser (.05 mf., 200V)	30-4519S
11	1st I.F. Transformer............	32-3149
12	2nd I.F. Transformer............	32-3150
13	Resistor (2 meg., 1/3 watt).....	33-520244
14	Mica Condenser (250 mmf.).......	30-1032
15	Resistor (20,000 ohms, 1/3 watt)	33-320244
16	Volume Control (500,000 ohms)...	33-5306
17	Tubular Condenser (.01 mf., 200V)	30-49S
18	Resistor (4 meg., 1/3 watt).....	33-524
19	Resistor (250,000 ohms, 1/3 watt)	33-424
20	Tubular Condenser (.01 mf., 400V)	30-42S
21	Resistor (500,000 ohms, 1/3 watt)	33-424
22	Resistor (130 ohms, 1/2 watt)...	33-133
23	Tubular Condenser (.02 mf., 400V)	30-45S
24	Output Transformer For Speaker 36-1469-1.......... For Speaker 36-1469-9..........	 32-80 32-80
25	Cone Assembly For Speaker 36-1469-1.......... For Speaker 36-1469-9..........	 36-41 36-41
26	Electrolytic Condenser (20-20 mf., 150 V.)..........	 30-23
27	Field Coil......Part of Speaker No	36-14
28	Pilot Lamp......................	34-20
29	Line Resistor...................	33-33
30	Tubular Condenser (.03 mf., 400 V.	30-44 S
31	Push-Button Switch..............	42-14
32	Padding Condenser Strip.........	31-62

MODEL TP-11 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 1720 kilocycles (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the p band. This model is assembled in a 2 toned, streamlined plastic cabinet.

This model is equipped with 6 electric push-buttons for automatically selecting statio addition to dial tuning. Five push-buttons are used for the stations and one push-button for se ing dial tuning. The push-buttons cover a frequency range as follows:

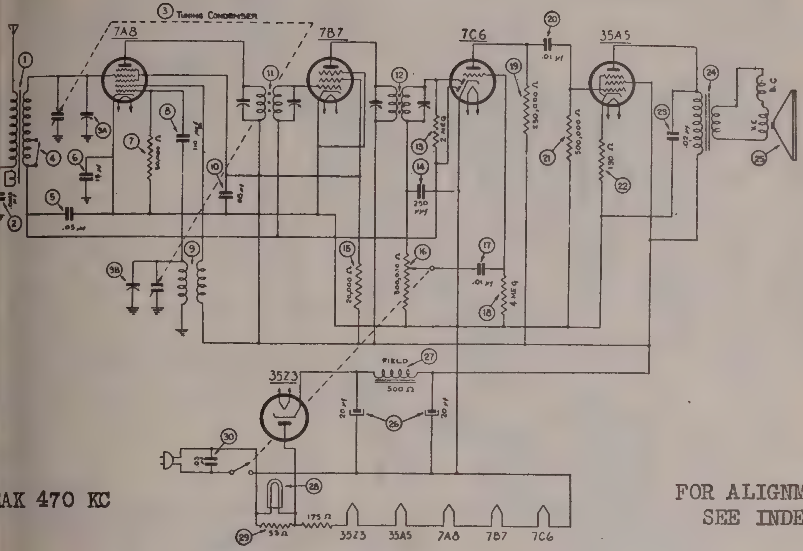
Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant. Osc.	1	540 to 1030 kilocycles	7 8	Ant. Osc.	4	900 to 1470 kilocycles
3 4	Ant. Osc.	2	650 to 1100 kilocycles	9 10	Ant. Osc.	5	1160 to 1600 kilocycles
5 6	Ant. Osc.	3	740 to 1240 kilocycles			6	Manual

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditi however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and suffic time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same cedure should be observed on A.C. power supplies when a slight hum is heard with the volume tu low.

MODEL TP-12
Schematic,Notes

PHILCO RADIO & TELEV. CORP.



F EAK 470 KC

FOR ALIGNMENT
SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-12

Description	*Philco Part No.*	*Schem. No.*	*Description*	*Philco Part No.*
nte a Transformer	32-3164		For Speaker 36-1469-9	32-8044
ubu r Condenser (.0015 mf.,200V)	30-4555S	25	Cone Assembly	
uni Condenser	31-2354		For Speaker 36-1469-1	36-4115
wit	42-1406		For Speaker 36-1469-9	36-4113
ubu r Condenser (.05 mf., 200V).	30-4519S	26	Electrolytic Condenser	
ubu r Condenser (.15 mf., 400V).	30-4505S		(20-20 mf., 150V)	30-2382
esi or (50,000 ohms, (1/3 watt).	33-350244	27	Field Coil.....Part of Speaker No	36-1469
ica ondenser (110 mmf.)	30-1031	28	Pilot Lamp	34-2068
sci ator Transformer	32-3152	29	Line Resistor	33-3367
ubu r Condenser (.05 mf., 200V).	30-4519S	30	Tubular Condenser (.03 mf., 400V)	30-4449S
st F. Transformer	32-3149		Cardboard	27-9299
nd F. Transformer	32-3150		Cabinet	10374
esi or (2 meg., 1/3 watt)	33-520244		Cable (Power)	L-3183
ica ondenser(250 mmf.)	30-1032		Dial Scale	27-5498
esi or (20,000 ohms, 1/3 watt)..	33-320244		Drive Drum	28-6662
olu Control (500,000 ohms)	33-5306		Drive Shaft Assembly	31-2355
ubu r Condenser (.01 mf., 200V).	30-4479S		Drive Cord Assembly	31-2358
esi or (4 meg., 1/3 watt)	33-540244		Knob Assembly	27-4820
esi or (250,000 ohms, 1/3 watt).	33-425244		Pointer Dial	56-1326
ubu r Condenser (.01 mf., 400V).	30-4572S		Spring (Drive Cord)	28-8751
esi or (500,000 ohms, 1/3 watt).	33-450244		Speaker	36-1469
esi or (130 ohms, 1/2 watt)	33-113336		Socket Assembly (Pilot Lamp)	38-9825
ubu r Condenser (.02 mf., 400V).	30-4516S		Sockets	27-6128
utp Transformer				
F Speaker 36-1469-1	32-8047			

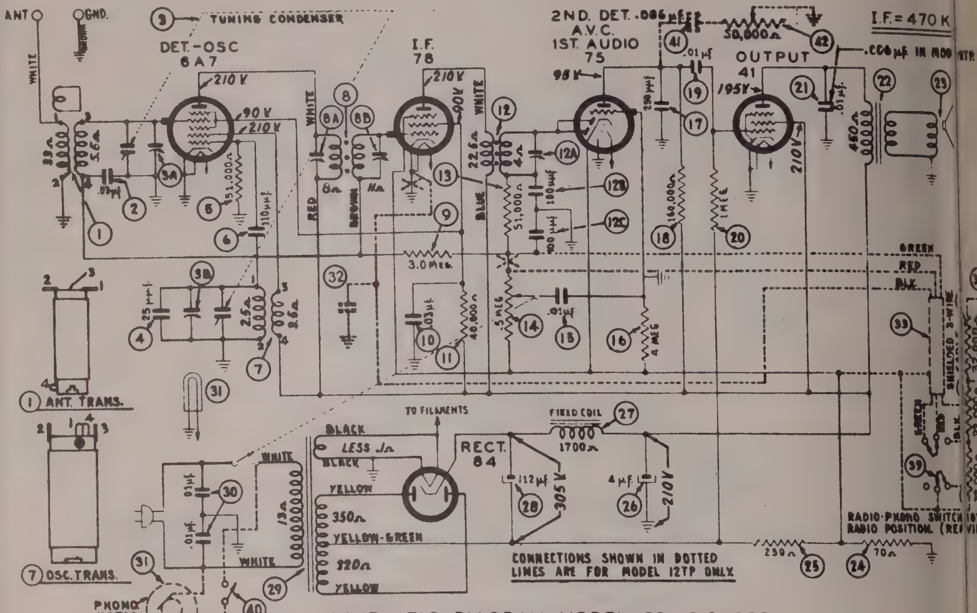
DEL P-12 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to loc les (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police Thi model is designed to operate on either alternating (A.C.) or direct current (D.C.) 115 Th model is assembled in a walnut cabinet with contrasting maple inlays.

in or aerial 20 feet in length is attached to the receiver for average receiving conditions; in partment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part 38 is recommended.

E: If no sound is heard after connecting the receiver to the power supply and sufficient be n allowed for the tubes to heat, reverse the electric plug in the outlet. The same pro- sho d be observed on A.C. power supplies when a slight hum is heard with the volume turned

MODELS 12TP,39-12
39-12TP,Early,Late
Schematic,Changes

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 39-12 & 12TP

The wiring of the earlier and later production models 12-TP were different. The complete ci diagram of the early production receiver is shown above. The later production receivers used a 39-6 chassis.

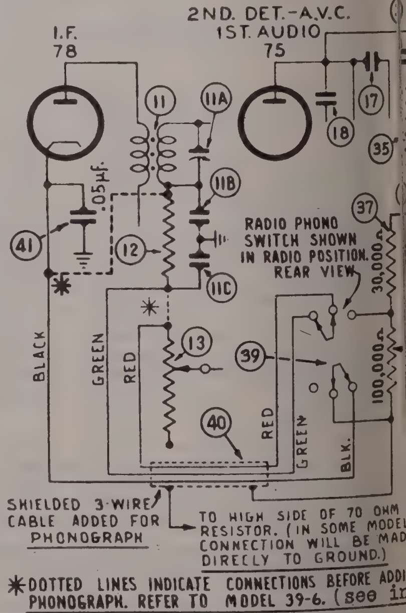
The Phonograph connections as used with Model 39-6 is shown below. Refer to **index** for Model

MODEL 39-12TP
"EARLY TYPE"

Schem. No.	Description	Part No.
31	Motor (115 Volts)	35-1174
32	Condenser (.05 mfd., 200 V.)	30-4519
33	Cable	
34	Resistor (32,000 ohms)	33-332339
35	Condenser (.006 mfd., 400 V.)	30-4591
36	Crystal Cartridge	415-1027
37	Resistor (32,000 ohms)	33-332339
38	Resistor (32,000 ohms)	33-332339
39	Switch (Radio-Phono)	42-1522
40	Motor (Power Switch)	42-1498
41	Condenser (.006 mfd., 400 V.)	30-4591
42	Tone Control	33-5330
	Pickup Complete	35-2027

MODEL 39-12TP
"LATER PRODUCTION MODELS"

Schem. No.	Description	Part No.
34	Condenser (.006 mfd., 400 V.)	30-4591
35	Tone Control	33-5330
36	Crystal Cartridge (Pickup)	415-1027
37	Resistor (30,000 ohms)	33-330339
38	Resistor (100,000 ohms)	33-410339
39	Switch (Radio-Phono)	42-1522
40	Cable	
41	Condenser (.05 mfd., 200 V.)	30-4519
	Pickup Complete	35-2027
	Motor (115 Volt A.C. 60 cycle)	35-1174
	Power Switch (Motor)	42-1498



SHIELDED 3-WIRE CABLE ADDED FOR PHONOGRAPH

TO HIGH SIDE OF 70 OHM RESISTOR. (IN SOME MODEL CONNECTION WILL BE MAD DIRECLY TO GROUND.)

✳DOTTED LINES INDICATE CONNECTIONS BEFORE ADDI PHONOGRAPH. REFER TO MODEL 39-6. (see ir

PHONOGRAPH CONNECTIONS FOR MODEL 12TP

PHILCO RADIO & TELEV. CORP.

MODELS 12TP,39-12
39-12TP,Early,Late
Alignment,Trimmers
Socket,Parts

PHILCO RADIO PHONOGRAPH.............................MODEL 12-TP

SPECIFICATIONS

TYPE F CIRCUIT: Model 39-12 TP is a table model combina on semi-automatic phonograph and superheterodyne ra o receiver. The phonograph mechanism automatically pl es the pickup on the record when the lid is closed an will play 10 or 12 inch records.

A. operated, superheterodyne with automatic volume contr , pentode audio output, and covers the standard broadca and state police frequencies.

POWE SUPPLY:

	Voltage	Frequency Cycles
	115	50 To 60

INTE EDIATE FREQUENCY: 470 K.C.

R.F. UNING RANGE: 540 to 1720 K.C.

AUDI OUTPUT: 2 watts.

PHIL TUBES USED: Five: One 6A7, Det. Osc.; One 78, I. ; One 75, 2nd Det., 1st Audio; One 41, Output, and On 84, Rectifier.

TUNI MECHANISM: 8 to 1 Ratio using Pulley and Cord.

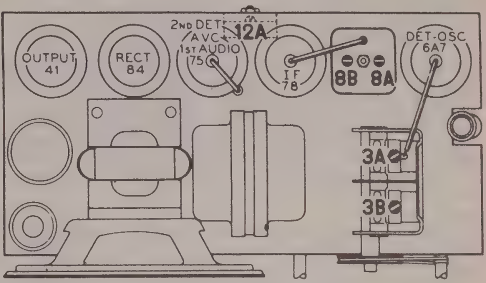


FIG. 2.—Locations of Compensators.

ALIGNMENT OF COMPENSATORS

EQUI MENT REQUIRED:

) Signal Generator
) Output Meter
) Philco Fibre Handle Screw Driver, Part No. 45-2610 and Fibre Wrench, Part No. 3164.

OUTP T METER:

ie 027 Output Meter is connected to the plate and thode terminals of the 41 tube. Adjust the meter use the (0-30) volt scale and advance the attenuor control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION:

1 Turn the tuning condenser to maximum capacity position (plates fully meshed).
2 Holding the tuning condenser in this position, turn the pointer until it is 1/16 of an inch below the three lines of the scale at the 550 K.C. end. This is the correct position of pointer at maximum capacity of tuning condenser.

O RATIONS IN RDER	SIGNAL GENERATOR			RECEIVER			NOTES
	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6A7 Grid	.1 mfd	470 KC	580 KC	Vol (Max)	(12A), (8B) (8A)	Adjust for Max.
2	Aerial (White Wire)	100 mmfd	1500 KC	1500 KC	Vol (Max)	(3B), (3A)	Adjust for Max.

REPLACEMENT PARTS

MODEL 39-12 TP

Sch . No	Description	Part No.
1	Antenna Transformer......................	32-2583
2	Condenser (0.05 mfd. tubular)..........	30-4444
3	Tuning Condenser Assembly)..............	31-2258
4	Compensator (Part of tuning condenser 3)	
5	Resistor (51,000 ohms, ½ watt).........	33-351339
6	110 mmfd. mica..........................	30-1031
7	Oscillator Transformer..................	32-3019
8	First I.F. Transformer..................	32-3018
9	Resistor (2 megohms)....................	33-520339
10	Condenser (0.03 mfd. tubular)..........	30-4449
11	Resistor (40,000 ohms, ½ watt).........	33-340339
12	Second I.F. Transformer................	32-2944
13	Resistor (51,000 ohms, ½ watt).........	33-351339
14	Volume Control.........................	33-5230
15	Condenser (0.01 mfd. tubular)..........	30-4479
16	Resistor (4 megohms, ½ watt)...........	33-540339
17	Condenser (250 mmfd. mica).............	30-1032
18	Resistor (160,000 ohms, ½ watt).......	33-416339
19	Condenser (0.01 mfd. tubular)..........	30-4169
20	Resistor (2 megohm, ½ watt)............	33-510339
21	Condenser (0.01 mfd. tubular)..........	30-4169
22	Output Transformer.....................	32-7861
23	Cone and Voice Coil Assembly...........	36-4084
24	Resistor (70 ohms, ½ watt).............	33-070339
25	Resistor (250 ohms, ½ watt)............	33-125431
26	Condenser (Electrolytic 4 mfd.)........	30-2236
*27	Field coil assembly (not supplied; see Note)	
28	Condenser (Electrolytic 12 mfd.)......	30-2235
29	Power Transformer (115V, 50 to 60 cycle)	32-7993
30	Condenser (0.01 mfd., .01 mfd.).......	3903-DG
	Pilot Lamp.............................	34-2068
	Bezel and Glass Assembly..............	40-6158
	Bezel Clamp............................	28-5153
	Cable (Power)..........................	L-2778
	Clip (R.F. Trans. small)...............	28-5002
	Clip (R.F. Trans. large)...............	28-5003
	Clip (Tuning Shaft)....................	28-8610
	Dial Assembly..........................	31-2097
	Dial Pointer...........................	28-5185
	Dial Drive Cord Assembly...............	31-2082
	Dial Drive Drum........................	28-6662
	Dial Drive Spring......................	28-8751
	Knob (Tuning and Volume)...............	27-4604
	Shaft Assembly (Tuning)................	31-2179
	Shield (Tube)..........................	28-5059
	Socket (6 prong).......................	27-6036
	Socket (7 prong).......................	27-6037
	Socket (5 prong).......................	27-6035
	Stop--Rubber...........................	27-4540
	Speaker Model BO-1.....................	36-1418
	Pilot Lamp Assembly....................	31-2179

* Entire Speaker must be replaced when field coil is open or damaged.

MODEL 35-1169, Automatic
Record Changer
Notes

PHILCO RADIO & TELEV. CORP.

Automatic record changer Part No. 35-1169 plays eight 10" records automatically or eight 12" records manually. The last record remains on the turntable and repeats as long as the record changer is in operation either in the manual or automatic position.

OPERATION

AUTOMATIC POSITION:

To load the mechanism lift the record removing arm at (A) Fig. 1 to the upright position. To adjust the pickup to play 10" records, automatically, push the pickup stop at (K) Fig. 1 back away from the pickup. To play 12" records manually, pull the stop forward toward the needle as far as it will go. Place records on turntable. Throw switch at (N) Fig. 1 to the "On" position. Mechanism will now operate and reject each record after it has been played through. To reject a record and play the next record below it, pull the latch lever at (L) Fig. 1 forward.

MANUAL POSITION:

To operate the mechanism in the manual position, lift the record removing arm at (A) Fig. 1 to the upright position. 10 or 12" records can then be played by the position of the pickup stop at (K) Fig. 1. To play 10" records manually, push the pickup stop at (K) Fig. 1 back away from the pickup needle. For 12" records, pull the stop forward toward the needle as far as it will go.

MOTOR LUBRICATION

The motor installed in this Record Changer is governor controlled, with all gearing enclosed and leaves the factory lubricated for proper operation. For best results, lubricate the motor at regular intervals with a pure mineral oil as light as obtainable. Under no circumstances use any oil heavier than an SAE #10 nor any oil containing mixtures of animal or vegetable oils.

The governor disc engages with a felt brake. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately six months under normal conditions. An oil hole is provided in the top of the governor housing for relubricating the brake felt.

MOTOR SPEED

The motor speed is adjusted by means of a slotted post (C) 3 Fig. 1 which is located under the turntable. To change motor speed rotate this post slightly by means of a screw driver.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at (O) Fig. 1 to drop in front of, and be actuated by the cam at (P) Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at (U) Fig. 1 latches properly in the notch in the lift lever at (1) Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at (J) Fig. 1. Now run the record changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at (H) Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at (E) Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT --- Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1-3/4" from the edge of the hole in the center of the record.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at (S) Fig. 2 engaging the serrated block on the trip lever at (T) Fig. 2. There must be a minimum of 1/32" play between the end of the pin and the block, when, with a short needle, (5/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

The oval head pivot screw at (R) Fig. 1 serves as a pivot for the lift lever at (1) Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at (O) Fig. 1 is not dropping in far enough to engage the cam at (P) Fig. 1 then check the tension of the trip spring at (B) Fig. 1.

RECORD REMOVING MECHANISM

The record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at (Q) Fig. 3. Next stop the motor in such a position that the latch bar at (O) Fig. 1 can swing by and clear the cam at (P) Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at (L) Fig. 1 first, it will be found possible to swing the record removing finger at (Y) Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at (Q) Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at (V) Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

IF the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at (W) Fig. 2.

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at (M) Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at (M) Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at (Z) Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at (K) Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at (X) Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

PHILCO RADIO & TELEV. CORP.

MODEL 35-1169
Assembly, Parts

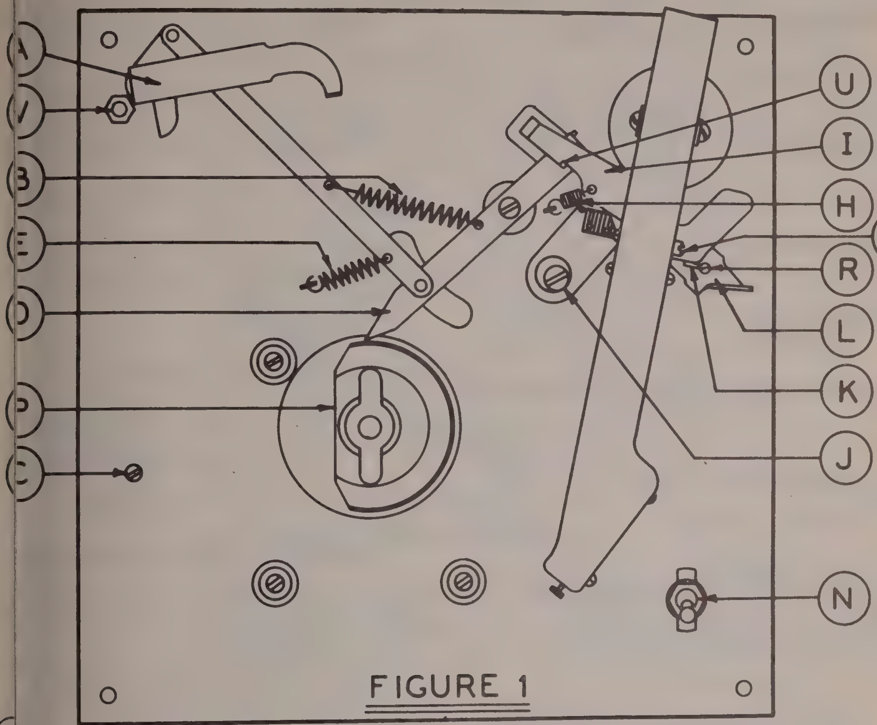
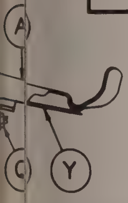


FIGURE 1



FIURE 3

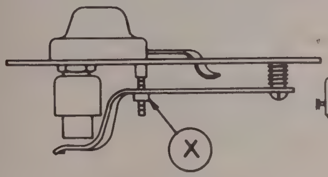


FIGURE 4

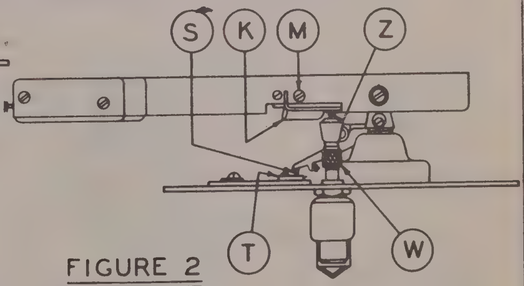


FIGURE 2

Reord Removing Mechanism Assy. Complete

Parts of Above Assembly

ecord Removing Arm Assembly
ecord Removing Sleeve & Link Assy.
ecord Removing Sleeve Link Mtg. Stud
ecord Removing Sleeve Screw
ecord Removing Link Screw
ecord Removing Link Spring
ecord Removing Finger Pin
ecord Removing Finger
ecord Removing Finger Spring
ecord Removing Arm Adjusting Nut
ecord Removing Arm Adjusting Screw
ecord Removing Arm Pin
(Arm to Sleeve & Link Assy.)

Tp Spring

Mor Speed Adjusting Post

Rord Removing Link Spring

Lch Spring

Lt Lever Assembly

ift Spring
ift Crank Washer
ift Lever Screw

Eentric Washer & Locking Screw

Austable Stop

L. Reject Lever

M. Pickup Positioning Adjusting Screw

N. Power Switch

O. Latch Bar Assembly Complete

Screw (Latch Bar Mtg.)
Stud Nut (Latch Bar & Bumper)
Stop (Latch Bar)
Washer (Latch Bar Mtg. Screw)
Mounting Screw (Latch Bar Stop)
Screw (Latch Bar & Pickup Lift Stop)

P. Cam (Latch Bar Stop)

Q. Record Removing Arm Adjusting Screw

Nut (Record Removing Arm)

R. Lift Lever Pivot Screw

S. Tone Arm Lift Crank

T. Trip Lever Serrated Block (Part of L)

U. Pin (Part of Latch Bar (O)

V. Record Removing Arm Adjusting Stud

W. Dash Pot Complete

X. Dash Pot Lift Lever

Y. Record Removing Finger

Z. Pickup Lift Shelf

Dash Pot
Nut (Dash Pot)
Adjusting Cap (Dash Pot)
Gland (Dash Pot)
Plunger Assembly (Dash Pot)
Lever Spring (Dash Pot)
Weight (Dash Pot)
Lever Spacer (Dash Pot)
Felt Washer (Dash Pot)
Leather (Dash Pot)
Washer Large (Dash Pot)
Washer Small (Dash Pot)

MODEL 35-1176, Intermix
Auto Record Changer
Assembly, Motor Notes

PHILCO RADIO & TELEV. CORP.

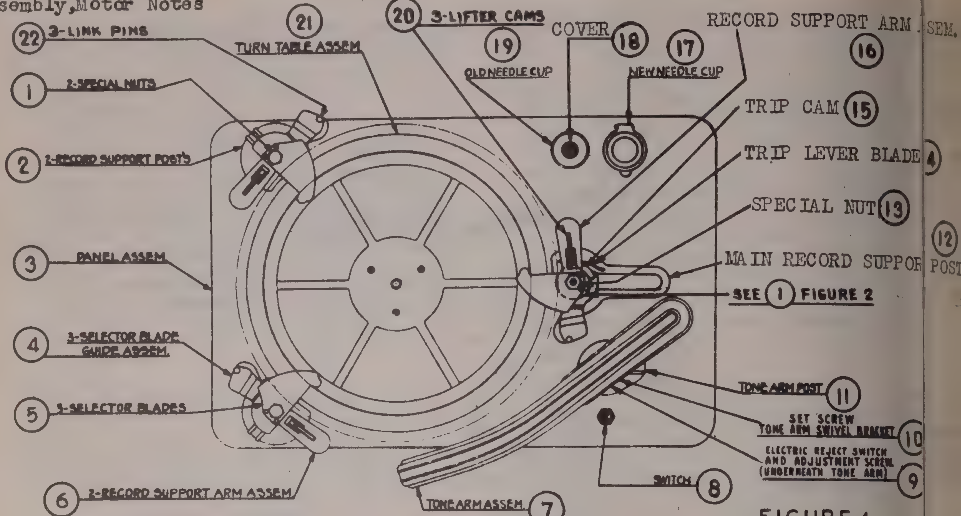


FIGURE 1

TOP VIEW OF RECORD CHANGER PART No. 35-1176

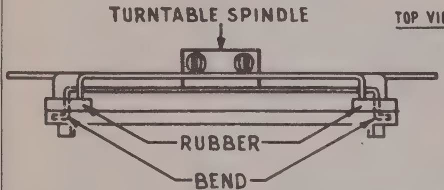


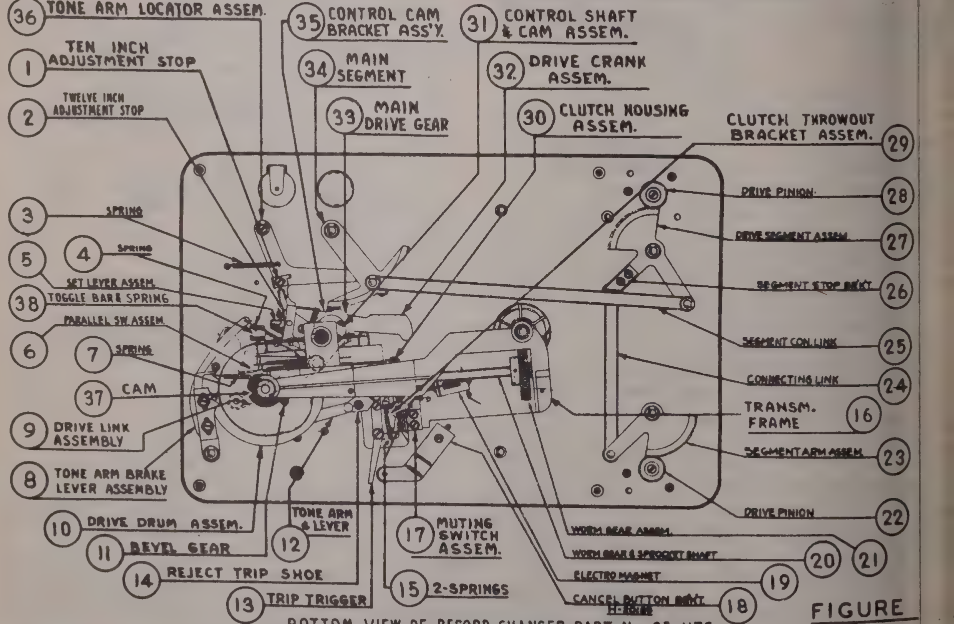
FIGURE 4

JULY, 1939.

REMOVING MOTOR TRANSMISSION

In removing the motor transmission, the following arts should be disassembled first:

1. Remove turntable shaft. (See paragraph — Rem ing Turntable Shaft Assembly.)
2. Unsolder pick-up wires.
3. Loosen the two set screws which hold the tone arm ver and the tone arm shaft and remove tone arm and shaft.
4. Remove the mounting screws which hold the tonearm post to the panel. Unsolder electric tone arm reject s itch wire from the terminal strip and remove tone arm post.
5. Remove "C" washer from the drive link pin — thi will allow the drive link to be removed from the transmissio and then remove the six mounting screws holding the transm sion to the panel and take out the transmission.



FIGURE

BOTTOM VIEW OF RECORD CHANGER PART No. 35-1176

P LCO INTER-MIX RECORD CHANGER, Part No. 35- '6 plays and automatically changes with one loading — 14 -inch and twelve-inch records mixed together in any ord This record changer will also separately play 15 ten-inc records or 13-twelve inch records. In addition, the me nism is designed to operate with slightly warped records.

S vice information contained in this bulletin covers operatio care, and adjustments that may be necessary if the me nism ceases to function properly.

V en ordering parts, refer to the part number of the entire me nism in addition to the number and name of parts shown in figures of this bulletin.

PHILCO RECORD PLAYER NEEDLES

T obtain brilliant life-like tone quality, PHILCO Record Pla r Needles are recommended. These needles are especiall designed to give high fidelity tone reproduction — less rec l wear and less surface noise. One needle plays 15 to 20 rec ls. The use of inferior needles in the pick-up of this mechani will greatly affect the tone reproduction performance.

AUTOMATIC AND MANUAL POSITIONS

control knob (1) Fig. 2 is provided for placing the me anism in the automatic or manual operating position.

V en changing from manual to automatic or automatic to ma al positions, the mechanism should be turned off and all ed to complete its cycle. The knob can then be set for the osition desired as follows:

T operate the mechanism manually, press knob (1) Fig. 2 ma ed "Press-Turn" down and turn to the right (clockwise) un record support arm assembly (16) Fig. 1 is in the ext me clockwise position.

F r the automatic operating position, control knob (1) Fig. 2 is ned to the left (counter-clockwise) until knob snaps up.

CK-UP DOES NOT INDEX PROPERLY ON UTER EDGE OF 10″ AND 12″ RECORDS

T pick-up is set for 12″ records by the trip cam (15) Fig. 1 t t is pivotally mounted under the selector blade on main rec d support post (12) Fig. 1. This trip cam is operated by e edge of a 12″ record compressing the cam when the rec d support arm moves in a clockwise direction. This cam mo s trip lever blade (14) Fig. 1 and toggle bar and spring (3 Fig. 3 which pushes set lever blade (5) Fig. 3 into po ion to hold the tone arm locator (36) Fig. 3 in the 12″ po ion.

ter playing a record or the mechanism has been rejected, the et lever (5) Fig. 3 is reset for the 10″ position by the co ol cam bracket lever (35) Fig. 3 mounted on the set lever sh . The control cam bracket (35) Fig. 3 engages the co ol shaft cam pin (31) Fig. 3 at the start of rotation.

justment of the tone arm when placing the needle in the fir groove of 10″ and 12″ records is controlled by tone arm loc or (36) Fig. 3. When 10″ or 12″ adjustments are made, th 2″ adjustment should be made first. If 10″ adjustment al is necessary, the 12″ adjustment should be re-checked. A stment of the locator lever is as follows:

12-inch Record Adjustment

Turn control knob (1) Fig. 2 to "manual" position.

Place a 12″ record on the turntable.

Start mechanism and allow pick-up to position itself on th outer edge of the record. If the needle has not been pl ed in the center of the smooth outer rim of the record, ad st stop (2) Fig. 3 by loosening set screw. Move the stop in e direction necessary to center the needle on the smooth ou r rim of the record.

10-inch Record Adjustment

Set control knob (1) Fig. 2 to "automatic" position.

Load the mechanism with several 10″ records.

Allow mechanism to set a record on turntable and place th pick-up on the smooth outer rim of the record.

If the pick-up does not come down in the center of the sm th outer edge of the record, adjust the following:

Loosen 10″ record stop (1) Fig. 3.

Move the stop slightly toward or away from the stop pin as e case may be to center the pick-up needle on the outer ec of the record.

, after making the above adjustments, it is found that the pi -up will not move into the first groove after the needle is ce ered on the outer edge of the record, examine the fo wing parts:

Spring (2) Fig. 3 on 12″ adjustment stop may be weak.

Tone arm lever or swivel shaft may be binding; e mine and lubricate.

TONE ARM ELECTRIC REJECT SWITCH WILL NOT OPERATE

(When no record is on turntable)

The tone arm electric reject switch operates when the mechanism is first loaded and no records are on the turntable or no records are on the record support arms. This switch closes when the pick-up needle drops into a groove provided in the turntable; allowing the tone arm to go to a lower level and causing switch contact to close. Adjustment of this switch is as follows:

1. Adjust screw (9) Fig. 1 located in the tone arm directly above the end of the tone arm shaft. Turn this screw in the direction necessary to obtain a clearance of 1/16″ between the bottom of the groove in the turntable and the bottom end of the needle.

2. With a record on the turntable and the needle resting on the record, a clearance of 1/16″ between the top and bottom contacts of the tone arm electric reject switch should be obtained. Bend the moving contacts spring upward or downward to obtain the necessary clearance.

3. Also check the electric magnet (19) Fig. 3 and associated wiring for open circuits.

4. Check the small metal rod connecting the trip trigger (13) Fig. 3 and lever of electric magnet.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

The tone arm is designed to reject records with an oscillating or spiral reject groove. To make the adjustments for either type of records, proceed as follows:

1. See that the screw (10) Fig. 1 which clamps the tone arm swivel bracket is tight. Make sure that the set screws holding the tone arm lever (12) Fig. 3 to the tone arm shaft are tight.

2. Oscillating Groove Records

Records with an oscillating reject groove are rejected by the trip dog located on the end of the tone arm lever (12) Fig. 3 engaging the saw teeth of the trip trigger (13) Fig. 3. When the mechanism will not reject an oscillating groove record, either the screws mentioned in paragraph 1 are loose or the trip dog trip trigger (13) Fig. 3 or springs (15) Fig. 3 are at fault. When it is found that these parts have become worn or weak, they should be replaced.

3. Spiral Groove Records

Records with spiral reject grooves are rejected by the trip shoe (14) Fig. 3 located on the end of the tone arm lever (12) Fig. 3. This trip shoe (14) Fig. 3 hits the pin on the trip trigger (13) Fig. 3 releasing the clutch throwout bracket (29) Fig. 3. This should occur when the pick-up needle has traveled to within a distance of 1⅞″ from the center of the turntable spindle. Adjust the mechanism to properly reject this type of record as follows: If the pick-up does not reject the mechanism after traveling to within 1⅞″ from the center of the turntable spindle (or 1¾″ from the edge of spindle), loosen the knurled nut holding trip shoe (14) Fig. 3 to the tone arm lever (12) Fig. 3. Move trip shoe toward or away from the pin on the trip trigger (13) Fig. 3 until the trip shoe operates the mechanism properly. When this point is found, the knurled nut should be well tightened.

TEN AND TWELVE INCH RECORDS DO NOT SEPARATE PROPERLY IN A MIXED LOADING

Ten and twelve inch records in a mixed loading are separated by lifter cams (20) Fig. 1 located on the record support arms (6) (16) Fig. 1. These cams operate when the next record to be selected by the mechanism is 10″ and are designed to lift a 12″ record when one is located directly above the 10″ record. This allows the selector blades (5) Fig. 1 and guide arms (4) Fig. 1 to slide under the 12″ record so that a 10″ record can be placed on the turntable. The lifter cams (20) Fig. 1 are caused to operate by the 10″ record hitting the end of the cam. Check the following parts when mechanism does not separate records properly:

1. The lifter cam link (20) Fig. 1 should be approximately 3/32″ above the surface of the record support arms (6) (16) Fig. 1 when no records are on support arms (6) (16) Fig. 1. This link is held in this position by the small return spring found under (20) Fig. 1 underneath the support arms (6) (16) Fig. 1. If link is not above the surface of support arms (6) (16) Fig. 1, check for loose spring; replace spring if necessary.

2. The selector blades (5) Fig. 1 should have a slight downward pressure on the top surface of the guide arms (4) Fig. 1 when in their return position ready for next selection.

3. In their full return position after a record has been placed on the turntable the selector blades should also pass the guide arm link pin (22) Fig. 1 so that the selector blades will carry the guide arm toward the edge of a record when making the next selection. If any one of the blades do not return enough to clear the guide arm link pin (22) Fig. 1, the blade should be adjusted as given in paragraph "RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM".

4. There should also be sufficient tension between the guide arm link pin (22) Fig. 1 and the end of the selector blade (5) Fig. 1 so that the guide arms (4) Fig. 1 will be pulled forward against the record when the selector blade (5) Fig. 1 moves to select the next record. Tension between guide arms and selector blades should be sufficient so that sloop on guide should lift a full load of records to proper height for selector blades to select bottom record. If guide arm pin (22) Fig. 1 does not have enough tension against end of selector blades (5) Fig. 1, check the springs holding the pin in position, also, for worn surface on side of pin.

5. Action of the selector guide arm (4) Fig. 1. The guide arm is designed to guide the selector blade (5) Fig. 1 and lift the record to the proper height necessary to separate the records. The top of the guide arm (4) Fig. 1 has two inclined surfaces. The outer surface for 10" records and the inner surface for 12" records. After the selector blades (5) Fig. 1 have entered between the records, the guide arm (4) Fig. 1 is released and returned to its normal position. If it does not return to its normal position, check for a weak spring on the guide arms (4) Fig. 1 or binding between guide arm and record support post (2) Fig. 1. These springs are attached to record support posts (2) (12) Fig. 1 and a pin at the swivel of the guide arm.

6. In case of a warped 10" record with its concave face down, resting on a warped 12" record with the concave face upward, there is a tendency for the selector blades to jam against the edge of the 10" record instead of going in under it. In order to prevent this condition the blades must be bent down sufficiently to slide along the top surface of the 12" record.

SELECTOR BLADE (5) FIG. 1 FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped condition of the record, or to its being of a thickness considerably different from those now in standard use. The design of both selector blade and record support arms is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be unfit for use in the automatic changer.

RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM

If the record selector blades (5) Fig. 1 do not operate in synchronism proceed as follows:

1. Set the control knob (1) Fig. 2 to "automatic" position. See page 1 "Automatic and Manual Positions". (Turn knob to the left until it snaps up). Place one 10" record on selector blades. After record has been dropped to record supports, pull lower plug and rotate turntable by hand until the selector blades are close to the edge of record. At this point all selector blades should be as nearly as possible the same distance from spindle. If the selector blades are not the same distance from the spindle due to replacement of gears, etc., the blades are resynchronized as follows:

2. With the mechanism in the same condition as outlined in paragraph 1, remove the "C" washer from segment arms (23) or (27) Fig. 3 depending on which of these selector blades are out of time. Pull segment arm down so that gears are disengaged, then move selector blade (5) Fig. 1 in direction necessary to align it with other blades. When this position is found, mesh gears and replace "C" washer.

MECHANISM DOES NOT RETURN SELECTOR BLADES TO LOADING POSITION

If the selector blades will not return to the loading position (pointed toward spindle) after a record has been placed on the turntable:

1. Look for trouble in the parallel cam switch (6) Fig. 3. The contact of this switch should be in a closed position, at the time a record is being played.

2. When the selector blades are in the proper loading position cam (37) Fig. 3 should open parallel switch (6) Fig. 3. To place the mechanism in the loading position, turn changer switch (8) Fig. 1 off. After the switch is off the changer should continue to operate until the next record is selected and dropped on the turntable. When the record is dropped on the turntable, cam (37) Fig. 3 should open parallel switch (6) Fig. 3. When the turntable stops rotating the selector blades should be pointed toward spindle.

3. To adjust cam (37) Fig. 3 loosen the two set screws and rotate cam on the shaft until proper position is obtained. Retighten set screws.

TOP RECORD SLIPS WHEN PICK-UP IS IN TH PLAYING POSITION

If the top record slips in the playing position, check th following parts:

1. Check for excessively warped records. Records warpe too badly should be replaced and not used in the changes.

2. Check for worn grooves in record, particularly ol records. After the grooves of the records lose their gloss, th pick-up does not glide through the groove. This condition ha a tendency to cause pick-up needle to drag resulting in th top record slipping.

3. Check record friction spring (16) Fig. 2 for tensio This spring should protrude far enough from the shaft to hol the top record from slipping when in the playing positio This spring when adjusted properly to hold a record, shoul also allow a 10" record to fall freely onto the turntable.

If the spring is in need of adjustment, see headin "Removing Turntable Shaft Assembly", Paragraph 4.

OILING AND GREASING MOTOR AND MECHANISM

The motor and mechanism should be oiled and greased ever six months with a good grade of S. A. E. 10 oil.

Parts to Lubricate:

1. All bearings of the mechanism.
2. All sliding surfaces such as, cams, etc., should be lubricated with a very light grease.
3. Motor bearings and governor felt.

TURNTABLE SPEED ADJUSTMENT

If motor runs too fast or slow, the governor adjustmen screw (27) Fig. 2 on the top side of the governor should b screwed in or out slightly as required. To do this, loosen th lock nut and turn screw, then retighten lock nut.

REMOVING TURNTABLE SHAFT ASSEMBLY

To remove the turntable shaft assembly, proceed as follows

1. Loosen the two set screws holding the motor coupling (21) Fig. 2 to the turntable shaft.
2. Loosen the two screws holding the turntable drive worm (23) Fig. 2 to the turntable shaft, then lift out turntable an shaft.
3. To remove the turntable from the shaft, remove the three screws and nuts which hold it to the hub.
4. The record friction spring (16) Fig. 2 on the turntable shaft can be removed by pushing the hub downward toward the heavy end of the shaft — the spring can then be removed. If it is desired to increase the record friction on spring, bend upward the lower section of the spring which contacts with the bottom surface of the hub. To decrease the record friction against the spring, bend the spring downward.

The motor is removed as follows:

1. Remove the three 10/32" machine screws which hold the motor to the motor mounting bracket. Three ½" spours will also be found which space the motor from the mounting plate.
2. There are two motor bracket locating pins on the underside of the changer base panel which pass through rubber grommets located in the motor mounting bracket. These are provided to keep the mounting panel and motor bracket in proper alignment.

MECHANISM AND CHASSIS MOUNTING

The mechanism is mounted in the cabinet as follows: 4 mounting studs are located in the bottom surface of the panel each threaded to take ¼" No. 20 machine screws. The mounting panel rests on four tapered coil springs. The small end of each spring is pressed over a mounting stud and the large end of each spring fits into a screw in the top surface of the mounting shaft in the cabinet. Four spacing blocks ⅛" thick and with a ⅝" hole are fastened to the lower side of the cabinet motor board. The ⅝" hole in each block is centered with the 7/16" screw clearance hole. These are provided and located on the lower side of the cabinet motor board into which each of the lower mounting springs are to fit. The ¼" No. 20 machine screws are turned through the four wing nuts until the head of each screw is against the head of the bottom side of each wing nut. The four lower springs are of smaller diameter than the upper springs. These lower springs are slipped over the nuts to each of the ¼" No. 20 machine screws with the smaller end toward the head and resting on the wing nuts.

The ¼" No. 20 machine screws are pushed through the 7/16" clearance hole and tightly screwed into the mounting studs. Wing nuts should be backed down on head of ¼" No. 20 bolt to place changer in operation.

NO REPRODUCTION WHEN NEEDLE IS OPERATING ON RECORD

muting switch (177 Fig. 3, the purpose of which is to rt the pick-up during the change cycle. This switch is nted on the transmission frame, and is operated from the ch throw-out (29) Fig. 3. When a record is on the turnle and the needle is in playing position, the contact of this tch should be in the open position.

TOMATIC CLUTCH DOES NOT COMPLETELY DISENGAGE AT THE END OF THE CYCLE

his trouble is identified by a steady thumping or clicking nd when the pick-up is in the playing position and is caused the clutch not properly disengaging at the end of the omatic cycle. In most cases, this trouble is due to the clutch arance adjusting plate not being in the proper position on tone arm brake (8) Fig. 3. To eliminate this trouble, ke the following adjustments:

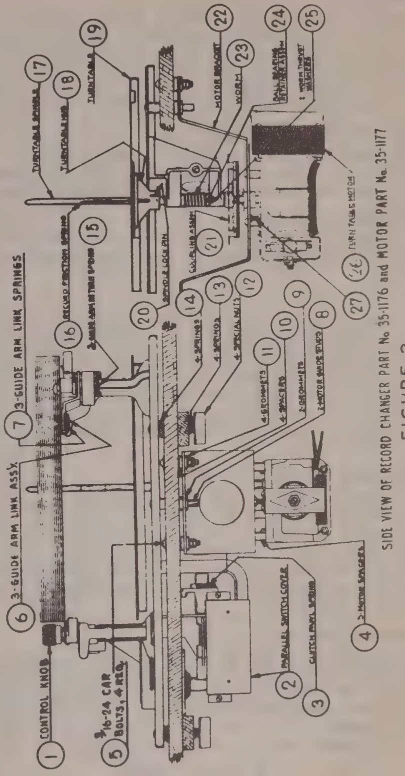
. Loosen the two screws that hold the clutch clearance justing plate to the tone arm brake lever (8) Fig. 3. Adnce the adjusting plate until the clutch pawl [found in tch housing (30) Fig. 3] clears the clutch sprocket.

. If the clutch disengages before the pin on the drive m (10) Fig. 3 reaches the inclined surface of the adjusting te, the plate should then be retarded until the drive drum passes over the humps and slides down inclined surface.

AILURE OF UNIVERSAL DRIVE COUPLING

The Universal drive coupling consists of four strips of bber held together by a frame having ears projecting into ts in the rubber.

If excessive strain is placed on the coupling, the projecting rs may slip out of the slots in the rubber, thus disconnecting e drive. In order to hold the coupling together more firmly, e outer end of these ears projecting through the rubber may bent outward at right angles to form a hook which will ld the rubber firmly in place. Do not make bend any more an ⅛" from end of ear. See Fig. 4.



SIDE VIEW OF RECORD CHANGER PART No. 35-1176 and MOTOR PART No. 35-1177

FIGURE 2

Automatic Record Changer
Part No. 35-1180

P ILCO AUTOMATIC RECORD CHANGER Part No. - 1180 automatically changes either twelve 10" or t 12" records. The service information contained in t s bulletin covers the operation, care, and adjustme s that may be necessary if the mechanism cea s to function properly.

V ien ordering parts for this mechanism, refer to the art number of the entire mechanism in addition to e number and names of the parts shown in the fig es of this bulletin.

CHANGER OPERATION

Se ng for Record Size

s changer plays up to twelve 10-inch records or ten 12-inc records at one loading.

each post you will see two plates. The lower one, on wh the records rest, is the **shelf plate.** The upper one is the sel **or blade** which selects the next record to be played from the ottom of the stack.

set for record size. (1) Clasp one of the posts just un neath the shelf plate, with thumb and finger of left ha With right hand, lift knob and turn selector plate until th igure 10 or 12 (whichever size you want to play) is op site the pointer. Do the same with the other post. Both sel tor plates must be in 10 or 12 position. (2) Push button m ed 10 or 12, as required (see Figure 1).

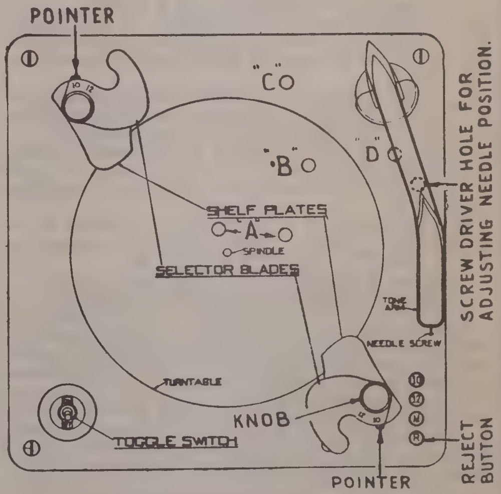


Fig. 1 shows Selector Blades in Position for 10-inch Records.

Loading

See that both shelf plates are turned toward center of turntable. As shelf plates near correct position you will feel the shelf plates drop into their indexing slots. Make sure both posts have dropped into their slots, if one is not in the slot, records may be damaged. Place the stack of records over center pin so they will rest on the two shelf plates.

Starting the Mechanism

To start motor and turntable (1) turn the switch to "ON" position. (2) Then push button "R". This will release the first record and start the record-changing mechanism.

Rejecting a Record

To reject a record press the "R" button. This can be done any time after the needle has come into contact with that record.

Turning Off

Turn changer switch to "OFF" position. Lift pickup arm, place it on the pickup rest. (If you happen to turn off the changer switch while the mechanism is going through a "change cycle", you will notice that it does not stop until the cycle has been completed, and pickup is again in playing position, ready to be lifted over onto the pickup rest.)

To avoid warping of records, **never leave records resting on the shelf plates.**

Removing Played Records

To remove records make sure motor switch is off, then take hold of both posts, just below the shelf plates, and turn them out of the way. Lift the played records from the turntable. Taking hold of posts as before (below shelf plate) move plates until post again falls into indexed position as outlined under loading. The changer may then be loaded with a new stack of records.

Manual Operation

To play records one at a time as in an ordinary phonograph: (1) Remove any records remaining on the turntable, leave plates turned outward as for removing played records Do not turn them back toward center of turntable. (2) Press button marked "M". Then place a record on the turntable, switch on motor and lift pickup into position.

LUBRICATION

The record changer will not need lubrication more than once a year and should be lubricated with a good light machine oil such as S.A.E. 10. There are 6 locations that will need oiling. These are shown in Figure 1. These lubricating holes can be reached from the top of the mechanism and are as follows:

1. The motor gear housing contains 3 lubricating wicks. These wicks are shown at "A" in Figure 1. Two of these wicks are reached through the hole directly in back of the turntable spindle and the other wick to the right of the turntable spindle.

2. A small quantity of oil should be dropped through hole marked "B" in Figure 1. Lubricating this point distributes oil to the various moving surfaces of the mechanism.

3. A felt wick directly below the hole marked "C" in Figure 1 should also be oiled.

4. Another felt wick marked "D" in Figure 1 should also be well oiled.

After long periods of use the oil becomes gummed in the above mentioned wicks. The wicks should be removed and cleaned with kerosene or carbon tetrachloride.

NEEDLE FAILS TO MOVE INTO RECORD GROOVE AFTER LANDING ON RECORD

Generally when the needle will not pull into the groove after landing on the record, trouble may be found due to lead spring (97) being weak. Increasing the tension of this spring or replacing spring will generally eliminate the trouble.

If after adjusting the lead spring (97) it is found that the needle jumps across the record, it may be necessary to adjust the angle of the pickup in relation to the turntable spindle. This procedure is covered under paragraph "Mechanism Will Not Reject at the End of Records".

TONE ARM SLIDES INWARD ACROSS RECO D

This is caused by the guide arms stud (12) not releasing m the grooves in the upper side of the large cam gear (11). is may be due to friction at the shoulder screw (26) or the oil spring lifting the arm may be weak.

If the coil spring appears to be weak, it may be strength ed by shortening. If there is binding at the bearing, a little oi ill help; also, a few movements by hand under considerable p sure will relieve the binding. If the binding is caused by he are being twisted out of line, the trouble can be sure oy straightening up the parts.

ADJUSTING THE RISING HEIGHT OF PICK-UP ARM

The pick-up arm should rise high enough during the cha e cycle so that the top of the tone arm clears the record r ting on the support arms by ⅛". When the maximum loa of records are on the turntable, the needle should clear ie top record, if not adjust as follows:

Loosen the lock nut in pick-up sleeve (22). Turn ie sleeve in the direction necessary to lengthen or shorten ie pick-up plunger (21). After correct adjustment is fo d, tighten lock nut.

ADJUSTING DISTANCE FROM TURNTABL SPINDLE AT WHICH REJECT WILL OPERATE AND CYCLE WILL BEGIN

The mechanism is designed to reject records of all t s whether they are provided with special grooves or not. e mechanism is adjusted to operate 1⅞" from the center of e record spindle; this distance has been found to be the n t satisfactory point for all modern records so that they wil e rejected after they have been played through. To ad t the reject mechanism for this distance or any distance t may be desired, a trip adjusting screw (18) is provided. y turning this screw toward the trip trigger (16), the me anism is caused to operate at a closer distance from e spindle. Turning the adjusting screw (18) away from e trip trigger, operates the reject closer to the turntable spin .

It may be found on some records of very early manuf ture that it will not be possible to obtain a satisfact adjustment that will always operate the changer mechanism

REJECT BUTTON "R" WILL NOT OPERATE MECHANISM

If the "R" button does not cause the mechanism to through a change cycle check the following parts:

a. Examine key control unit (75) for parts that have b come out of shape or any obstruction that will prevent t "R" button from moving to its maximum length of travel.

b. Inspect reject rod (78). If this rod does not trip t mechanism even when properly revolved by complete d pressing of "R" button, the rod has probably been bent out shape. Replace the rod or reshape it to its former position.

c. If trigger (16) is properly actuated but without startin a change cycle see instructions as given under "Mechanis Will Not Reject at End of Records" paragraph 3.

PRESSING "M" BUTTON DOES NOT CHANGE MECHANISM FROM AUTOMATIC TO MANUAL POSITIONS

Observe action of "M" button. Button should travel fa enough down when depressed to cause the manual rod (77) t actuate the key control unit. The key control unit (75) shoul also be checked for parts which have become out of shape o any foreign obstruction.

MOTOR STOPS IMMEDIATELY WHEN CHANGEF SWITCH IS TURNED OFF DURING A CHANGE CYCLE

The normal action of the mechanism when the changer switch is turned off during a change cycle is to continue to operate until the needle is again on the record. The mechanism should then stop. This action is caused by the cycling switch (85) short circuiting the manual changer switch during a change cycle. The switch should be changed when the above mentioned trouble develops.

MECHANISM DOES NOT REPEAT THE LAST RECORD

If the mechanism does not repeat the last record, any one of the parts listed under "Mechanism Will Not Reject at End of Record" may be causing the trouble.

RECORDS FALL UNEVENLY ON THE TURNTABLE

Records falling unevenly on the turntable is generally due to the turntable spindle not being correctly centered between the record loading posts. To correct this trouble, see "Replacing Motor."

LAST RECORD DROPS ON ONE SIDE

This trouble is due in most cases to the loading posts being bent out of perpendicular to the main plate. To check for this trouble, test the posts with a steel square as directed under "Replacing Motor". Replace or adjust post so that it will be perpendicular to the main plate.

CHANGER CONTINUES CYCLING

If the mechanism continues to change records constantly, it indicates trouble in the lift (37). Failure of this lift to disengage with the cam gear (11), Fig. 2, will cause the trouble. Check the various rivets at which motion occurs to find a point where friction or binding is interfering with freedom of motion. The cam lever (39), Fig. 2, should also be checked for too much friction. Oil this part if necessary.

SELECTOR BLADE FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped record or to its being of a thickness considerably different from records now in standard use. The selector blade and shelf blades are designed to accommodate a maximum variation in thickness and thinness of records now in standard use. There are certain records, however, that may be found which vary in thickness so much as to be impracticable for use in the automatic changer.

SELECTOR BLADES JAM INTO EDGE OF RECORD

This is generally caused by too small a spacing between the selector plate and the spacing between the selector plate and the shelf plate. This space should never be less than [illegible] inch when selector plate is in 10" position. Another cause of jamming is too sharp an edge on the selector plate. To eliminate this trouble, check spacing of plates. Bend the selector plate slightly, if necessary. Smooth up the edge of selector plate by means of a piece of fine emery cloth.

MECHANISM SLOW IN STARTING OR STALLS DURING A CHANGE OF CYCLE

Trouble is probably due to:

1. Motor mechanism is not thoroughly lubricated. See heading "Lubrication".
2. Check for loose set screws.
3. Line voltage may be abnormally low or motor windings damaged. If the windings of the motor are damaged, replace motor. To remove motor, see heading "Replacing Motor".

REPLACING MOTOR

Replacing the motor necessitates extreme care in aligning and correctly mounting the new motor. The procedure listed below should be followed closely. When replacing a new motor or ordering a new one from your distributor, specify the power supply from which the motor is to be operated. The motor electrical wiring is shown in Fig. 4.

When mounting replacement motor, it is most important to see that record pin is centered between the two posts of the changer, that it stands perpendicular to main plate (53), that it has not become bent so as to wobble. Even though the posts are stout and not easy to bend, it is well to check them also, with a 12" combination square laid clear across the concave upper surface of main plate. When the new motor has been attached, with three screws through grommet sleeves (51) (spacers) into its frame, and record pin is seen to revolve without appreciable wobble, the correct position of the record pin between the record-mounting posts can be accurately checked as follows: Place a single 12" record on the shelf plates, press "R" button, and turn turntable forward by hand. Immediately after the shelf plates open and allows the record to fall, turn turntable slightly backward, and with other hand support the record between the shelf plates; it can then be readily seen whether record pin is off center. If the record pin is found to be off center, remove the record and turntable, and loosen slightly the motor mounting screw or screws nearest the shelf plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 on photo, showing a shim in place upon one of the grommet sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard—or an assortment of shims of different thicknesses can be had from your distributor. (Order "Assortment of Part No. 45-2785"). They should be inserted around proper screws (when screws have been sufficiently loosened) between motor frame and the metal grommet sleeve. Do not insert shims next to rubber grommet.

TURNING CHANGER SWITCH OFF FAILS TO STOP MECHANISM

If after turning the changer switch off the mechanism continues to operate it indicates trouble in the cycling switch (85). Replace the switch when this trouble develops.

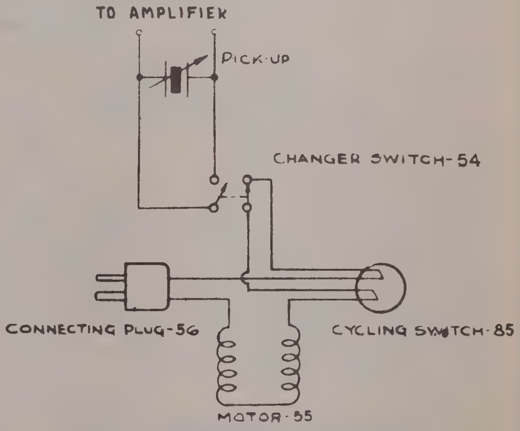
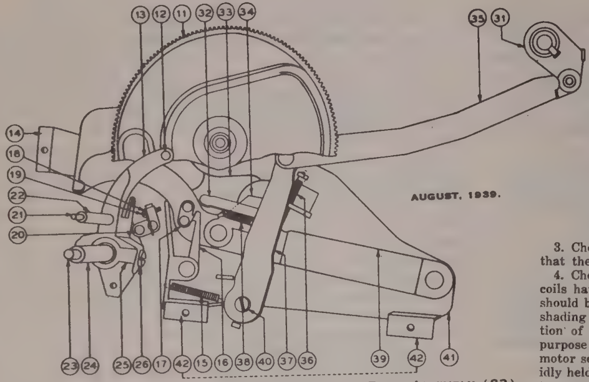


FIG. 4. MOTOR ELECTRICAL CONNECTIONS

DISASSEMBLING THE CHANGER

Before attempting to remove sub-plate assembly (83) detach key control unit (75) from main plate. To do this, start with control unit truss bar (80). Then take out the screw which holds left end of adjusting rod lever (94). Next remove adjusting rod (92) and adjusting rod extension (79). Take out the screw holding spring (73); then the screws holding key control unit (75) to main plate. Rods (77) and (78) can then, with due care, be extracted without bending. Free the cam connecting rod (58) by loosening setscrew holding spreader and hub assembly (59). Sub-plate assembly can then be detached without bending parts. In reassembling, reverse the procedure.

MODEL 35-1180
Assembly,Notes



AUGUST, 1939.

FIG. 2. CUTAWAY VIEW SHOWING PARTS UNDER SUB-PLATE ASSEMBLY (83)

FIG. 3

Numbers on Figs. 2 and 3	PART DESCRIPTION	Numbers on Figs. 2 and 3	PART DESCRIPTION	Numbers on Figs. 2 and 3	PART DESCRIPTION
11	Cam Gear	38	Spring	77	Manual Rod
12	Stud	39	Cam Lever	78	Reject Rod
13	Guide Arm	40	Shoulder Screw	79	Extension Rod
14	Bracket	41	Sub-Plate	80	Truss Bar
15	Trigger Spring	42	Bracket	81	Adjusting Cam
16	Trigger	51	Grommet Sleeve	82	Cam Gear
17	Trigger Catch	52	Shim	83	Sub-Plate Assem.
18	Trip Adj. Screw	53	Main Plate	84	Spring
19	Lock Spring	54	Changer Switch	85	Cycling Switch
20	Release Lever	55	Motor	86	Bracket
21	Pickup Plunger	56	Connecting Plug	87	Spring
22	Pickup Sleeve	57	Changer Connect. Rod	88	Link
23	Swivel Shaft	58	Cam Connecting Rod	89	Release Lever
24	Swivel Tube	59	Spreader-Hub Assem.	90	Upper Spreader
25	Swivel Trunnion	60	Shaft	91	Lower Spreader
26	Shoulder Screw	61	Spring Roller	92	Rod
31	Spreader-Hub Assem.	62	Spreader Spring	93	Lever-Hub Assem.
32	Bridge	71	Post Nut	94	Lever
33	Lifter Cam	72	Lever-Hub Assem.	95	Swivel Spring
34	Pawl	73	Flat Spring	96	Lever Spring
35	Cam Connecting Rod	74	Shaft	97	Lead Spring
36	Spring	75	Key Unit		
37	Lift	76	Key Bracket		

SQUEAKS OR OTHER NOISES DURIN PLAYING OF RECORDS

If squeaks or various noises are heard from the me nism during the playing of records or changing of reco the following items should be checked:

1. In the majority of the cases, these squeaks l be usually found to come from the friction between the cked records and the turntable spindle. To check for this uble, operate the mechanism with and without a load of ords. To eliminate this condition, apply a very thin coat light motor grease or vaseline to the turntable spindle.

2. Check the 5 wicks given under the paragraph "Lubrication." Each wick should be thoroughly saturat with oil. All 3 motor wicks should be removed from the r ning holes with tweezers and examined to see if the oil be- come gummy. In this case, the wicks should be tho ghly cleaned and relubricated with oil and replaced i their sockets.

3. Check all set screws to see that they are in place and tight.

4. Check motor windings. If coils have been jarred loose they should be tightened in place. The shading coils which encircle a portion of each laminated pole, the purpose of which is to make the motor self-starting, should be rigidly held in place by the retaining tape.

TURNTABLE SPEED VARIES

The turntable speed should be 78 R.P.M. + or — 2 R.P.M. when a record is being played, and the mechanism will operateate satisfactorily. If the speed is below or above these limits, it indicates either trouble in the motor windings or bearings of the motor. Sometimes a few drops of oil on the bearings will increase the speed to normal. If upon investigation the normal speed cannot be obtained, replace the motor.

ADJUSTING LAND G POSITION OF NEEI E ON RECORD

Adjustment of the landin posi- tion of the needle on records on- trolled by the adjusting scr lo- cated in the hole shown in ure 1. This adjustment is mad ith a screw driver from the top the mechanism and does not r ire the removal of the changer om the cabinet. If the needle nes down too far from the edge the record, playing of records w not start at their beginning. I his case, turn the needle posit ng adjustment screw very sl tly counter-clockwise. If the dle comes down too close to the ge of the record, the pickup ma lip off the record. To adjust is condition turn the adjusting rew clock-wise. If adjustment sc i too far to rear and cannot b d justed through hole in base p e, depress "Manual" push butto and push bracket—Forward.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

There are several parts that will cause the mechanism to fail in the operation of rejecting of records. These items are listed as follows:

1. Examine swivel spring (95) for stretching. This spring is attached to the lugs at the end of the swivel spreaders (90) (91). The purpose of this spring is to keep the swivel spreaders (90) (91) closed, so that the trip trigger can be actuated. Increasing the tension of the spring (95) will prevent the swivel spreads from opening allow the trip trigger to actuate properly.

If after increasing the tension of the spring (95) it is found that the needle jumps across the record, it may be necessary to adjust the horizontal level of the pickup. Sometimes the pickup leans towards the center of the record. To remedy this condition, the pickup mounting post should be examined for proper mounting position or the pickup arm may be twisted out of shape. In either of these cases the pickup arm should be replaced or adjusted to its original position. When the pickup arm is properly adjusted, it should lean slightly in an outward direction (toward the edge of the record).

2. After it is found that the trip trigger (16) is operating properly, trouble may be found due to the cam lever (39) binding against sub-Plate (41). In this case, look for some obstruction or foreign material on these two parts. Also see that the rivets are operating freely. If lever (39) engages cam lever pawl (34) so that lift (37) forces its rollers up into the groove on cam gear (82) and if the set screws are tight, the change cycle should go into motion as the cam gear (82) turns.

3. Sometimes friction between the trigger (16) and trigger catch (17) due to burrs or rough surfaces may also prevent the reject from operating. If the trigger unlatches but the cam lever (39) does not move, it indicates binding between sliding surfaces. This may be caused by above mentioned burrs or by the cam lever being slightly warped.

To eliminate this condition, locate the position where there is excessive friction. If it is found that the parts are out of shape due to being bent, new parts should be added or the old ones straightened. When it is found that trouble is due to a burr on the edge of the metal parts, burrs should be removed with a very fine file or scraper. After eliminating this trouble, a small amount of oil should be applied to the sliding surfaces.

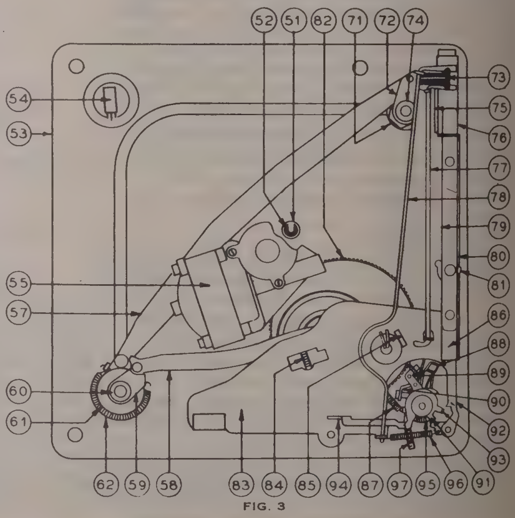


FIG. 3

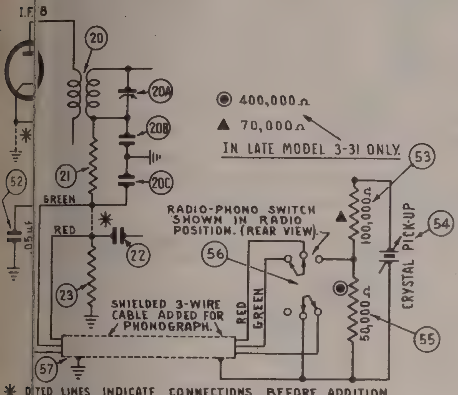
PHILCO Model 39-3-31 PA

Mo 3-31 PA is a combination automatic record chang phonograph and electric push-button tuning superheter ne radio. This model is identical to the Model 39-31 Code 1 with the exception of the automatic record changer.

The automatic record changer plays seven 12" or eight 10" records automatically. The last record remains on the turntable and repeats as long as the record changer is in operation. The electric pick-up is a crystal type.

The specifications for the radio receiver, alignment of compensators and adjustments of push-buttons for reception of stations is covered under the Model 39-31 Code 121. Connections for the phonograph pick-up as connected to the Model 39-31 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-31 Schematic.

For automatic record changer Model "L" used with this set, see index.



* D TED LINES INDICATE CONNECTIONS BEFORE ADDITION O PHONOGRAPH. (REFER TO MODEL 39-35.)

PHO OGRAPH CONNECTIONS FOR MODEL 3-31.

Replacement Parts — Model 39-3-31 PA

SCHE. No.	DESCRIPTION	PART No.
52	Condenser (.05 mfd., 200 V.)	30-4519
53	Resistor (100,000 ohms)	33-410339
54	Crystal Cartridge	35-2030
55	Resistor (50,000 ohms)	33-350339
56	Switch (Radio-Phono)	42-1053
57	Cable	
	MISCELLANEOUS PARTS	
	Motor (115 V., 60 cycle A. C.)	
	Motor Switch	
	Tone Arm Complete	35-2055
	Turntable	35-3041

Model 39-31XF and 39-31XK are identical to Model 39-35, Code 21 with the exception of cabinets.

The el 39-35, code 121 specifications, diagram and repla ment parts apply to Models 39-31XF and XK.

ee Philco pages 10-13 through 10-16.

NOTE:-
Models 39-30 and 39-35 code 121 are similar with the exception of the type of Cabinets, Speakers and Power Transformers. These differences are shown on the Replacement Parts list and circuit diagram.

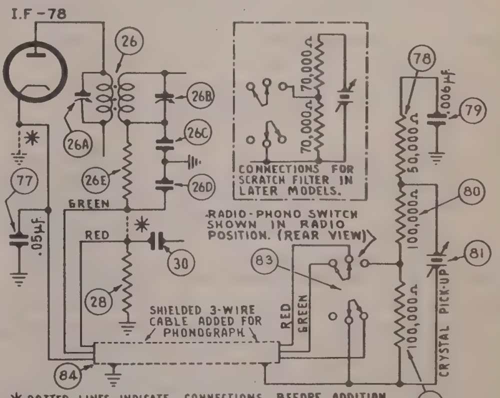
HILCO Models 39-40 PCX and 2-40 PC

Mo s 39-40 PCX and 2-40 PC are combination automatic recor changer phonograph and electric push-button tuning super terodyne radio receivers. These models are identical o th Model 39-40 Code 121 with the exception of the phono aph mechanism. The phonograph contains an automatic ecord changer which plays ten records either 10 or 12 inches epeating the last selection until the records are restack or the set is turned off.

The adio receiver specifications, aligning instructions and djus ents for electric push-button tuning are covered under Mode 9-40 Code 121. The cabinet size and power consumption, wever, differ on the Models 39-40 PCX and 2-40 PC nd a listed below.

The honograph connections diagram shown below indicates he c nections to the radio receiver of the Model 39-40 Code 21. The circle numbers of the diagram correspond to he c le numbers of the Model 39-40 Code 121 diagram.

CAB ET DIMENSIONS:
He t, 37⅛". Width, 39$\frac{1}{16}$". Depth, 17⅛".



* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-40.

PHONOGRAPH CONNECTIONS FOR MODELS 39-40PCX. 2-40PC

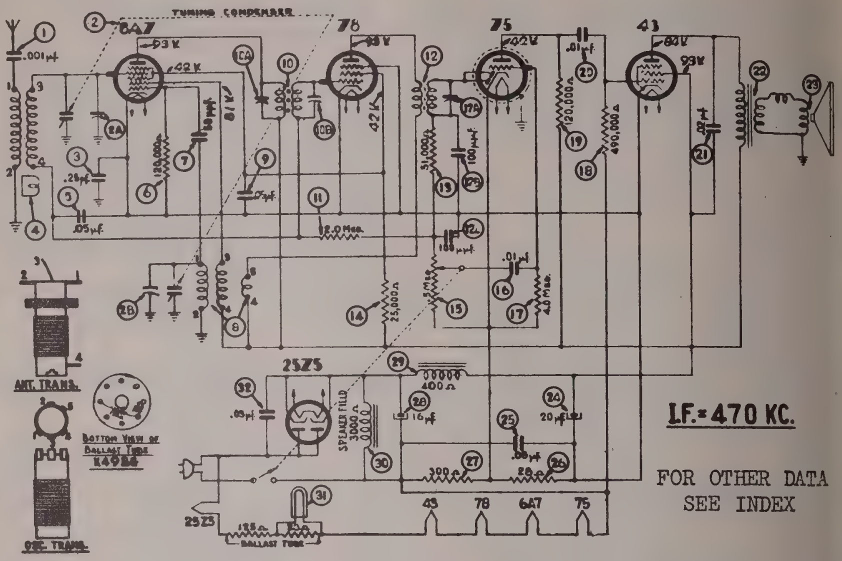
Replacement Parts — Models 39-40 PCX and 2-40 PC

CHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
77	ndenser (.05 mfd., 200 V.)	30-4519	81	Crystal Cartridge	35-2030
78	sistor (50,000 ohms)	33-350339	82	Resistor (100,000 ohms)	33-410339
79	ndenser (.006 mfd., 200 V.)	30-4583	83	Switch (Radio-Phono)	42-1053
80	sistor (100,000 ohms)	33-410339	84	Cable	

SCHE. No.	DESCRIPTION	PART No.
	MISCELLANEOUS PARTS	
	Motor 110 volt, 60 cycle	35-1187
	Motor 110 volt, 50 cycle	35-1186
	Automatic Record Chgr. (Com.)	35-1178
	Governor (motor)	35-1165

MODELS 39-8,39-8T
Schematic
Voltage

PHILCO RADIO & TELEV. CORP.



I.F.= 470 KC.

FOR OTHER DATA
SEE INDEX

SPECIFICATIONS

TYPE OF CIRCUIT: Model 39-8T is a 5 tube superheterodyne receiver designed for operation on AC or DC current in a frequency range from 25 to 100 cycles. In addition, other features of design are: Automatic Volume Control and Pentode Audio Output.

PHILCO TUBES USED: 6A7, First Detector, Oscillator; 78, I.F. Amplifier; 75, Second Detector, A.V.C., First Audio; 43, Audio Output and 25Z5, Rectifier.

POWER SUPPLY: 100 to 125 volts AC
25 to 60 cycles or D.C.

POWER CONSUMPTION: 30 watts.

AUDIO OUTPUT: One (1) watt.

FREQUENCY RANGE: 530 to 1720 K.C.

INTERMEDIATE FREQUENCY: 470 K.C.

REPLACEMENT PARTS
MODEL 39-8

Schem. No.	*Description*	*Part No.*
1	Tubular Cond. (.001 mfd.)........	30-4453
2	Tuning Cond. Assy................	
2A (2B (	Part of No. 2..................	
3	Tubular Cond. (.25 mfd.).........	30-4146
4	Antenna Trans....................	32-2583
5	Tubular Cond. (.05 mfd.).........	30-4444
6	Resistor (120,000 ohms, 1/2 watt)	33-412339
7	Mica Cond. (50 mmfd.)............	30-1029
8	Oscillator Trans.................	32-2860
9	Tubular Cond. (.05 mfd.).........	30-4444
10	1st I.F. Trans. Assy............	32-3018
10A (10B (	Part of No. 10	
11	Resistor (2.0 meg., 1/2 watt)....	33-520339
12	2nd I.F. Trans. Assy............	32-2674
12A (12B (12C (	Part of No. 12	
13	Resistor (51,000 ohms, 1/2 watt).	33-351339
14	Resistor (25,000 ohms, 1/2 watt)	33-325339
15	Volume Control (.5 meg.)........	33-5254
16	Tubular Cond. (.01 mfd.)........	30-4479
17	Resistor (4.0 meg., 1/2 watt)...	33-540339
18	Resistor (490,000 ohms. 1/2 watt)	33-449339
19	Resistor (120,000 ohms, 1/2 watt)	33-412339
20	Tubular Cond. (.01 mfd.)........	30-4479
21	Tubular Cond. (.02 mfd.)........	30-4215
22	Output Transformer..............	32-7874

Schem. No.	*Description*	*Part No.*
23	Cone & Voice Coil Assembly...... Speaker Part No. 36-1362-1).....	36-[illegible]81
24	Electrolytic Cond. (20 mfd.,150V)	30-[illegible]45
25	Tubular Cond. (.05 mfd.)........	30-[illegible]44
26	Resistor (27 ohms, 1/2 watt)....	33-[illegible]733
27	Resistor (300 ohms)..............	33-[illegible]14
28	Electrolytic Cond. (16 mfd.,150V)	30-[illegible]46
29	Filter Choke.....................	32-[illegible]38
30	Field Coil (Replace Speaker)....	
31	Pilot Lamp......................	34-[illegible]38
32	Tubular Cond. (.03 mfd.)........	30-4[illegible]19

MISCELLANEOUS PARTS

Bezel & Glass Assembly.....	13105
Bezel Clamp................	20162
Dial Scale.................	16104P
Drive Drum & Set Screw.....	31-1282
Drive Shaft Assembly.......	31-2140
Drive Cord Assembly........	90325
Output Transformer.........	32-7874
Pointer (Dial).............	28-5468
Spring Drive Cord..........	28-8751
Speaker....................	36-1362
Socket (7 prong)...........	27-6037
Socket (6 prong)...........	27-6036
Socket (8 prong)...........	27-6058

MODELS 39-17,39-18,39-19
39-19PA,39-19PF,39-19PCS
39-19PT,39-75
Tuner Data
MODEL 39-85
Alignment,Trimmers

Alignment of Compensators

EQUI IENT REQUIRED:

(1) 'hilco Model 077 Signal Generator which has a fundamental freque / range from 115 to 36,000 KC is the correct instrument for th purpose.

(2) 'utput Meter, Philco Model 027 Circuit Tester, incorporate sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, part No. 45-2610 and Fiber Wrench, part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and screen terminals of the 1A5G tube. Set the meter to use the 0-30 volt scale.

Opera tions in Orde	Signal Generator			Receiver			Special Instructions
	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	1A7G Grid	.1 mf	470 KC	580 KC	Vol. Cont. max.	(20A) (19B) (19A)	
2	Ant. Lead (white)	400 ohms	18.0 MC	18.0 MC	Vol. Cont. max.	(6B)	See Note B
3	Ant. Lead (white)	225 mmf	1550 KC	1550 KC	Vol. Cont. max.	(9) (6A)	
4	Ant. Lead (white)	225 mmf	580 KC	580 KC	Vol. Cont. max.	(9A)	Roll gang
5	Ant. Lead (white)	225 mmf	1550 KC	1550 KC	Vol. Cont. max.	(9)	

NOTE -The "Dummy Antenna" consists of a condenser or resistor connected series with the signal generator output lead (high side). Use the capacity resistance as specified in each step of the above procedure.

MODEL 39-85.

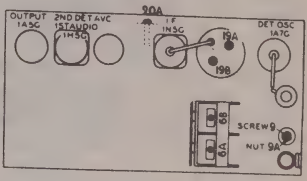


Fig. 1. ·Locations of Compensators

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer horizontally across the dial.

Specifications

TYPE F CIRCUIT: Four tube, battery operated superhetrodyne circuit, t .tuning ranges, Automatic Volume Control, and Pentode Output

TUNI RANGES: Range 1, 540 to 1720 KC.; Range 2, 5.6 to 8.0 M

NTE IEDIATE FREQUENCY: 470 KC.

PHIL TUBES USED: 1-1A7G, 1st Detector and Oscillator; -1N5 I. F. Amplifier; 1-1H5G, 2nd Detector, 1st Audio, and Autom c Volume Control; and 1-1A5G, Output.

ERIA AND GROUND: Philco "Farm Radio Aerial," part No. 0-6383 is required for maximum performance. A good ground is ery es ntial.

ABIN TS: Types "B" and "XF."

ATT IES REQUIRED: One Philco "A" Pack, part No. 41-8014, nd one 'hilco "B" Pack, part No. 41-8015.

ATT Y DRAIN: 6.5 Ma. "B" and 200 Ma. "A." Total with sign

UNI MECHANISM: Pulley and cable drive for Manual tuning. lectri Push-Button for Automatic Tuning.

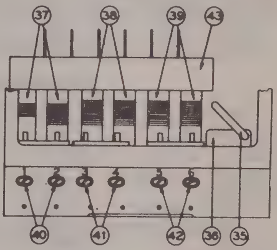


Fig. 4. Automatic Tuning Unit

Instructions for setting up and operating the electric push-button tuning will be found on **Philco Page 10-16.**

SETTING AND OPERATING AUTOMATIC TUNING

M dels 39-17, 30-18, 39-19, 39-19PA, 39-19PF, 39-19PCS, 39-19PT, and 39-75.

For st results follow these instructions carefully.

Selec six of your favorite nearby broadcast stations and move heir call letters from the station call letter tab sheets pplie Insert these call letters in the escutcheon directly in ont o he buttons at the top of the cabinet.

Hold e "Station Selector" knob to prevent it from rotating ile y insert a large coin in the screw head at the center the ob, (see figure) and loosen by turning counter-clockse a t one turn. Press down any one of the six buttons. lding t down, tune in with the "Station Selector" the stan co esponding to the call letters in front of the button. th t volume low, turn the "Station Selector" knob slowly ck a forth until the signal is clearest. The station is then ned i correctly.

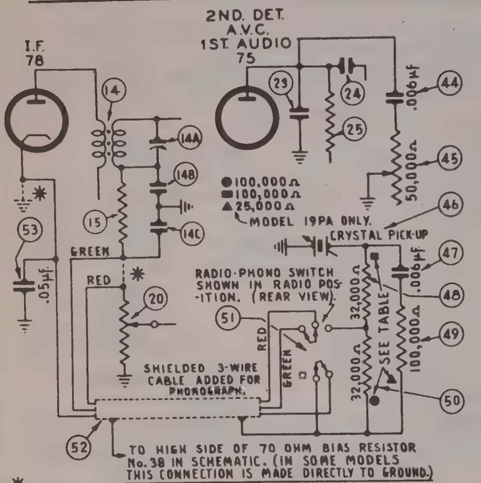
Release the button and press another button all the way down. Follow the above instructions, tuning in the station accurately with the button held down. In the same way continue to set all the buttons.

After all buttons are set, and the last one is released, hold the "Station Selector" knob to prevent it from turning while you tighten the screw at the center of the knob. When the screw is tightened the unit is ready to operate.

If it is ever desired to substitute a station received well in your locality for a station already set, follow the same procedure, setting up only the desired station.

To tune your receiver automatically simply press down the button in the rear of the desired station call letters. Be sure that you press the button all the way down until a distinct stop is noted.

Models 39-19 PA, 39-19 PF, 39-19 PCS, 39-19 PT



TO HIGH SIDE OF 70 OHM BIAS RESISTOR No. 38 IN SCHEMATIC. (IN SOME MODELS THIS CONNECTION IS MADE DIRECTLY TO GROUND.)

* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-19. see index.

PHONOGRAPH CONNECTIONS
MODELS 19PA, 19PF, 19PCS, 19PT.

Model 39-19 PA is a combination automatic record anger phonograph and automatic push-button tuning superhet odyne radio receiver. The radio receiver of this model is iden al to the Model 39-19 Code 122 with the exception of the au matic phonograph connections. The automatic record change plays eight 10-inch records automatically or 12-inch records m ually.

The specifications of this model with the exception f the cabinet dimensions and power consumption and au matic record changer are the same as Model 39-19 Code 12 The connections for the phonograph pick-up as connected the Model 39-19 Code 122 are shown below. The circle num rs of this diagram correspond to the circle numbers of the odel 39-19 Code 122.

The alignment of compensators will also be found nder Model 39-19 Code 122 (see index)

For record changer 35-1169 see inde.

Models 39-19 PF, 39-19 PCS and 39-19 PT, are com ation phonograph and automatic tuning superheterodyne ra o receivers. The radio receivers of Models 39-19 PF and S are identical to Model 39-19 Code 122 with the exception the phonograph connections. The radio receiver of Model 3 9 PT is identical to Model 39-19 Code 121 with the addi n of phonograph connections. The phonograph section o these models consists of a semi-automatic pick-up that place itself automatically on the turntable when the lid is closed an plays either 10- or 12-inch records.

The specifications of this model with the exception of binet dimensions, power consumption and semi-automatic pick p are the same as Model 39-19 Codes 121, 122. The connecti s for the phonograph pick-up as connected to Model 39-19 Codes 121 and 122 are shown below. The circle numbers this diagram correspond to the circle numbers of the Mode 39-19 Codes 121, 122.

The alignment of the compensators will also be foun nder Model 39-19 Codes 121, 122 (see index)

Replacement Parts — Model 39-19 PA

SCHE. No.	DESCRIPTION	PART No.
44	Condenser (.006 mfd., 400 V.)	30-4591
45	Tone Control	33-5327
46	Crystal Cartridge	35-2044
47	Condenser (.006 mfd., 400 V.)	30-4591
48	Resistor (32,000 ohms)	33-332339
49	Resistor (100,000 ohms)	33-410339
50	Resistor (32,000 ohms)	33-332339
51	Switch (Radio-Phono)	42-1053
52	Cable (Radio-Phono Switch)	
53	Condenser	30-4519

MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
	Automatic Record Changer Complete	35-1169
	Governor (Motor)	35-1199
	Grille and Baffle	40-6491
	Tone Arm Complete with Crystal	35-2047
	Tone Arm Complete with Crystal and Bas	5-2046
	Turntable (10")	5-3032
	Tuning Shaft	6-6015
	Motor (110 V., 60 cycle)	5-1163
	Shaft (Wave Switch and Volume Control	8-9640
	Tuning Shaft Tube	6-6004
	Dashpot Assy. (Automatic Record Chgr.)	5-1003
	Handles (For Lid of 19PA Cabinet)	7-4591
	Springs (Governor Ball of Record Chgr.	5-1179

Replacement Parts — Models 39-19 PF, 39-19 PCS, 39-19 PT

SCHE. No.	DESCRIPTION	PART No.
44	Condenser (.006 mfd., 400 V.)	30-4591
45	Tone Control	33-5327
46	Crystal Cartridge	415-1027
47	Condenser (.006 mfd., 400 V.)	30-4591
48	Resistor (32,000 ohms)	33-332339
49	Resistor (100,000 ohms)	33-410339
50	Resistor (32,000 ohms)	33-332339
51	Switch (Radio-Phono)	42-1053
52	Cable (Radio-Phono Switch)	
53	Condenser (.05 mfd., 200 V.)	30-4519
	Crystal Cartridge Holder	35-2057
	Extension Shaft (Tuning) PCS, PF	28-6928
	Sleeve for Tuning Shaft	8-6935
	Shaft (Wave Change and Volume Control	8-9740
	Tuning Shaft Tube	8-6935
	Tone Arm and Pick-up Complete	5-2027
	Turntable (9")	5-3035

PHILCO Model 39-30 PCX

Model 39-30 PCX is a combination automatic record changer phonograph and electric push-button tuning superheterodyne radio receiver. This model is identical to the Model 39-30 Code 121 with the exception of the automatic record changer The automatic record changer plays ten records either 10 or 12 inches repeating the last selection until the records are restacked or the set is turned off. The electric pick-up is a crystal type.

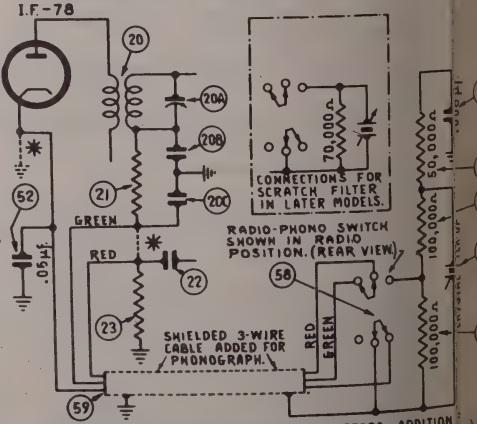
The specifications for the radio receiver, alignment of compensators and adjustment of push-buttons for reception of stations is covered under Model 39-30 Code 121. The connections for the phonograph pick-up as connected in the Model 39-30 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-30 Code 121 schematic.

Replacement Parts — Model 39-30 PCX

SCHE. No.	DESCRIPTION	PART No.
52	Condenser (.05 mfd., 200 V.)	30-4519
53	Condenser (.006 mfd., 200 V.)	30-4583
54	Resistor (50,000 ohms)	33-350339
55	Resistor (100,000 ohms)	33-410339
56	Crystal Cartridge	35-2030
57	Resistor (100,000 ohms)	33-410339
58	Switch (Radio-Phono)	42-1522
59	Cable	

MISCELLANEOUS PART

SCHE. No.	DESCRIPTION	PART No.
	Tone Arm and Pick-up (Less Base)	35-2059


I.F.-78
20
20A
20B
20C
21
22
23
52
58
59
.05µf
GREEN
RED
70,000Ω
CONNECTIONS FOR SCRATCH FILTER IN LATER MODELS.
RADIO-PHONO SWITCH SHOWN IN RADIO POSITION. (REAR VIEW).
50,000Ω
100,000Ω
100,000Ω
SHIELDED 3-WIRE CABLE ADDED FOR PHONOGRAPH.
RED
GREEN

* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION PHONOGRAPH. (REFER TO MODEL 39-30. (see ind x)

PHONOGRAPH CONNECTIONS FOR MODEL 39- PC

MODEL 39-85,Code 121
Schematic,Chassis
Voltage

PHILCO RADIO & TELEV. CORP

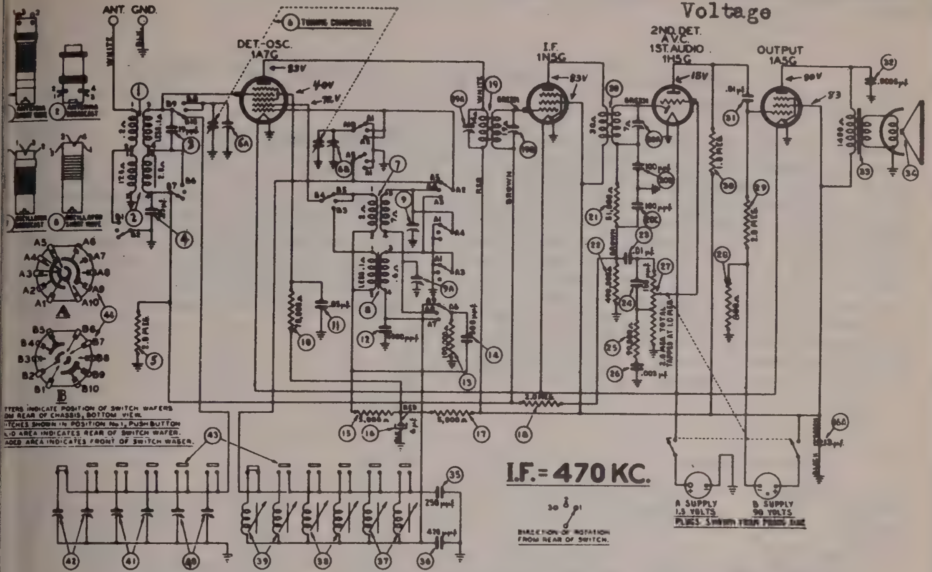

ANT. GND.
TUNING CONDENSER
DET.-OSC. 1A7G
I.F. 1N5G
2ND DET. A.V.C. 1ST AUDIO 1H5G
OUTPUT 1A5G
83V
40V
18V
90V
A5 A6 A7 A8 A9 A10 A4 A3 A2 A1
A
B5 B6 B7 B8 B9 B10 B4 B3 B2 B1
B
…TTERS INDICATE POSITION OF SWITCH WAFERS …ON REAR OF CHASSIS, BOTTOM VIEW.
…ITCHES SHOWN IN POSITION No 1, PUSH BUTTON
…ID AREA INDICATES REAR OF SWITCH WAFER.
…ADED AREA INDICATES FRONT OF SWITCH WAFER.
I.F. = 470 KC.
30 31
DIRECTION OF ROTATION FROM REAR OF SWITCH.
A SUPPLY 1.5 VOLTS
B SUPPLY 90 VOLTS
250 mmf
420 mmf

Fig. 2. Schematic Diagram

FOR OTHER DATA
SEE INDEX

Rep cement Parts
lode 39-85, Code 121

	Description	Part No.
ntenn (Incl	Transformer, Range 2 No. 3)	32-3092
ntenn	Transformer, Range 1	32-3084
onden No.	(19 mmf) (part of	30-1090
onden	(.05 mf tubular)	30-4519
esisto	2.0 megohms, ½ watt)	33-520339
uning	ndenser Assembly	31-2300
scillat	Transformer, Range 1	32-3082
scillat	Transformer, Range 2	32-3085
ompen	or (two sections)	31-6100
esisto	70,000 ohms, ½ watt)	33-370339
onden	(.05 mf tubular)	30-4444
onden	(4500 mmf mica)	30-1109
esisto	190,000 ohms, ½ watt)	33-419339
onden	(500 mmf mica)	30-1114
esisto	5000 ohms, ½ watt)	33-250339
lectro 3 mf	ic Condenser (6 mf—	30-2348
esisto	5000 ohms, ½ watt)	33-250339
esisto	2.0 megohms)	33-520339
t I. F	ransformer Assembly	32-2841
d I.	Transformer Assembly	32-3081
esisto	51,000 ohms, ½ watt)	33-351339
esisto	490,000 ohms, ½ watt)	33-449339
onden	(.01 mf tubular)	30-4572
onden	(150 mmf mica)	30-1033
esisto	99,000 ohms, ½ watt)	33-399330
onden	(.003 mf tubular)	30-4580
olume Switc	Control and On-Off	33-5288
esisto	800 ohms, ½ watt)	33-180339
esisto	2.0 megohms, ½ watt)	33-520339
esisto	1.0 megohm, ½ watt)	33-510339
onden	(.01 mf tubular)	30-4572
onden	(.0005 mf mica)	30-1114
tput	ransformer	32-7984
ne & Spea	oice Coil Assembly for (Part No. 36-1410)	36-4093
ne & Spea	oice Coil Assembly for (Part No. 36-1436)	36-4094
nden plate	(250 mmf, silver nica)	30-1104
nden plate	(420 mmf, silver nica)	30-1116

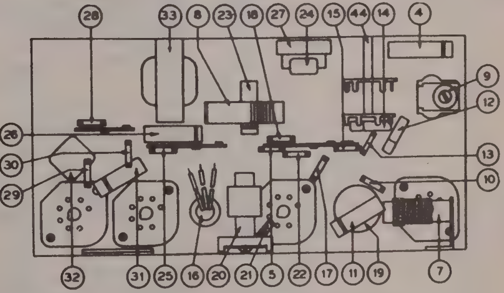


Fig. 3. Part locations, underside of chassis

Replacement Parts

CONTINUED

Schem. No.	Description	Part No.
37	Oscillator Coil Assem. (High freq. No. 1 and 2)	32-2941
38	Oscillator Coil Assem. (Medium frequency No. 3 and 4)	32-2942
39	Oscillator Coil Assem. (Low frequency No. 5 and 6)	32-2943
40	Compensator (two sections) (Nos. 1 and 2)	31-6244
41	Compensator (two sections) (Nos. 3 and 4)	31-6245
42	Compensator (two sections) (Nos. 5 and 6)	31-6246
43	Push-Button Switch	42-1471
44	Wave Switch	42-1466

Description	Part No.
Bezel Assy. (Dial)	40-6374
Cable (Battery)	41-3437
Dial Assy.	31-2307
Dial Pointer	56-1091
Dial Drive Cord	31-2318
Dial Drive Spring	28-8751
Dial Tuning Shaft	31-2290
Escutcheon (Push-Button)	28-5561
Knob (Push-Button)	27-4702
Knob (Range Switch)	27-4321
Knob (Volume & Tuning)	27-4332
Pulley (Tuning Condenser)	28-6662
Speaker (B Cabinet)	36-1410
Speaker (XF Cabinet)	36-1436
Socket (6 prong)	27-6086
Socket (7 prong)	27-6099
Socket (Speaker)	27-6115
Tab Kit	40-6408

PHILCO Model 39-116 PCX

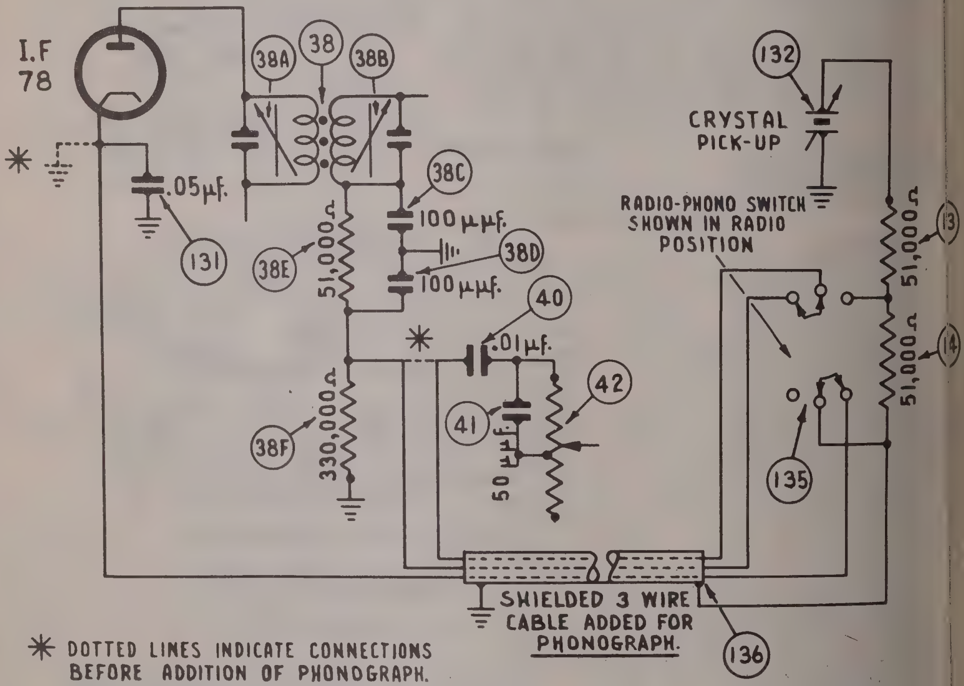
Model 39-116 PCX is a combination phonograph and 14 tube radio receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short-wave broadcast stations. Incorporated in this receiver is Philco mystery control for electric automatic tuning of eight standard broadcast stations from a remote point. The phonograph section contains an automatic record changer which plays ten records either 10- or 12-inch size automatically repeating the last record until the records are restacked or the switch turned off.

This model with the exception of the phonograph mechanism is identical to the Model 39-116 RX. The same specifications for the Model 39-116 RX apply to this model except the cabinet size and power consumption which are listed below.

CABINET DIMENSIONS:

Height, 37⅛". Width, 44⅝". Depth, 17

The adjustment of the mystery control circuit for recep of stations and alignment of compensators is also cov under Model 39-116 RX. The phonograph connections shown below as connected in the Model 39-116 RX cir diagram. The circle numbers of this phonograph diag correspond to the circle numbers of the Model 39-116 diagram.



✳ DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH.

REFER TO SERVICE BULLETIN No. 310.

PHONOGRAPH CONNECTIONS FOR MODEL 39-116PCX

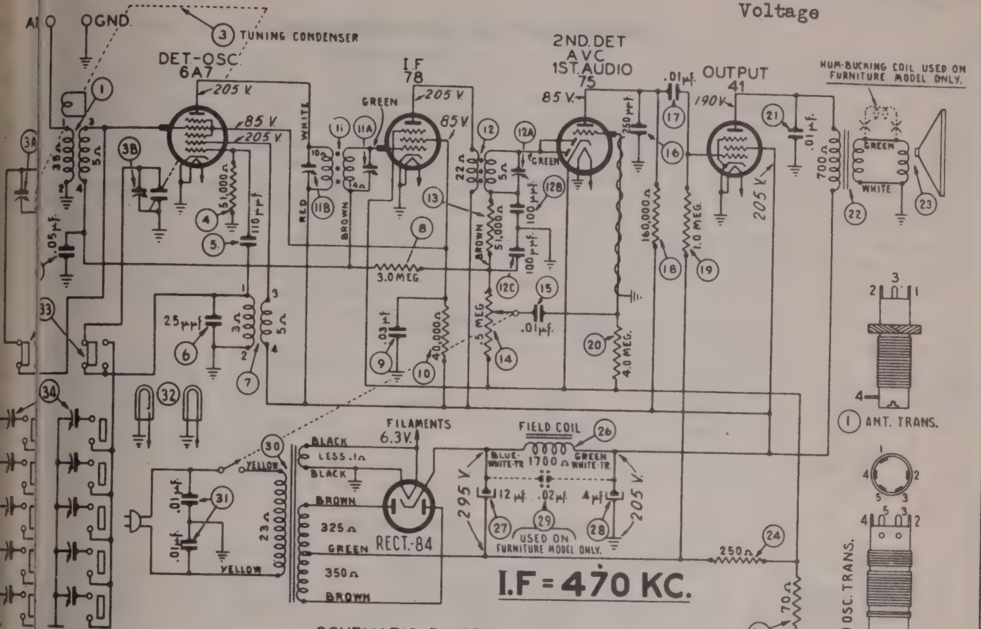
Replacement Parts — Model 39-116 PCX

SCHE. No.	DESCRIPTION	PART No.
131	Condenser (.05 mfd., 200 V.)	30-4519
132	Crystal Cartridge (Pick-up)	35-2030
133	Resistor (51,000 ohms)	33-351339
134	Resistor (51,000 ohms)	33-351339
135	Switch (Radio-Phono)	42-1053
136	Cable	

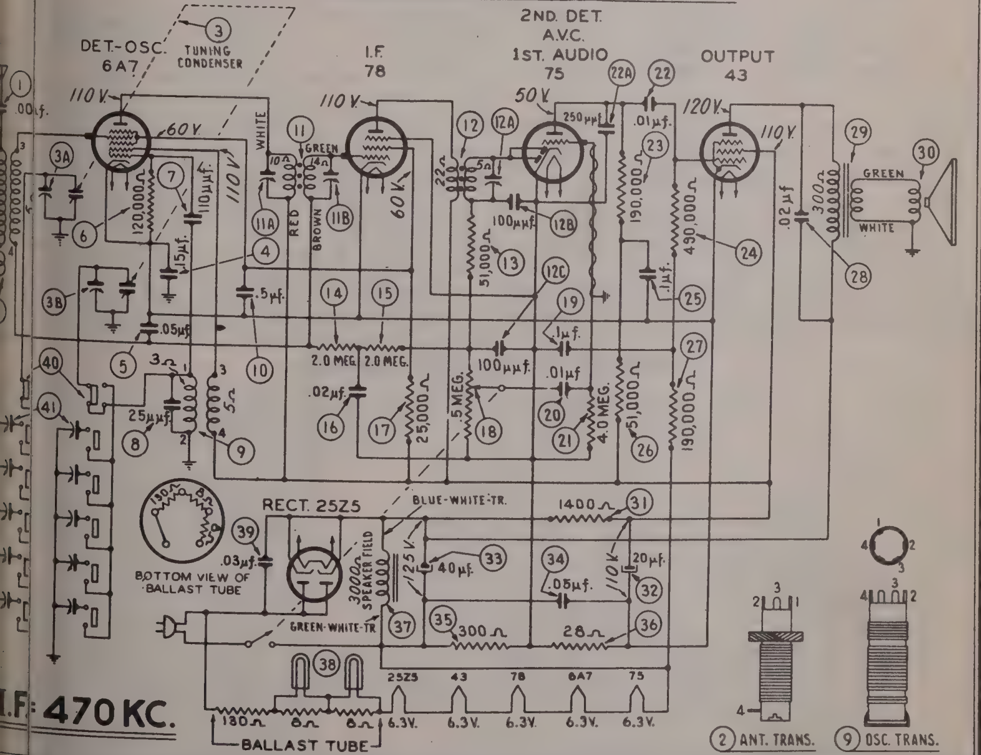
SCHE. No.	DESCRIPTION	PART No.
	MISCELLANEOUS PARTS	
	Automatic Record Changer (Complete)	35-1178
	Motor 110 volts, 60 cycles	35-1187
	Motor 110 volts, 50 cycles	35-1186
	Governor (motor)	35-1165

PHILCO RADIO & TELEV. CORP.

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Schematics
Voltage



SCHEMATIC DIAGRAM MODEL 39-117
VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS



SCHEMATIC DIAGRAM MODEL 39-118
VOLTAGES MEASURED FROM SOCKET CONTACTS TO B MINUS

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Alignment

PHILCO RADIO & TELEV. CORP

MODEL 39-119(12 122
Alignment,Trimm s
Chassis,Parts

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator: Philco Model 077 Signal Generator, which has a fundamental frequency range from 115 to 36,000 K.C., is the correct instrument for this purpose.

(2) Output Meter: Philco Model 027 Vacuum Tube voltmeter and Circuit Tester incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

(4) Philco Set Transformer, Part No. 32-2763

OUTPUT METER:

Two indicating devices for aligning of the re iver can be used; either an audio output meter or a cuum tube voltmeter. The method of connecting the dio output meter is given in the next paragraph. Th procedure for connecting the vacuum tube voltme r as an aligning indicator will be found on Page 5 here greater accuracy of the various tuned circuits desired, the vacuum tube voltmeter is recommended s an aligning device.

The Philco 027 Output Meter is connected the plate and cathode terminals of the type 41 t in Model 39-117 and 119 and type 43 tube in Model 3 118. Set the meter to use the 0-30 volt scale.

Procedure—Model 39-117

	SIGNAL GENERATOR			RECEIVER			
Operations in Order	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	cial In ctions
1	6A7 Grid	.1 mf.	470 K.C.	580 K.C.	Vol. Cont. (Max.)	12A, 11A, 11B	Pus In" Manu Button
2	Ant. Ter.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Cont. (Max.)	3B, 3A	Se ote B

Procedure—Model 39-118

1	6A7 Grid	.1 mfd.	470 K.C.	580 K.C.	Vol. Cont. (Max.)	12A, 11A, 11B	Se ote C
2	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Cont. (Max.)	3B, 3A	Se ote B Se ote D

Procedure—Model 39-119

1	6A7 Grid	.1 mfd.	470 K.C.	580 K.C.	Vol. Max.	14A, 13B, 13A	
2	Ant. and Gnd.	200 mmf.	18 M.C.	18 M.C.	Vol. Max.	4B	e B
3	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Max.	8, 4A	
4	Ant. and Gnd.	200 mmf.	580 K.C.	580 K.C.	Vol. Max.	8A	Rol uning Co enser
5	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Max.	8, 4A	

A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

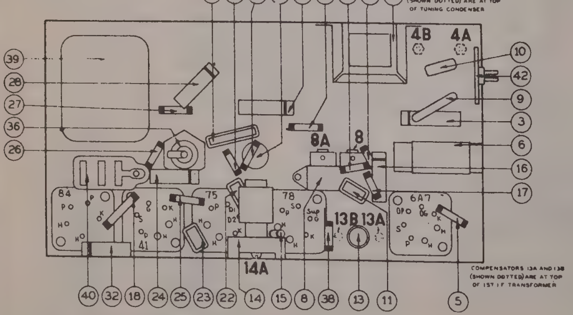
B—Dial Calibration: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set on the first index line at the low frequency end of the scale (540 K.C.).

* Several speakers on these models have the same part number with the exception of a -1. -2, etc., following the part number. These speakers are interchangeable. The cone assembly, however, cannot be interchanged. When ordering cones, be sure to order correct cone part number as indicated in each parts list.

C—Insert the signal generator output lead into the "Med" k and the ground lead into the "Gnd" jack of the signal generator. nnect the other end of the output lead to terminal No. 1 on the Set Tra ormer Part No. 32-2763, and the cable ground to terminal No. 2. Nos. and 4 terminals of Set Transformer are then connected to the chassis 6A7 grid respectively of the receiver with short pieces of wire. In t the 0.1 mf. in series with the No. 4 lead which connects to the l.

D—Insert the signal generator output lead into the "Med" k and the ground lead into the "Gnd" jack of the signal generator. nnect the other end of the output lead to terminal No. 1 of the Se ransformer, Part No. 32-2763, and the cable ground to terminal o. 2 Nos. 3 and 4 terminals of Set Transformer are then connecte o the chassis and antenna lead respectively of the receiver with sho pieces of wire. Insert the 100 mmf. in series with the No. 4 lead wh connects to the antenna lead.

MODEL 39-119, CODE 121-122



37
19
21
31
29
30
7
12
33
COMPENSATORS 4A AND 4B (SHOWN DOTTED) ARE AT TOP OF TUNING CONDENSER
4B
4A
39
28
27
36
26
10
42
9
3
6
16
17
8A
8
84
PO
HO
75
OP
41
78
SO
6A7
13B
13A
14A
COMPENSATORS 13A AND 13B (SHOWN DOTTED) ARE AT TOP OF 1ST I.F. TRANSFORMER
40
32
18
24
25
23
22
14
15
8
38
13
11
5

Fig. 3—Part Locations, Model 39-119

Description	Part
Bezel Assembly (Dial)	40-63
Bezel Gasket (Dial)	27-91
Bezel (Push Button)	56-13
Bezel Gasket (Push Button)	27-92
Bezel Clamp (Push Button)	28-51
Cable & Plug (Power Supply)	L-27
Dial	27-54
Dial Tuning Drum Assy.	31-22
Drive Cord Assy. (Pointer operation)	31-22
Drive Cord Assy. (Tuning Cond.)	31-23
Clip (Mtg. Ant. Coils)	28-30
Clip (Mtg. Osc. Coil)	28-30
Escutcheon Plate (extension shafts F cabinet)	56-10
Escutcheon Pin	W-95
Knobs (Volume & Tuning)	27-47
Knob (Wave Switch)	27-47
Pilot Lamp Socket Assembly	38-96
Pointer (Dial)	28-59
Push Button	27-48
Screws (Bezel Mtg.)	W-1834
Shaft Extensions (Volume, Tuning and Wave Switch)	38-96
Spring (Tuning Cond. Cord)	28-87
Spring (Pointer Cord)	28-89
Speaker (T cabinet, code 121—optional)	*36-14 *36-14 *36-14
Speaker (F cabinet—code 122)	28-89
Spring, Retaining (Volume Shaft)	27-60
Socket (5 prong, Rect. tube)	27-60
Socket (6 prong, type 78, 75 and 41 tubes)	27-61
Socket (7 prong, type 6A7 tube)	27-54
Tab (Manual)	40-63
Tab Kit	

† Replace speaker.

PHILCO RADIO & TELEV. CORP.

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Chassis, Trimmers
Parts

Mode 39-117, Codes 121-122

E OF CIRCUIT: A.C. operated; super- terodyn circuit, covering standard broadcast d polic stations (540 K.C. to 1720 K.C.). additic other features of design are: Elec- c Pus lutton Tuning; Automatic Volume ntrol; d pentode audio output.

Codes and 122 chassis of this model are nilar h the exception of Speaker and binet.

This receiver is designed to operate from a hilco Utility Aerial," Part No. 45-2450. This rial sysn should be used to obtain maximum forma e from the receiver.

VER SPPLY: Voltage—115 volts. Fre- ency—60 cycles. Power Consumption—40 tts.

ERMEIATE FREQUENCY: 470 K.C.

ING RNGE: 540 to 1720 K.C.

IO OUPUT: 2 watts.

LCO TBES USED: Five tubes: 1-6A7, 1st tector ad oscillator; 1-78, I.F.; 1-75, 2nd tector, automatic Volume Control, and 1st dio; 1-, Output; and 1-84, Rectifier.

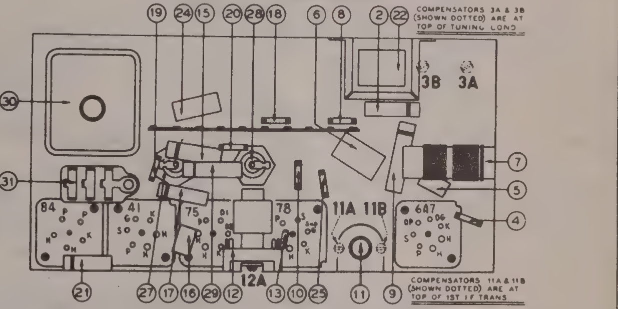
ING ECHANISM: Pulley and cable drive Man tuning. Six Electric Push-Buttons Autoatic Tuning. Five push-buttons are d for tations and one for manual tuning. e proc ure for adjusting and operating the ectric ush-Buttons will be found in the tructic supplied with each set.

INETS Code 121 chassis in type "T" cabinet
Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	A Trans.	32-3039
2	Tlar Cond. (.05 mfd.)	30-4519
3	Tng Cond. Assy.	31-2362
4	Rstor (51,000 ohms, 1 watt)	33-351439
5	M Cond. (110 mmfd.)	30-1031
6	Sr Mica Cond. (25 mmfd.)	30-1112
7	O Trans.	32-3040
8	Rstor (3.0 meg., 1 watt)	33-530439
9	Tlar Cond. (.03 mfd.)	30-4449
10	Rstor (40,000 ohms, 1 watt)	33-340439
11	1I. F. Trans. Assy.	32-3075
12	2I. F. Trans. Assy.	32-2944
13	Rstor (51,000 ohms, 1 watt)	33-351439
14	Vme Control & On-Off switch	33-5276
15	Tubular Cond. (.01 mfd.)	30-4479
16	Mica Cond. (250 mmfd.)	30-1032
17	Tubular Cond. (.01 mfd.)	30-4572
18	Resistor (160,000 ohms, 1 watt)	33-416439
19	Resistor (1.0 meg., 1 watt)	33-510439
20	Resistor (4.0 meg., 1 watt)	33-540439
21	Tubular Cond. (.01 mfd.)	30-4572
22	Output Trans.	32-7980
23	Cone & Voice Coil Assy. For Speaker (Pt. No. 36-1426-1)	36-4083
	(Pt. No. 36-1426-3)	36-4085
	Cone & Voice Coil Assy. for Speaker (Pt. No. 36-1440-3)	36-4086
24	Resistor (250 ohms wirewound)	33-125431
25	Resistor (70 ohms, 1 watt)	33-070439
26	†Field Coil for Speaker (Pt. No. 36-1426)	
	†Field Coil for Speaker (Pt. No. 36-1440)	
27	Electro. Cond. (12 mfd.)	30-2319
28	Electro. Cond. (4 mfd.)	30-2236
29	Tubular Cond. (.02 mfd.)	30-4215
30	Power Trans. (115 volts, 50-60 cycles)	32-7974
31	Bakelite Cond. (.01 mfd.—.01 mfd.)	3903 DG
32	Pilot Lamps	34-2064
33	Push button switch	42-1484
34	Padder strip	31-6292

Description	Part No.
Bezel Assy. (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel (Push buttons)	56-1364
Bezel Gasket (push buttons)	27-9218
Bezel Clamp (Dial)	28-5153
Cable & Plug (Power Supply)	L-2778
Dial	27-5406
Dial Tuning Drum Assy.	31-2281
Drive Cord Assy. (Pointer)	31-2275
Drive Cord Assy. (Tuning cond.)	31-2243
Clip (Mtg. Ant. Coil)	28-5002
Clip (Mtg. Osc. Coil)	28-5003
Escutcheon Plate (extension shafts F Cabinet)	56-1051
Escutcheon Pin	W-950
Knobs (Volume & Tuning)	27-4753
Pilot Lamp Socket Assy.	38-9612
Pointer (Dial)	28-5934
Push buttons (6 used)	27-4814
Screws (bezel mtg.)	W-1834 FGA
Shaft Extensions (2 used) F cabinet only	38-9640
Spring (retaining, volume and tuning) F cabinet only	28-8915
Spring (Tuning cond cord)	28-8751
Spring (Pointer Cord)	28-8946
Socket (5 prong, Rect. tube)	27-6035
Socket (6 prong, type 78 75 & 41 tubes)	27-6036
Socket (7 prong, type 6A7 tube)	27-6107
*Speaker (F cabinet)	*36-1440
*Speaker (T cabinet) *Optional	36-1426 1 36-1426 3
Tab Kit	40-6391

† Replace speaker.


19
24
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22
COMPENSATORS 3A & 3B (SHOWN DOTTED) ARE AT TOP OF TUNING COND
3B
3A
30
7
5
31
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84
41
75
78
11A
11B
6A7
12A
21
27
17
16
29
12
13
10
25
11
9
COMPENSATORS 11A & 11B (SHOWN DOTTED) ARE AT TOP OF 1ST I F TRANS

Mode 39-118, Codes 121-122

OF RCUIT: A.C. D.C. operated; super- erodyn circuit, covering standard broadcast polic stations (540 K.C. to 1720 K.C.). additic other features of design are: Elec- Pus Button Tuning; Automatic Volume trol; d pentode audio output.

udes and 122 chassis of this model are ilar th the exception of Speaker and inet.

he reiver is designed to operate from a o Utty Aerial," Part No. 45-2450. This al sysm should be used to obtain maximum forma e from the receiver.

ER SPPLY: Voltage—115 volts. A.C. or . Pow Consumption—55 watts.

RMEIATE FREQUENCY: 470 K.C.

NG INGE: 540 to 1720 K.C.

CO TBES USED: 1-6A7, 1st detector and llator 1-78, I.F.; 1-75, 2nd detector, Auto- ic Vome Control and 1st audio; 1-43, Out- ; 1-25, Rectifier; and 1-BKV51DJ, ballast .

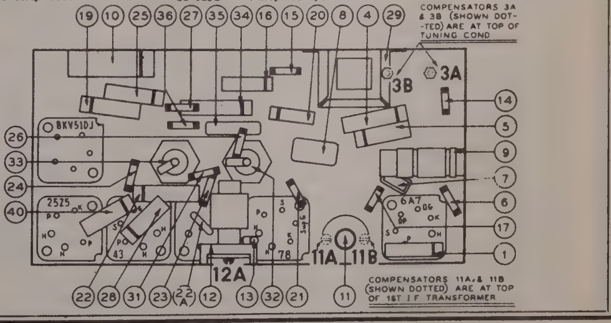
NG ECHANISM: Pulley and cable drive Man tuning. Six Electric Push-Buttons Autoatic Tuning. Five push-buttons are for tions and one for manual tuning. The cedure or adjusting and operating the Elec- Push Buttons will be found in the instruc- s supied with each set.

NETS Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	Tlar Cond. (.001 mfd.)	30-4453
2	A Trans.	32-3039
3	Tng cond. Assy.	31-2362
4	Tlar Cond. (.15 mfd.)	30-4505
5	Tlar Cond. (.05 mfd.)	30-4519
6	Rstor (120,000 ohms, 1 watt)	33-412439
7	M Cond. (110 mmfd.)	30-1031
8	Sr Mica Cond. (25 mmfd.)	30-1112
9	O Trans.	32-3040
10	Tlar Cond. (.5 mfd.)	30-4551
11	1I. F. Trans. Assy.	32-3075
12	2I. F. Trans. Assy.	32-2944
13	Rstor (51,000 ohms, 1 watt)	33-351439
14	Rstor (2.0 megohms, 1 watt)	33-520439
15	Resistor (2.0 megohms, 1 watt)	33-520439
16	Tubular Cond. (.02 mfd.)	30-4215
17	Resistor (25,000 ohms, 1 watt)	33-325439
18	Volume Control & On-Off Switch	33-5276
19	Tubular Cond. (.1 mfd.)	30-4499
20	Tubular Cond. (.01 mfd.)	30-4572
21	Resistor (4.0 megohms, 1 watt)	33-540439
22	Tubular Cond. (.01 mfd.)	30-4572
23	Resistor (190,000 ohms, 1 watt)	33-419439
24	Resistor (490,000 ohms, 1 watt)	33-449439
25	Tubular Cond. (.1 mfd.)	30-4499
26	Resistor (51,000 ohms, 1 watt)	33-351439
27	Resistor (190,000 ohms, 1 watt)	33-419439
28	Tubular Cond. (.02 mfd.)	30-4516
29	Output Trans.	32-7986
30	Cone & Voice Coil Assy. Speaker Part No. 36-1444-1.	*36-4083
	Speaker Part No. 36-1444-3.	*36-4085
	Cone & Voice Coil Assy. Speaker Part No. 36-1445	*36-4086
31	Resistor (1400 ohms, 1 watt)	33-214439
32	Electro. Cond. (20 mfd.)	30-2245
33	Electro. Cond. (40 mfd.)	30-2332
34	Tubular Cond. (.05 mfd.)	30-4444
35	Resistor (300 ohms) (wirewound)	33-130431
36	Resistor (28 ohms, 1 watt)	33-028439
37	†Field Coil for Speaker, Part No.	36-1444
	†Field Coil for Speaker, Part No.	36-1445
38	Pilot Lamps	34-2068
39	Tubular Cond. (.03 mfd.)	30-4449
40	Push button switch	42-1484
41	Padder strip	31-6292

Description	Part No.
Bezel Assy. (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel (Push Buttons)	56-1364
Bezel Gasket (Push Buttons)	27-9218
Bezel Clamp (Dial)	28-5153
Cable & Plug (Power Supply)	L-2778
Dial	27-5406
Dial Tuning Drum Assy.	31-2281
Drive Cord Assy. (Pointer)	31-2275
Drive Cord Assy. (Tuning Cond.)	31-2343
Clip (Mtg. Ant. Coil)	28-5002
Clip (Mtg. Osc. Coil)	28-5003
Escutcheon Plate (extension shafts F cabinet)	56-1051
Escutcheon Pin	W-950
Knobs (Volume & Tuning)	27-4753
Pilot Lamp Socket Assy.	38-9649
Pointer	28-5934
Push Buttons (6 used)	27-4814
Screws (Bezel Mtg.)	W-1834 FGA
Shaft Extensions (2 used F cabinet only)	38-9640
Spring (retaining) Volume & Tuning F Cabinet only	28-8915
Spring (Tuning Cond. Cord)	28-8751
Spring (Pointer Cord)	28-8946
Socket (5 prong, Ballast tube)	27-6035
Socket (6 prong, type 25Z5, 43, 75 & 78 tubes)	27-6036
Socket (7 prong, type 6A7 Tube)	27-6107
*Speaker (F cabinet)	36-1445
*Speaker (T cabinet, optional)	36-1444-1 36-1444-3
Tab Kit	40-6391

† Replace speaker.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COMPENSATORS 3A & 3B (SHOWN DOT-TED) ARE AT TOP OF TUNING COND
3B
3A
14
5
9
7
6
17
1
26
33
24
40
BKV51DJ
2525
43
6A7
78
11A
11B
12A
22
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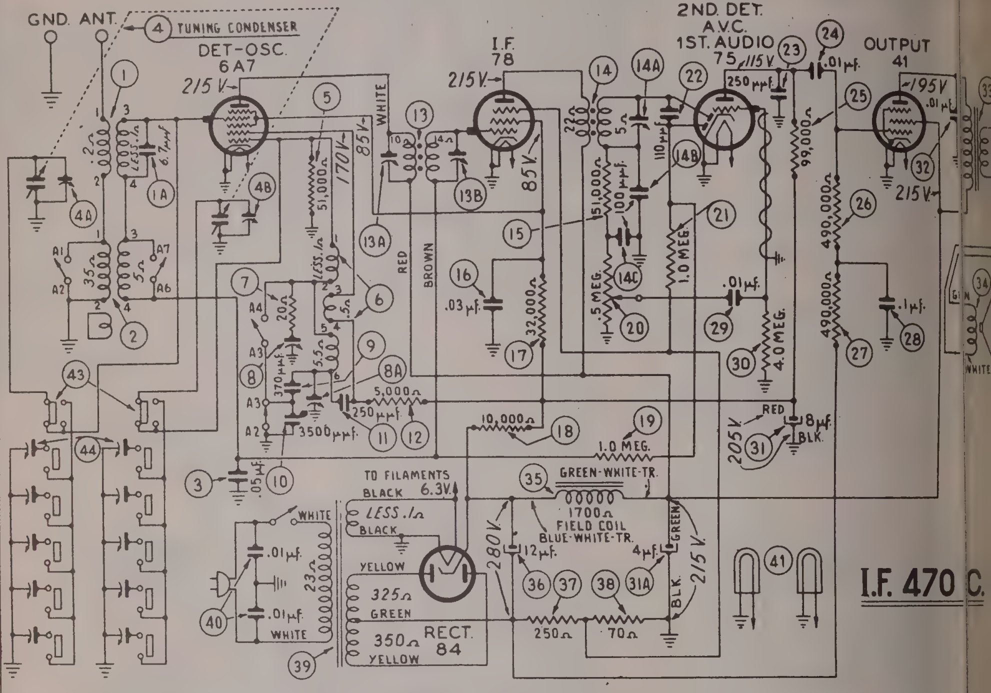
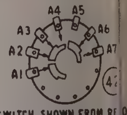
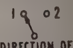
22A
12
13
32
21
11
COMPENSATORS 11A & 11B (SHOWN DOTTED) ARE AT TOP OF 1ST I F TRANSFORMER



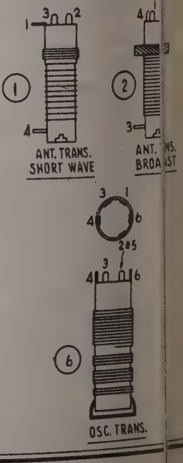
SCHEMATIC DIAGRAM MODEL 39-119
VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS



SWITCH SHOWN FROM RE OF CHASSIS, BOTTOM VIEW BROADCAST POSITION



DIRECTION OF ROTATION FROM REAR OF CHASSIS



PRODUCTION CHANGES
MODEL 39-119EZ, CODE 121-122

(39) Power Trans. 110/220 V., 60 cycle 32-8005

TYPE OF CIRCUIT: A.C. operated; superheterodyne circuit with two tuning ranges, covering standard broadcast (540 K.C. to 1720 K.C.) and short wave (5.5 M.C. to 18.0 M.C.) frequencies. In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power Consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGES: 540 K.C. to 1720 K.C.; 5.5 M.C. to 18.0 M.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual Tuning. Six push-buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Tuning Push-Buttons will be found in the instructions supplied with each set.

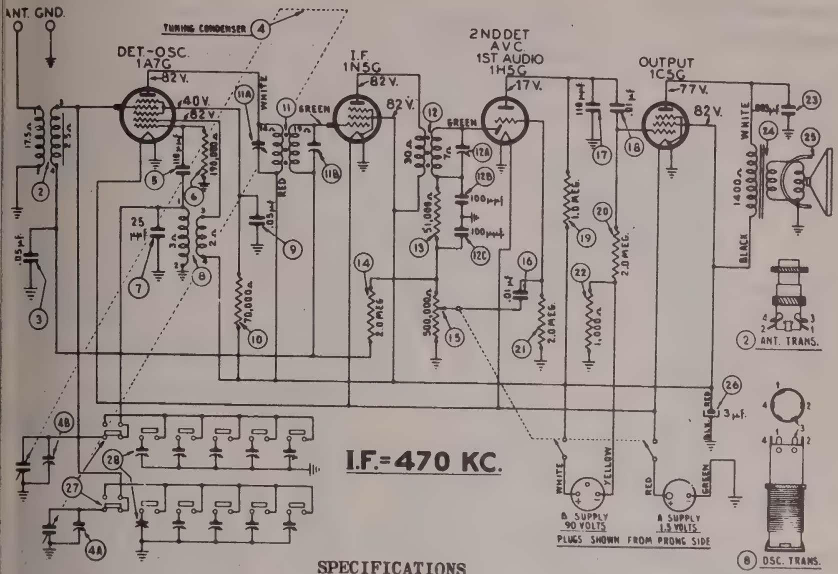
CABINETS: Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	Ant. Trans. (Short Wave)	32-3162
1A	Mica Cond. (5 mmfd.)	30-1097
2	Ant. Trans. (Broadcast)	32-3161
3	Tubular Cond. (.05 mfd.)	30-4519
4	Tuning Cond. Assy.	31-2363
5	Resistor (51,000 ohms, 1 watt)	33-351439
6	Oscillator Trans.	32-3163
7	Resistor (20 ohms, 1 watt)	33-020439
8	Compensator (2 section)	31-6257
9	Silver Mica Cond. (370 mmfd.)	30-1110
10	Mica Cond. (3500 mmfd.)	30-1094
11	Mica Cond. (250 mmfd.)	30-1032
12	Resistor (5000 ohms, 1 watt)	33-250439
13	1st I. F. Trans. Assy.	32-3075
14	2nd I. F. Trans Assy.	32-2944
15	Resistor (51,000 ohms, 1 watt)	33-351439
16	Tubular Cond. (.03 mfd.)	30-4449
17	Resistor (32,000 ohms, 1 watt)	33-332439
18	Resistor (10,000 ohms, 1 watt)	33-310439
19	Resistor (1.0 meg., 1 watt)	33-510439
20	Volume Control and On-Off Switch	33-5276
21	Resistor (1.0 meg., 1 watt)	33-510439
22	Mica Cond. (110 mmfd.)	30-1031
23	Mica Cond. (250 mmfd.)	30-1032
24	Tubular Cond. (.01 mfd.)	30-4572

Schem. No.	Description	Part No.
25	Resistor (99,000 ohms, 1 watt)	33-399439
26	Resistor (490,000 ohms, 1 watt)	33-449439
27	Resistor (490,000 ohms, 1 watt)	33-449439
28	Tubular Cond. (.1 mfd.)	30-4499
29	Tubular Cond. (.01 mfd.)	30-4479
30	Resistor (4.0 meg., 1 watt)	33-540439
31	Electrolytic Cond. (4-8 mfd.)	30-2323
32	Tubular Cond. (.01 mfd.)	30-4572
33	Output Trans.	32-7980
*34	Cone & Voice Coil Assy.	
	Speaker Part No. 36-1426-1	*36-4083
	Speaker Part No. 36-1426-3	*36-4085
	Cone & Voice Coil Assy.	
	Speaker Part No. 36-1449	*36-4086
35	†Field Coil (Speaker Part No. 36-1426)	
	†Field Coil (Speaker Part No. 36-1449)	
36	Electrolytic Cond. (8 mfd.)	30-2319
37	Resistor (250 ohms, wirewound)	33-125431
38	Resistor (70 ohms, 1 watt)	33-070439
39	Power Trans. (115 volts, 50-60 cycles)	32-7974
40	Bakelite Cond. (.01—.01 mfd.)	3903 DG
41	Pilot Lamps	34-2064
42	Wave Switch	42-1449
43	Push Button Switch	42-1484
44	Padder Strip	31-6292

PHILCO RADIO & TELEV CORP

MODEL 39-175(121,122)
Schematic, Voltage



SPECIFICATIONS

E: 0 to 1720 K.C.

l 39 75 is a 4 tube battery operated superhetero- rec ver covering standard broadcast and state ce s tions. The receiver is equipped with electric -but n tuning in addition to manua' tuning, low ent ttery tubes and extremely sensitive speaker.

electic push-button tuning contains 6 push buttons seleing any of 5 stations in the standard broad- bam and one button for dial tuning. The pro- re f adjusting and operating the push-buttons be und in the instructions on page 3.

121 s assembled in a type T cabinet and has the ker unted on the chassis. Code 122 is assembled conle cabinet with the speaker detached from chass s.

nmen of the R.F. and I.F. compensating condensers his del is the same as that given for the Model cod 121 and 122.

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES: One 1A7G, First Detector and Oscillator; one 1N5G, I.F. Amplifier: one 1H5G, Second Detector; First Audio and Automatic Volume Control, and one 1C5G Pentode Output.

BATTERIES REQUIRED: One (1) Philco "A" Pack, Part No. 41-8014; one (1) Philco "B" Pack, Part No. 41-8015.

BATTERY DRAIN:
"A"- (250 M.A.) "B"- (8½ M.A.)

AERIAL AND GROUND: In order to obtain the highest amount of sensitivity from these receivers the Philco Farm Radio Aerial, Part No. 40-6383, should be used. This aerial is accurately designed to match the tuned antenna circuit in the receiver so that maximum performance will be obtained.

A good ground connection to the nearest water pipe or any other good ground source is also required.

A enna Transformer	32-3169
Tu lar Condenser (.05 mfd.)	30-4519
Tu ing Condenser Assembly	31-2362
C denser (110 mmfd., mica)	30-1031
Re istor (190,000 ohms, 1 watt)	33-419439
C denser (25 mmfd., silver plated mica)	30-1112
Os illator Transformer	32-3083
Tu lar Cond. (.05 mfd.)	30-4444
Re istor (70,000 ohms, 1 watt)	33-370439
1s I.F. Transformer Assembly	32-3078
2n I.F. Transformer Assembly)	32-3081
Re istor (51,000 ohms, 1 watt)	33-351439
Re istor (2.0 megohms, 1 watt)	33-520439
Vo me Control	33-5291
Tu lar Condenser (.01 mfd.)	30-4572
Co denser (110 mmfd., mica)	30-1031
Tu lar Condenser (.01 mfd.)	30-4572
Re istor (1.0 megohm, 1 watt)	33-510439
Re istor (2.0 megohms, 1 watt)	33-520439
Re istor (2.0 megohms, 1 watt)	33-520439
Re istor (1000 ohms, 1 watt)	33-210439
Tu lar Condenser (.003 mfd.)	30-4469
Ou put Transformer	32-7995
Co & Voice Coil Assemblies	
peaker Part No. 36-1442-3	36-4090
peaker Part No. 36-1447-3	36-4092
El trolytic Condenser (3 mfd.)	30-2346
Pu h-Button Switch	42-1484
Pa er Strip	31-6292

Spring (On-Off Indicator)	28-8927
Snap Fastener (On-Off Indicator)	28-4342
Speaker (T Cabinet)	36-1442
(F Cabinet)	36-1447
Socket (6 prong)	27-6086
Socket (7 prong)	27-6099
Socket (Speaker)	27-6115
Wire Link (On-Off Indicator)	28-8922
Tab (Manual)	27-5487
Tab Kit	40-6408
Shaft Extension (Tuning, Volume)	38-9640
Spring (Shaft Retaining)	28-8915
Bezel (Push button)	56-1364
Bezel Assembly (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel Gasket (Push Button)	27-9218
Cable Battery	41-3429
Dial	27-5420
Drive Drum Assembly	31-2281
Drive Pulley	28-6662
Drive Cord (Pointer)	31-2275
Drive Cord (Cord Drive)	31-2343
Knob (Push Button)	27-4814
Knob (Tuning, Volume)	27-4753
Pointer	28-5934
Shaft (Tuning)	56-6032
Spring (Drive Cord Tuning Condenser)	28-8751
Spring (Drive Cord Pointer)	28-8946

Replacement Parts
Model 39-711

Schem No	Description	Part No
1	Tubular Cond. (.001 mfd. 1000 V	30-4601
2	Tubular Cond. (.01 mfd., 400 V.)	30-4572
3	Tubular Cond. (.25 mfd., 400 V.)	30-4589
4	Ant. Trans. (B.C. & Police)	32-3141
5	Ant. Trans. (S.W.)	32-3143
6	Compensator (2 section)	31-6287
7	Tubular Cond. (.1 mfd., 200 V.)	30-4586
8	Tubular Cond. (.25 mfd., 400 V.)	30-4589
9	Resistor (51,000 ohms, 1 watt)	33-351439
10	Resistor (120,000 ohms, 1 watt)	33-412439
11	Tuning Cond.	31-2357
12	Osc. Trans. (B C. & Police)	32-3142
13	Osc. Trans. (S.W.)	32-3144
14	Compensator (2 section)	31-6287
15	Compensator	31-6289
16	Mica Cond. (1650 mmfd.)	5877
17	Mica Cond. (3500 mmfd.)	30-1094
18	Resistor (3300 ohms, 1 watt)	33-233439
19	Mica Cond. (250 mmfd.)	30-1119
20	Resistor (5000 ohms, 1 watt)	33-250439
21	1st I.F. Trans. Assy	32-3139
22	2nd I.F. Trans. Assy	32-3140
23	Tubular Cond. (.1 mfd., 200 V.)	30-4586
24	Tubular Cond. (.01 mfd , 600 V.)	30-4581
25	Resistor (20,000 ohms, 1 watt)	33-320439
26	Resistor (2.0 meg., 1 watt)	33-520439
27	Tubular Cond. (.05 mfd., 200 V.)	30-4519
28	Volume Control (5 meg.)	33-5305
29	Tubular Cond. (.001 mfd., 200 V.)	30-4592
30	Resistor (10.0 meg., 1 watt)	33-610439
31	Resistor (99,000 ohms, 1 watt)	33-399439
32	Resistor (330,000 ohms, 1 watt)	33-433439
33	Mica Cond. (250 mmfd.)	30-1119
34	Tubular Cond. (.02 mfd., 200 V.)	30-4584
35	Resistor (330,000 ohms, 1 watt)	33-433439
36	Resistor (150 ohms, 1 watt)	33-115439
37	Tubular Cond. (.1 mfd., 200 V.)	30-4586
38	Tone Control Switch	42-1481
39	Tubular Cond. (.05 mfd., 400 V.)	40-4518
40	Electrolytic Cond. (6 mfd., 25 V.)	30-2380
	(20 mfd., 150 V.)	30-2380
41	Tubular Cond. (.015 mfd., 400 V.)	30-4515
42	Output Trans.	32-8033
43	Cone & Voice Coil Assy	36-4110
44	Filter Choke	32-8029
45	Electrolytic Cond. (20 mfd., 150 V.)	30-2245
46	Tubular Cond. (.05 mfd., 600 V.)	30-4602
47	Pilot Lamp	34-2068
48	Wave Switch	42-1480

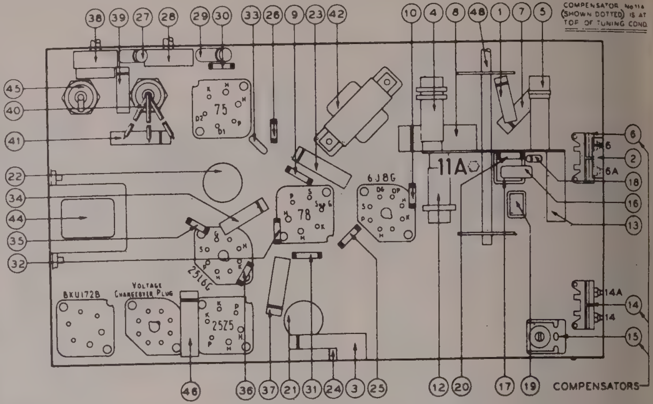


Fig. 3—Part Locations, Model 39-711, Underside of Chassis

Miscellaneous Par

Description	Part N
Cord (Wave Band Indicator)	27-9294
Cord (Pointer Operation)	31-2358
Dial	27-5468
Indicator (Wave Band)	36-1268
Knobs (4 used)	27-4332
Pointer (Dial)	36-1276
Socket (Pilot Lamp)	38-9127
Socket (6 prong, type 25Z5 & Ballast tube)	27-6036
Socket (6 prong, type 78 & 75 tubes)	27-6123
Socket (8 prong, type 6J8G & 25L6G tubes)	7-6120
Socket (8 prong, voltage changeover plug)	7-6127
Spring (Tuning Indicator Cord)	8-8913
Spring (Wave Band Indicator Mounting)	8-8943
Spring (Wave Band Indicator Cord)	8-8945

Replacement Parts
Model 39-751

Schem. No.	Description	Part No.
1	Tubular Cond. (.25 mfd.)	30-4589
2	Tubular Cond. (.01 mfd.)	30-4572
3	Ant Trans. (B.C.)	32-2588
4	Ant. Trans (S.W. 1)	32-3093
5	Ant. Trans. (S.W. 2)	32-2885
6	Compensator	31-6258
7	Tubular Cond. (.01 mfd.)	30-4572
8	Tubular Cond. (.15 mfd.)	30-4600
9	Tubular Cond. (.05 mfd.)	30-4519
10	Tubular Cond. (.05 mfd.)	30-4519
11	Resistor (100 ohms, 1 watt)	33-110439
12	Tubular Cond. (.1 mfd.)	30-4586
13	Tubular Cond. (.1 mfd.)	30-4586
14	Resistor (1.5 megohm)	33-515439
15	R.F. Trans. (Brdcst.)	32-2379
16	R.F. Trans. (S.W. 1)	32-3099
17	R F. Trans. (S.W. 2)	32-3165
18	Mica Cond. (5 mmfd.)	30-1120
19	Compensator	31-6288
20	Tubular Cond. (.05 mfd.)	30-4519
21	Tubular Cond. (.05 mfd.)	30-4519
22	Resistor (51,000 ohms, 1 watt)	33-351439
23	Resistor (100 ohms, 1 watt)	33-110439
24	Resistor (32,000 ohms, 1 watt)	33-332439
25	Mica Cond. (250 mmfd.)	30-1119
26	Tuning Cond.	31-2325
27	Osc. Trans. (Brdcst.)	32-2120
28	Osc. Trans. (S. W. 1)	32-3094
29	Osc. Trans. (S. W. 2)	32-3102
30	2 Section Compensator	31-6287
31	Compensator	31-6289
32	Semi-Fixed Condenser (1605 mmfd.)	31-6282
33	Compensator	31-6288
34	Semi-Fixed Condenser (3300 mmfd.)	31-6283
35	Mica Cond. (250 mmfd.)	30-1119
36	Resistor (5.000 ohms, 1 watt)	33-250439
37	Resistor (2,000 ohms, 1 watt)	33-220439
38	Tubular Cond. (.05 mfd.)	30-4519
39	Resistor (600 ohms, 1 watt)	33-160439
40	Tubular Cond. (.05 mfd.)	30-4519
41	Tubular Cond. (.001 mfd.)	30-4592
42	Resistor (20,000 ohms, 1 watt)	33-320439
43	1st I.F. Trans. Assy	32-3116
44	2nd I.F. Trans. Assy	32-3133
45	Resistor (10.000 ohms, 1 watt)	33-310439
46	Mica Cond. (250 mmfd.)	30-1119
47	Tubular Cond. (.1 mfd.)	30-4586
48	Resistor (120,000 ohms, 1 watt)	33-412439
49	Resistor (99,000 ohms, 1 watt)	33-399439
50	Resistor (240,000 ohms, 1 watt)	33-424439
51	Resistor (120,000 ohms, 1 watt)	33-412439
52	Resistor (1 0 meg., 1 watt)	33-510439
53	Resistor (10.0 meg., 1 watt)	33-610439
54	Tubular Cond. (.006 mfd.)	30-4583
55	Tubular Cond. (01 mfd.)	30-4581
56	Tone Control (4.0 meg.)	33-5299
57	Tubular Cond. (.02 mfd.)	30-4584
58	Mica Cond. (110 mmfd.)	30-1118
59	Volume Control	33-5304
60	Resistor (70,000 ohms, 1 watt)	33-370439
61	Tubular Cond. (.006 mfd.)	30-4583
62	Tubular Cond. (.25 mfd.)	30-4588
63	Resistor (32,000 ohms, 1 watt)	33-332439
64	Resistor (32,000 ohms, 1 watt)	33-332439
65	Resistor (25,000 ohms, 1 watt)	33-325439
66	Resistor (5,000 ohms, 1 watt)	33-250439
67	Tubular Cond. (.02 mfd.)	30-4584
68	Resistor (490,000 ohms, 1 watt)	33-449439
69	Tubular Cond. (.01 mfd.)	30-4581
70	Tubular Cond. (.02 mfd.)	30-4584
71	Resistor (240,000 ohms, 1 watt)	33-424439
72	Resistor (240,000 ohms, 1 watt)	33-424439
73	Electrolytic Cond. (16 mfd.) 300 V, 10 mfd., 25 V.	30-2372
74	Resistor (150 ohms, 1 watt)	33-115439
75	Tubular Cond. (.01 mfd.)	30-4581
76	Output Trans.	32-8028
77	Cone & Voice Coil Assy. (For Speaker 36-1456-3)	36-4108
	Cone & Voice Coil. Assy. (For Speaker 36-1455-3)	36-4107
78	Tubular Cond. (01 mfd.)	30-4581
79	Electrolytic Cond. (40 mfd. 300 V.)	30-2373
80	Filter Choke	32-8029
81	Electrolytic Cond. (20 mfd. 150 V.)	30-2245
82	Tubular Cond. (02 mfd.)	30-4599
83	Tubular Cond. (.5 mfd.)	30-4590
84	Resistor (10,000 ohms, 3 watt)	33-3368
85	Pilot Lamps	34-2068
86	Wave Switch	42-1454

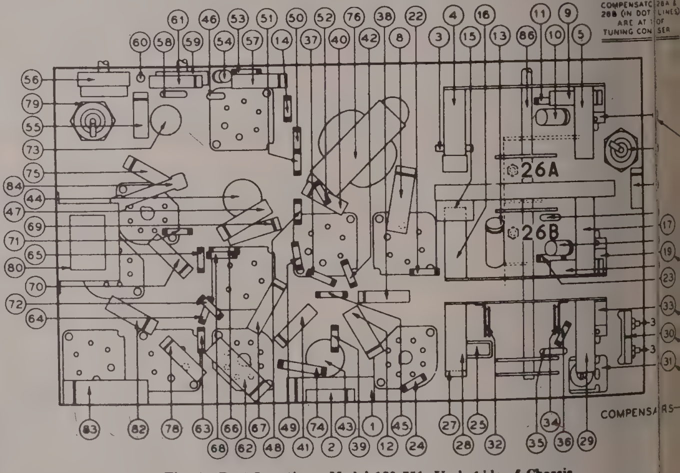
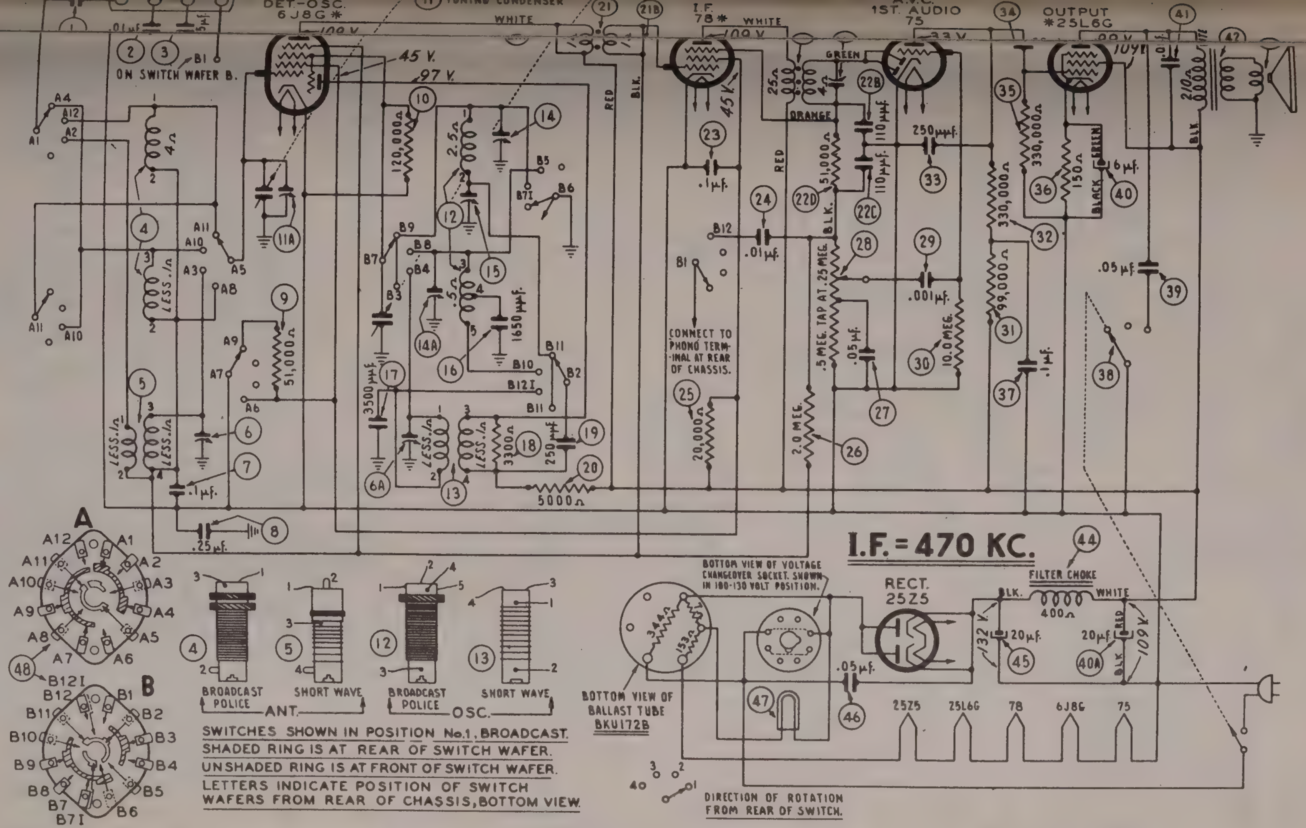


Fig. 4—Part Locations, Model 139-751, Underside of Chassis

Miscellaneous Par

Description	Part
Bezel (39-751T)	-1240
Bezel (39-751XX)	-1222
Cord (Wave Band Indicator)	-9294
Cord (Pointer Operation)	-2330
Cord (Tone Control Indicator)	-2331
Dial	-5433
Indicator (Wave Band & Tone Control)	-1265
Knob (Tuning)	-4330
Knob (Vernier)	-433
Knob (Tone Control & Vol. Cont.)	-433
Pointer (Dial)	-1270
Screws (Bezels)	W-4(F
Socket (Pilot Lamps)	-981
Socket (5 prong, type 76 tube)	-612
Socket (6 prong, type 78 & 75 tubes)	-612
Socket (6 prong, type 25Z5 & Ballast Tubes)	-603
Socket (8 prong, type 6J8G & 25L6G tubes)	-612
Socket (8 prong, voltage changeover plug)	-612
Spring (Tuning Indicator Cord)	-891
Spring (Indicator Operation)	-893
Spring (Indicator Mounting)	-894
Vernier Drive	-232
Speaker	-1456
Speaker	145

MODEL 39-711(121)
Schematic,Voltage
Changes


DET-OSC.
6J8G*
TUNING CONDENSER
WHITE
I.F.
78*
WHITE
A.V.C.
1ST. AUDIO
75
OUTPUT
*25L6G
ON SWITCH WAFER B.
45 V.
97 V.
100 V.
33 V.
99 V.
104 V.
RED
BLK.
GREEN
ORANGE
RED
CONNECT TO PHONO TERMINAL AT REAR OF CHASSIS.
I.F. = 470 KC.
FILTER CHOKE
BLK.
WHITE
400 Ω
RECT.
25Z5
132 V.
109 V.
20 μf.
.05 μf.
BOTTOM VIEW OF VOLTAGE CHANGEOVER SOCKET. SHOWN IN 100-130 VOLT POSITION.
BOTTOM VIEW OF BALLAST TUBE BKU172B
DIRECTION OF ROTATION FROM REAR OF SWITCH.
25Z5
25L6G
78
6J8G
75
BROADCAST POLICE
SHORT WAVE
ANT.
OSC.
SWITCHES SHOWN IN POSITION No.1, BROADCAST.
SHADED RING IS AT REAR OF SWITCH WAFER.
UNSHADED RING IS AT FRONT OF SWITCH WAFER.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, BOTTOM VIEW.
A
B

SCHEMATIC DIAGRAM MODEL 39-711

TYPE CIRCUIT: Model 39-711, code 121, is a six (6) tube A.C. or D.C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Three Point Tone Control; Bass Compensation; and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volts A.C. or D.C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

POWER CONSUMPTION: 86 watts at 240 V.
43 watts at 120 V.

TUNING RANGES: 530 to 1720 K.C.;
2.3 to 7.4 M.C.; 7.3 to 22 M.C.

PRODUCTION CHANGES

Condenser Part No. 30-1119, 250 mmfd. added from suppressor grid of the 6J8EG tube to ground to prevent regeneration at 15 to 22 M.C,

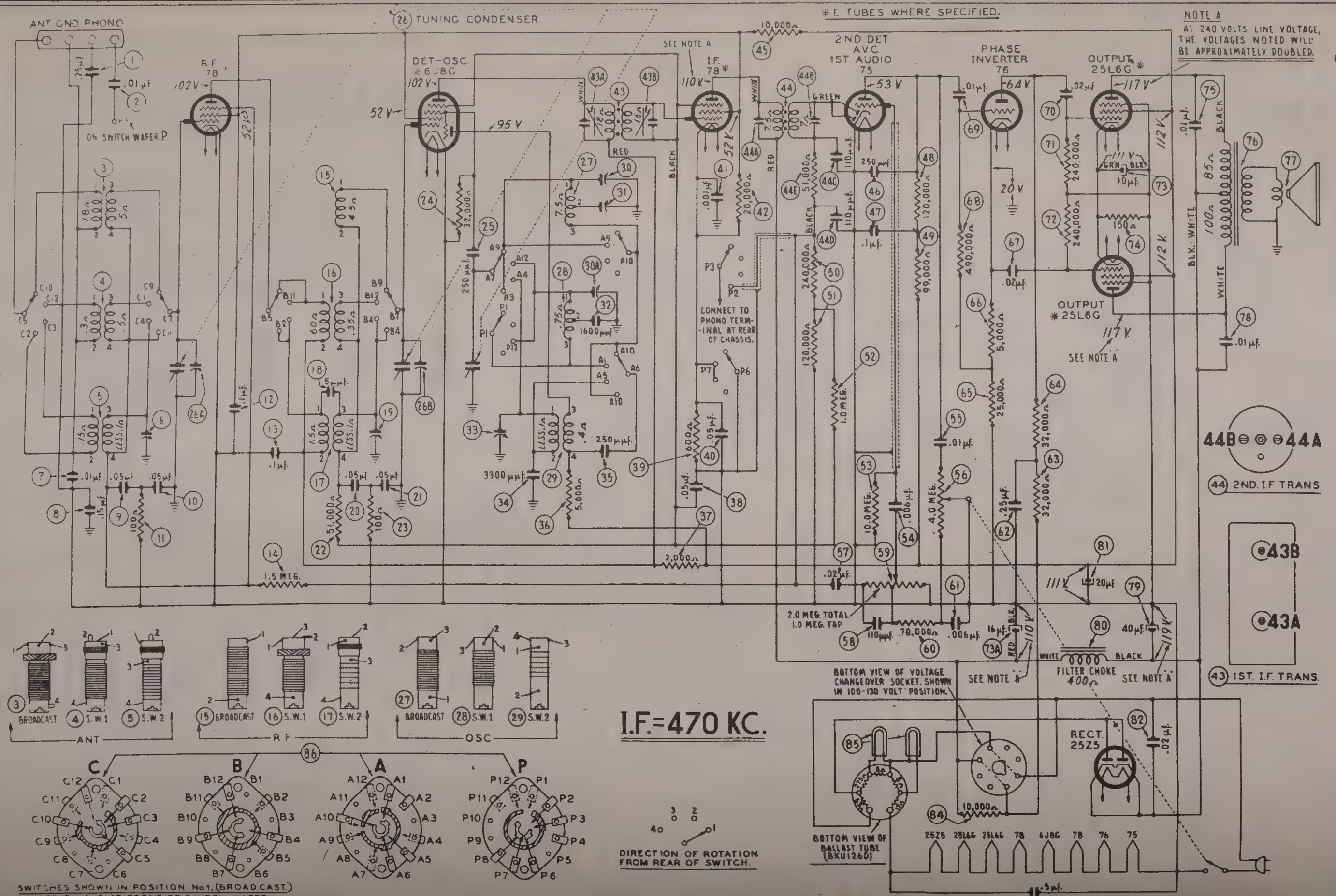
AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used and a good ground connection to the nearest water pipe or any other good source.

CABINET DIMENSIONS:

	Height	Width	Depth
T	12⅝	16¾	9⅞

MODEL 39-751(121)
Runs 1,2
Schematic,Voltage
Changes

PHILCO RADIO & TELEV. CORP.



NOTE A
AT 240 VOLTS LINE VOLTAGE, THE VOLTAGES NOTED WILL BE APPROXIMATELY DOUBLED.
* E TUBES WHERE SPECIFIED.
TUNING CONDENSER
ANT GND PHONO
ON SWITCH WAFER P
RF 78
DET-OSC. # 6J8G
I.F. 78 *
2ND DET AVC. 1ST AUDIO 75
PHASE INVERTER 76
OUTPUT 25L6G *
OUTPUT * 25L6G
SEE NOTE A
CONNECT TO PHONO TERMINAL AT REAR OF CHASSIS.
2.0 MEG. TOTAL 1.0 MEG. TAP
BOTTOM VIEW OF VOLTAGE CHANGEOVER SOCKET. SHOWN IN 100-130 VOLT POSITION.
FILTER CHOKE 400Ω
RECT. 25Z5
BOTTOM VIEW OF BALLAST TUBE (BKU126D)
2ND. I.F TRANS
1ST. I.F. TRANS.
44B 44A
43B 43A
BROADCAST S.W.1 S.W.2
ANT
R F
OSC
C B A P
DIRECTION OF ROTATION FROM REAR OF SWITCH.
SWITCHES SHOWN IN POSITION No1,(BROADCAST.)
SHADED RING IS AT FRONT OF SWITCH WAFER
UNSHADED RING IS AT REAR OF SWITCH WAFER
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS,(BOTTOM VIEW.)

I.F.=470 KC.

POWER CONSUMPTION: 50 watts at 120 volts.
100 watts at 240 volts.

TUNING RANGES: 530 to 1720 K.C.; 2.3 to 7.4 M.C.; 7.3 to 22 M.C.

TYPE CIRCUIT: Model 39-751, code 121, is an eight (8) tube A.C. or D.C. operated receiver employing a superheterodyne circuit with three [illegible] impedance Electric Phonograph pick-up. Other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation; Push-Pull Pentode Audio Output; and special compensation for reducing frequency drift to a minimum. [illegible] voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

AERIAL AND GROUND: Same as Model 39-711

CABINET DIMENSIONS: Height Width Depth

Run 2 To prevent instability at 530 K.C. a 70000 ohm resistor, Part No. 33-370339 was connected in parallel with the primary R.F. transformer (16).

PHILCO RADIO & TELEV. CORP.

MODEL 39-711(121)
MODEL 39-751(121)
Alignment

Alignment of Compensators

IPME REQUIRED:

(1) S nal Generator; Philco Model 077.
(2) O put Meter, Philco Model 027 Circuit Tester.
(3) P lco Fiber Handle Screw Driver, Part No. 27-7059
a Fiber Wrench, Part No. 3164.

PUT TER:

T indicating devices for aligning of the receiver can b used; either an audio output meter or a vacuum tube ltmeter. The method of connecting the audio output m er is given in the next paragraph. The procedure for c necting the vacuum tube voltmeter as an aligning indic or will be found on page 5. Where greater accuracy of the various tuned circuits is desired, the vacuum tube voltmeter is recommended as an aligning device.

The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 25L6G tube (use one tube in Model 39-751) and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 3, Model 39-711, and Fig. 4, Model 39-751. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

MODEL 39-711

SIGNAL GENERATOR			RECEIVER			
Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	Special Instructions
6J8EG	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	22A, 21B, 21A	
Ant. & Grnd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	14, 11A	Note B
Ant. & Grnd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	15	Roll gang Repeat Oper. 2
Ant. & Grnd.	400 ohms	7.0 M.C.	7.0 M.C.	Range Sw. Police	14A	Roll Gang
Ant. & Grnd.	400 ohms	20 M.C.	20 M.C.	Range Sw. S. W.	6A, 6	Note C

MODEL 39-751

SIGNAL GENERATOR			RECEIVER			
Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	Special Instructions
6J8G Grid and Ground	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone-Treble	44B, 44A, 43B, 43A	
Ant. and Grd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Range Sw. Brdcst.	30, 26B, 26A	Note B
Ant. and Grd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max.	31	Roll gang Repeat Operation 2
Ant. and Grd.	400 ohms	6.0 M.C.	6.0 M.C.	Vol. Max. Tone-Treble Range Sw. Police	30A	Roll gang
Ant. and Grd.	400 ohms	20 M.C.	20 M.C.	Vol. Max. Tone-Treble Range Sw. S. W.	33, 19, 6	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (33) model 39-751 and (6A)—model 39-711 be sure to tune in the fundamental signal (20 M.C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 940 K.C. below the fundamental signal, which will be 19.060 M.C.

ilco-T pic radio is particularly recommended for locations where ecept of short wave is necessary and where the radio and the are posed to extreme conditions. The receiver is especially con- to thstand decay, spoilage and deterioration caused by extreme ns o humidity, heat, salt air and cold; and to stand up under t se e tropic weather conditions.

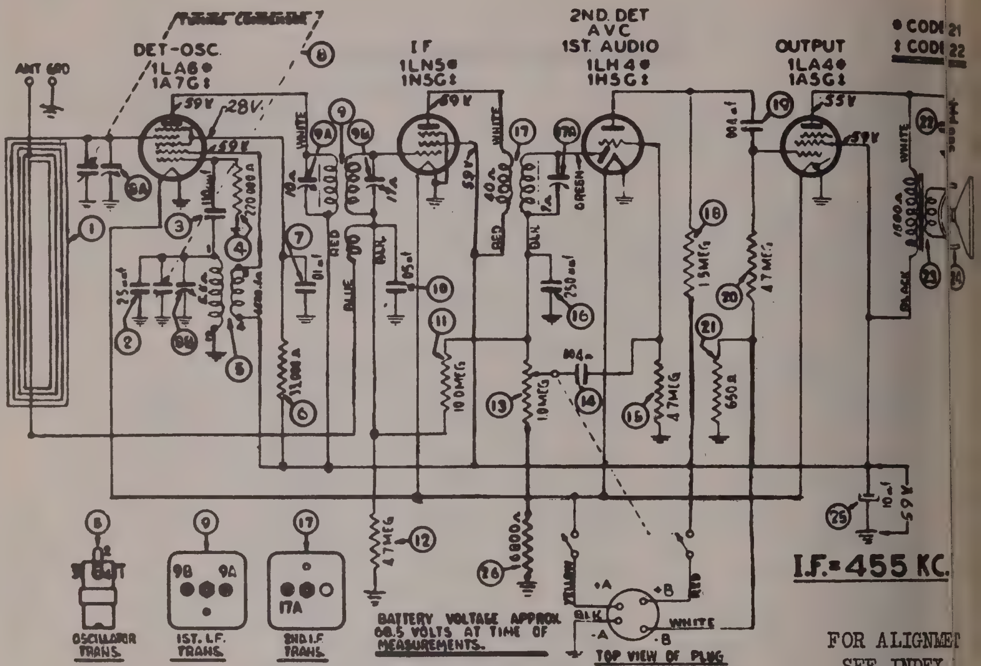
The chassis is heavily plated, making it impervious to salt air, rust and corrosion.

The various parts, such as coils, condensers, chokes and transformers, are treated with special wax that will withstand very high temperatures. In addition the wax is treated with chemicals which repel rodents and insects.

The cabinet is treated with a special sealing compound which protects it against moisture and heat.

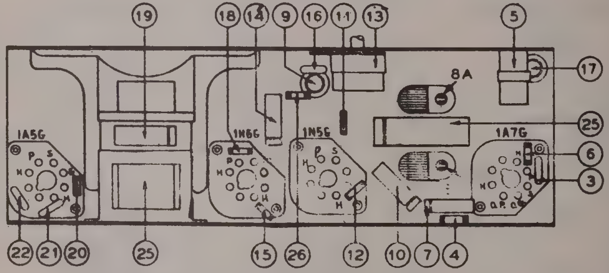
MODEL 40-81(121,122)
Schematic,Voltage
Chassis

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 40-81 CODES 121&122.

FOR ALIGNME
SEE INDEX



PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-81

AUGUST, 1939.

Replacement Parts — Models 40-81, Codes 121, 122

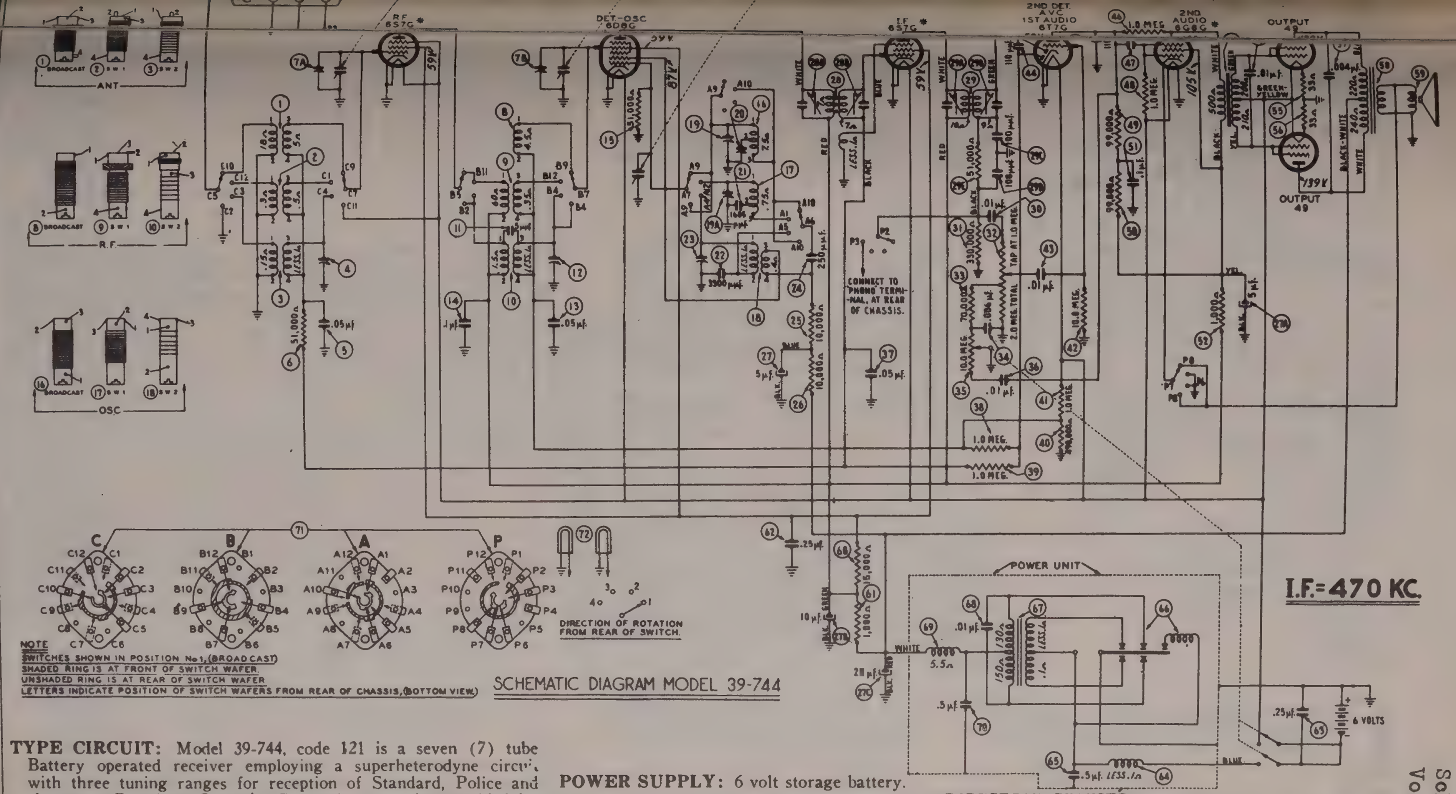
SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Part of Cabinet)	10413A
2	Mica Condenser (15 mmfd.)	61-0038
3	Mica Condenser (110 mmfd.)	30-1031
4	Resistor (220,000 ohms, ½ watt)	33-422339
5	Oscillator Transformer	32-3277
6	Resistor (33,000 ohms, ½ watt)	33-333339
7	Tubular Condenser (.01 mfd.)	30-4572
8	Tuning Condenser Assembly	31-2432
9	1st I. F. Transformer Assembly	32-3265
10	Tubular Condenser (.05 mfd.)	30-4519
11	Resistor (10.0 meg., ½ watt)	33-610339
12	Resistor (4.7 meg., ½ watt)	33-547339
13	Volume Control and On-Off Switch	33-5331
14	Tubular Condenser (.004 mfd.)	30-4578
15	Resistor (4.7 meg., ½ watt)	33-547339
16	Mica Condenser (250 mmfd.)	61-0033
17	2nd I. F. Transformer Assembly	32-3266
18	Resistor (1.5 meg., ½ watt)	33-515339
19	Tubular Condenser (.004 mfd.)	30-4578
20	Resistor (4.7 meg., ½ watt)	33-547339
21	Resistor (650 ohms, ½ watt)	33-165326
22	Mica Condenser (500 mmfd.)	30-1114
23	Output Transformer	32-8062
24	Cone and Voice Coil Assembly (Speaker Part No. 36-1461-3)	36-4121
25	Electrolytic Condenser (10 mfd., 150 V.)	30-2396
26	Resistor (6800 ohms, ½ watt)	33-268339

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Acetate Window	27-5541
Cabinet	10431A
Clip (Coil Mounting)	28-5002
Drive Cord Assembly	31-2411
Dial	27-5561
Grille Screen	56-1539
Knobs (Volume and Tuning)	27-4876
Pointer	27-4891
Speaker	36-1461
Shield (Tube, Code 122)	56-1566
Sockets (Loktal, Code 121)	55-0575
Sockets (Octal, Code 122)	27-6133
Spring (Drive Cord)	28-8751
Tuning Shaft Assembly	38-9875

PHILCO RADIO & TELEV. CORP.

MODEL 39-744(121)
Runs 1,2,3
Schematic
Voltage,Changes



NOTE
SWITCHES SHOWN IN POSITION No.1,(BROADCAST)
SHADED RING IS AT FRONT OF SWITCH WAFER.
UNSHADED RING IS AT REAR OF SWITCH WAFER
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS,(BOTTOM VIEW)

SCHEMATIC DIAGRAM MODEL 39-744

TYPE CIRCUIT: Model 39-744, code 121 is a seven (7) tube Battery operated receiver employing a superheterodyne circuit, with three tuning ranges for reception of Standard, Police and shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition, other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation, and special compensators for reducing frequency drift to a minimum.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used, a good ground connection to the nearest water pipe or any other good ground source.

POWER SUPPLY: 6 volt storage battery.

TUNING RANGES:

530 to 1720 K.C.;
2.3 to 7.4 M.C.;
7.3 to 22 M.C.

AUDIO OUTPUT: 2.5 watts.

PRODUCTION CHANGES

Run 2 To prevent Oscillation resistor (60) 15000 ohms, 1 watt, part no. 33-315339 was changed to 20000 ohms, part no. 33-320339.

Run 3 Beginning with Run 3, a resistor 33-370339 7000 ohms, was added across No. 9 R.F. Transformer primary.

To stabilize tuning of broadcast band and prevent regeneration, condensers (62) were removed from the wiring panel and connected directly to the screen terminal of the 6S7G tube.

MODEL 39-744(121)
Runs 1,2,3
Alignment,Chassis
Trimmers,Parts

PHILCO RADIO & TELEV. CORP.

Replacement Parts Model 39-744

Schem. No.	Description	Part No.
1	Ant. Trans. (Brdcst.)	32-2588
2	Ant. Trans. (S.W. 1)	32-3093
3	Ant. Trans. (S.W. 2)	32-2885
4	Compensator	31-6288
5	Tubular Cond. (.05 mfd.)	30-4519
6	Resistor (51,000 ohms, 1 watt)	33-351439
7	Tuning Cond.	31-2325
8	R.F. Trans. (Brdcst.)	32-2379
9	R.F. Trans. (S.W. 1)	32-3099
10	R.F. Trans. (S.W. 2)	32-3165
11	Mica Cond. (5 mmfd.)	30-1120
12	Compensator	31-6288
13	Tubular Cond. (.05 mfd.)	30-4519
14	Tubular Cond. (.1 mfd.)	30-4586
15	Resistor (51,000 ohms, 1 watt)	33-351439
16	Osc. Trans. (Brdcst.)	32-2120
17	Osc. Trans. (S.W. 1)	32-3094
18	Osc. Trans. (S.W. 2)	32-3102
19	2 Section Compensator	31-6287
20	Compensator	31-6289
21	Semi-fixed Cond. (1605 mmfd.)	31-6282
22	Semi-fixed Cond. (3300 mmfd.)	31-6283
23	Compensator	31-6288
24	Mica Cond. (250 mmfd.)	30-1119
25	Resistor (10,000 ohms, 1 watt)	33-310439
26	Resistor (10,000 ohms, 1 watt)	33-310439
27	Electrolytic Cond. (5 mfd., 150 V.)	30-2374
27A	Electrolytic Cond. (5 mfd., 150 V.)	
27B	Elect. Cond. (10 mfd., 150 V.)	
27C	Elect. Cond. (20 mfd., 150 V.)	
28	1st I F. Trans. Assy.	32-3127
29	2nd I.F. Trans. Assy.	32-3117
30	Tubular Cond. (.01 mfd.)	30-4581
31	Resistor (330,000 ohms, 1 watt.)	33-433439
32	Volume Control (2.0 meg.)	33-5298
33	Resistor (70,000 ohms, 1 watt)	33-370439
34	Tubular Cond. (.006 mfd.)	30-4583
35	Tone Control (10.0 meg.)	33-5303
36	Tubular Cond. (.01 mfd.)	30-4581
37	Tubular Cond. (.05 mfd.)	30-4519
38	Resistor (1.0 megohm, 1 watt)	33-510439
39	Resistor (1.0 megohm, 1 watt)	33-510439
40	Resistor (490,000 ohms, 1 watt)	33-449439
41	Resistor (1.0 megohm, 1 watt)	33-510439
42	Resistor (10.0 megohm, 1 watt)	33-610439
43	Tubular Cond. (.01 mfd.)	30-4581
44	Mica Cond. (110 mmfd.)	30-1118
45	Mica Cond. (110 mmfd.)	30-1118
46	Resistor (1.0 megohm, 1 watt)	33-510439
47	Tubular Cond. (.006 mfd.)	30-4583
48	Resistor (1.0 megohm, 1 watt)	33-510439
49	Resistor (99,000 ohms, 1 watt)	33-399439
50	Resistor (99,000 ohms, 1 watt)	33-399439

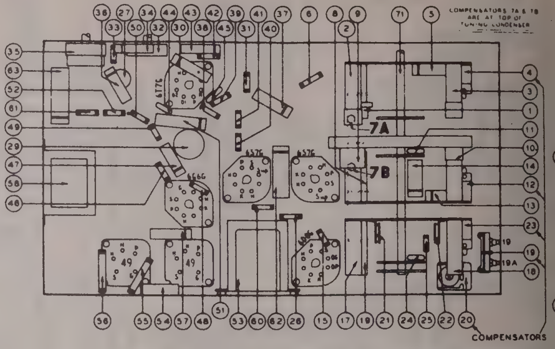


Fig. 1—Part Locations—Underside of Chassis

Schem. No.	Description	Part No.
51	Tubular Cond. (.1 mfd.)	30-4586
52	Resistor (1,000 ohms, 1 watt)	33-210439
53	Driver Trans.	32-8027
54	Tubular Cond. (.01 mfd.)	30-4581
55	Resistor (33 ohms, 1 watt, wire-wound)	33-033421
56	Resistor (33 ohms, 1 watt, wire-bound)	33-033421
57	Tubular Cond. (.004 mfd.)	30-4578
58	Output Trans.	32-8026
59	Cone & Voice Coil Assy. (Spkr. 36-1455-3)	36-4107
	Cone & Voice Coil Assy. (Spkr. 36-1456-3)	36-4108
60	Resistor (15,000 ohms, 1 watt)	33-315439
61	Resistor (1,000 ohms, 1 watt)	33-210439
62	Tubular Cond. (.25 mfd.)	30-4588
63	Tubular Cond. (.25 mfd.)	30-4588
64	"A" Choke	32-1954
65	Tubular Cond. (.5 mfd., metal case)	30-4296
66	Vibrator	41-3222
67	Power Trans.	32-7682
68	Tubular Cond. (.01 mfd.)	30-4598
69	"B" Choke	32-2925
70	Tubular Cond. (.5 mfd., metal case)	30-4296
71	Wave Switch	42-1474
72	Pilot Lamp Bulbs	34-2068
	Bezel (T Cabinet)	56-1246
	Bezel (XX Cabinet)	56-1222

Description	Part No.
Cable (Battery)	41-3472
Cord (Wave Switch)	27-9294
Cord (Tuning Drive)	31-2330
Cord (Tone Control)	31-2331
Dial	27-5438
Drum (Tone Control)	28-6996
Drum (Wave Switch)	28-7315
Drum and Coupling (Tuning Drive)	31-2327
Gasket (Dial Mtg.)	27-9258
Indicator (Tone & Range)	56-1269
Knob (Tuning)	27-4330
Knob (Vernier)	27-4331
Knob (Tone, Volume)	27-4332
Pointer	56-1276
Speaker (T Cabinet)	36-1455-3
Speaker (XX Cabinet)	36-1456-3
Spring (Tuning Cord)	28-8913
Spring (Tone and Range Indicators)	28-8945
Spring (Indicator Mtg.)	28-8943
Socket (5 prong.)	27-6035
Socket (6 prong) Vibrator Unit).	27-6036
Socket (6 prong)	27-6086
Socket (8 prong)	27-6120
Socket Assy. (Pilot Lamp)	38-9796
Shield (Square)	28-2726
Shield Cap (Square Shield)	28-2727
Shield—Round (two required)	56-1072
Shield Cap (Round Shield)	56-1073
Shield Base	56-1074
Station Card	27-5436
Station Card Shield	27-5437
Station Card Holder	56-1273
Vernier Drive	31-2329

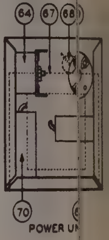


Fig.
—Part Loc ons—
Power U t

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 A.C. operated or Model 177 Battery operated.

(2) Output Meter, Philco Model 027 Circuit Tester.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is conr ted t the plate and cathode terminals of one of the type 49 tu s and adjusted for the 0 to 30 V.A.C. scale. After connecting th utpu meter, adjust the compensators in the order as shown n the tabulation below. Locations of the compensators are sh wn i Fig. 1. If the output meter pointer goes off scale when a usting the compensators, reduce the strength of the signal fr n the generator.

Order	Signal Generator			Receiver			Sp ial Inst ctions
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6D8EG Grid and Ground	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone-Treble	29B, 29A, 28B, 28A	
2	Ant. and Grd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Range Switch Brdcst.	19, 7B, 7A	N B
3	Ant. and Grd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max.	20	Ro Gang Repe Oper
4	Ant. and Grd.	400 ohms	6.0 M.C.	6.0 M.C.	Vol. Max. Tone-Treble Range Switch Police	19A	Rol Gang
5	Ant. and Grd.	400 ohms	20 M.C.	20 M.C.	Vol. Max. Tone-Treble Range Switch S. W.	23, 12, 4	N C

A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

C—When adjusting compensator sure to tune in the fundamental sig M.C.—second signal from tight pa padder) instead of the image signal. compensator is correctly adjusted, th signal will be found by turning the dial 940 K.C. below the fundamental

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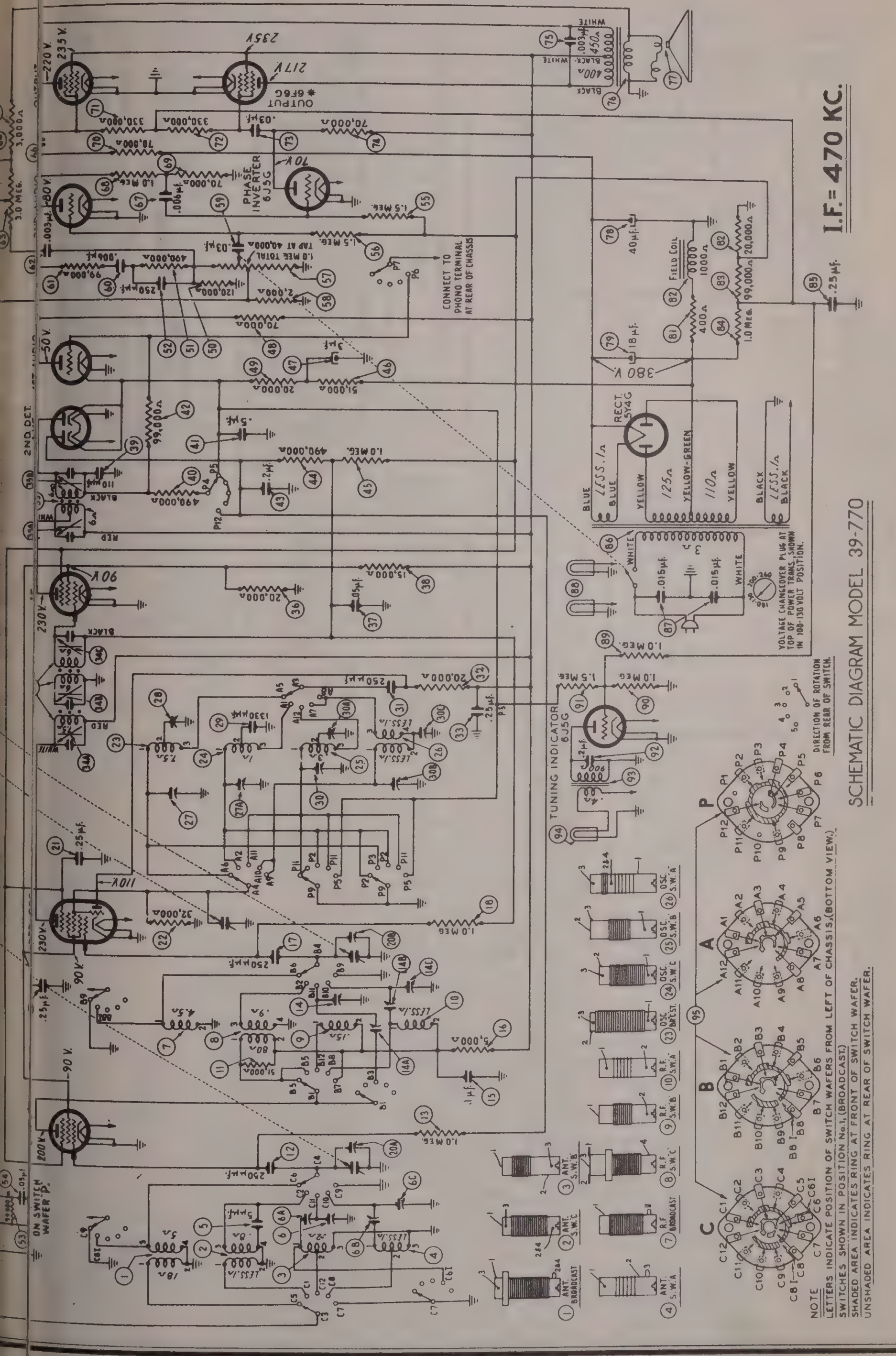
MODEL 39-770(121)
Schematic,Voltage



Voltages Measured from Socket Contacts to Ground; Line Voltage 115 V.A.C.; Dial at No-Signal and using a 1000 ohm per Voltmeter (Philco Model 027).

MODEL 39-770(121)
Chassis, Trimmers
Drive Cord Data

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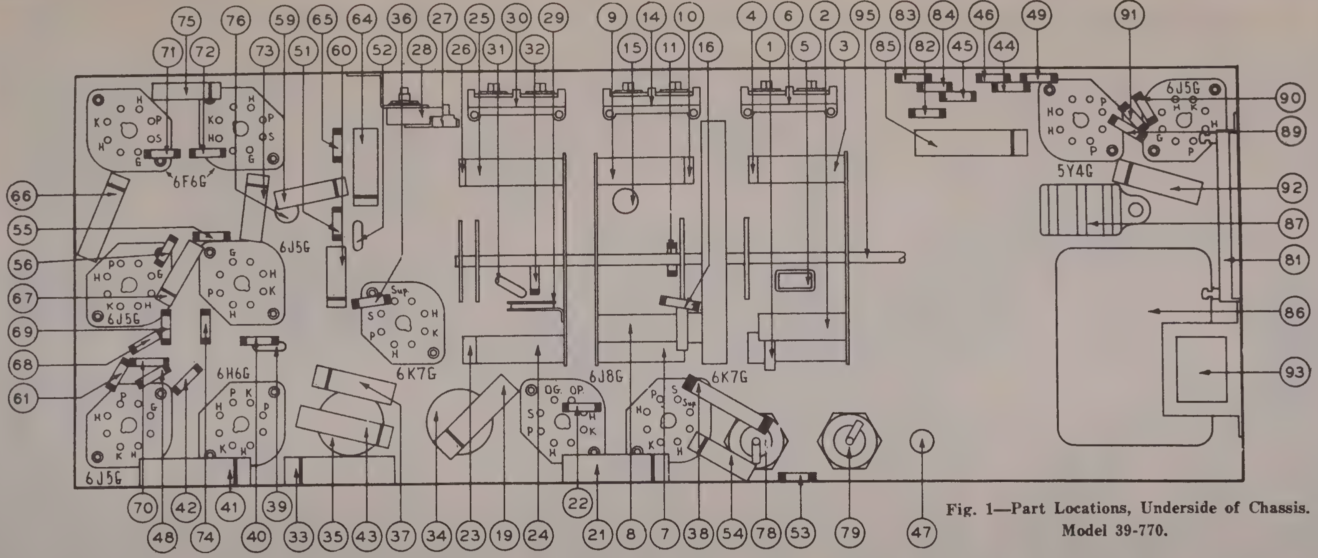
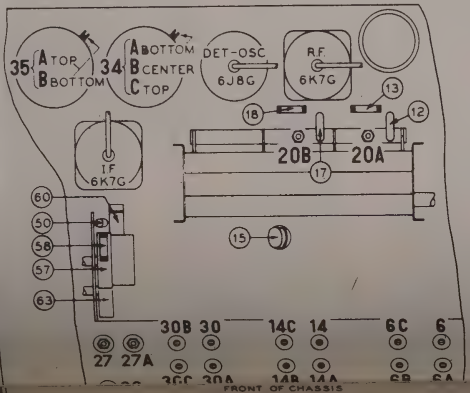
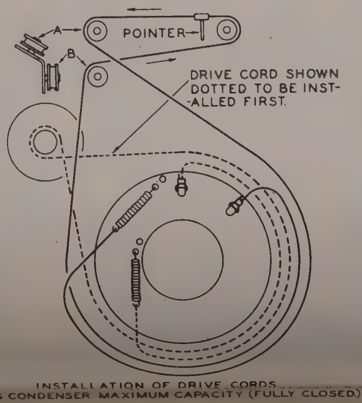


Fig. 1—Part Locations, Underside of Chassis. Model 39-770.




POINTER
A
B
DRIVE CORD SHOWN DOTTED TO BE INSTALLED FIRST.
INSTALLATION OF DRIVE CORDS
TUNING CONDENSER MAXIMUM CAPACITY (FULLY CLOSED)

TYPE CIRCUIT: Model 39-770 is an eleven (11) tube A.C. operated superheterodyne circuit with four (4) tuning ranges covering the frequencies listed below. Provisions are also provided for connecting a high impedance phonograph pick-up. In addition other features of design are: Tuning Light Indicator; Continuously Variable Tone Control with Variable Bass Compensation; Amplified Automatic Volume Control; Push-Pull Pentode Audio Output; and Special Compensation in all circuits to prevent frequency drift.

POWER SUPPLY: 115 or 220 V. 50 to 60 Cycle A.C. 115 Watts. To operate the receiver on either of the above voltages, insert the plug on top of power transformer as indicated on the transformer. Special Power Transformers for operation on 25 cycle current are available.

TUNING RANGES: 530 to 1720 K.C.; 1.7 M.C. to 5.6 M.C. 5.5 M.C. to 11.6 M.C.; 11.6 M.C. to 22.0 M.C.

AUDIO OUTPUT: 7.5 Watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370, should be used together with a good ground connection to the nearest water pipe or any other good ground source.

	Height	*Width*	*Depth*
Type T	18⅛	23⅜	12⅜
Type XX	36⅛	34⅝	14⅜

Alignment of Compensators

	SIGNAL GENERATOR			RECEIVER			
Operatio	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	Special Instructions
1	6J8G Grid	.1 mfd.	470 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	35B, 35A, 34C, 34A	Turn 34B "IN" full
2	6J8G Grid	.1 mfd.	470 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	34B	TO MAX. OUTPUT
3	Ant. & Gnd. Panel	200 mmfd.	1500 K.C.	1500 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	27, 20B, 20A	Note B
4	Ant. & Gnd. Panel	200 mmfd.	580 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	28	Roll Gang
5	Ant. & Gnd. Panel	200 mmfd.	5.0 M.C.	5.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWC"	27A	Roll Gang Note C
6	Ant. & Gnd. Panel	400 ohms	11 M.C.	11 M.C.	Tone-Treble Vol.—Max. Range Switch "SWB"	30, 14, 6	Note D Roll Gang on 14 and 6 Image above 11.0 M.C.
7	Ant. & Gnd. Panel	400 ohms	6.0 M.C.	6.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWB"	30A, 14A, 6A	Note D Roll Gang on 14A and 6A Image above 6.0 M.C. Repeat Operation 6
8	Ant. & Gnd. Panel	400 ohms	20.0 M.C.	20.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWA"	30B, 14C, 6C	Note D Roll Gang on 14C and 6C Image above 20.0 M.C.
9	Ant. & Gnd. Panel	400 ohms	12.0 M.C.	12.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWA"	30C, 14B, 6B	Note D Roll Gang on 14B and 6B Image above 12.0 M.C. Repeat Operation 7

E A—e "Dummy Antenna" consists of a ndense r resistance connected in series with sign generator output lead (high side). e the pacity or resistance as specified in ch step f the above procedure.

E B—al Calibration: In order to adjust the ceiver rrectly the dial must be aligned to ck pr erly with the tuning condenser. To just t dial, proceed as follows: With the ing c enser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable with condenser and pointer in this position is shown.

NOTE C—Compensator (27A) should be peaked to the Fundamental signal which is the second (2) signal from the tight (maximum capacity) position. If the compensator is correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. *below* 5.0 M.C.

NOTE D—Compensators of Shortwave Ranges "A" and "B" should be peaked to the first signal from the tight (maximum capacity) position. If the compensators are correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. *above* the frequencies being used. Example: 11.0 M.C. (Image 11.940); 20.0 M.C. (Image 20.940).

m.	*Description*	*Part No.*
	Ant. ans. (Brdcst.)	32-2588
	Ant. ans. (S.W. C)	32-3105
	Ant. ans. (S.W. B)	32-3108
	Ant. ans. (S.W. A)	32-3111
	Mica ond. (5 mmfd.)	30-1120
	Comp sators (4 section)	31-6284
	R.F. ans. (Brdcst.)	32-2379
	R.F. ans. (S.W. C)	32-3106
	R.F. ans. (S.W. B)	32-3109
	R.F. ans. (S.W. A)	32-3112
	Resis (32,000 ohms, 1 watt)	33-351439
	Mica ond. (250 mmfd.)	30-1119
	Resis (1.0 meg., 1 watt)	33-510439
	Comp sators (4 section)	31-6284
	Tubu Cond. (.1 mfd.)	30-4527
	Resis (5000 ohms, 1 watt)	33-250439
	Mica ond. (250 mmfd.)	30-1119
	Resis (1.0 megohm)	33-510439
	Tubu Cond. (.25 mfd.)	30-4588
	Tuni Cond.	31-2326
	Tubu Cond. (.25 mfd.)	30-4588
	Resis (32,000 ohms, 1 watt)	33-332439
	Osc. ans. (Brdcst.)	32-2120
	Osc. ans. (S.W. C)	32-3107
	Osc. ans. (S.W. B)	32-3110
	Osc. ans. (S.W. A)	32-3113
	Comp sator	31-6288
	Comp sator	31-6289
	Semi xed Cond. (1330 mmfd.)	31-6286
	Comp sators (4 section)	31-6285
	Mica ond. (250 mmfd.)	30-1119
	Resis (20,000 ohms, 1 watt)	33-320439
	Tubu Cond. (.25 mfd.)	30-4589
	1st I Trans. Assy.	32-3114
	2nd . Trans. Assy.	32-3115
	Resis (20,000 ohms, 1 watt)	33-320439
	Tubu Cond. (.05 mfd.)	30-4519
	Resis (15,000 ohms, 2 watt)	33-315539
	Mica ond. (110 mmfd.)	30-1118
	Resis (490,000 ohms, 1 watt)	33-449439
	Tubu Cond. (.5 mfd.)	30-4590
	Resis (99,000 ohms, 1 watt)	33-399439
	Tubu Cond. (.2 mfd.)	30-4587

Schem. No.	*Description*	*Part No.*
44	Resistor (490,000 ohms, 1 watt)	33-449439
45	Resistor (1.0 megohm, 1 watt)	33-510439
46	Resistor (51,000 ohms, 1 watt)	33-351439
47	Electrolytic Cond. (.3 mfd., 150 V.)	30-2367
48	Resistor (70,000 ohms, 1 watt)	33-370439
49	Resistor (20,000 ohms, 1 watt)	33-320439
50	Resistor (120,000 ohms, 1 watt)	33-412439
51	Resistor (490,000 ohms, 1 watt)	33-449439
52	Mica Cond. (250 mmfd.)	30-1119
53	Resistor (99,000 ohms, 1 watt)	33-399439
54	Tubular Cond. (.05 mfd.)	30-4519
55	Resistor (1.5 megohms, 1 watt)	33-515439
56	Resistor (1.5 megohms, 1 watt)	33-515439
57	Volume Control (1.0 megohm)	33-5302
58	Resistor (2000 ohms, 1 watt)	33-220439
59	Tubular Cond. (.03 mfd.)	30-4585
60	Tubular Cond. (.006 mfd.)	30-4591
61	Resistor (99,000 ohms, 1 watt)	33-399439
62	Tubular Cond. (.003 mfd.)	30-4580
63	Tone Control (3.0 megohms)	33-5287
64	Tubular Cond. (.15 mfd.)	30-4593
65	Resistor (3000 ohms, 1 watt)	33-230439
66	Tubular Cond. (.03 mfd.)	30-4517
67	Tubular Cond. (.006 mfd.)	30-4591
68	Resistor (1.0 megohm, 1 watt)	33-510439
69	Resistor (70,000 ohms, 1 watt)	33-370439
70	Resistor (70,000 ohms, 1 watt)	33-370439
71	Resistor (330,000 ohms, 1 watt)	33-433439
72	Resistor (330,000 ohms, 1 watt)	33-433439
73	Tubular Cond. (.03 mfd.)	30-4517
74	Resistor (70,000 ohms, 1 watt)	33-370439
75	Tubular Cond. (.003 mfd.)	30-4582
76	Output Trans.	32-8020
77	Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1460-3)	36-4105
77A	Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1459-2)	36-4106
78	Electrolytic Cond. (40 mfd., 300 V.)	30-2366
79	Electrolytic Cond. (18 mfd.)	30-2368
80	Field Coil (Replace Spkr. 36-1459-2 in "T" Cabinet and Replace Spkr. 36-1460-3 in "XX" Cabinet).	
81	Resistor (400 ohms, wire wound)	33-3365
82	Resistor (20,000 ohms, 1 watt)	33-320439
83	Resistor (99,000 ohms, 1 watt)	33-399439
84	Resistor (1.0 megohm, 1 watt)	33-510439
85	Tubular Cond. (.05 mfd.)	30-4588
86	Power Trans. 100/130 or 200/260 V., 50 to 60 cycles	32-8008
87	Bakelite Cond. (.015 and .015 mfd.)	3793-ODG
88	Pilot Lamps (Dial)	34-2064
89	Resistor (1.0 megohm, 1 watt)	33-510439
90	Resistor (1.0 megohm, 1 watt)	33-510439
91	Resistor (1.5 megohms, 1 watt)	33-515439
92	Tubular Cond. (.2 mfd.)	30-4587
93	Tuning Indicator Trans.	32-8009
94	Pilot Lamp (Tuning Indicator)	34-2221
95	Wave Switch	42-1476
	Bezel	56-1163
	Bezel Gasket	38-9734
	Cable (Power)	L-3180
	Coupling (Tuning Cond. to Drive)	31-2291
	Disc (Volume Control)	27-4765
	Disc (Range Switch)	27-4767
	Disc (Tuning)	27-4798
	Disc (Tone Control)	27-4802
	Dial	27-5448
	Dial Pointer	56-1033
	Dial Cord Spring	28-8913
	Drive Cord (Pointer)	31-2352
	Drive Cord (Tuning Drum)	31-2350
	Drum Assembly (Tuning Cond.)	38-9716
	Range Switch Operating Arm and Link Assembly	38-9756
	Socket (7 prong—6K7G R.F. Tube)	27-6099
	Socket (6 prong)	27-6121
	Socket (8 prong—6J8G)	27-6120
	Socket Assembly (Dial Lamp)	38-9694
	Socket Assembly (Dial Lamp)	38-9695
	Socket Assembly (Bullseye XX Cabinet)	38-9696
	Station Card	27-5446
	Station Card Shield	27-5447
	Spring (Retaining Station Card)	56-1294
	Speaker (XX Cabinet)	36-1460-3
	Speaker (T Cabinet)	36-1459-2

SPECIFICATIONS

Model 39-2770 is an eleven (11) tube A. C. operated superheterodyne circuit with four tuning ranges covering—long wave, 140 390 K. C.; standard broadcasts, 540 to 1720 K. C.; short wave (A) 5.7 to 11.5 M. C.; short wave (B) 11.5 to 22 M. C. Other than the tunin ange coverage Model 39-2770 is similiar in design to the Model 39-770.

Service information for Model 39-2770 is the same as that given for Model 39-770 with the exception of "Alignment of Compensator" procedure and some parts in the R. F. section.

These differences are listed below:—

SCHEMATIC NO.	DESCRIPTION	PART NO.
(2)	Ant. Trans.	32-3135
(8)	R. F. Trans.	32-3136
(24)	Osc. Trans.	32-3137

1—Add a 2200 mmfd. condenser, Part No. 30-1125, from contact C1 on Range Switch to ground.

2—Add a 5 mmfd. condenser, Part No, 30-1120, from contact C2 on Range Switch to ground.

3—Add a 110 mmfd. condenser, Part No. 30-1118 in place of the 51,000 ohm resistor, Part No. 33-351439, now used in the Model 770.

4—Add a 5 mmfd. condenser, Part No. 30-1120 from contact B2 on Range Switch to ground.

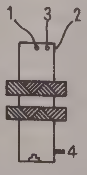
5—Add a compensator, Part No. 31-6297, from contact A1 on Wave Switch to ground. (The 1330 mmfd. semi-fixed condenser, P No. 31-6286, used in Model 39-770 is removed from Model 39-2770.)

ALIGNMENT OF COMPENSATORS

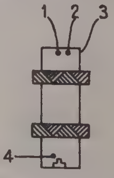
SIGNAL GENERATOR					RECEIVER		
Operations	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	Special Instruct
1	6J8G Grid	.1 mfd.	470 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	35B, 35A, 34C, 34A	Turn 34B "in"
2	6J8G Grid	.1 mfd.	470 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	34B	To Max. Outp
3	Ant. & Gnd. Panel	200 mmfd.	1500 K. C.	1500 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	27, 20B, 20A	Note B
4	Ant. & Gnd. Panel	200 mmfd.	580 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	28	Roll gang
5	Ant. & Gnd. Panel	200 mmfd.	350 K. C.	350 K. C.	Tone-Treble Vol.-Max. Range Switch "LW"	27A	Note B
6	Ant. & Gnd. Panel	200 mmfd.	160 K. C.	160 K. C.	Tone-Treble Vol.-Max. Range Switch "LW"	New Compensator contact A1 Range Switch	Roll gang
7	Ant. & Gnd. Panel	400 ohms	11 M. C.	11 M. C.	Tone-Treble Vol.-Max. Range Switch "SWB"	30, 14, 6	Note D Roll gang 14 and 6 image abov 11.0 M. C.
8	Ant. & Gnd. Panel	400 ohms	6.0 M. C.	6.0 M. C.	Tone-Treble Vol.-Max. Range Switch "SWB"	30A, 14A, 6A	Note D Roll gang o 14A and 6A image abo 6.0 M. C. Repeat opera n 6
9	Ant. & Gnd. Panel	400 ohms	20.0 M. C.	20.0 M. C.	Tone-Treble Vol.-Max. Range Switch "SWA"	30B, 14C, 6C	Note D Roll gang o 14C and 6C image abov 20.0 M. C.
10	Ant. & Gnd. Panel	400 ohms	12.0 M. C.	12.0 M. C.	Tone-Treble Vol.-Max Range Switch "SWA"	30C, 14B, 6B	Note D Roll gang o 14C and 6B image abov 2.0 M. C. Repeat opera n 7

COILS SHOWN BELOW

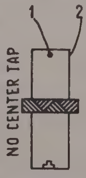
The numbers on coil connections shown, correspond to same numbers on coil connections for Model 39-770.



32-3135



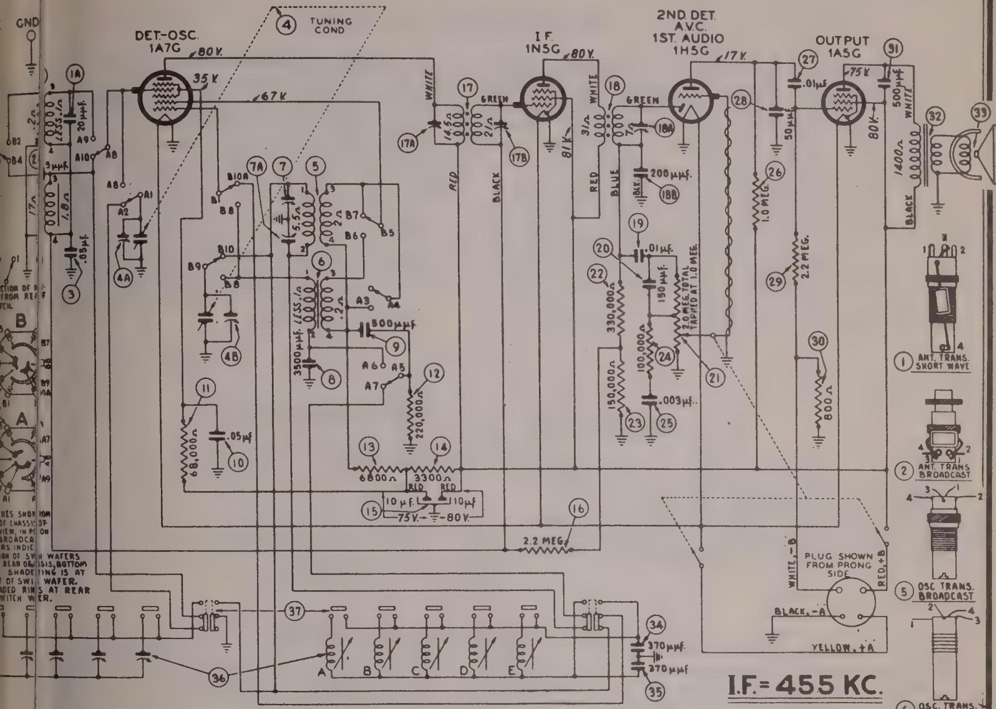
32-3136



32-3137

MODEL 40-110
Schematic,Voltage
Chassis,Trimmers

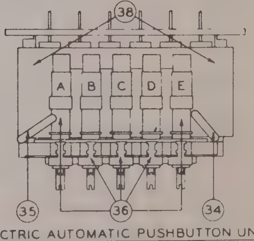
PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 40-110

Replacement Parts — Model 40-110

SCHE. No.	DESCRIPTION	PART No.
1	A Trans. Ass'y. (Short Wave)	32-3289
1A	M Condenser (20 mmfd.)	61-0039
2	A Trans. Ass'y. (Broadcast)	32-3279
2A	M Condenser (5 mmfd.)	30-1097
3	T lar Condenser (.05 mfd.)	30-4519
4	T ng Condenser Assembly	31-2404
5	O Transformer (Broadcast)	32-3287
6	O Transformer (Short Wave)	32-3288
7	C pensator	31-6321
8	M Condenser (3500 mmfd.)	30-1094
9	M Condenser (500 mmfd.)	30-1114
10	T lar Condenser (.05 mfd.)	30-4444
11	R stor (68,000 ohms, ½ watt)	33-368339
12	R stor (220,000 ohms, ½ watt)	33-422339
13	R stor (6800 ohms, ½ watt)	33-268339
14	R stor (3300 ohms, ½ watt)	33-233339
15	E. Condenser (10-10 mfd., 150 V.)	30-2408
16	R stor (2.2 meg., ½ watt)	33-522339
17	1 I. F. Transformer Assembly	32-3198
18	2 I. F. Transformer Assembly	32-3259
19	T lar Condenser (.01 mfd.)	30-4572
20	M Condenser (150 mmfd.)	30-1033
21	V me Control (2 meg.)	33-5326
22	Resistor (330,000 ohms, ½ watt)	33-433339
23	Resistor (150,000 ohms, ½ watt)	33-415339
24	Resistor (100,000 ohms, ½ watt)	33-410339
25	Tubular Condenser (.003 mfd.)	30-4469
26	Resistor (1.0 meg., ½ watt)	33-510339
27	Tubular Condenser (.01 mfd.)	30-4572
28	Mica Condenser (50 mmfd.)	30-1029
29	Resistor (2.2 meg., ½ watt)	33-522339
30	Resistor (800 ohms, ½ watt)	33-180326
31	Mica Condenser (500 mmfd.)	30-1114
32	Output Transformer	32-8066
33	Cone and Voice Coil Assembly (Speaker Part No. 36-1410-1)	36-4093
34	Silver Mica Condenser (370 mmfd.)	30-1110
35	Silver Mica Condenser (370 mmfd.)	30-1110
36	Coils—Padder Strip and Brk. Assembly	
36A	Coil No. 1 (540-1030 K. C.)	32-3042
36B	Coil No. 2 (650-1100 K. C.)	32-3042
36C	Coil No. 3 (650-1100 K. C.)	32-3042
36D	Coil No. 4 (740-1240 K. C.)	32-3041
36E	Coil No. 5 (1160-1600 K. C.)	32-3041
37	Push-Button Switch	42-1527
38	Wave Switch	42-1516



ELECTRIC AUTOMATIC PUSHBUTTON UNIT

FIG. 2.

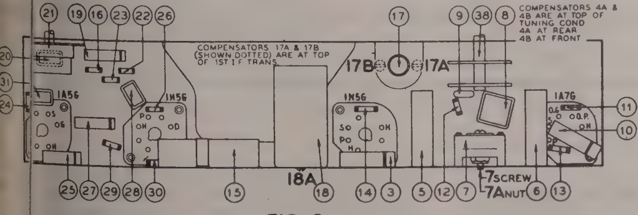

21
19
16
23
22
26
20
31
24
COMPENSATORS 17A & 17B (SHOWN DOTTED) ARE AT TOP OF 1ST I F TRANS.
17
17B
17A
9
38
8
COMPENSATORS 4A & 4B ARE AT TOP OF TUNING COND 4A AT REAR 4B AT FRONT
1A5G
1N5G
1N5G
1A7G
11
10
25
27
29
28
30
15
18A
18
14
3
5
12
7
7SCREW
7ANUT
6
13

FIG. 3.

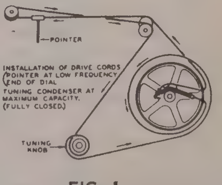

POINTER
INSTALLATION OF DRIVE CORDS (POINTER AT LOW FREQUENCY END OF DIAL TUNING CONDENSER AT MAXIMUM CAPACITY. (FULLY CLOSED)
TUNING KNOB

FIG. 1.
INSTALLATION OF DRIVE CORD.

AUGUST. 1939.

ISCELLANEOUS PARTS

DESCRIPTION	PART No.
l (Dial)	56-1453
l (Push-Buttons)	56-1455
inet	103938
(Coil Mounting)	28-5002
	27-5539
Tab	27-5524
e Cord Assembly	31-2405
Knob Ass'y. (Vol., Tuning, Wave Switch)	27-4329
Knob Assembly (Push-Buttons)	27-4824
Pointer	56-1464
Speaker	36-1410
Spring (Drive Cord Assembly)	28-8913
Spring (Flag Assembly Mounting)	28-8949
Spring (Locking, Flag Drive and Flag Assembly Mounting)	28-8498
Socket (6 prong)	27-6086
Socket (7 prong)	27-6087
Socket (7 prong, type 1A7G tube)	27-6099
Socket (Speaker)	27-6115
Screw (Push-Button Bezel Mounting)	W-1834FG2
Screw (Bezel Mounting)	W-1836FG2
Tab Kit	40-6472
Tuning Shaft Assembly	31-2395

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

TYPE OF CIRCUIT: Model 40-110 is a four tube battery operated superheterodyne receiver with electric push-button tuning. In addition other features of design are: Low current drain tubes, new high sound output speaker, specially designed tone chamber, two tuning ranges, automatic volume control, and pentode audio output.

The receiver is equipped with six electric tuning push-buttons for automatically selecting stations. Five of the push-buttons are used for broadcast stations and one for selecting dial tuning. The procedure for adjusting the push-buttons will be found in the instructions supplied with each set.

TUNING RANGES: 540 to 1630 K. C. 5.4 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: One 1A7G, Converter; on N5G, I. F. Amplifier; one 1H5G, 2nd Detector, A. V. . 1st Audio; one 1A5G, Audio Output.

PHILCO BATTERIES: One Type P-60D-11L.

BATTERY DRAIN: "A" 200 M. A. "B" 7. M. A.

CABINET DIMENSIONS:	Height	Width	Depth
40-110K	37½	26¾	11½
40-110B	17½	17⅛	9½

AERIAL AND GROUND: To obtain maximum op ating performance with this model, Philco Farm Radio erial Part No. 40-6383 is recommended and a good grounc ource such as a water pipe.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

Signal Generator covering a frequency range of 115 K. C. to 36 M. C. such as Philco Model 077.

Aligning Indicator: A vacuum tube voltmeter or audio output meter such as contained in Philco Models 027 and 028 circuit testers. Either of these meters can be used to align the receiver and are connected as given below.

Tools: Aligning screw driver Part No. 45-2610.

CONNECTING ALIGNING METERS

Audio Output Meter: The audio output meter is connected to the plate and screen terminals of the 1A5G tube. Adjust the meter for the 0 to 30 volt A. C. scale.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows: Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to any point in the A. V. C. circuit where voltage can be obtained. The positive (+) terminal is connected to the receiver chassis.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below.

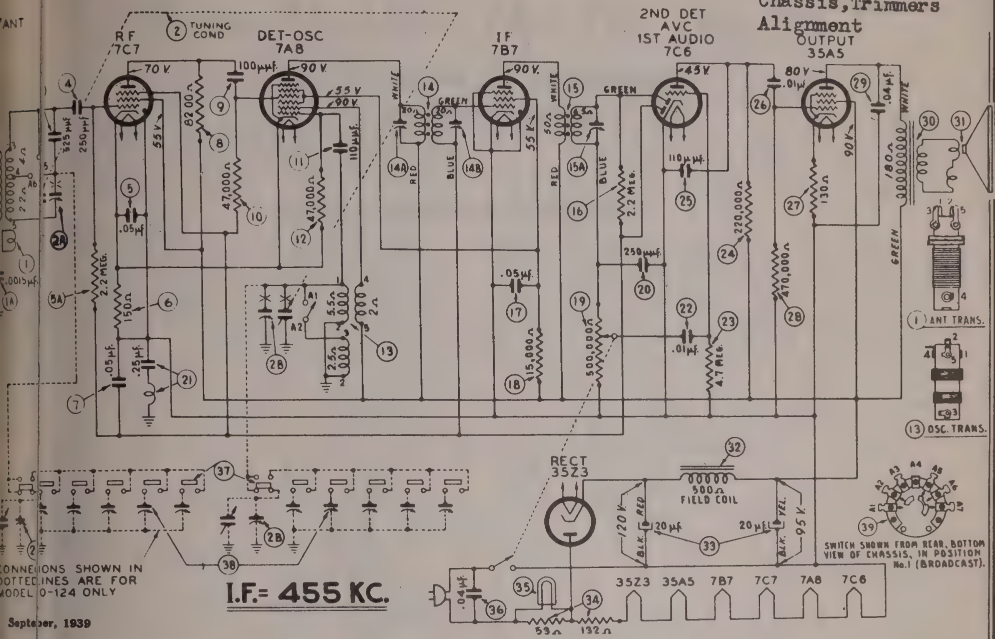
Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTION
	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Setting	Adjust Padders	
1	Aerial	Note A	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	18A, 17A, 17B	Manual Push-butto "IN"
2	Aerial	400 ohms	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	4A	Note B
3	Aerial	225 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw, 4B	Note E
4	Aerial	225 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcst"	7A (nut)	Roll Tuning Conde r
5	Aerial	400 ohms	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw	

NOTE A — The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (High side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as fo ws: Turn the tuning condenser to the maximum capacity p tion (plates fully meshed). With the condenser in this po ion, the tuning pointer is set horizontal at the low frequenc end of the scale (530 K. C.).

MODELS 40-115,40-124
Code 121
Schematic,Voltage
Chassis,Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.



CONNECTIONS SHOWN IN DOTTED LINES ARE FOR MODEL 0-124 ONLY

I.F.= 455 KC.

Septe ber, 1939

SCHE. No.	DESCRIPTION	PART No.
1	enna Transformer (Model 40-115)	32-3303
	enna Transformer (Model 40-124)	32-3321
1A	ular Condenser (.0015 mfd.)	30-4555
2	ing Condenser (Model 40-115)	31-2425
	ing Condenser (Model 40-124)	31-2426
3	a Condenser (525 mmfd.)	30-1142
4	a Condenser (250 mmfd.)	61-0033
5	ular Condenser (.05 mfd.)	30-4519
5A	istor (2.2 meg., ½ watt)	33-522339
6	istor (150 ohms, ½ watt)	33-115336
7	ular Condenser (.05 mfd.)	30-4519
8	istor (8200 ohms, ½ watt)	33-282339
9	a Condenser (100 mmfd.)	30-1128
10	istor (47,000 ohms, ½ watt)	33-347339
11	a Condenser (110 mmfd.)	30-1130
12	istor (47,000 ohms, ½ watt)	33-347339
13	illator Trans. (Model 40-115)	32-3255
	illator Trans. (Model 40-124)	32-3256
14	I. F. Transformer Assembly	32-3237
15	I. F. Transformer Assembly	32-3238
16	istor (2.2 meg., ½ watt)	33-522339
17	ular Condenser (.05 mfd.)	30-4519
18	istor (15,000 ohms, ½ watt)	33-315339
19	ume Control and On-Off Switch	33-5306
20	a Condenser (250 mmfd.)	30-1074
21	ke and Condenser Assembly (.25 mfd.)	38-9956
22	ular Condenser (.01 mfd.)	30-4479
23	istor (4.7 meg., ½ watt)	33-547339
24	istor (220,000 ohms, ½ watt)	33-422339
25	a Condenser (110 mmfd.)	30-1130
26	ular Condenser (.01 mfd.)	30-4572
27	istor (130 ohms, ½ watt)	33-113336
28	istor (470,000 ohms, ½ watt)	33-447339
29	ular Condenser (.04 mfd.)	30-4119
30	put Transformer	
	Speaker Part No. 36-1469-1)	32-8047
	Speaker Part No. 36-1469-9)	32-8044
31	e and Voice Coil Assembly	
	Speaker Part No. 36-1469-1)	36-4115
	Speaker Part No. 36-1469-9)	36-4113
32	ld Coil	
	Replace Speaker Part No. 36-1469)	
33	ctrolytic Condenser (20-20 mfd.)	30-2403
34	ment Resistor	33-3375
35	t Lamp	34-2068
36	ular Condenser (.04 mfd.)	30-4119
37	Pushbutton Switch (Model 40-124)	42-1512
38	Padder Strip (Model 40-124)	31-6312
39	Wave Switch	42-1505
	Pointer (Knob)	27-9521
	Spring (Drive Cord Assembly)	28-8954
	Speaker Assembly	36-1469
	Sockets (Loktal)	55-0575

MISCELLANEOUS PARTS

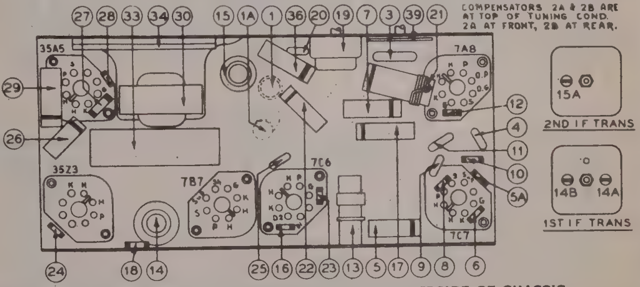
Cable and Plug (Power Supply)	L-3199
Cabinet (Model 40-115)	10432A
Clip (Coil Mounting)	28-5002
Dial	27-5517
Drive Cord Assembly	31-2387
Drive Shaft Assembly	31-2370
Knobs (Volume, Tuning, Wave Switch)	27-4809
Pilot Lamp Socket Assembly	38-9825
Pointer (Dial)	27-4868

MISCELLANEOUS PARTS

MODEL 40-124

Cabinet	10433A
Knobs (Pushbutton)	27-4824
Tab (Dial)	27-5526
Tab (Television)	27-9450
Tab Kit	40-6473

COMPENSATORS 2A & 2B ARE AT TOP OF TUNING COND. 2A AT FRONT, 2B AT REAR.



MODELS 40-115, 40-124 PART LOCATIONS, UNDERSIDE OF CHASSIS.

Opera tions Orde	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Settings	Adjust Padders	
1	7A8 Grid	.004	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	15A, 14A, 14B	Manual Pushbutton "IN" Model 40-124
2	Aerial	100 mmfd.	1580 K. C.	1580 K. C.	Range Switch "Brdcst"	(2B)	Note B, Note C
3	Aerial	100 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	(2A)	

N E B — DIAL CALIBRATION: In order to adjust the receiver corr ly, the dial must be aligned to track properly with the tuning con ser. To do this, proceed as follows: Turn the tuning condenser to t maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (530 K. C.).

NOTE C — Compensators 2A and 2B are on top of the Tuning Condenser. 2A at the front, 2B at the rear.

Models 40-140, 40-145, 40-507.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

1. **Signal Generator** with a frequency range from 115 to 36,000 K. C., such as Philco Model 077.

2. **Aligning Indicator,** Philco Model 027 or 028, vacuum tube voltmeter and circuit tester incorporates sensitive audio output meters and vacuum tube voltmeters. Either of these struments can be used as an aligning indicator.

3. **Fibre Handle Screw Driver,** Philco Part No. 45-2610 When using the vacuum tube voltmeter for aligning the rece r, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING METERS

1. **Audio Output Meter:** If the Philco Models 027 and 028 audio output meters are used, they are connected to the speaker voice coil terminals or the plate and screen terminals of the 7B5 tube. Adjust the meter to use the 0 to 10 volt A. C. scale.

2. **Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator make the following connections:

Adjusting I. F. Circuit: Remove the 1232 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

Adjusting R. F. Circuit: To adjust the R. F. circ the aligning adaptor is inserted in the 7C6 second detect tube socket. The vacuum tube voltmeter remains connected the adaptor as given in the paragraph above. With the vo neter connected in this manner, a very sensitive indication the A. V. C. voltage is obtained when the padders are adju d.

After connecting the aligning adaptors, adjust the c pensators as shown in the tabulation below. Locations the compensators are shown in Schematic Diagram. If the a ning meter pointer goes off scale when adjusting the compe tors, reduce the strength of the signal from the generator.

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIO
	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	No. 1 Ter. on Loop Panel Note B	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	33A, 33B, 28A, 28B	Dial Push-Butto n" Model 40-14
2	Use Loop, Note C	18.0 M. C.	18.0 M. C.	Vol. Cont. Max. Range Switch "S.W."	27A, 2A, Note D	Check Image 17.090 K. C.
3	Use Loop, Note C	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	25A, 1A	Note A
4	Use Loop, Note C	580 K. C.	580 K. C.	Range Switch "Brdcst"	25	Roll Tuning Cond er
5	Use Loop, Note C	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	25A, 2A	
6	Use Loop, Note C	18.0 M. C.	18.0 M. C.	Range Switch "S.W."	2A, Note D	Roll Tuning Conde r & Adjust Padder to st Peak from Tight P ion

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the generator is connected to the chassis of the receiver.

NOTE C — When aligning the R. F. Circuits a loop is made m a few turns of wire and connected to the generator output termi ; the signal generator is then placed two or three feet from the loop the cabinet.

NOTE D — S. W. Oscillator compensator (27A) is located on p of the tuning condenser. Antenna compensators (1A) and (2 are located on the loop. When adjusting the "Ant" compensato the receiver loop should be held in place against the back of the inet.

Models 40-81, Codes 121, 122

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	See Paragraph on Signal Generator above	455 K. C.	580 K. C.	Vol. Max.	17A, 9B, 9A	See Paragraph on Signal Generator ab
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max.	8B, 8A	Padder location Fig Note A

Model 40-88, Code 121

1	See Signal Generator Paragraph above	455 K. C.	580 K. C.	Vol. Max.	21A, 20B, 20A	
2	Use Loop on Generator	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	8B	Note A
3	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
4	Use Loop	580 K. C.	580 K. C.	Range Switch "Brdcst"	12A, Nut	Roll Tuning Conden
5	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
6	Use Loop	18 M. C.	18 M. C.	Range Switch "S. W."	3	See Paragraph on Signal Generator abo

NOTE A — DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

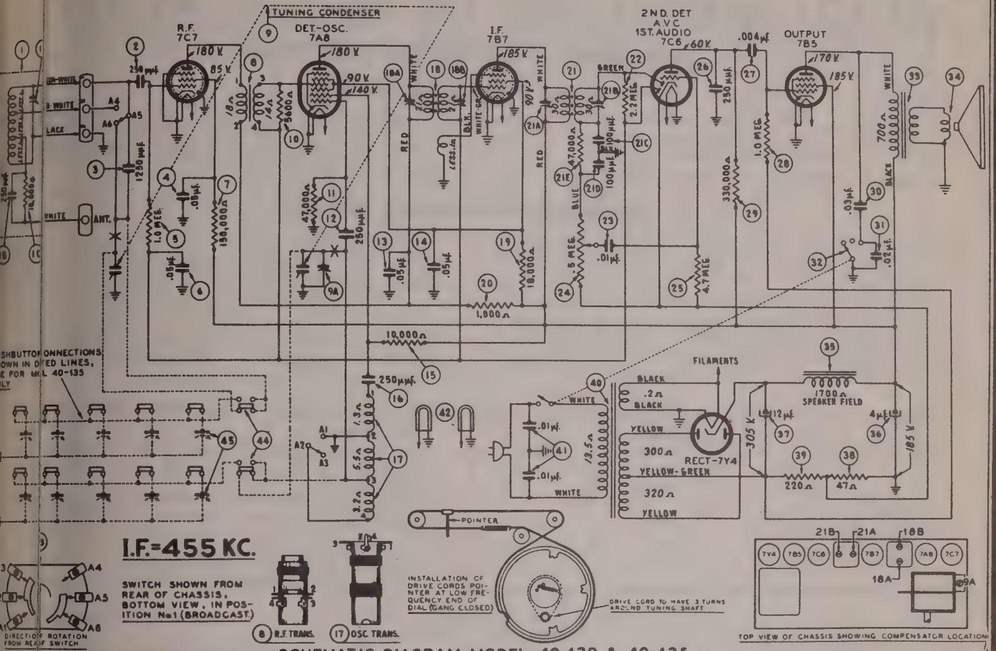
BATTERY CURRENT: "A" Battery, 200 M. A. Model 40-81 Battery, 5.6 M.

BATTERY CURRENT: "A" Battery, 250 M. A. Model 40-88 "B" Battery, 8 M

MODE 40-503,40-506,
MODE 40-525
Chas s,Tuner

PHILCO RADIO & TELEV. CORP.

MODELS 40-130,40-135
Schematic,Voltage,Tuner
Chassis,Trimmers



SCHEMATIC DIAGRAM MODEL 40-130 & 40-135

JUNE, 1939.

Replacement Parts — Models 40-130 and 40-135

SCHE. No.	DESCRIPTION	PART No.
1	p Assembly	38-9891
1A	pensator	31-6318
1B	a Cond. (250 mmfd.)	61-0033
1C	istor (10,000 ohms, ½ watt)	33-310339
2	a Cond. (250 mmfd.)	61-0033
3	a Cond. (1250 mmfd.)	5856
4	ular Cond. (.05 mfd.)	30-4518
5	istor (1.0 meg., ½ watt)	33-510339
6	ular Cond. (.05 mfd.)	30-4518
7	istor (150,000 ohms, ½ watt)	33-415339
8	F. Transformer	32-3283
9	ing Condenser	31-2374
10	istor (5600 ohms, ½ watt)	33-256339
11	istor (47,000 ohms, ½ watt)	33-347339
12	a Cond. (250 mmfd.)	61-0033
13	ular Cond. (.05 mfd.)	30-4518
14	ular Cond. (.05 mfd.)	30-4518
15	istor (10,000 ohms, ½ watt)	33-310339
16	a Cond. (250 mmfd.)	61-0033
17	illator Transformer	32-3212
18	I. F. Trans. Assy.	32-3210
19	istor (18,000 ohms, 1 watt)	33-318439
20	istor (1,000 ohms, ½ watt)	33-210339
21	I. F. Trans. Assy.	32-3281
22	istor (2.2 meg., ½ watt)	33-522339
23	ular Cond. (.01 mfd.)	30-4572
24	ume Control (.5 meg.)	33-5332
25	istor (4.7 meg., ½ watt)	33-547339
26	a Cond. (250 mmfd.)	61-0033
27	ular Cond. (.004 mfd.)	30-4578
28	istor (1.0 meg., ½ watt)	33-510339
29	istor (330,000 ohms, ½ watt)	33-433339
30	ular Cond. (.03 mfd.)	30-4449
31	ular Cond. (.02 mfd.)	30-4481
32	ne Control and On-Off Switch	42-1520
33	put Transformer	32-8063
34	ne and Voice Coil Assy. (Spkr. Part No. 36-1478-3)	36-4085
35	ld Coil (Replace Spkr. Part No. 36-1478)	
36	ctrolytic Cond. (4 mfd., 400 V.)	30-2401
37	ctrolytic Cond. (12 mfd., 400 V.)	30-2409
38	istor (47 ohms, ½ watt)	33-047331
39	istor (220 ohms, 1 watt)	33-122431
40	wer Trans. (115 V., 50-60 cycles)	32-8064
41	elite Cond. (.01-.01 mfd.)	3903-DG
42	ot Lamps	34-2064
43	ve Switch	42-1494
44	shbutton Switch (Model 40-135 only)	42-1528
45	dder Strip (Model 40-135 only)	31-6318

SCHE. No.	DESCRIPTION	PART No.
	Clip (R. F. and Osc. Trans. Mtg.)	28-3002
	Dial	27-5506
	Drive Cord Assy. (Pointer)	31-2399
	Drive Cord Assy. (Tuning Cond.)	31-2400
	Escutcheon (Pushbutton) (Model 40-135)	28-5742
	Escutcheon Pin (Model 40-135)	W-1074
	Insulating Bushing (Insulate Drive Shaft)	27-9437
	Knobs (Tuning, Tone, Volume and Wave Switch)	27-4332
	Knobs (Pushbutton, Model 40-135)	27-4824
	Pilot Lamp Socket Assy.	38-9904
	Pointer	56-1532

SCHE. No.	DESCRIPTION	PART No.
	Rubber Bushing (Tuning Cond. Drive)	27-9432
	Spring (Drive Cord, Tuning Cond.)	28-8751
	Spring (Drive Cord, Pointer)	28-8953
	Spring (Tuning Shaft Assy.)	28-8955
	Speaker	36-1478
	Socket (Loktal, all tubes)	55-0575
	Tuning Shaft	56-6052
	Tuning Drive Drum Assy.	38-9883
	Tab (Dial, Model 40-135)	27-5526
	Tab (Television, Model 40-135)	27-9450
	Tab Kit (Model 40-135)	40-6473
	Washer "C" Type, Tuning Shaft)	28-2043

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
binet (Model 40-130)	10394A
binet (Model 40-135)	10394B
ble and Plug (Power Supply)	L-3199

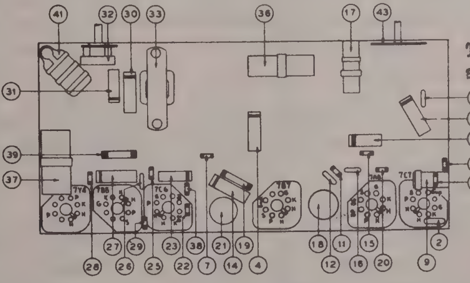


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

This parts layout
applies to Models
40-130, 40-135,
40-503, 40-506,
and 40-525.

Mo l 40-130 is dial tuned and assembled in cabinet type "T"

*Mo l 40-135 is equipped with six electric push buttons for auto tically selecting stations in addition to dial tuning. Five ush buttons are used for stations one of which can be used combination with Special type PHILCO TELEVISION recei rs for reception of television sound programs. The sixth push tton selects dial tuning. The push buttons in this model cove requency ranges as follows:

40 to 1030 K. C. 740 to 1300 K. C.
50 to 1100 K. C. 900 to 1470 K. C.
1160 to 1600 K. C.

The procedure for adjusting the push buttons for reception of stations is similar to the method described in volume ten the only difference being that the frequency range of each button is different.

Philco television sets and record players contain instructions for setting up and adjusting the push-button in model 40-135.

TUNING RANGES: 540 to 1550 K. C.; 1.5 to 3.3 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C., 60 cycles.

POWER CONSUMPTION: 35 watts.

See Philco
page 10-16.

*NOT : Push button data and tuning ranges apply for Models 40-503,40-506 and 40-525 also.

MODELS 40-130,40-135
MODEL 40-165
MODELS 40-503,40-506
MODEL 40-525

PHILCO RADIO & TELEV. CORP.

40-503, 40-506,40-130, 40-135, 40-525

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

(1) **Signal Generator:** Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose.

(2) **Aligning Indicator:** Philco Models 027 or 028 Vacuum Tube Voltmeters and Circuit Testers incorporate sensitive uum tube voltmeters and audio output meters and are recomi ded.

(3) Philco Fiber Handle Screw Driver, Part No. 45-2610. ign-ing adaptor Part No. 45-2767, when using the vacuu tube voltmeter for alignment.

CONNECTING ALIGNING METERS

Audio Output Meter: Philco Model 027 or 028 Audio Output Meters is connected to the voice coil terminals of the speaker or the plate and screen of the 7B5 tube and adjusted for the 0 to 10 volt A. C. scale.

Vacuum Tube Voltmeter: To use the Vacuum Tube Voltmeter as an alignment indicator make the following connections:

(1) **Adjusting I. F. Circuit:** Remove the 7C7 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

(2) **Adjusting R. F. Circuit:** To adjust the R. F. circ the aligning adaptor is inserted in the 7C6 second detect tube socket. The vacuum tube voltmeter remains connected the adaptor as given in the paragraph above. With the vo ieter connected in this manner a very sensitive indication the A. V. C. voltage is obtained when the padders are adjust

After connecting the aligning adaptors, adjust the c pen-sators as shown in the tabulation below. Locations of tl com-pensators are shown in Fig. 1. If the output meter point goes off scale when adjusting the compensators, reduce the s ngth of the signal from the generator.

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIO
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compen-sators in Order	
1	No. 1 Ter. on Panel Note B	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	21B, 21A, 18B, 18A	Dial Push-Butto " Model 40-12
2	Loop Note C	1500 K. C.	1500 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	9A, 1A Note D	Note A

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the generator is connected to the ch is of the receiver.

NOTE C — When aligning the R. F. a loop is made from a fe urns of wire and connected to the signal generator output termin the signal generator is then placed two or three feet from the loo the cabinet.

NOTE D — Oscillator compensator (9A) is located on top the tuning condenser. Antenna compensator (1A) is located on t loop. When adjusting the "ANT" compensators the receiver loop sh d be held in place against the back of the cabinet.

Model 40-165

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is mad om a few turns of wire and connected to the signal gen tor output terminals; the generator is then placed two or ree feet from the loop in the cabinet. Do not remove the re ver loop from the cabinet. It is necessary when adjustin the padders, that the receiver be left in the cabinet.

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			
	Output Connections to Receiver	Frequency Setting	Dial Setting	Control Settings	Adjust Compensators	Special Instructions
1	High Side to No. 1 Ter. Loop Panel	455 K. C.	580 K. C. No Signal	Range Switch "Brdcst." Vol. Max. Dial Push-Button "In"	37A, 37B, 34A, 34B	See paragraph o signal generator a e
2	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	61A	Note A. Image sho be 910 K.C. below 18 C.
3	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Switch Brdcst.	26A	Roll tuning conden
5	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
6	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	2A	Note B, Note C

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Schematic Diagram.

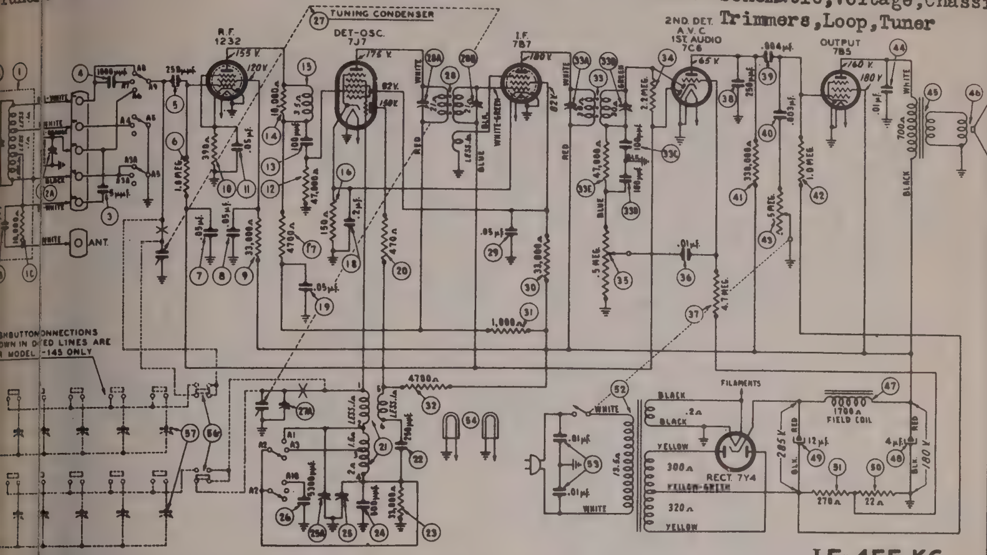
NOTE B — Turn loop padder to closed position (maximum capacity), then adjust to the first signal peak from this position; at the same time roll the tuning condenser. See Note C.

NOTE C — When adjusting the low frequency compensator of age One (Broadcast) or the antenna compensators of the high freq ncy tuning ranges; the receiver Tuning Condenser must be adjusted (r ed) as follows: First tune the compensator for maximum output, hen vary the tuning condenser of the receiver for maximum output. ow turn the compensator slightly to the right or left. Continue t ing compensator in the direction that gives greatest signal and again ary the receiver tuning condenser for maximum output. This proc ure of first setting the compensator and then varying the tuning con ser is continued until there is no further gain in output reading.

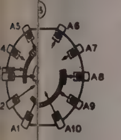
MODEL 40-507
Tuner Shassis

PHILCO RADIO & TELEV. CORP.

MODELS 40-140,40-145
Schematic,Voltage,Chassis
Trimmers,Loop,Tuner



I.F.=455 KC.

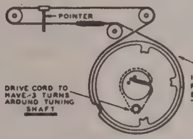


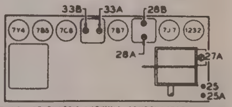
SWITCH SHOWN FROM REAR OF CHASSIS, BOTTOM VIEW, IN POSITION No.1 B'DCAST.
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
UNSHADED AREA INDICATES RING AT REAR OF SWITCH WAFER.

30 o o1

DIRECTION OF ROTATION FROM REAR OF SWITCH.

(21) OSC. TRANS.


POINTER
DRIVE CORD TO MAKE 3 TURNS AROUND TUNING SHAFT
INSTALLATION OF DRIVE CORDS. POINTER AT LOW FREQUENCY END OF DIAL GANG CLOSED



TOP VIEW OF CHASSIS SHOWING COMPENSATOR LOCATION

SCHEMATIC DIAGRAM MODEL 40-140 & 40-145

JUNE, 1939.

FOR OTHER

DATA

SEE INDEX

Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9892
1A	Compensator	31-6318
1B	Mica Cond. (250 mmfd.)	61-0033
1C	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Assembly (Short Wave)	38-9893
2A	Compensator	31-6320
3	Mica Cond. (5 mmfd.)	30-1097
4	Mica Cond. (1000 mmfd.)	30-1063
5	Mica Cond. (250 mmfd.)	61-0033
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4518
8	Tubular Cond. (.05 mfd.)	30-4518
9	Resistor (33,000 ohms, ½ watt)	33-333339
10	Resistor (390 ohms, ½ watt)	33-139331
11	Tubular Cond. (.05 mfd.)	30-4518
12	Resistor (47,000 ohms, ½ watt)	33-347339
13	Mica Cond. (100 mmfd.)	30-1128
14	Resistor (10,000 ohms, ½ watt)	33-310339
15	I. F. Transformer	32-3194
16	Resistor (150 ohms, ½ watt)	33-115331
17	Resistor (4700 ohms, ½ watt)	33-247339
18	Tubular Cond. (.2 mfd.)	30-4536
19	Tubular Cond. (.05 mfd.)	30-4518
20	Resistor (470 ohms, ½ watt)	33-147339
21	Oscillator Transformer	32-3195
22	Mica Cond. (250 mmfd.)	61-0033
23	Resistor (33,000 ohms, ½ watt)	33-333339
24	Silver Mica Cond. (500 mmfd.)	30-1138
25	Compensator (2 section)	31-6317
26	Mica Cond. (5300 mmfd.)	30-1134
27	Tuning Condenser	31-2378
28	1st I. F. Trans. Assy.	32-3210
29	Tubular Cond. (.05 mfd.)	30-4518
30	Resistor (33,000 ohms, ½ watt)	33-333339
31	Resistor (1,000 ohms, ½ watt)	33-210339
32	Resistor (4700 ohms, ½ watt)	33-247339
33	2nd I. F. Trans. Assy.	32-3281
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Volume Control (.5 meg.)	33-5319
36	Tubular Cond. (.01 mfd.)	30-4572
37	Resistor (4.7 meg., ½ watt)	33-547339
38	Mica Cond. (250 mmfd.)	61-0033
39	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.003 mfd.)	30-4580
41	Resistor (330,000 ohms, ½ watt)	33-433339
42	Resistor (1.0 meg., ½ watt)	33-510339
43	Tone Control (.5 meg.) & On-Off Switch	33-5333
44	Tubular Cond. (.01 mfd.)	30-4572
45	Output Transformer	32-8063
46	Cone and Voice Coil Assy. (Spkr. Part No. 36-1478-3)	36-4085
47	Field Coil (Replace Spkr. Part No. 36-1478)	
48	Electrolytic Cond. (4 mfd., 400 V.)	30-2401
49	Electrolytic Cond. (12 mfd., 400 V.)	30-2409
50	Resistor (22 ohms, ½ watt)	33-022331
51	Resistor (270 ohms, 1 watt)	33-127431
52	Power Trans. (115 V., 50-60 cycles)	32-8064
53	Line Condenser (.01-.01 mfd.)	3903-ODG
54	Pilot Lamps	34-2064
55	Wave Switch	42-1495
56	Push Button Switch (Model 40-145 only)	42-1528
57	Padder Strip (Model 40-145 only)	31-6316

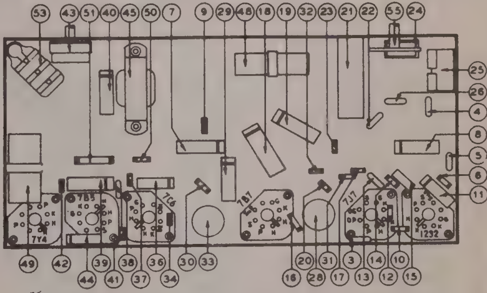


*FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cable and Plug Assy. (Power Supply)	L-3199
Cabinet (Model 40-140)	10395A
Cabinet (Model 40-145)	10395B
Clip (Mtg. Osc. Coil)	38-3003
Drive Cord Assy. (Pointer)	31-2399
Drive Cord Assy. (Tuning Cond.)	31-2400
Dial	27-5507
Escutcheon (Pushbuttons, Model 40-145)	28-5742
Escutcheon Pin (Model 40-145)	W-1074
Insulating Bushing (Drive Shaft)	27-9437
Knobs (Tuning, Tone, Vol., Wave Switch)	27-4332
Knobs (Pushbuttons, Model 40-145)	27-4824
Pilot Lamp Socket Assy.	38-9904
Pointer	56-1532
Rubber Bushing (Tuning Cond. Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1478
Sockets (Loktal Tubes)	55-0575
Tuning Shaft	56-6052
Tuning Drive Drum Assy.	38-9883
Tab (Dial, Model 40-145)	27-5526
Tab (Television, Model 40-145)	27-9450
Tab Kit (Model 40-145)	40-6473
Washer ("C" Type, Tuning Shaft)	28-2043

BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. A feature of the built-in broadcast band statically shielded loop is that the receiver may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the receiver may be set in the position where best reception is obtained.

In addition, other features of design are: Three tuning range; special high gain R. F. stage; Philco high-efficiency Loktal tubes; automatic volume control, tone control and a Beam power audio output stage. In general, these models are similar but differ in their tuning mechanisms and cabinets.

Model 40-140 is dial tuned and assembled in cabinet type "T" Table model).

Model 40-145 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with special type PHILCO TELEVISION receivers for reception of television sound programs. The sixth push button selects dial tuning.

The procedure for adjusting the push buttons to broadcast stations is the same as that contained in volume ten.

The frequency coverage of each push button is as follows:

540 to 1030 K. C. 740 to 1300 K. C.
650 to 1100 K. C. 900 to 1470 K. C.
1160 to 1600 K. C.

Philco television sets and record players contain information for adjusting the push button on the 40-145.

***TUNING RANGES:** 540 to 1550 K. C. 1.5 to 3.3 M. C. 5.7 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C., 60 cycle.

POWER CONSUMPTION: 38 watts.

AUDIO OUTPUT: 2 watts.

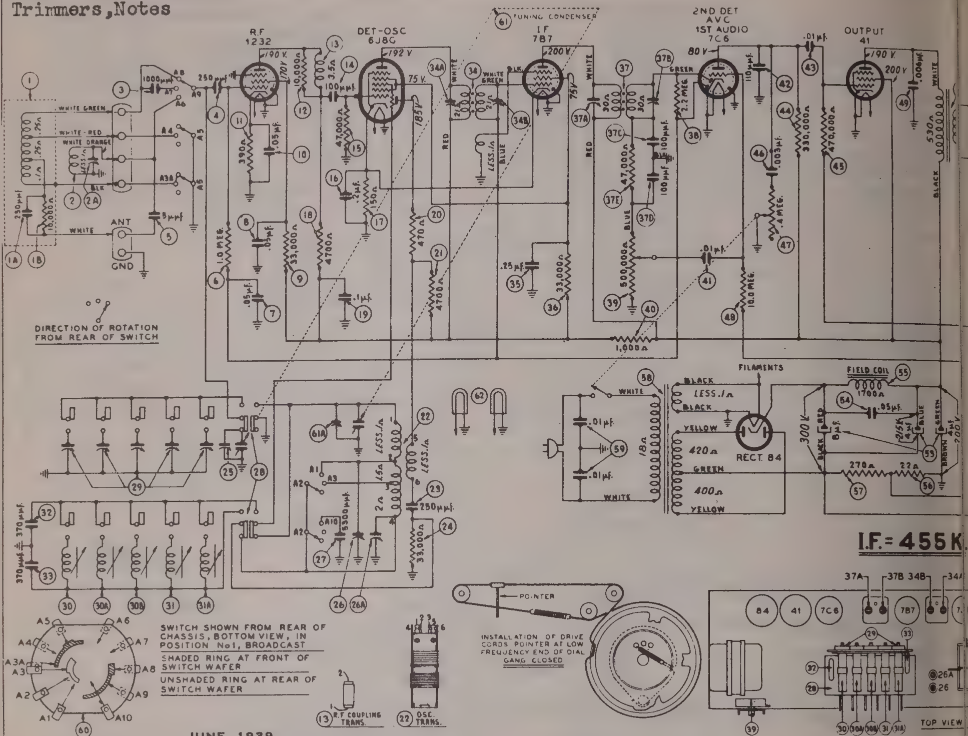
PHILCO TUBES USED: 1232, R. F.; 7J7, converter; 7B7, I. F.; 7C6, second detector, AVC and first audio; 7B5, audio output and 7Y4, rectifier.

*See Philco page 10-16.

* APPLIES TO MODEL 40-507 ALSO

MODEL 40-165
Schematic,Voltage,Chassis
Trimmers,Notes

PHILCO RADIO & TELEV. CORP.



JUNE, 1939.

Replacement Parts — Model 40-165

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9895
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Assy. (Short Wave)	38-9896
2A	Compensator (Part of S. W. Loop)	
3	Mica Cond. (1000 mmfd.)	30-1063
4	Mica Cond. (250 mmfd.)	61-0033
5	Mica Cond. (5 mmfd.)	30-1143
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4519
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (33,000 ohms, ½ watt)	33-333339
10	Tubular Cond. (.05 mfd.)	30-4519
11	Resistor (390 ohms, ½ watt)	33-139339
12	Resistor (10,000 ohms, ½ watt)	33-310339
13	R. F. Coupling Trans.	32-3194
14	Mica Cond. (100 mmfd.)	30-1128
15	Resistor (47,000 ohms, ½ watt)	33-347339
16	Tubular Cond. (.2 mfd.)	30-4587
17	Resistor (150 ohms, ½ watt)	33-115339
18	Resistor (4700 ohms, ½ watt)	33-247339
19	Tubular Cond. (.1 mfd.)	30-4527
20	Resistor (470 ohms, ½ watt)	33-147339
21	Resistor (4700 ohms, ½ watt)	33-247339
22	Osc. Trans.	32-3195
23	Mica Cond. (250 mmfd.)	61-0033
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Compensator (Single)	31-6308
26	Compensator (2 section)	31-6302
27	Mica Cond. (5300 mmfd.)	30-1134
28	Push Button Switch	42-1493
29	Padder Strip and Bracket Assy.	31-6325
30	Coil No. 1 (540-1000 K.C.)	32-3042
30A	Coil No. 2 (650-1100 K.C.)	
30B	Coil No. 3 (740-1300 K.C.)	
31	Coil No. 4 (900-1500 K.C.)	32-3041
31A	Coil No. 5 (1100-1600 K.C.)	
32	Silver Mica Cond. (370 mmfd.)	30-1110
33	Silver Mica Cond. (370 mmfd.)	30-1110
34	1st I. F. Trans.	32-3210
35	Tubular Cond. (.25 mfd.)	30-4589
36	Resistor (33,000 ohms, ½ watt)	33-333339
37	2nd I. F. Trans.	32-3211
38	Resistor (2.2 meg., ½ watt)	33-522339
39	Volume Control (500,000 ohms)	33-5319
40	Resistor (1000 ohms, ½ watt)	33-210339
41	Tubular Cond. (.01 mfd.)	30-4572
42	Mica Cond. (110 mmfd.)	30-1130
43	Tubular Cond. (.01 mfd.)	30-4572
44	Resistor (330,000 ohms, ½ watt)	33-433339
45	Resistor (470,000 ohms, ½ watt)	33-447339
46	Tubular Cond. (.003 mfd.)	30-4469
47	Tone Control and On-Off Switch (.4 meg.)	33-5333
48	Resistor (10.0 meg., ½ watt)	33-610339
49	Tubular Cond. (.006 mfd.)	30-4504
50	Output Trans.	32-8056
51	Cone and Voice Coil Assy. (Spkr. Part No. 36-1480-3)	36-4086
53	Electrolytic Cond. (4-4-8 mfd.)	30-2400
54	Tubular Cond. (.05 mfd.)	30-4123
55	Field Coil (Replace Spkr. Part No. 36-1480)	
56	Resistor (22 ohms, ½ watt)	33-022331
57	Resistor (270 ohms, 1 watt)	33-127439
58	Power Trans. (110 volt, 60 cycle)	32-8055
59	Line Cond. (.01-.01 mfd.)	3903-DG
60	Wave Switch	42-1495
61	Tuning Cond.	31-2375
62	Pilot Lamps	34-2064

MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
	Bezel	27-4842
	Cabinet	103988
	Cable and Plug (Power Supply	L-3199
	Clip (Coil Mtg.)	28-5003
	Dial	27-5507
	Drive Cord Assy. (Pointer)	31-2382
	Drive Cord Assy. (Tuning Cond.)	31-2400
	Escutcheon (Push Button)	27-4843
	Insulating Bushing (Insulate Drive Shaft)	27-9437
	Knobs (Push Buttons)	27-4824
	Knobs (Tuning, Tone, Volume, Wave Switch)	2 332
	Pilot Lamp Socket Assy.	3 908
	Pointer	5 479
	Rubber Hose (Tuning Cond. Drive)	2 432
	Spring (Tuning, Drive Cord)	2 751
	Spring (Pointer, Drive Cord)	2 953
	Spring Drive Shaft, Grounding))	2 955
	Screw (Bezel Mtg.)	834
	Speaker	3 480
	Socket (Type 84 Tube)	2 035
	Socket (Type 41 Tube)	2 036
	Socket (Loktal, Type 1232, 7B7, 7C6 Tubes)	2 131
	Socket (Type 6J8G Tube)	2 120
	Tab (Dial)	2 328
	Tab (Television)	2 151
	Tab Kit	4 174
	Tuning Shaft	5 352
	Tuning Drive Drum Assy.	3 383
	Washer ("C" Type, Tuning Shaft)	2 343

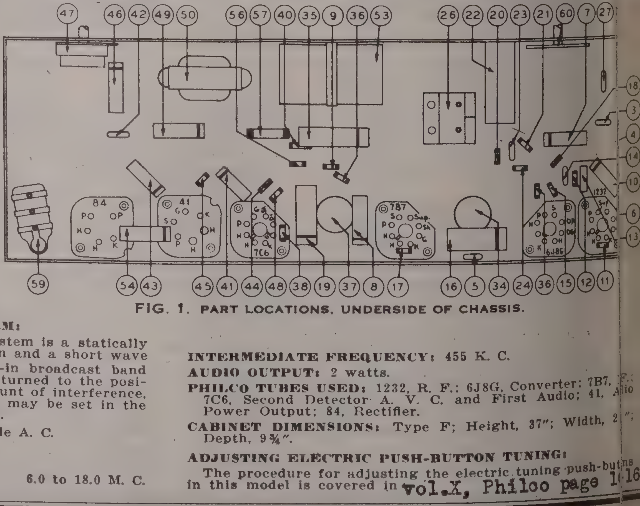


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

POWER SUPPLY: 115 Volts, 25 and 60 Cycle A. C.

POWER CONSUMPTION: 45 watts.

FREQUENCY TUNING RANGES: (Three)
540 to 1550 K. C. 1.5 to 3.5 M. C. 6.0 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: 1232, R. F.; 6J8G, Converter; 7B7, I.F.; 7C6, Second Detector A. V. C. and First Audio; 41, Audio Power Output; 84, Rectifier.

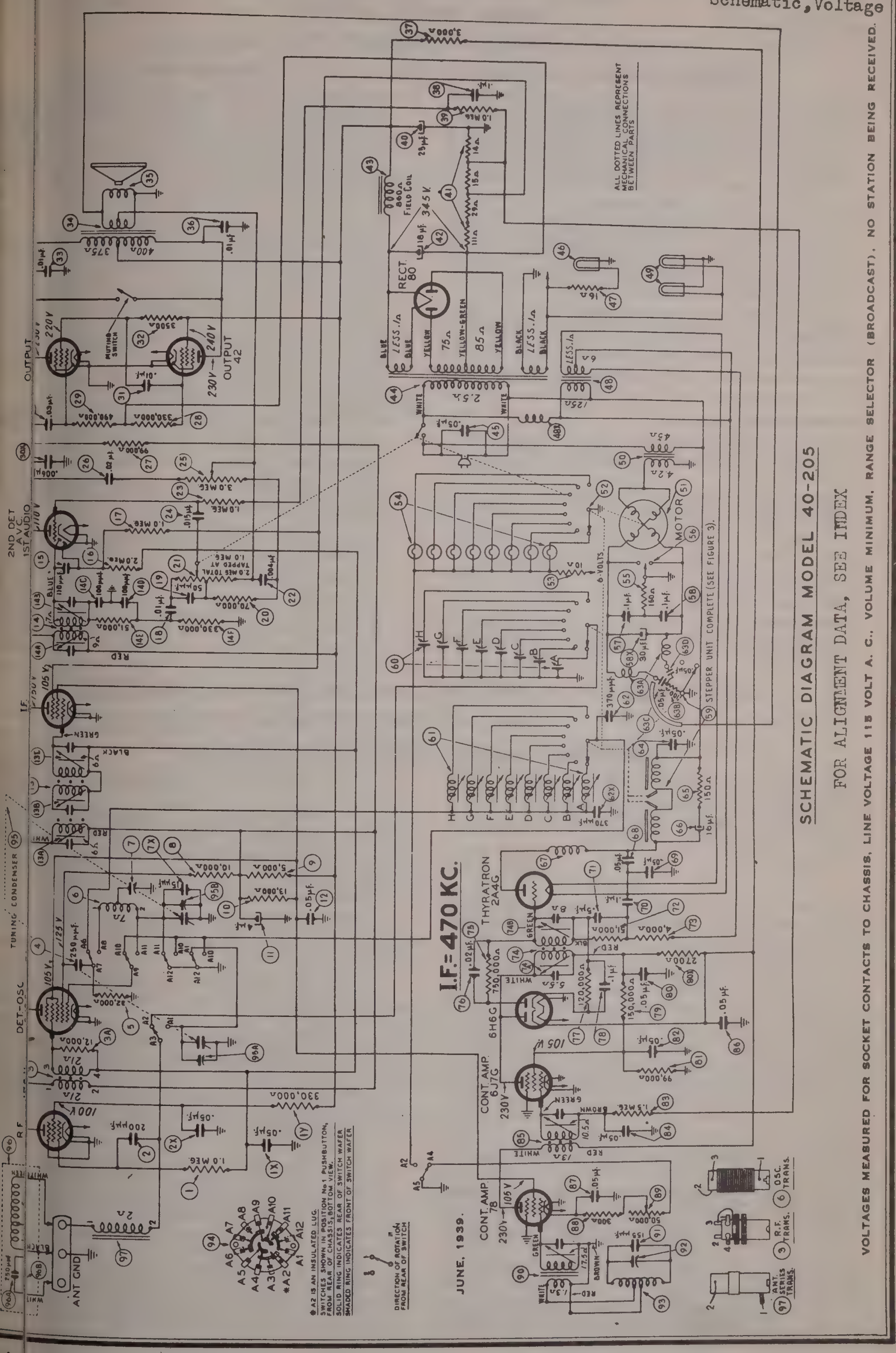
CABINET DIMENSIONS: Type F; Height, 37"; Width, 2 "; Depth, 9¾".

ADJUSTING ELECTRIC PUSH-BUTTON TUNING:

The procedure for adjusting the electric tuning push-buttons in this model is covered in vol.X, Philco page 1 16

PHILCO RADIO & TELEV. CORP.

MODEL 40-205
Schematic, Voltage



ALL DOTTED LINES REPRESENT MECHANICAL CONNECTIONS BETWEEN PARTS

A2 IS AN INSULATED LUG.
SWITCHES SHOWN IN POSITION No 1 PUSHBUTTON, FROM REAR OF CHASSIS, BOTTOM VIEW.
SOLID RING INDICATES REAR OF SWITCH WAFER
SHADED RING INDICATES FRONT OF SWITCH WAFER

DIRECTION OF ROTATION FROM REAR OF SWITCH

JUNE, 1939.

SCHEMATIC DIAGRAM MODEL 40-205

FOR ALIGNMENT DATA, SEE INDEX

VOLTAGES MEASURED FOR SOCKET CONTACTS TO CHASSIS, LINE VOLTAGE 115 VOLT A. C., VOLUME MINIMUM, RANGE SELECTOR (BROADCAST). NO STATION BEING RECEIVED.

MODEL 40-205
MODEL 40-216
MODEL 40-510
MODEL 40-516

PHILCO RADIO & TELEV. CORP.

Models 40-205, 40-216

and MODELS 40-510,40-516.

Wireless Remote Co rol
Adjustments,Notes

ⓐ Model 40-205 ,510.

TYPE CIRCUIT: Model 40-205, code 121, is a 12-tube wireless remote control and dial tuned receiver employing a superheterodyne circuit for reception of standard broadcast stations. Eight broadcast stations can be automatically tuned in from the remote control unit. The wireless remote control unit also increases and decreases volume and turns off the set without any connections between the receiver and the control unit. This model is also designed to receive the sound of a television program tuned in by Philco Television sets.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside aerial is also incorporated in this model. Included in the built-in super aerial system is a statically shielded loop for broadcast band reception. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition, other features of design are automatic volume control, continuously variable tone control, base compensation, degenerated push pull pentode audio output.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 180 watts. (Model 40-205 only)

TUNING RANGES: 540 to 1600 K. C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver — 7C7, F. R. Amplifier; 6J8G, First Detector Oscillator; 78, I. F. Amplifier; 6Q7G, Second Detector, A. V. C. and First Audio; two (2) 42 Audio Output, and one 80 Rectifier.

Wireless Remote Control Amplifier — 78, First Control Amplifier; 6J7G, Second Control Amplifier; A. V. C.; 6ZY5G, A. V. C. and a 2A4G Thyratron Rectifier.

Wireless Remote Control Unit — One type 30.

AUDIO OUTPUT: 10 watts. (Model 40-205 only)

CABINET DIMENSIONS:

	Height	Width	Depth
Console	38	30	15⅝
Wireless Remote Control	5⅛	7¼	9⅛

Model 40-510 is a radio-phonograph combination assembled in a console cabinet consisting of a 12 tube, wireless remote control superheterodyne radio receiver and a Deluxe Inter-Mix Record Changer.

ⓑ Model 40-216 ,516.

TYPE CIRCUIT: Model 40-216, code 121, is a 14-tube wi ess remote control and dial tuned receiver employing a s er-heterodyne circuit with three tuning ranges for recept of standard and short wave broadcast stations. Eight broa ast stations can be automatically tuned in from the remote c rol unit. The wireless remote control unit also increase nd decreases volume and turns off the set without any conne ons between the receiver and the control unit. This model i lso designed to receive the sound of a television program tu in by Philco Television sets. A Philco wireless record playe an also be set up for use with this receiver.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside ial is also incorporated in this model. Included in the bu -in super aerial system is a statically shielded loop for broa ast band reception and a short wave receiving loop. The fe ure of the built-in broadcast band statically shielded loop is t it may be turned to the position in which it picks up a min um amount of interference or if interference is not presen he loop may be set in the position where best recepti is obtained.

In addition other features of design are automatic vo ne control, continuously variable tone control, base compens on, degenerated push pull pentode audio output. Outside ial connections are also provided for remote localities re station signal strength is exceptionally weak.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 190 watts. (Model 40-216 ly)

TUNING RANGES: 540 to 1600 K.C., 1.6 to 4.5 M.C., 6.0 to 18.0 C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver — 6J7G, R. F. Amplifier; 6 G, Converter; 78, I. F. Amplifier; 6Q7G, Second Detector, A. C. and First Audio; 37, Phase Inverter; two 42 Audio Output nd one 80, Rectifier.

Wireless Remote Control Amplifier — 78, First Control n-plifier; 6J7G, Second Control Amplifier; 6J5G, A. V. C., 6 G and 2A4G, Rectifier.

Wireless Remote Control Unit — 1 type 30 tube.

AUDIO OUTPUT: 10 watts.

Model 40-516 is a radio-phonograph combination assen ed in a console cabinet consisting of a 14 tube, wireless re te control superheterodyne radio receiver and a Deluxe Inter ix Record Changer.

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Models 40-205, 40-216 and 40-510,40-516.

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5......355 K. C.
Code 7......375 K. C.
Code 6......367 K. C.
Code 8......383 K. C.
Code 9......395 K. C.

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).

2. Philco wireless remote control aligning adapter. Part No. 45-2769.

3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.

2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".

3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation control to "mod on" and turn the attenuator control about fourth on.

4. The control frequency to which the control amplifie s tuned can now be determined by tuning the signal gener r between 350 and 400 K. C. When the signal generator is tu d to the control frequency, the vacuum tube voltmeter will s v maximum deflection. If this frequency is to be used, leave e signal generator at this point or turn the indicator to any ot r frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or chan , compensators (103A), (103B) Model 40-216; and (74A), (7) Modelⓐ40-205 are adjusted for maximum indication on e vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shi s in their sockets and remove the signal generator lead fi the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" "ground" of the signal generator output terminals and place signal generator near the secondary inductor loop in the bott of the cabinet. When doing this, do not disturb the setting of signal generator indicator. Turn the sensitivity control loca on the right rear of the chassis toward the position mar "extreme" then adjust compensators (119), (115) Modelⓑ40-2 (90), (85) Modelⓐ40-205 for maximum reading on the vacu tube voltmeter.

8. Next adjustⓑthe secondary inductor loop compensa (121) in the Model 216 and (92) Modelⓐ205 located in the bott of the cabinet. This compensator is encased in a cardboard c tainer that is attached to one corner of a loop. Extreme c should be used in adjusting the compensator to the exact po of resonance as the secondary inductor is a very sharply tu circuit.

9. If the vacuum tube voltmeter pointer goes off scale wh adjusting the compensators, turn the attenuator control of signal generator toward the "off" position. After these co pensators are adjusted to maximum, the control amplifier tuned to the frequency selected.

PHILCO RADIO & TELEV. CORP.

MODEL 40-205
MODEL 40-216
MODEL 40-510
MODEL 40-516
Alignment
Remote Cont.Notes

ALIGNING OF COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) Si al Generator. In order to properly adjust this re- iver a librated signal generator such as Philco Model 077 is quired This signal generator covers a frequency range of 0 to 3 00 K. C.

(2) In ating Device. To obtain maximum signal strength d acc ate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver Philco Part No. 45-2610. When using the vacuum tube voltmeter for adjusting the set, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING INSTRUMENTS

VACU 1 TUBE VOLTMETER: To use the vacuum tube volteter a an aligning indicator it should be connected to the V. C. cuit as follows:

1. Co ect the negative (—) terminal of the voltmeter rough 2 meg. resistor to the converter grid (6J8G) Model 5; (6A) Model 216. The resistor must be connected directly the g of the tube and the voltmeter wire attached to the sistor.

2. Co ect the positive (+) terminal to the chassis ground rminal

AUDI OUTPUT METER: If this type of meter is used as an gning dicator, it should be connected to the plate terminals the 42 ubes. Adjust the meter for the 0 to 30 volt A. C. scale.

After nnecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 6 and 7, page No. 6. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Receiver Circuit Adjustments — Model 40-216 and MODEL 40-516.

pera-tion	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 I. F. Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	38A, 38B	Turn Out 33B Full
2	6A8G Det. Osc. Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	33C, 33A, 33B	Note A
3	Use Loop on Generator	18.0 M.C.	18.0 M.C.	Vol. Max. Range Switch "Short Wave"	22B, 124A, 2A	Note C, Note D
4	Use Loop on Generator	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	22, 13X, 3X	Note A
5	Use Loop on Generator	580 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	23	Rollgang
6	Use Loop on Generator	1550 K.C.	1550 K.C.	Vol. Max. Range Switch "Brdcst"	22	
7	Use Loop on Generator	3.5 M.C.	3.5 M.C.	Vol. Max. Range Switch "Police"	22A	Note B

Receiver Circuit Adjustments — Model 40-205 and MODEL 40-510.

era-ion	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	14A, 14B	Turn Out 13B Full
2	6J8G Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	13A, 13C, 13B, 14A	
3	Loop	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	95B, 95A	Note A
4	Loop	580 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	7	Rollgang when Adjusting Padder
5	Loop	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	95B, 95A	Note B

— D Calibration: In order to adjust the corr ly the dial must be aligned to track with he tuning condenser. To adjust the ceed follows: With the tuning condenser maxi m capacity), set the dial pointer on me l index line at the low frequency end of the broadcast scale. The arrangement of the drive cable and dial pointer in shown in Fig. 5.

NOTE C — If two peaks (signals) are observed on the aligning meter when adjusting the oscillator padder No. 22A tune the padder to the second peak from the maximum capacity position (screw all the way in).

NOTE D — If two peaks (signals) are observed on the aligning meter when adjusting the R. F. and loop padders 124A and 2A, tune the padders to the first peak signal from the maximum capacity position (screw all the way in). When adjusting the padders to this first peak roll the tuning condenser (rock) slightly back and forth to obtain the maximum readings on the aligning meter.

NOTE B — See Remote Control Amplifier adjustments.

A JUSTING WIRELESS REMOTE CONTROL UNIT

he w eless remote control unit is now adjusted to the con- frec ency of the amplifier as follows:

Tu off the signal generator, then dial any one of the ions dicated on the remote control unit by pulling the ctor the stop position; release the selector and at the e ti press the stop down and hold it in this position.

No bring the wireless remote control unit close to the iver. sing a padding wrench, Philco Part No. 3164, tune the pens or (127) Fig. 3, located on the bottom of the remote rol it until a maximum voltage reading is indicated on vacu n tube voltmeter. When tuning this compensator, it ld b done very slowly so as not to pass over the frequency hich he control amplifier is tuned.

3. After adjusting the compensator with the sensitivity control on the receiver in the "extreme" position, the remote control unit is adjusted for maximum sensitivity by setting the sensitivity control in the "near" position and placing the remote control unit a few feet away from the receiver. The compensator (127) Fig. 3, is then adjusted again for maximum voltage reading of the vacuum tube voltmeter.

4. After making these adjustments, remove the aligning adapter from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

MODEL 40-205
MODEL 40-510
Chassis, Trimmers

PHILCO RADIO & TELEV. CORP.

Stepper nit
Adjustmets

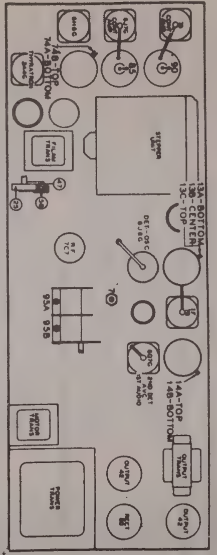


FIG. 6. LOCATIONS OF COMPENSATORS, MODEL 40-205.

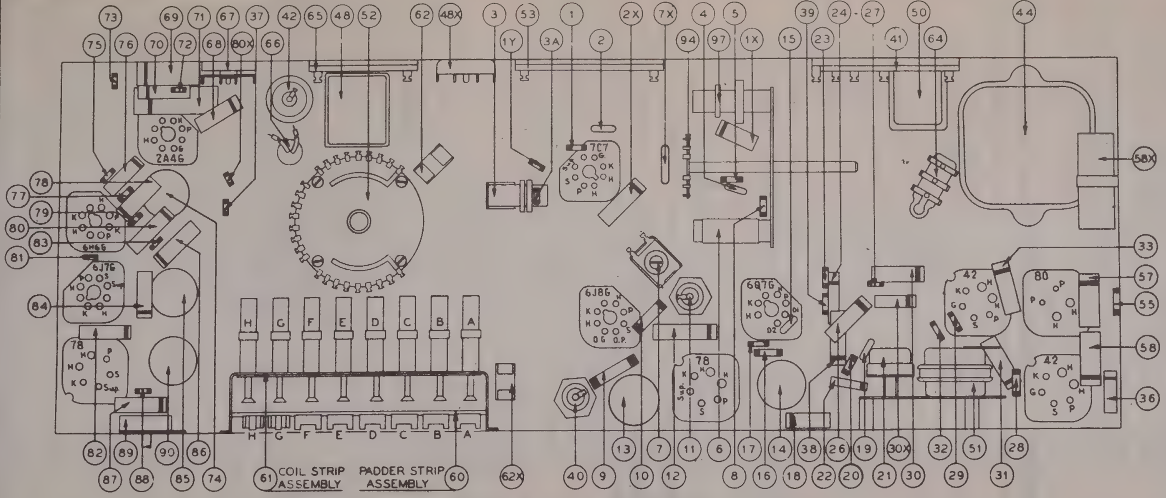


FIG. 1. LOCATIONS OF PARTS, UNDERSIDE OF CHASSIS.

Adjusting Wireless Remote Control for Reception of Stations

NOTE: In Model 40-510 No. 8 position is used for phonograph. This position is already connected and will not need adjustment.

The procedure for setting up stations on the wireless remote control receivers is similar to the procedure in setting up Philco electric automatic tuning models. The eight push buttons, however, are automatically dialed by the remote control unit instead of by pushing buttons. To set up stations on these models for best reception, a signal generator, Philco Model 077 and a vacuum tube voltmeter Philco Model 027 or 028 should be used. With this equipment proceed as follows:

1. Select and remove the desired eight station call letters from the large station tab card supplied with the receiver. Insert the station tabs in the apertures (windows) of the bezel. The lowest frequency station is placed in the first window on the left and the remaining station tabs in the order of increasing frequency. Turn "on" power switch.

2. Remove from the small call letter card the tab of the first low frequency station. Insert the tab in the third aperture on the right side of the bezel on the remote control unit dial. Transparent tabs are also supplied to be placed over each call letter. The remaining call letter tabs are then placed in the order of increasing frequency around the bezel from right to left (counter clock-wise).

3. Insert the loud and soft tabs in the first and second windows respectively on the right hand side of the bezel.

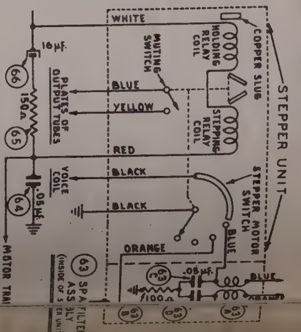
4. Connect the negative terminal of the vacuum tube voltmeter [illegible] resistor must be connected directly to the grid of the tube and the voltmeter attached to the resistor at this point. Connect the positive terminal to the chassis ground terminal.

5. Attach a loop consisting of a few turns of wire to the output terminals of the Model 077 signal generator. Turn the signal generator modulation control to "mod on". Turn the receiver range selector switch to "Broadcast" and manually tune in the lowest frequency station desired. This station should be between 540 and 1030 K. C. The signal generator is then tuned to the frequency of the station being received. A beat note should then be heard when the volume control is turned on.

6. Turn the range selector disc of the receiver to "remote". Dial first low frequency station on the right side of the bezel of the remote control unit.

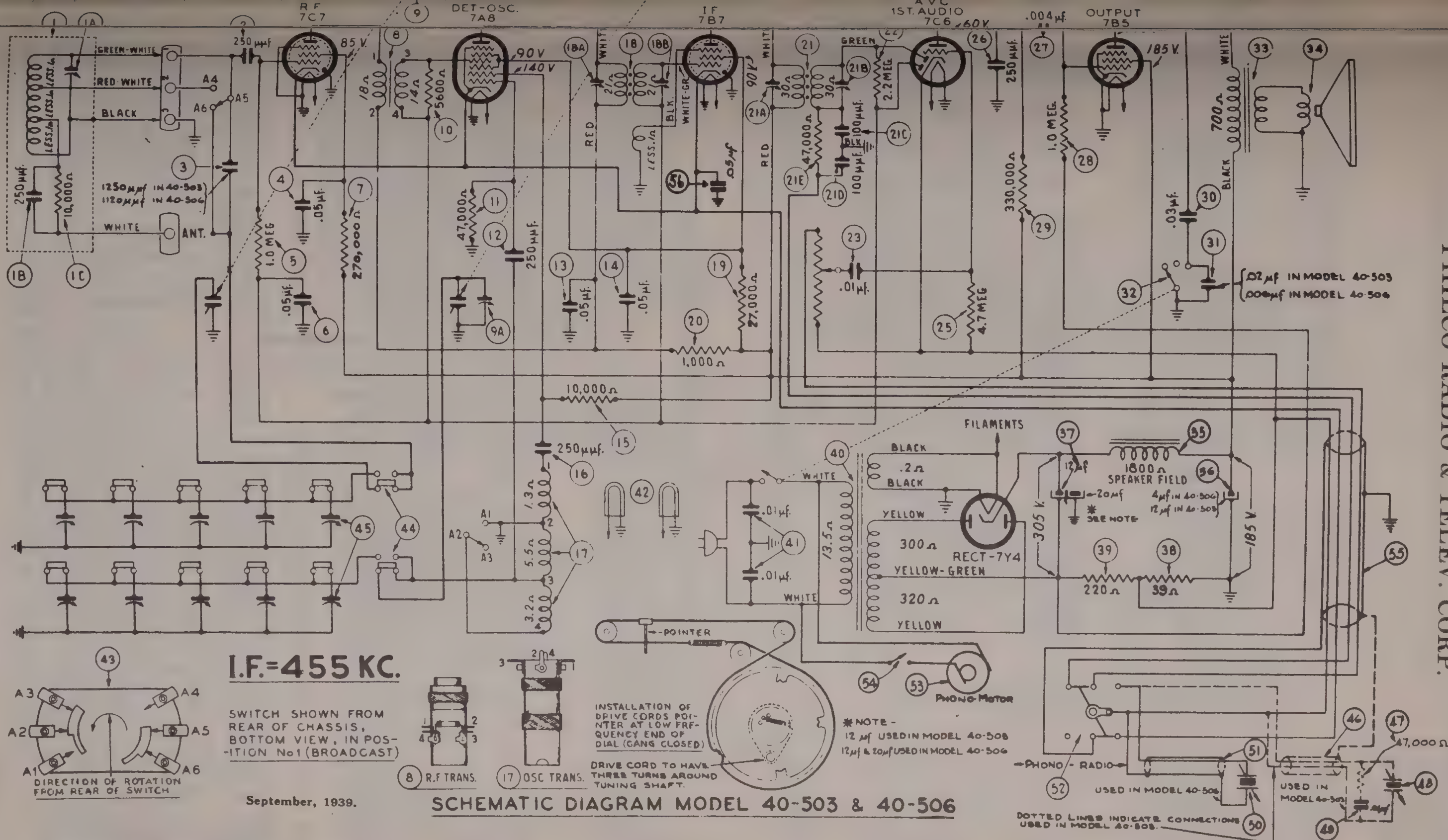
7. Using a padding screw driver, adjust the first 540 to 1030 K .C. "Osc" padder (bottom row of holes) at the left rear of the chassis, until the station identified by the modulated signal of the generator is tuned in to maximum on the vacuum tube voltmeter. Next adjust the first 540 to 1030 K. C. "Ant" padder (top row of holes) for maximum indication on the voltmeter.

8. Turn the signal generator off the station frequency and readjust the "Ant" and "Osc" padders with the station signal for maximum reading on the voltmeter. This should be done with the volume control of the receiver adjusted for low volume. This procedure is repeated for each of the remaining stations to be set up. The next station to be set up should be within the frequency range of 540 to 1030 K. C. [illegible] should be within a frequency range of 670 to 1160 K. C. The remaining stations are then set up in the order of increasing frequency.



(59) STEPPER UNIT COMPLETE

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 40-503 & 40-506

THE VOLTAGES INDICATED WERE MEASURED WITH A 1000 OHMS PER VOLTMETER. PHILCO MODEL 027. LINE VOLTAGE 115 VOLTS A. C., NO SIGNAL BEING RECEIVED.

Model 40-503 is assembled in a table model cabinet and consists of a semi-automatic crystal pickup mechanism which will play 10″ or 12″ records. The pickup is placed on the record automatically when the lid is closed.

Model 40-506 is assembled in a console type cabinet and consists of a manually operated crystal pickup and will play 10″ or 12″ records. An automatic switch is provided on this model that starts the phonograph motor when the pickup is lifted from the mounting.

FOR OTHER DATA, SEE INDEX

POWER CONSUMPTION:

Model 40-503—65 watts.
Model 40-506—65 watts.

MODELS 40-503,40-506
MODEL 40-507
MODEL 40-525
Parts Lists

PHILCO RADIO & TELEV. CORP.

Replacement Parts — Models 40-503 and 40-506

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9926
1A	Compensator	31-6318
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Mica Condenser (250 mmfd.)	61-0033
3	Mica Condenser	
	(1250 mmfd., 40-503)	5886
	(1120 mmfd., 40-506)	30-1140
4	Tubular Condenser (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4518
7	Resis. (270,000 ohms, ½ watt)	33-427339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resist. (47,000 ohms, ½ watt)	33-347339
12	Mica Condenser (250 mmfd.)	61-0033
13	Tubular Condenser (.05 mfd.)	30-4518
14	Tubular Condenser (.05 mfd.)	30-4518
15	Resist. (10,000 ohms, ½ watt)	33-310339
16	Mica Condenser (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assembly	32-3210
19	Resistor (27,000 ohms, 1 watt)	33-327439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assembly	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Condenser (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Condenser (250 mmfd.)	61-0033
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resis. (330,000 ohms, ½ watt)	33-433339
30	Tubular Condenser (.03 mfd.)	30-4449
31	Tubular Condenser	
	(.02 mfd., 40-503)	30-4481
	(.006 mfd., 40-506)	30-4504
32	Tone Control & On-Off Switch	42-1520
33	Output Transformer	32-8063
34	Cone & Voice Coil Assembly:	
	For Spkr. 36-1484-2, 40-503	36-4126
	For Spkr. 36-1487-2, 40-506	36-4088
	For Spkr. 36-1487-3, 40-506	36-4128
35	Field Coil	
	(For 40-503, Replace Spkr.)	36-1484
	(For 40-506, Replace Spkr.)	36-1487
36	Electrolytic Condenser	
	(12 mfd., 475 V., 40-503)	30-2410
	(4 mfd., 400 V., 40-506)	30-2411
37	Electrolytic Condenser	
	(12 mfd., 475 V, 40-503)	30-2410
	(12-20 mfd., 475 V., 40-506)	30-2437
38	Resistor (39 ohms, ½ watt)	33-039339
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Transformer	
	(115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
44	Pushbutton Switch	42-1528
45	Padder Strip	31-6315
46	Pickup Cable (Model 40-503)	
47	Resistor (47,000 ohms,	
	½ watt, Model 40-503)	33-347339
48	Crystal Cartridge	
	(Pickup, Model 40-503)	415-1027
49	Condenser, Tubular (.01 mfd.)	30-4518
50	Crystal Cartridge	
	(Pickup, Model 40-506)	415-1027
51	Pickup Cable (Model 40-506)	
52	Radio-Phono. Switch	42-1523
53	Motor (110 V., 60 cycles)	35-2021
54	Motor Switch (40-506)	42-1536
	Motor Switch (40-503)	42-1498
55	Cable (Radio-Phono)	L-3217
56	Condenser (.05 mfd.)	30-4518

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cabinet (40-503)	10406
Cabinet (40-506)	10408A
Cable (Power)	L-3199
Cable (Speaker)	41-3430
Cable (Radio-Phono)	L-3217
Dial Scale	27-5506
Drive Cord (Pointer Drive)	31-2399
Drive Cord (Cond. Drive)	31-2400
Drive Drum (Tuning)	38-9883
Escutcheon (Station Tubes)	28-5742
Knobs (Vol., Tone., Wave Sw.)	27-4332
Knob (Pushbutton Switch)	27-4824
Motor (Phono) Model 40-503	35-2021
Motor Con. Plug (Female)	41-3507
Motor Connecting Plug	
(Male, 40-503, 40-506)	27-4863
Motor Switch	42-1536
Pilot Lamp	34-2064
Pilot Light Socket Assy.	38-9904
Pointer	56-1532
Plate Switch	28-2401
Pickup Assembly (40-503)	35-2028
Pickup Assembly (40-506)	35-2042
Shaft (Tuning)	56-6052
Spring (Cond. Drive Cord)	28-8751
Spring (Pointer Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker (40-503)	36-1484
Speaker (40-506)	36-1487
Switch (Motor)	42-1498
Sockets	55-0575
Tab Kit (Station Call Letters)	40-6473

MOUNTING PARTS

DESCRIPTION	PART No.
Sleeve (Chassis Mtg.)	28-5274
Screw (Chassis Mtg., 40-503)	W-2030
Screw (Chassis Mtg., 40-506)	W-783
Screw (Motor Mtg.)	W-599
Screw (Pickup Mtg.)	W-2027
"T" Nut (Motor Mtg.)	W-1758
Washer (Motor Mtg.)	W-1366
"C" Washer (Tuning Shaft)	28-2043

Replacement Parts — Model 40-507

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9943
1A	Compensator	31-6308
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Loop Assembly (Short Wave)	38-9944
2A	Compensator	31-6320
3	Mica Condenser (5 mmfd.)	30-1097
4	Mica Condenser (1,000 mmfd.)	30-1063
5	Mica Condenser (250 mmfd.)	61-0033
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Condenser (.05 mfd.)	30-4518
8	Tubular Condenser (.05 mfd.)	30-4518
9	Resist. (33,000 ohms, ½ watt)	33-333339
10	Resistor (390 ohms, ½ watt)	33-139331
11	Tubular Condenser (.05 mfd.)	30-4518
12	Resist. (47,000 ohms, ½ watt)	33-347339
13	Mica Condenser (100 mmfd.)	30-1128
14	Resist. (10,000 ohms, ½ watt)	33-310339
15	R. F. Transformer	32-3194
16	Resistor (150 ohms, ½ watt)	33-115331
17	Resist. (4700 ohms, ½ watt)	33-247339
18	Tubular Condenser (.2 mfd.)	30-4536
19	Tubular Condenser (.05 mfd.)	30-4518
20	Resistor (470 ohms, ½ watt)	33-147339
21	Oscillator Transformer	[illegible]
23	Resist. (33,000 ohms, ½ watt)	33-333339
24	Silver Mica Cond. (500 mmfd.)	30-1138
25	Compensator (Two Section)	31-6317
26	Mica Condenser (5300 mmfd.)	30-1134
27	Tuning Condenser	31-2375
28	First I. F. Trans. Assembly	32-3210
29	Tubular Condenser (.05 mfd.)	30-4518
30	Resist. (33,000 ohms, ½ watt)	33-333339
31	Resistor (1,000 ohms, ½ watt)	33-210339
32	Resistor (4700 ohms, ½ watt)	33-247339
33	Second I. F. Trans. Assembly	32-3281
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Volume Control (.5 meg.)	33-5289
36	Tubular Condenser (.01 mfd.)	30-4572
37	Resistor (4.7 meg., ½ watt)	33-547339
38	Mica Condenser (250 mmfd.)	61-0033
39	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.003 mfd.)	30-4580
41	Resis. (330,000 ohms, ½ watt)	33-433339
42	Resistor (1.0 meg., ½ watt)	33-510339
43	Tone Control (.5 meg.) and	
	On-Off Switch	33-5333
44	Tubular Cond. (.003 mfd.)	30-4580
45	Output Transformer	32-8071
46	Cone and Voice Coil Assembly	
	(Replace Spkr. Part No. 36-1489-2)	
48	Elect. Cond. (12 mfd., 400 V.)	30-2410
49	Elect. Cond. (12 mfd., 400 V.)	30-2410
50	Resistor (22 ohms, ½ watt)	33-022331
51	Resistor (220 ohms, 1 watt)	33-122431
52	Power Transformer	
	(115 V., 50-60 cycles)	32-8068
53	Line Condenser (.01-.01 mfd.)	3903-ODG
54	Pilot Lamps	34-2064
55	Wave Switch	42-1495
56	Push-Button Switch	42-1528
57	Padder Strip	31-6316
58	Resist. (10,000 ohms, ½ watt)	33-310339
59	Tubular Condenser (.03 mfd.)	30-4517
60	Resist. (20,000 ohms, ½ watt)	33-320339
61	Radio-Phono Cable	L-3218
62	Radio-Phono Switch	42-1523
63	Pickup Cable	L-3195
64	Crystal Pickup Cartridge	35-2030
65	Motor	35-1205
66	Switch (Off-On Motor)	42-1548

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Automatic Record Changer	35-1160
[illegible] (Power Supply)	L-3199
Clip (Mtg. Osc. Coil)	28-5003
Drive Cord Assy. (Pointer)	31-2398
Drive Cord Assy. (Tun. Cond.)	31-2400
Dial	27-5507
Escutcheon (Push-Buttons)	28-5742
Escutcheon Pin	W-1074
Insul. Bushing (Drive Shaft)	27-9437
Knobs (Tuning, Tone,	
Volume, Wave Switch)	27-4332
Knobs (Push-Buttons)	27-4824
Pilot Lamp Socket Assembly	38-9904
Pointer	56-1532
Rubber Bushing	
(Tuning Condenser Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1489
Sockets (Loktal Tubes)	55-0575
Tuning Shaft	56-6052
Tuning Drive Drum Assembly	38-9883
Tab (Dial)	27-5526
Tab (Television)	27-9450
Tab Kit	40-6473
Washer (C Type, Tun. Shaft)	28-2043

Replacement Parts — Model 40-525

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9897
1A	Compensator	31-6308
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Mica Condenser (250 mmfd.)	61-0033
3	Mica Condenser (1120 mmfd.)	30-1140
4	Tubular Condenser (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4518
7	Resis. (270,000 ohms, ½ watt)	33-427339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resist. (47,000 ohms, ½ watt)	33-347339
12	Mica Condenser (250 mmfd.)	61-0033
13	Tubular Condenser (.05 mfd.)	30-4518
14	Tubular Condenser (.05 mfd.)	30-4518
15	Resist. (10,000 ohms, ½ watt)	33-310339
16	Mica Condenser (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assembly	32-3210
19	Resistor (27,000 ohms, 1 watt)	33-327439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assembly	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Condenser (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Condenser (250 mmfd.)	61-0038
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resis. (330,000 ohms, ½ watt)	33-433339
30	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Condenser (.02 mfd.)	30-4481
32	Tone Control & On-Off Switch	42-1520
33	Output Transformer	32-8063
34	Cone & Voice Coil Assembly:	
	For Speaker 36-1480-3	36-4086
35	Field Coil	
	(Replace Spkr. Part No. 36-1480)	
36	Electrolytic Condenser	
	(4 mfd., 400 V.)	30-2401
37	Electrolytic Condenser	
	(12-20 mfd., 475 V.)	30-2437
38	Resistor (39 ohms, ½ watt)	33-039339
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Transformer	
	(115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
45	Padder Strip	31-6315
46	Motor Switch	42-1548
47	Motor (110 volts, 60 cycles)	35-1204
48	Switch (Part of 46)	
49	Crystal Cartridge (Pickup)	35-2030
50	Pickup Cable Assembly	
	Switch Section	41-3508
	Changer	318-1775
51	Radio-Phono Switch	42-1551
52	Cable (Radio-Phono Switch)	L-3217
53	Condenser (.05 mfd.)	30-4518

MISCELLANEOUS PARTS

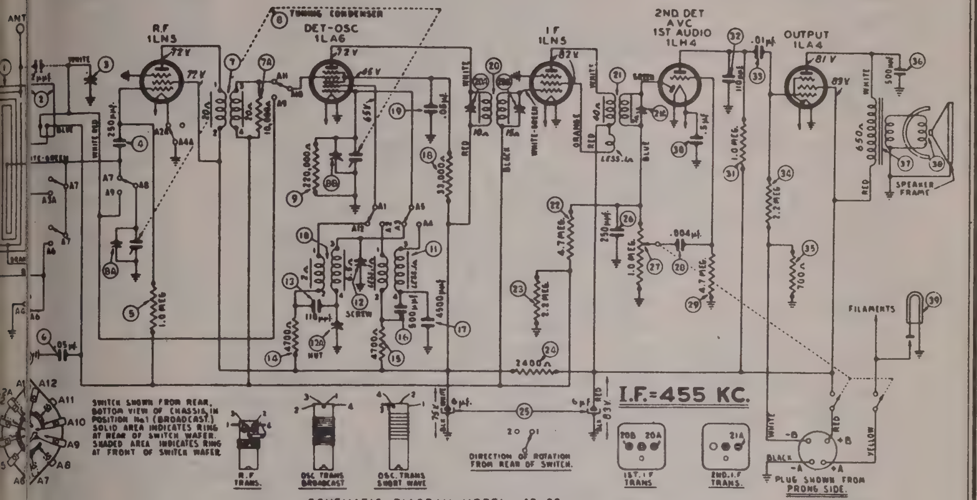
DESCRIPTION	PART No.
Automatic Record Changer	35-1180
Cabinet	10452-A
Cable (Power)	L-3199
Cable (Speaker)	41-3329
Cable (Radio-Phono)	L-3217
Dial Scale	27-5506
Drive Cord (Pointer Drive)	31-2399
Drive Cord (Cond. Drive)	31-2400
Drive Drum (Tuning)	38-9883
Escutcheon (Station Tabs)	28-5742
Knobs (Vol., Tone., Wave Sw.)	27-4332
Knob (Pushbutton Switch)	27-4824
Knob (Phono Off-On)	27-4627
Pilot Light Socket Assy.	38-9904
Pointer	56-1532
Shaft (Tuning)	318-1506
Spring (Cond. Drive Cord)	28-8751
Spring (Pointer Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1480
Sockets	55-0575
Tab (Dial)	27-5526
Tab (Television)	27-9450
Tab Kit (Station Call Letters)	40-6473

MOUNTING PARTS

DESCRIPTION	PART No.
Nail Escutcheon Mounting	W-1074
Nut Speaker Mounting	W-124FA3
Nut Phono Switch Mtg.	W-684FA4
Screw (Chassis Mounting)	W-2068
Screw (Speaker Plug)	W-1714
Washer (Speaker Mounting)	[illegible]
"C" Washer (Tuning Shaft)	28-2043

PHILCO RADIO & TELEV. CORP.

MODEL 40-88(121)
Schematic,Voltage
Chassis,Trimmers



SCHEMATIC DIAGRAM MODEL 40-88

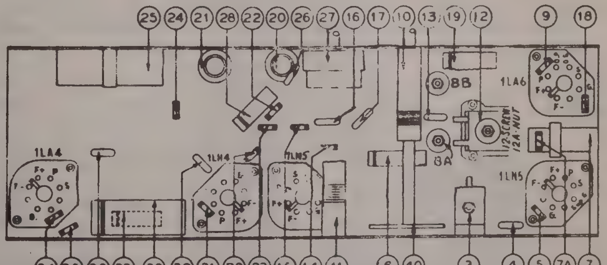
Replacement Parts — Model 40-88, Code 121

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9917
2	Loop Assembly (Short Wave)	38-9865
3	Compensator	31-6288
4	Mica Condenser (250 mmfd.)	61-0033
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4519
7	R. F. Transformer Assembly	32-3219
7A	Resistor (10,000 ohms, ½ watt)	33-310339
8	Tuning Condenser Assembly	31-2378
9	Resistor (220,000 ohms, ½ watt)	33-422339
10	Oscillator Transformer (Broadcast)	32-3249
11	Oscillator Transformer (Short Wave)	32-3220
12	Compensator	31-6100
13	Mica Condenser (110 mmfd.)	30-1130
14	Resistor (4700 ohms, ½ watt)	33-247339
15	Resistor (4700 ohms, ½ watt)	33-247339
16	Mica Condenser (500 mmfd.)	30-1114
17	Mica Condenser (4500 mmfd.)	30-1109
18	Resistor (33,000 ohms, ½ watt)	33-333339
19	Tubular Condenser (.05 mfd.)	30-4519
20	1st I. F. Transformer Assembly	32-3222
21	2nd I. F. Transformer Assembly	32-3223
22	Resistor (4.7 meg., ½ watt)	33-547339
23	Resistor (2.2 meg., ½ watt)	33-522339
24	Resistor (2400 ohms, ½ watt)	33-224339
25	Electrolytic Condenser (6-6 mf., 150 V.)	30-2388
26	Mica Condenser (250 mmfd.)	61-0033
27	Volume Control and On-Off Switch	33-5310
28	Tubular Condenser (.004 mfd.)	30-4578
29	Resistor (4.7 meg., ½ watt)	33-547339
30	Tubular Condenser (.5 mfd.)	30-4551
31	Resistor (1.0 meg., ½ watt)	33-510339
32	Mica Condenser (110 mmfd.)	30-1130
33	Tubular Condenser (.01 mfd.)	30-4572
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Resistor (700 ohms, ½ watt)	33-170339
36	Mica Condenser (500 mmfd.)	30-1114
37	Output Transformer	32-8096
38	Cone and Voice Coil Assembly (Speaker Part No. 36-1482-3)	36-4121
39	Pilot Lamp	34-2246
40	Wave Switch	42-1499

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	27-4855
Cabinet	10414A
Clip (Coil Mounting)	28-5002
Drive Cord Assembly	31-2380
Dial	27-5511
Flag (On-Off Indication)	56-1418
Flag Bearing	56-6045
Flag Spring	28-8947
Flag Cam and Hub Assembly	38-9861
Gasket (Dial Mounting)	27-9472
Knobs (Tuning, Volume and Wave Switch)	27-4862
Pilot Lamp Socket Assembly	38-9839
Pointer	27-4868
Pushbutton (Pilot Lamp)	27-4844
Operating Finger (Pilot Lamp)	56-1487
Speaker	36-1482
Speaker Grille	56-1255
Spring (Pilot Lamp)	28-8952
Spring (Drive Cord)	28-8882
Spring (Wave Switch Centering)	28-8665
Snap Fastener (Dial Mounting)	28-4342
Sockets (Loktal)	55-0575
Tuning Shaft	56-6070
Tuning Drum	56-1486

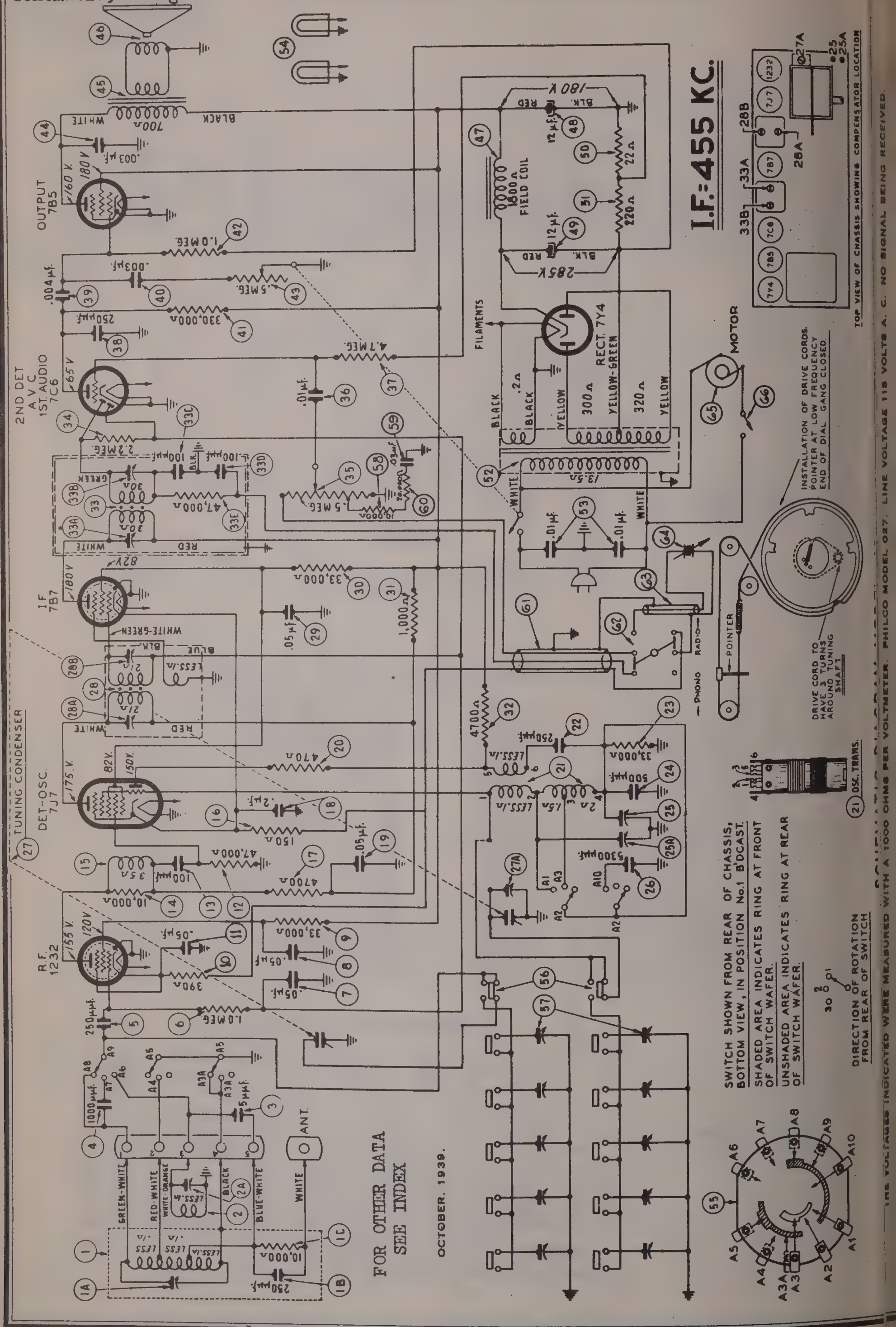
FOR ALIGNMENT
SEE INDEX



PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-88

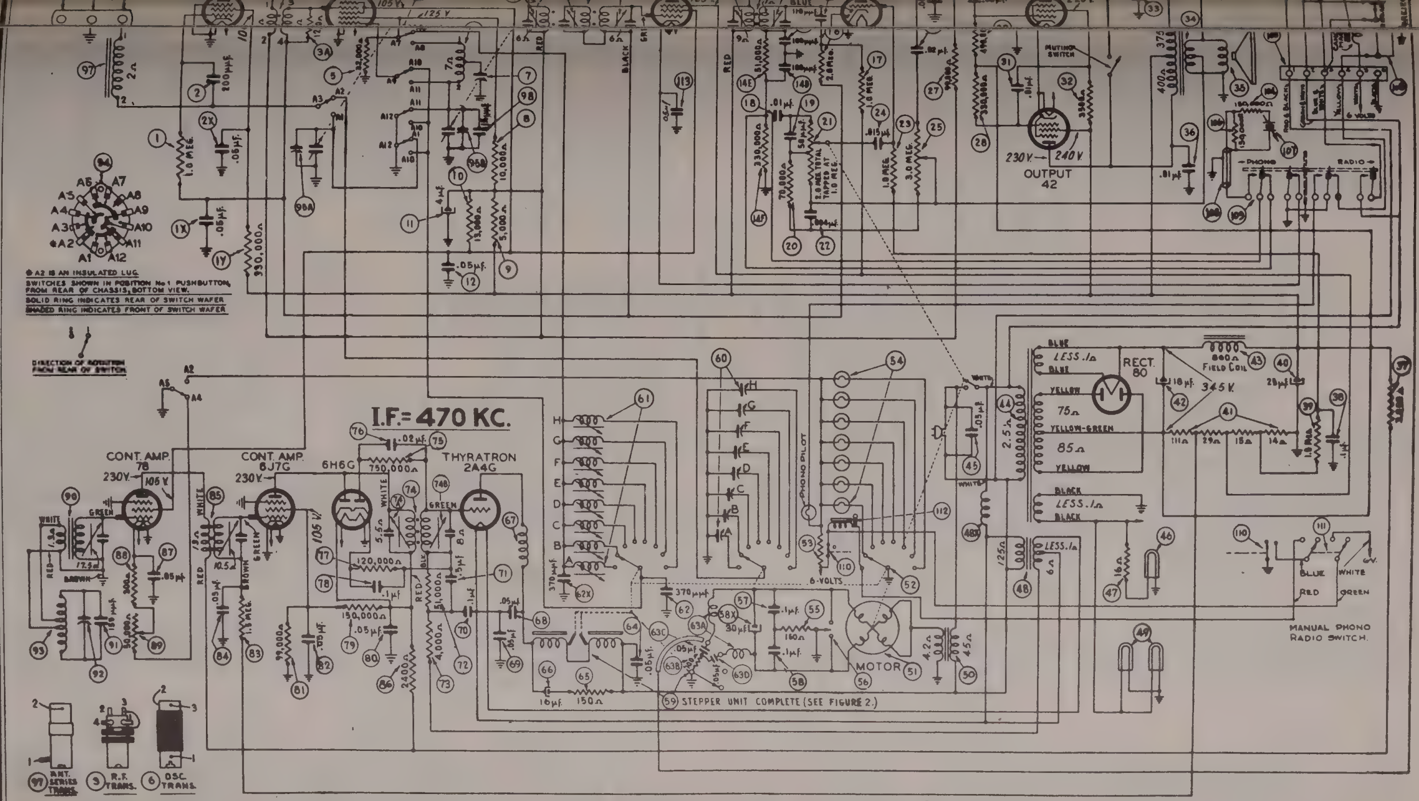
MODEL 40-507
Schematic, Voltage

PHILCO RADIO & TELEV. CORP.


Trimmers
I.F.=455 KC.
OUTPUT 7B5
2ND DET A V C 1ST AUDIO 7C6
I F 7B7
DET-OSC. 7J7
R.F. 1232
RECT. 7Y4
TUNING CONDENSER
FILAMENTS
MOTOR
POINTER
PHONO
RADIO
ANT.
WHITE
BLACK
RED
BLK.
GREEN
YELLOW
YELLOW-GREEN
WHITE-GREEN
BLUE
GREEN-WHITE
RED-WHITE
WHITE-ORANGE
BLUE-WHITE
1600 Ω FIELD COIL
700 Ω
180 V
285 V
160 V
65 V
82 V
175 V
150 V
155 V
120 V
FOR OTHER DATA SEE INDEX
OCTOBER, 1939.
TOP VIEW OF CHASSIS SHOWING COMPENSATOR LOCATION
INSTALLATION OF DRIVE CORDS. POINTER AT LOW FREQUENCY END OF DIAL GANG CLOSED.
DRIVE CORD TO HAVE 3 TURNS AROUND TUNING SHAFT
(21) OSC. TRANS.
SWITCH SHOWN FROM REAR OF CHASSIS, BOTTOM VIEW, IN POSITION No.1 B'DCAST.
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
UNSHADED AREA INDICATES RING AT REAR OF SWITCH WAFER.
DIRECTION OF ROTATION FROM REAR OF SWITCH
SCHEMATIC DIAGRAM
VOLTAGES INDICATED WERE MEASURED WITH A 1000 OHMS PER VOLTMETER. PHILCO MODEL 027. LINE VOLTAGE 115 VOLTS A. C. NO SIGNAL BEING RECEIVED.

MODEL 40-510
Schematic, Voltage
Notes

PHILCO RADIO & TELEV. CORP.


I.F.= 470 KC.
CONT. AMP. 78
CONT. AMP. 6J7G
6H6G
THYRATRON 2A4G
OUTPUT 42
RECT. 80
230V
105 V
240 V
345 V
MOTOR
6-VOLTS
PHONO PILOT
STEPPER UNIT COMPLETE (SEE FIGURE 2.)
MANUAL PHONO RADIO SWITCH
MUTING SWITCH
FIELD COIL
LESS .1Ω
BLUE
YELLOW
YELLOW-GREEN
BLACK
WHITE
GREEN
RED
BROWN
*A2 IS AN INSULATED LUG
SWITCHES SHOWN IN POSITION No 1 PUSHBUTTON, FROM REAR OF CHASSIS, BOTTOM VIEW.
SOLID RING INDICATES REAR OF SWITCH WAFER
SHADED RING INDICATES FRONT OF SWITCH WAFER
DIRECTION OF ROTATION FROM REAR OF SWITCH
ANT. SERIES TRANS.
R.F. TRANS.
OSC. TRANS.

SCHEMATIC DIAGRAM MODEL 40-510

VOLTAGES INDICATED AT TUBE ELEMENTS WERE MEASURED WITH A PHILCO MODEL 027 CIRCUIT TESTER AND VACUUM TUBE VOLTMETER. LINE VOLTAGE 115 VOLTS A. C., NO SIGNAL BEING RECEIVED. **OCTOBER, 1939.**

POWER CONSUMPTION: 220 Watts.
CABINET DIMENSIONS: 38⅛″ High· 40½″ Wide: 21″ Deep.

FOR OTHER DATA, SEE INDEX

The Deluxe Inter-Mix Record Changer plays fourteen 10″ and 12″ records intermixed, fifteen 10″ or thirteen 12″ records at one loading. The record changer can be operated manually or from the wireless remote control circuit of the radio receiver. When using the wireless remote control to operate the phonograph, the Inter-Mix Record Changer can be started and stopped, records rejected and volume adjusted, from the remote control unit. The automatic record changer is selected by dialing "PHONO" position. This operates relay (112) which pulls "Radio-Phono" switch (109) to the "PHONO" position. Records are also rejected by dialing the "PHONO" position on the wireless remote control unit. Phono relay (112) is connected to No. 8 contact of the pilot lamp section of rotary switch (52).

MODEL 40-510
Stepper Unit,Parts
MODEL 40-516
Parts List

PHILCO RADIO & TELEV. CORP.

Replacement Parts — Model 40-510

SCHE. No.	DESCRIPTION	PART No.
1	Resistor (1.0 meg., ½ watt)	33-510339
1X	Tubular Cond. (.05 mfd.)	30-4519
1Y	Resistor (330,000 ohms, ½ watt)	33-433339
2	Mica Cond. (200 mmfd.)	30-1078
2X	Tubular Cond. (.05 mfd.)	30-4123
3	R. F. Trans.	32-3282
3A	Resistor (12,000 ohms, ½ watt)	33-312339
4	Mica Cond. (250 mmfd.)	30-1032
5	Resistor (32,000 ohms, ½ watt)	33-332339
6	Oscillator Trans.	32-3278
7	Compensator	31-6230
7X	Mica Cond. (15 mmfd.)	30-1139
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	Resistor (5,000 ohms, 2 watts)	33-250539
10	Resistor 13,000 ohms, 1 watt)	33-313439
11	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
12	Tubular Cond. (.05 mfd.)	30-4123
13	1st I. F. Trans. Assy.	32-3089
14	2nd I. F. Trans. Assy.	32-2645
15	Mica Cond. (110 mmfd.)	30-1031
16	Resistor (2.0 meg., ½ watt)	33-520339
17	Resistor (1.0 meg., ½ watt)	33-510339
18	Tubular Cond. (.01 mfd.)	30-4479
19	Mica Cond. (50 mmfd.)	30-1029
20	Resistor (70,000 ohms, ½ watt)	33-370339
21	Volume Control (2.0 meg.)	33-5300
22	Tubular Cond. (.004 mfd.)	30-4334
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Cond. (.015 mfd.)	30-4358
25	Tone Control (3.0 meg.)	33-5287
26	Tubular Cond. (.02 mfd.)	30-4481
27	Resistor (99,000 ohms, ½ watt)	33-399339
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Resistor (490,000 ohms, ½ watt)	33-449339
30	Tubular Cond. (.03 mfd.)	30-4517
30X	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Cond. (.01 mfd.)	30-4501
32	Resistor (3500 ohms, ½ watt)	33-235339
33	Tubular Cond. (.01 mfd.)	30-4501
34	Output Trans.	32-7997
35	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
36	Tubular Cond. (.01 mfd.)	30-4501
37	Resistor (3000 ohms, ½ watt)	33-230339
38	Tubular Cond. (.1 mfd.)	30-4499
39	Resistor (1.0 meg., ½ watt)	33-510339
40	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
41	Bias Resistor (Wirewound)	33-3361
42	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
43	Field Coil (Replace Spkr. Part No. 36-1450)	
44	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
45	Condenser (.05 mfd., 115 V. Plug)	30-4576
46	Pilot Lamp (Bullseye)	34-2210
47	Pilot Lamp Resistor (16 ohms, 1 watt)	33-016431
48	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
48X	Choke Coil	32-1281
49	Pilot Lamps (Dial)	34-2064
50	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
51	Volume Control Motor Assy.	35-1151
52	Rotary Switch	42-1468
53	Bias Resistor (Wirewound, 10 ohms)	33-3363
54	Pilot Lamps (Station Indicator)	34-2064
55	Resistor (150 ohms, ½ watt)	33-115339
56	Volume Control Switch (Motor Control)	42-1469
57	Tubular Cond. (.1 mfd.)	30-4499
58	Tubular Cond. (.1 mfd.)	30-4499
58X	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
59	Stepper Unit Complete	38-9689
60	Compensator Strip (Pushbutton)	31-6264
60A	Compensator No. 1	
60B	Compensator No. 2	
	540-1030 K.C., Part of 60	
60C	Compensator No. 3	
60D	Compensator No. 4	
	670-1160 K.C., Part of 60	
60E	Compensator No. 5	
60F	Compensator No. 6	
	900-1470 K.C., Part of 60	
60G	Compensator No. 7	
60H	Compensator No. 8	
	1170-1600 K.C., Part of 60	
61	Coil Assy. (Pushbuttons)	
61A	Oscillator Coil No. 1	
61B	Oscillator Coil No. 2	
	540-1030 K.C.	32-3042
61C	Oscillator Coil No. 3	
61D	Oscillator Coil No. 4	
	670-1160 K.C.	32-3042
61E	Oscillator Coil No. 5	
61F	Oscillator Coil No. 6	
	900-1470 K.C.	32-3041
61G	Oscillator Coil No. 7	
61H	Oscillator Coil No. 8	
	1170-1600 K.C.	32-3041
62	Silver Mica Cond. (370 mmfd.)	30-1110
62X	Silver Mica Cond. (370 mmfd.)	30-1110
63	Spark Filter Assy.	
63A	Spark Filter Choke	32-3276
63B	Resistor (100 ohms, ½ watt)	33-110339
63C	Tubular Cond. (.05 mfd.)	30-4444
63D	Tubular Cond. (.05 mfd.)	30-4444
64	Bakelite Cond. (.05 mfd.)	3615-SG
65	Resistor (150 ohms, Wirewound)	33-3362
66	Electrolytic Cond. (16 mfd., 150 V.)	30-2387
67	Choke Coil	32-1281
68	Tubular Cond. (.05 mfd.)	30-4123
69	Tubular Cond. (.05 mfd.)	30-4123
70	Tubular Cond. (.1 mfd.)	30-4499
71	Tubular Cond. (.05 mfd.)	30-4551
72	Resistor (51,000 ohms, ½ watt)	33-351339
73	Resistor (4,000 ohms, ½ watt)	33-240339
74	No. 3 Control Amp. Coil	32-3275
75	Resistor (750,000 ohms, ½ watt)	33-475339
76	Tubular Cond. (.02 mfd.)	30-4516
77	Resistor (120,000 ohms, ½ watt)	33-412339
78	Tubular Cond. (.01 mfd.)	30-4455
79	Resistor (150,000 ohms, ½ watt)	33-415339
80	Tubular Cond. (.05 mfd.)	30-4123
81	Resistor (99,000 ohms, ½ watt)	33-399339
82	Tubular Cond. (.05 mfd.)	30-4123
83	Resistor (1.5 meg., ½ watt)	33-515339
84	Tubular Cond. (.05 mfd.)	30-4519
85	No. 2 Control Amp. Coil	32-3087
86	Resistor (2700 ohms, ½ watt)	33-227339
87	Tubular Cond. (.05 mfd.)	30-4444
88	Resistor (300 ohms, ½ watt)	33-130339
89	Sensitivity Control (50,000 ohms)	33-5295
90	No. 1 Control Amp. Coil	32-3086
91	Silver Mica Cond. (155 mfd.)	30-1121
92	Air Padder (Secondary Inductor)	31-6268
93	Secondary Inductor	40-6414
94	Wave Switch	42-1454
95	Tuning Cond.	31-2311
95A	Part of Tuning Condenser (95)	
95B	Part of Tuning Condenser (95)	
96	Loop Assembly	38-9882
97	Loop Series Transformer	32-3226
98	Mica Condenser (15 mmfd.)	30-1139
99	Phono-Motor (115 V., 60 cycle)	35-1177
100	Reject Magnet (Record Changer)	42-1552
101	Cam Parallel Switch (Record Changer)	42-1555
102	Adjust. Screw (Tone Arm Reject Switch)	W-2100
103	Terminal Panel Record Changer	
104	Resistor (150,000 ohms)	33-415339
105	Contact Blade (Tone Arm Reject Switch)	56-1663
106	Resistor (150,000 ohms)	33-415339
107	Crystal Pick-up Cartridge	35-2030
108	Pick-up Cable (Record Changer)	41-3504
	Pick-up Cable (Chassis)	41-3496
109	Remote Phono Radio Switch (Operates from Relay 112, mounted in chassis)	42-1526
110	Auxiliary Sw. (Mntd. on Range Sw. Cam)	42-1531
111	Man. Phono Radio Sw. (Mntd. on Chngr.)	42-1533
112	Relay — Part of 109 (Operates Remote Phono Radio Switch 109)	
113	Condenser (.05 mfd., Tubular)	30-4519

MISCELLANEOUS PAR

SCHE. No.	DESCRIPTION	PART No.
	Automatic Record Changer Complete	5-1176
	Arm (Operating Auxiliary Switch)	6-1563
	Bezel	6-1511
	Bezel Gasket Assembly	8-9734
	Cable (Chassis to Changer)	1-3495
	Cable and Plug Assembly (Pilot Lamp)	1-3502
	Cable and Plug (Power Supply)	1-3196
	Cabinet	L-0412A
	Drive Cord Tuning Condenser	-2350
	Drive Cord Pointer	1-2320
	Dial	7-5537
	Disc (Tuning)	7-4766
	Disc (Tone Control)	7-4764
	Disc (Volume Control)	7-4765
	Disc (Wave Switch)	7-4767
	Escutcheon Plate (Radio Phono)	8-5403
	Jewel Pilot Light	7-4777
	Knob (Radio Phono Switch)	7-4627
	Pilot Lamp Assembly (R. H. Bracket)	8-9694
	Pilot Lamp Assembly (L. H. Bracket)	8-9711
	Pilot Lamp Assembly (Station Lights)	8-9709
	Socket Assembly Bull's-eye Jewel	8-9922
	Socket (4 prong, type 80 tube)	7-6044
	Socket (6 prong, type 42 and 78 tubes)	7-6036
	Socket (6 prong, Octal, 6J5G, 6Q7G tubes	7-6086
	Socket (7 prong, Octal, 6J7G tube)	7-6057
	Socket (7 prong, Octal, 6A8G tube)	7-6099
	Speaker	5-1450
	Spring (Drive Cords)	3-8913
	Screw (Bezel)	-1834
	Screw (Mtg. Chassis)	-1345
	Tone Arm Assy. Com. (Record Changer	5-2067
	Turntable Assy. (Record Changer)	5-3039
	Tab Television	7-9447
	Washer (Keyed Washer, Tuning Disc)	-1029
	Washer (Spring Washer, Tuning Disc)	6717

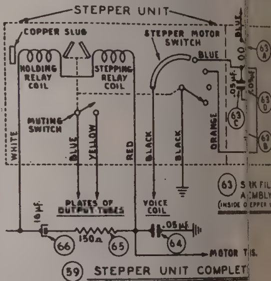


FIG. 2. INTERNAL WIRING OF S PPER UNIT. NUMBERS CORRE OND TO SCHEMATIC,

Replacement Parts — Model 40-516

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9882
1A	Resistor (10,000 ohms, ½ watt)	33-310339
1B	Mica Cond. (250 mmfd.)	61-0033
2	Loop Assy. (Short Wave)	38-9945
2A	Compensator	31-6326
3	Ant. Series Trans. (Broadcast)	32-3291
3X	Compensator	31-6212
4	Ant. Series Trans. (Short Wave)	32-3293
5	Ant. Trans. (Police Shunt)	32-3292
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (2.0 meg., ½ watt)	33-520339
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (150,000 ohms, ½ watt)	33-415339
10	Resistor (12,000 ohms, ½ watt)	33-312339
11	Tubular Cond. (.05 mfd.)	30-4123
12	R. F. Trans. (Broadcast, Pushbutton and Police)	32-3230
12X	Mica Condenser (35 mmfd.)	30-1141
13	R. F. Trans. (Broadcast Manual)	32-3227
13X	Compensator	31-6212
14	R. F. Trans. (Short Wave)	32-3046
14X	Mica Cond. (5 mmfd.)	30-1097
15	Tubular Cond. (.1 mfd.)	30-4455
16	Tubular Cond. (.05 mfd.)	30-4519
17	Tubular Cond. (.1 mfd.)	30-4455
18	Resistor (51,000 ohms, ½ watt)	33-351339
19	Oscillator Trans. (Broadcast)	32-3231
20	Oscillator Trans. (Police)	32-3294
21	Oscillator Trans. (Short Wave)	32-3051
22	Compensator (3 section, oscillator)	31-6266
23	Compensator (Broadcast, Low Frefuency)	31-6230
24	Tracking Cond. (1230 mmfd.)	31-6262
25	Tracking Cond. (3425 mmfd.)	31-6263
26	Mica Cond. (250 mmfd.)	61-0033
27	Resistor (32,000 ohms, ½ watt)	33-332339
28	Resistor (10,000 ohms, ½ watt)	33-310339
29	Resistor (18,000 ohms, ½ watt)	33-318339
30	Resistor (5,000 ohms, 2 watt)	33-250539
31	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
32	Mica Cond. (250 mmfd.)	61-0033
33	1st I. F. Trans. Assy.	32-3089
34	Tubular Cond. (.01 mfd.)	30-4572
34X	Condenser (.05 mfd., 200 V.)	30-4519
35	Resistor (1.0 meg., ½ watt)	33-510339
36	Resistor (330,000 ohms, ½ watt)	33-433339
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	2nd I. F. Trans. Assy.	32-2645
39	Mica Cond. (110 mmfd.)	30-1031
39X	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.01 mfd.)	30-4479
41	Mica Cond. (50 mmfd.)	30-1029
42	Volume Control	33-5300
43	Resistor (70,000 ohms, ½ watt)	33-370339
44	Tubular Cond. (.004 mfd.)	30-4334
45	Resistor (2.0 meg., ½ watt)	33-520339
46	Tubular Cond. (.015 mfd.)	30-4529
47	Resistor (1.0 meg., ½ watt)	33-510339
48	Tubular Cond. (.1 mfd.)	30-4527
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Tubular Cond. (.01 mfd.)	30-4169
51	Resistor (490,000 ohms, ½ watt)	33-449339
52	Resistor (5,000 ohms, ½ watt)	33-250339
53	Resistor (45,000 ohms, ½ watt)	33-345339
54	Tubular Cond. (.02 mfd.)	30-4481
55	Tone Control (3.0 meg.)	33-5287
56	Tubular Cond. (.01 mfd.)	30-4572
57	Tubular Cond. (.01 mfd.)	30-4572
58	Resistor (51,000 ohms, ½ watt)	33-351339
59	Resistor (490,000 ohms, ½ watt)	33-449339
60	Resistor (490,000 ohms, ½ watt)	33-449339
61	Resistor (240,000 ohms, ½ watt)	33-424339
62	Tubular Cond. (.1 mfd.)	30-4499
63	Tubular Cond. (.01 mfd.)	30-4501
64	Output Trans.	32-7996
65	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
66	Tubular Cond. (.01 mfd.)	30-4501
67	Resistor (3,000 ohms, ½ watt)	33-230339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
70	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Resistor (Wirewound, Bias)	33-3364
73	Power Trans. (115 V., 50-60 cycles)	32-8001
	Power Trans. (115 V., 25-40 cycles)	32-8017
74	Bypass Cond. (.05 mfd., 110 V. Plug)	30-4576
75	Pilot Lamp (Bullseye)	34-2210
76	Pilot Lamp Resistor (16 ohms)	33-016331
77	Pilot Lamps (Dial)	34-2064
78	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
78X	Choke Coil	32-1281
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assy. (Volume Control)	35-1151
81	Stepper Unit (Complete)	38-9689
81X	Rotary Switch (Stepper Unit)	42-1468
82	B. C. Resistor (Wirewound, 10 ohms)	33-3363
83	Pilot Lamp Assy. (Station Indicator)	34-2064
84	Switch (Volume Control-Motor)	42-1469
85	Resistor (150 ohms, ½ watt)	33-115339
86	Tubular Cond. (.1 mfd.)	30-4499
87	Tubular Cond. (.1 mfd.)	30-4499
88	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
89	Padder Strip (Pushbuttons)	31-6264
89A	Compensator No. 1	
89B	Compensator No. 2	
	540-1030 K. C., Part of 89	
89C	Compensator No. 3	
89D	Compensator No. 4	
	670-1160 K. C., Part of 89	
89E	Compensator No. 5	
89F	Compensator No. 6	
	900-1470 K. C., Part of 89	
89G	Compensator No. 7	
89H	Compensator No. 8	
	1100-1600 K. C., Part of 89	
90	Elec. Pushbutton Trans. Assy. (8 Trans.)	32-3091
90A	Osc. Trans. No. 1	
90B	Osc. Trans. No. 2	
	540-1030 K. C.	32-3042
90C	Osc. Trans. No. 3	
90D	Osc. Trans. No. 4	
	670-1160 K. C.	32-3042
90E	Osc. Trans. No. 5	
90F	Osc. Trans. No. 6	
	900-1470 K. C.	32-3041
90G	Osc. Trans. No. 7	
90H	Osc. Trans. No. 8	
	1100-1600 K. C.	32-3041
91	Silver Mica Cond. (370 mmfd.)	30-1110
92	Silver Mica Cond. (370 mmfd.)	30-1110
93	Bakelite Cond. (.05 mfd.)	3615SG
94	Resistor (150 ohms)	33-3362
95	Electrolytic Cond. (16 mfd., 200 V.)	30-2356
96	Choke Coil	32-1281
97	Tubular Cond. (.05 mfd.)	30-4123
98	Tubular Cond. (.05 mfd.)	30-4123
99	Tubular Cond. (.1 mfd.)	30-4499
100	Tubular Cond. (.5 mfd.)	30-4551
101	Resistor (4000 ohms, ½ watt)	33-240339
102	Resistor (51,000 ohms, ½ watt)	33-351339
103	No. 3 Control Amp. Trans.	32-3275
104	Tubular Cond. (.02 mfd.)	30-4516
105	Resistor (750 000 ohms, ½ watt)	33-475339
106	Resistor (2700 ohms, ½ watt)	33-227339
107	Tubular Cond. (.1 mfd.)	30-4455
108	Resistor (120,000 ohms, ½ watt)	33-412339
109	Tubular Cond. (.05 mfd.)	30-4123
110	Resistor (99,000 ohms, ½ watt)	33-399339
111	Tubular Cond. (.05 mfd.)	30-4123
112	Resistor (150,000 ohms, ½ watt)	33-415339
112X	Tubular Cond. (.05 mfd.)	30-4123
113	Resistor (1.5 meg., ½ watt)	33-515339
114	Tubular Cond. (.05 mfd.)	30-4519
115	No. 2 Control Amp. Trans.	32-3087
116	Tubular Cond. (.05 mfd.)	30-4444
117	Sensitivity Control	33-5295
118	Resistor (300 ohms, ½ watt)	33-130339
119	No. 1 Control Amp. Trans.	2-308
120	Silver Mica Cond. (130 mmfd.)	0-112
121	Compensator (Secondary Inductor)	1-626
122	Secondary Inductor (Mystery Tuning)	0-641
123	Wave Switch	2-153
124	Tuning Cond.	1-241

WIRELESS REMOTE CONTRC UN

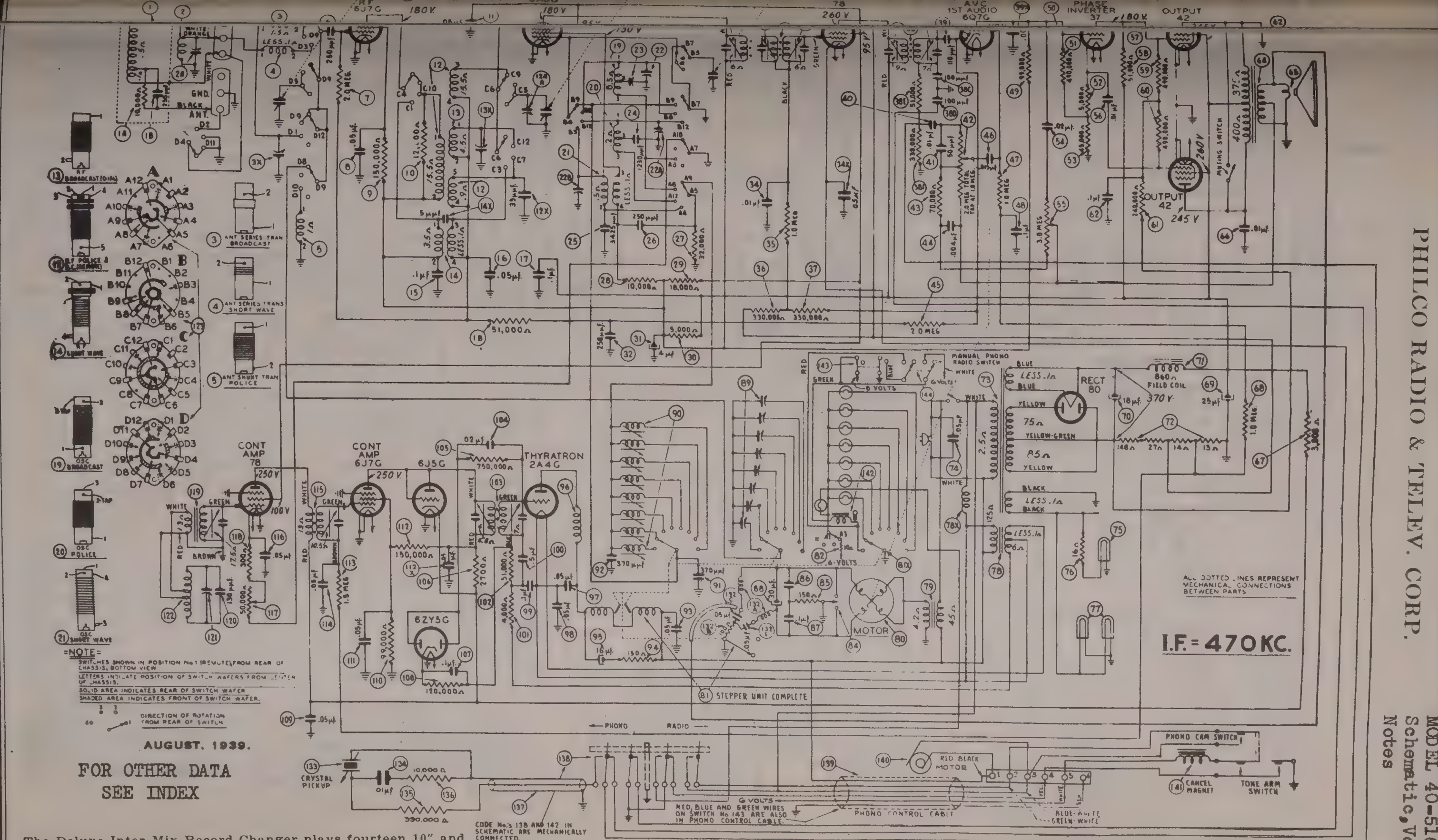
SCHE. No.	DESCRIPTION	PART No.
125	Primary Inductor	2-309
126	Silver Mica Cond. (200 mmfd.)	-111
127	Tubular Cond. (.05 mfd.)	-451
128	Air Padder	1-626
129	Resistor (500 ohms, ½ watt)	-150
130	Mystery Pack (Battery)	1-802
131	Dial Unit (Pulser)	-970
132	Spark Filter Assy. (Inside of Sepper Unit)	-989
132A	Spark Filter Choke	1-327
132B	Resistor (100 ohms, ½ watt)	-110
132C	Tubular Cond. (.05 mfd.)	-444
132D	Tubular Cond. (.05 mfd.)	-444
133	Crystal Pickup Bakelite Case	-203
134	Condenser (.01 mfd., 200 V.)	-458
135	Resistor (330,000 ohms)	-433
136	Resistor (10,000 ohms)	-310
137	Pickup Cable	-350
138	Remote Phono Relay and Switch	-152
139	Cable Radio-Phono Switch	-351
140	Motor (Record Changer Mech.)	-117
141	Cancel Magnet	-155
142	Relay (Part of 138) Operates Remote Radio-Phono Switch 138	
143	Auxiliary Switch (Mounted on Range Switch Cam)	-153
144	Manual Radio-Phono Switch (Mounted on Changer) Removes power from record changer when range switch is in Brdcst., Police, or S. W.	-153

MISCELLANEOUS PART

DESCRIPTION	PART No.
Bezel	993
Bezel Gasket and Staple Assy.	973
Cable (Power Supply)	317
Cable and Plug (Pilot Lamp Assy.)	350
Dial	553
Drive Cord (Tuning Cond.)	231
Drive Cord (Pointer)	232
Disc (Tuning)	476
Disc (Volume)	476
Disc (Wave Switch)	476
Disc (Tone Control)	476
Inter-Mix Record Changer (See Bulletin 332 for Service Information and Additional Parts)	117
Knob Phono-Switch	462
Loop Assembly (Broadcast)	988
Loop Assembly (Shortwave)	994
Plate (Radio-Phono)	540
Pilot Lamp Assy.	992
Pilot Lamp Assy. (R. H. Bracket)	969
Pilot Lamp Assy. (L. H. Bracket)	971
Pilot Lamp Assy. (Station Lights)	970
Pilot Lamp Assy. (Cabinet Bullseye)	871
Pilot Light Jewel (Bullseye)	477
Speaker	145
Socket (4 prong, type 80 tube)	504
Socket (5 prong type 37 tube)	303
Socket (6 prong, type 42 and 78 tubes)	303
Socket (Octal, type 6J5G, 6Q7G tubes, etc.)	306
Socket (Octal, type 6J7G tube)	305
Socket (Octal, type 6A8G tube)	309
Spring (Drive Cords)	[illegible]
Tab (Television)	[illegible]
Washer (Keyed Washer Tuning Disc)	102
Washer (Spring Washer Tuning Disc)	171

PHILCO RADIO & TELEV. CORP.

MODEL 40-516
Schematic,Voltage
Notes


RF 6J7G
180 V
AVC 1ST AUDIO 6Q7G
78
260 V
PHASE INVERTER 37
180 V
OUTPUT 42
OUTPUT 42
260 V
245 V
MUTING SWITCH
400Ω
37Ω
I.F. = 470 KC.
ALL DOTTED LINES REPRESENT MECHANICAL CONNECTIONS BETWEEN PARTS
RECT 80
FIELD COIL 860Ω
370 V
MANUAL PHONO RADIO SWITCH
6 VOLTS
MOTOR
STEPPER UNIT COMPLETE
CONT AMP 78
250 V
100 V
CONT AMP 6J7G
250 V
6J5G
THYRATRON 2A4G
6ZY5G
CRYSTAL PICKUP
PHONO
RADIO
PHONO CONTROL CABLE
RED, BLUE AND GREEN WIRES ON SWITCH No 143 ARE ALSO IN PHONO CONTROL CABLE.
CODE No.'s 138 AND 142 IN SCHEMATIC ARE MECHANICALLY CONNECTED.
RED BLACK MOTOR
PHONO CAM SWITCH
CANCEL MAGNET
TONE ARM SWITCH
ANT SERIES TRAN BROADCAST
ANT SERIES TRANS SHORT WAVE
ANT SHUNT TRAN POLICE
BROADCAST (DIAL)
RF POLICE & SHORT WAVE
SHORT WAVE
OSC BROADCAST
OSC POLICE
OSC SHORT WAVE
=NOTE=
SWITCHES SHOWN IN POSITION No 1 (REMOTE) FROM REAR OF CHASSIS, BOTTOM VIEW
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.
SOLID AREA INDICATES REAR OF SWITCH WAFER
SHADED AREA INDICATES FRONT OF SWITCH WAFER.
DIRECTION OF ROTATION FROM REAR OF SWITCH

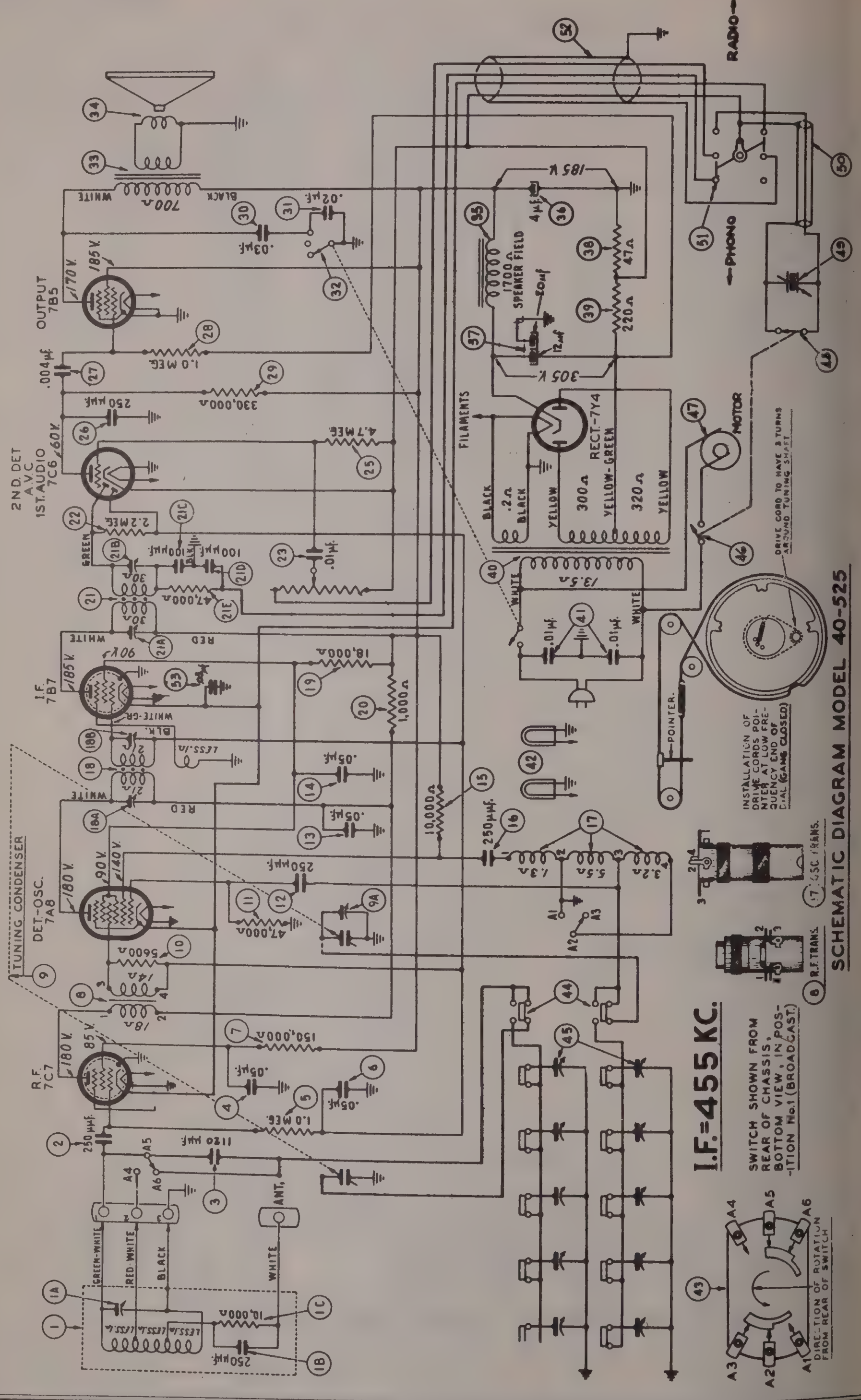
AUGUST, 1939.

FOR OTHER DATA
SEE INDEX

The Deluxe Inter-Mix Record Changer plays fourteen 10" and 12" records intermixed, fifteen 10" or thirteen 12" records at one loading. The record changer can be operated manually or from the wireless remote control circuit of the radio receiver. When using the wireless remote control to operate the phonograph, the Inter-Mix Record Changer can be started and stopped, records rejected and volume adjusted, from the remote control unit. The automatic record changer is selected by dialing "PHONO" position. This operates relay (142) which pulls "Radio-Phono" switch (138) to the "PHONO" position. Records are also rejected by dialing the "PHONO" position on the wireless remote control unit. Phono relay (142) is connected to No. 8 contact of the pilot lamp section of rotary switch (81X).

MODEL 40-525(121)
Schematic,Voltage

PHILCO RADIO & TELEV. CORP.

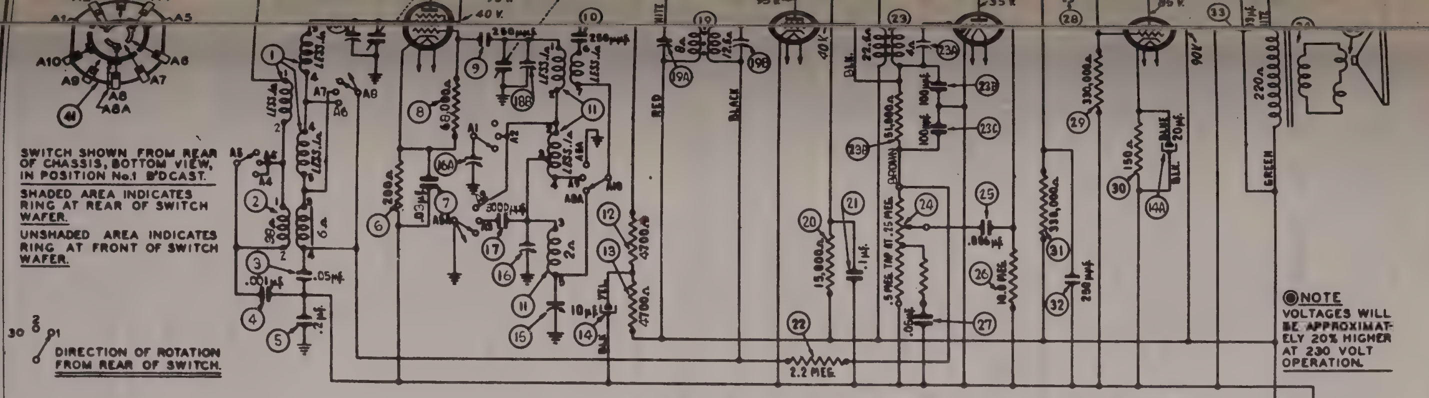


SCHEMATIC DIAGRAM MODEL 40-525

VOLTAGES INDICATED AT TUBE ELEMENTS WERE MEASURED WITH A

PHILCO RADIO & TELEV. CORP.

MODEL 40-710
Schematic, Voltage
Chassis, Trimmers


SWITCH SHOWN FROM REAR OF CHASSIS, BOTTOM VIEW, IN POSITION No.1 B'DCAST.
SHADED AREA INDICATES RING AT REAR OF SWITCH WAFER.
UNSHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
DIRECTION OF ROTATION FROM REAR OF SWITCH.
NOTE VOLTAGES WILL BE APPROXIMATELY 20% HIGHER AT 230 VOLT OPERATION.
A1
A5
A6
A7
A8
A8A
A9
A10
40 V.
250µµf
68,000Ω
200Ω
.03µf
.05µf
.001µf
.2µf
3000µµf
10µf
4700Ω
RED
BLACK
15,000Ω
.1µf
2.2 MEG.
51,000Ω
BROWN
.5 MEG TAP AT .25 MEG.
100µµf
.006µf
10.0 MEG.
330,000Ω
250µµf
150Ω
BLUE
BLK.
20µf
GREEN
220Ω
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
16A
17
18B
19
19A
19B
20
21
22
23
23A
23B
23C
24
25
26
27
28
29
30
31
32
33
14A
41

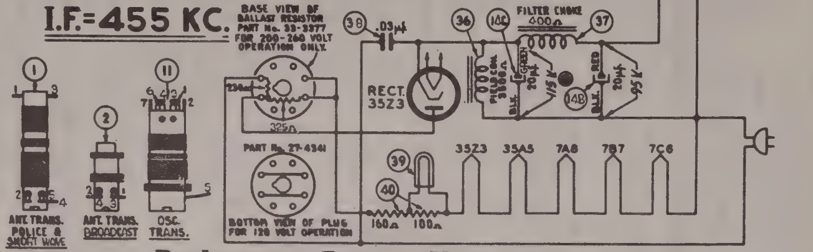
POWER SUPPLY: 100-130 or 200-260 volts A. C. or D. C. To operate the receiver on 200-260 volts A. C. or D. C. requires the use of a Ballast resistor, Part No. 33-3377 which can be obtained from your distributor. The Ballast resistor is inserted in the socket provided on the top of the chassis.

POWER CONSUMPTION: 120 volts, 35 watts; 240 volts, 70 watts.

TUNING RANGES:

530 to 1720 K. C.	2.3 to 7.4 M. C.	7.3 to 22 M. C.

I.F.=455 KC.



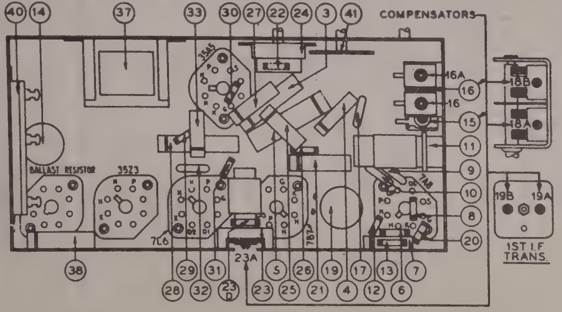


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

JULY, 1939.

FOR ALIGNMENT SEE INDEX

Replacement Parts — Model 40-710

SCHE. No.	DESCRIPTION	PART No.
1	Ant. Trans. (Police, Short Wave)	32-3295
2	Ant. Trans. (Broadcast)	32-3166
3	Tubular Cond. (.05 mfd.)	30-4609
4	Tubular Cond. (.001 mfd.)	30-4601
5	Tubular Cond. (.2 mfd.)	30-4594
6	Resistor (200 ohms, ½ watt)	33-120339
7	Tubular Cond. (.03 mfd.)	30-4585
8	Resistor (68,000 ohms, ½ watt)	33-368339
9	Mica Cond. (250 mmfd.)	30-1119
10	Mica Cond. (250 mmfd.)	30-1119
11	Oscillator Trans.	32-3296
12	Resistor (4700 ohms, ½ watt)	33-247339
13	Resistor (4700 ohms, ½ watt)	33-247339
14	Electrolytic Cond. (20,20,20,10 mf. 250V.)	30-2436
15	Compensator (single)	31-6289
16	Compensator (2 section)	31-6323
17	Mica Cond. (3000 mmfd.)	30-1028
18	Tuning Condenser	31-2410
19	1st I. F. Trans. Assy.	32-3297
20	Resistor (15,000 ohms, ½ watt)	33-315339
21	Tubular Cond. (.1 mfd.)	30-4586
22	Resistor (2.2 meg., ½ watt)	33-522339
23	2nd I. F. Trans. Assy.	32-2674
24	Volume Control (.5 meg.)	33-5336
25	Tubular Cond. (.006 mfd.)	30-4583
26	Resistor (10.0 meg., ½ watt)	33-610339
27	Tubular Cond. (.05 mfd.)	30-4519
28	Tubular Cond. (.006 mfd.)	30-4610
29	Resistor (330,000 ohms, ½ watt)	33-433339
30	Resistor (150 ohms, ½ watt)	33-115336
31	Resistor (330,000 ohms, ½ watt)	33-433339
32	Mica Cond. (250 mmfd.)	30-1119
33	Tubular Cond. (.03 mfd.)	30-4585
34	Output Trans.	32-8095
35	Cone and Voice Coil Assy. (Spkr. Part No. 36-1486-2)	36-4126
36	Field Coil (Replace Spkr. Part No. 36-1486)	
37	Filter Choke	32-8073
38	Tubular Cond. (.03 mfd.)	30-4520
39	Pilot Lamp	34-2068E
40	Filament Resistor	33-3372
41	Wave Switch	42-1534

PHILCO RADIO & TELEV. CORP.

ALIGNMENT MODELS 40-710, 40-715

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver, a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 recommended. These testers also contain an audio o which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Philco Part No. 45-2610.

MODEL 40 -710 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit with the Philco aligning adaptor, Part No. 45-2767, as follows:

Remove the 7C6 tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

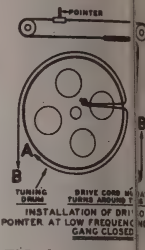


FIG. 1. DIAL CALI

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECI INSTRUC
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	7A8	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	23A, 19B, 19A	
2	Ant. & Chassis	400 ohms	20 M. C.	20 M. C.	Range Switch "S. W. 2"	18B, 18A	Note
3	Ant. & Chassis	400 ohms	7.0 M. C.	7.0 M. C.	Range Switch "S. W. 1"	16A	Rollga
4	Ant. & Chassis	200 mmfd.	1400 K. C.	1400 K. C.	Vol. Max. Range Switch "Brdcst"	16	Note
5	Ant. & Chassis	200 mmfd.	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	15	Rollgang I Oper.

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial poin first mark on the left edge (low frequency end) of the broa

NOTE C — When adjusting compensator (18B) be sure the fundamental signal (20 M. C.) instead of the image si compensator is correctly adjusted, the image signal will b turning dial 910 K. C. below the fundamental signal, wh 19.090 M. C.

MODEL 40-715 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

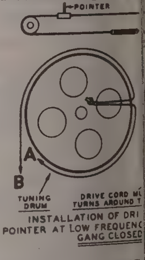


FIG. 1. DIAL CALIB

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIA INSTRUCT
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8EG	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	24, 16B, 16A	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	9A, 15A	Note
3	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	11	Roll Gang Oper.
4	Ant. & Grnd.	400 ohms	7.0 M. C.	7.0 M. C.	Range Switch "Police"	9	Roll Ga
5	Ant. & Grnd.	400 ohms	20 M. C.	20 M. C.	Range Switch "S.W."	5A, 5	Note

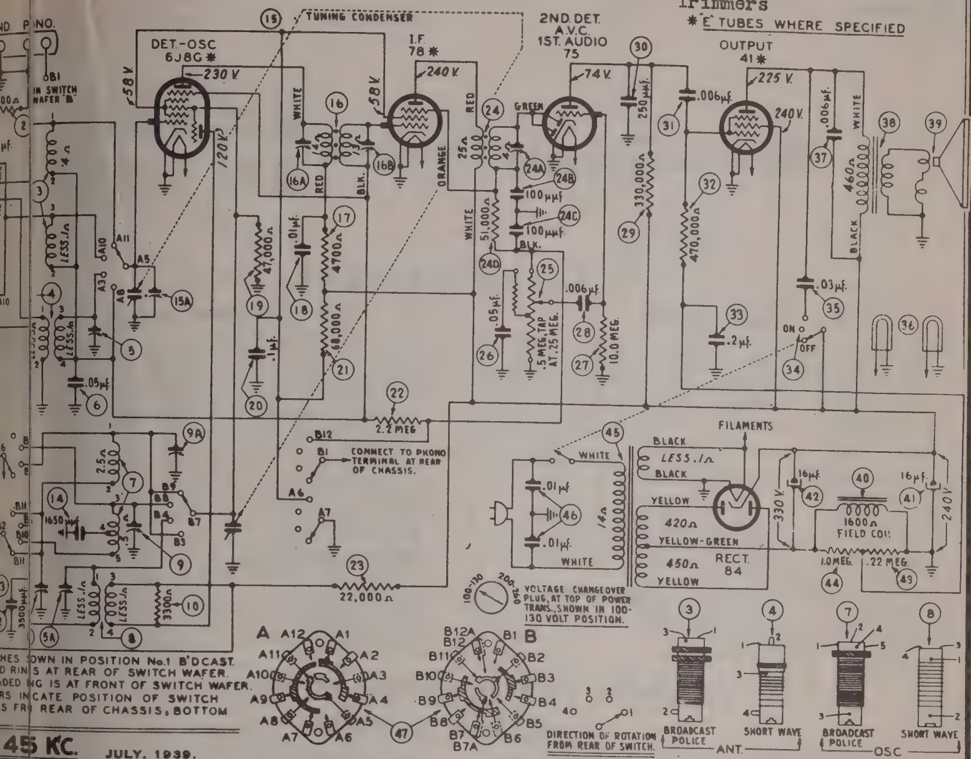
NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer mark on the left edge (low frequency end) of the broadcas

NOTE C — When adjusting compensator (5A) be sure to fundamental signal (20 M. C.) instead of the image sig compensator is correctly adjusted, the image signal will b turning dial 910 K. C. below the fundamental signal, wh 19.090 M. C.

PHILCO RADIO & TELEV. CORP.

MODEL 40-715(121)
Schematic,Voltage,Chassis
Trimmers



HES SOWN IN POSITION No.1 B'DCAST.
D RINS AT REAR OF SWITCH WAFER.
ADED NG IS AT FRONT OF SWITCH WAFER.
RS INCATE POSITION OF SWITCH
S FR REAR OF CHASSIS, BOTTOM

45 KC.

JULY, 1939.

Replacement Parts — Model 40-715

DESCRIPTION	PART No.
Tubular ond. (.001 mfd.)	30-4592
Resisto 10,000 ohms, ½ watt)	33-310339
Antenna rans. (Broadcast, Police)	32-3141
Antenna rans. (Short Wave)	32-3143
Compen or (2 section)	31-6287
Compen or (Part of 5)	
Tubular ond. (.05 mfd.)	30-4609
Oscillat Trans. (Broadcast, Police)	32-3142
Oscillat Trans. (Short Wave)	32-3144
Compen or (2 section)	31-6287
Compen or (part of 2)	
Resisto 3300 ohms, ½ watt)	33-233339
Compen or (1 section)	31-6289
Mica C . (3500 mmfd.)	30-1094
Mica C . (250 mmfd.)	30-1119
Mica C . (1650 mmfd.)	5877
Tuning ondenser	31-2357
1st I. Transformer	32-3139
Part of	
Part of	
Resisto 4700 ohms, ½ watt)	33-247339
Tubular ond. (.01 mfd.)	30-4572
Resisto 47,000 ohms, ½ watt)	33-347339
Tubular ond. (.1 mfd.)	30-4527
Resisto 68,000 ohms, ½ watt)	33-368439
Resisto 2.2 meg., ½ watt)	33-522339
Resisto 22,000 ohms, ½ watt)	33-322339
2nd I. Transformer	32-3140
Part of	
Part of	
Part of	
Volume ontrol (.5 meg.)	33-5305
Tubular ond. (.05 mfd.)	30-4519
Resisto 10.0 meg., ½ watt)	33-610339
Tubular ond. (.006 mfd.)	30-4583
Resisto 330,000 ohms, ½ watt)	33-433339
Mica C . (250 mmfd.)	30-1119
Tubular ond. (.006 mfd.)	30-4610
Resisto 470,000 ohms, ½ watt)	33-447339
Tubular ond. (.2 mfd.)	30-4587
Tone C rol and On-Off Switch	42-1481
Tubular ond. (.03 mfd.)	30-4517
Pilot L ps	34-2064E
Tubular ond. (.03 mfd.)	30-4551
Output ansformer	32-8018
Cone a Voice Coil Assembly (Spkr art No. 36-1452-2)	36-4193
Field C (Replace Spkr. Part No. 36-1452)	
Electrol c Cond. (16 mfd., 300 V.)	30-2363
Electrol c Cond. (16 mfd., 400 V.)	30-2364
Resisto 22 meg., ½ watt)	33-422339
Resisto 1.0 meg., ½ watt)	33-510339
Power nsformer (100-130 V., 200- V., 50-60 cycles)	32-8008

SCHE. No.	DESCRIPTION	PART No.
46	Line Cond. (.01-.01 mfd.)	3903-ODG
47	Wave Switch	42-1480
	MISCELLANEOUS PARTS	
	Clamp (Dial Mounting)	56-1271
	Cabinet	10365A
	Cable and Plug (Power Supply)	L-2289
	A. C. Plug (Special)	L-1367
	Dial	27-5469
	Drive Cord Assembly (Pointer Operation)	31-2359
	Gasket (Dial Mounting)	27-9258
	Knobs (Tuning, Tone, Volume, Wave Sw.)	27-4332

SCHE. No.	DESCRIPTION	PART No.
	Pilot Lamp Socket Assembly	38-9796
	Pointer	56-1276
	Speaker	36-1472
	Socket (5 prong, type 84 tube)	27-6035
	Socket (6 prong, type 41, 75 & 78 tubes)	27-6036
	Socket (8 prong, Octal, type 6J8G tube)	27-6058
	Spring Clip (Coil Mounting)	28-5002
	Spring (Drive Cord)	28-8913
	Station Card Shield	27-5437
	Station Card Holder	56-1273
	Tuning Condenser Drum	31-2353
	Tuning Shaft and Bracket Assembly	31-2356

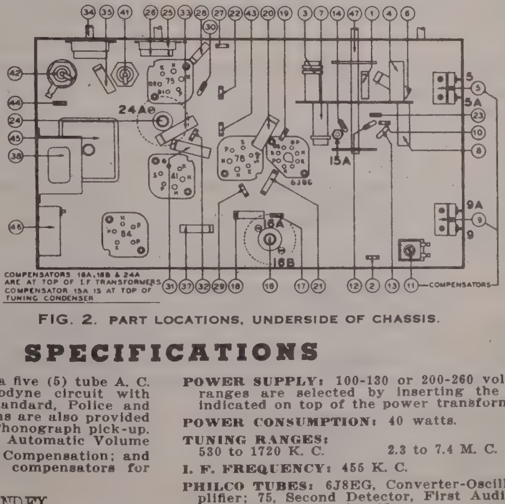


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MANY OF THE PARTS IN THIS PHILCO SUCH AS CONDENSERS AND RESISTORS, ARE HELD TO MUCH CLOSER TOLERANCE THAN STANDARD REPLACEMENT PARTS. GENUINE PHILCO REPLACEMENT PARTS MUST BE USED TO OBTAIN SATISFACTORY PERFORMANCE OF THIS MODEL.

SPECIFICATIONS

C CI UIT: Model 40-715, code 121, is a five (5) tube A. C.
rate radio employing a superheterodyne circuit with
ee t ing ranges for reception of Standard, Police and
rtw e Broadcast Stations. Connections are also provided
atta ing a high impedance Electric Phonograph pick-up.
addi n other features of design are: Automatic Volume
trol three Point Tone Control; Bass Compensation; and
cial mperature and humidity-proof compensators for
acin frequency drift to a minimum.

FOR ALIGNMENT SEE INDEX

POWER SUPPLY: 100-130 or 200-260 volts A. C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the power transformer.

POWER CONSUMPTION: 40 watts.

TUNING RANGES:

530 to 1720 K. C.	2.3 to 7.4 M. C.	7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio and A. V. C.; 41E, Audio Output; 84, Rectifier.

PHILCO RADIO & TELEV. CORP.

Philco-Tropic Models 40-725, code 121 40-755, code 121

SPECIFICATIONS

Model 40-725

TYPE CIRCUIT: Model 40-725, code 121, is a six (6) tube A. C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation, and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50-60 cycle, 60 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio, and A. V. C.; 41E, Pentode Audio Output; 84, Rectifier.

AUDIO OUTPUT: 2.5 watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used and a good ground connection to the nearest water pipe or any other good ground.

CABINET DIMENSIONS:
Height, 14⅛". Width, 18⅛". Depth, 10¼".

Model 40-755

TYPE CIRCUIT: Model 40-755, code 121, is an eight (8) tu
operated receiver employing a superheterodyne circ
three tuning ranges for reception of Standard, Po
Shortwave Broadcast Stations. Connections are also
for attaching a high impedance Electric Phonograph
Other features of design are: Automatic Volume Contr
tinuously Variable Tone Control; Bass Compensation
Pull Pentode Audio Output; Tuning Resonance Indica
special compensation for reducing frequency drif
minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50 to 60 cycle, 8
The voltage ranges are selected by inserting the
indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converte
lator; 78E, I. F. Amplifier; 75, Second Detector, First
and A. V. C.; 76, Inverter; two 42E, Pentode Audio
80, Rectifier.

AUDIO OUTPUT: 6 watts.

AERIAL AND GROUND: Same as Model 40-725.

CABINET DIMENSIONS:
Height, 14⅝". Width, 20". Depth

ALIGNING COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and
recommended. These testers also contain an audio
meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Phil
No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used
aligning indicator, it should be connected to the pla
screen terminals of the 41 tube. Adjust the meter for the
volt A. C. scale.

After connecting the aligning meter, adjust the compe
in the order as shown in the tabulation below. Locations
compensators are shown in Fig. 1. If the output meter
goes off scale when adjusting the compensators, redu
strength of the signal from the generator.

Opera-tions in Order	SIGNAL GENERATOR			RECEIVER				SPECI INSTRUC
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators Model 40-725	Adjust Compensators Model 40-755	
1	6J8G Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble	38B, 38A, 32B, 32A	39B, 39A, 33B, 33A	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	27, 22B, 22A	27, 32B, 32A	Note
3	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	23	23	Roll Ga
4	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	27, 22B, 22A	27, 32B, 32A	
5	Ant. & Grnd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	27A	27A	Roll Ga
6	Ant. & Grnd.	400 ohms	20 M. C.	20 M. C.	Vol. Max. Tone Treble Range Switch "S.W.2"	29, 15, 5	29, 16, 5	Note

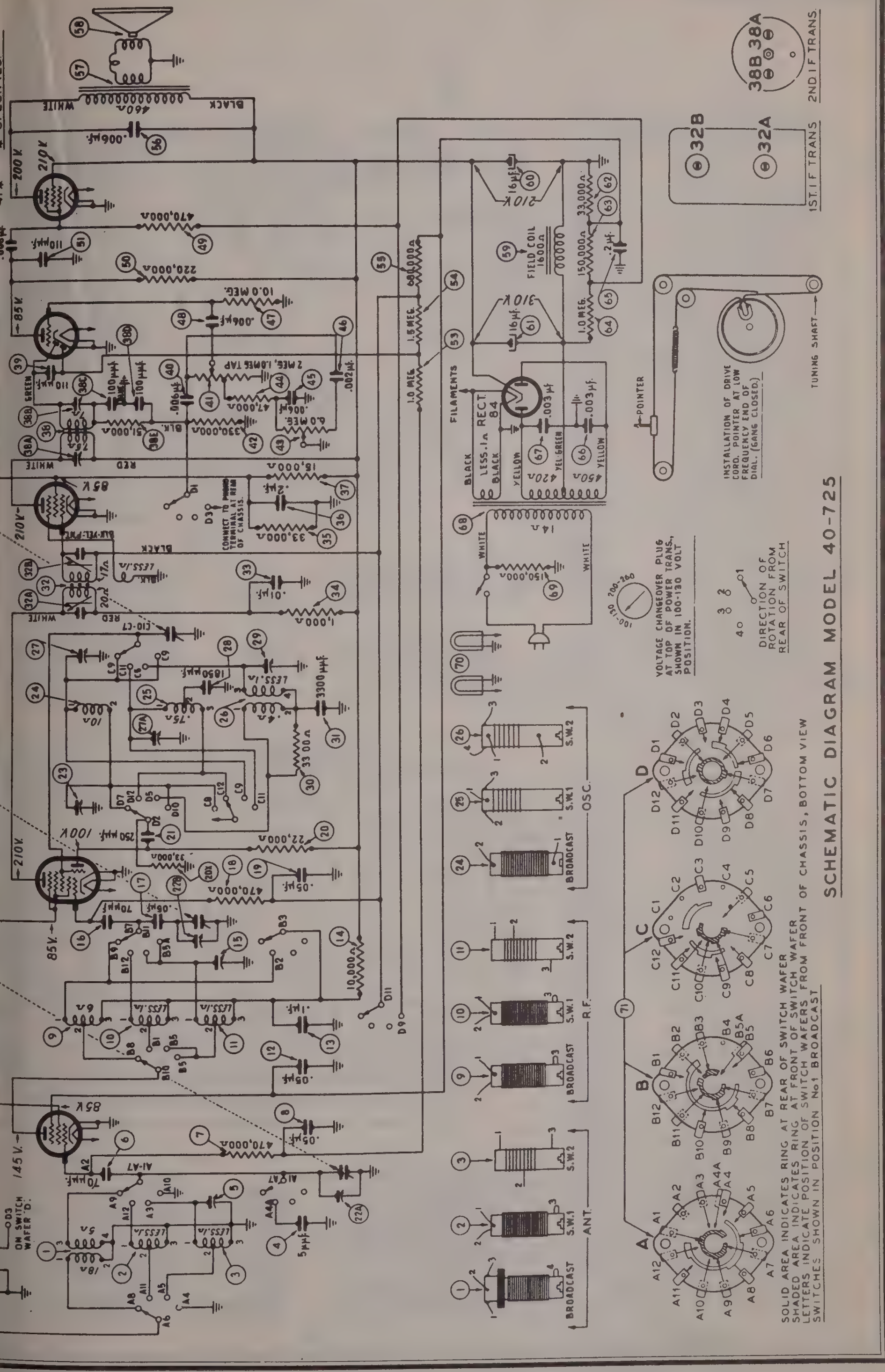
NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on
mark on the left edge (low frequency end) of the broadcast

NOTE C — When adjusting compensator (29) be sure to tun
fundamental signal (20 M. C.) instead of the image signal.
compensator is correctly adjusted, the image signal will be 91
below the fundamental signal, which will be 19.090 M. C.

PHILCO RADIO & TELEV. CORP.

MODEL 40-725(121)
Schematic, Voltage



CONNECT TO PHONO TERMINAL AT REAR OF CHASSIS.

INSTALLATION OF DRIVE CORD. POINTER AT LOW FREQUENCY END OF DIAL. (GANG CLOSED.)

VOLTAGE CHANGEOVER PLUG AT TOP OF POWER TRANS. SHOWN IN 100-130 VOLT POSITION.

DIRECTION OF ROTATION FROM REAR OF SWITCH

SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW
SWITCHES SHOWN IN POSITION No.1 BROADCAST

SCHEMATIC DIAGRAM MODEL 40-725

MODEL 40-725(121)
MODEL 40-755(121)
Chassis,Parts

PHILCO RADIO & TELEV. CORP.

Model 40-725, Code 121 Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Tubular Condenser (5 mmfd.)	30-1120
5	Compensator (Antenna S. W. 2)	31-6288
6	Mica Condenser (70 mmfd.)	30-1117
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Tubular Condenser (.05 mfd.)	30-4609
9	R. F. Transformer (Broadcast)	32-3189
10	R. F. Transformer (S. W. 1)	32-3190
11	R. F. Transformer (S. W. 2)	32-3197
12	Tubular Condenser (.05 mfd.)	30-4519
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (10,000 ohms, 1 watt)	33-310439
15	Compensator (R. F., S. W. 2)	31-6288
16	Mica Condenser (70 mmfd.)	30-1117
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Tubular Condenser (.05 mfd.)	30-4609
20	Resistor (22,000 ohms, 1/2 watt)	33-322339
20X	Resistor (33,000 ohms, 1/2 watt)	33-333339
21	Mica Condenser 250 mmfd.)	30-1119
22	Tuning Condenser Assembly	31-2386
23	Compensator (Broadcast series)	31-6287
24	Oscillator Transformer (Broadcast)	32-3254
25	Oscillator Transformer (S. W. 1)	32-3094
26	Oscillator Transformer (S. W. 2)	32-3102
27 27A	Compensator (Broadcast shunt) Compensator (S. W. 1)	31-2687
28	Tracking Condenser (1850 mmfd.)	31-6310
29	Compensator (S. W. 2)	31-6288
30	Resistor (3300 ohms, 1/2 watt)	33-233339
31	Tracking Condenser (3300 mmfd.)	31-6311
32	1st I. F. Transformer Assembly	32-3187
33	Tubular Condenser (.01 mfd.)	30-4572
34	Resistor (1.000 ohms, 1/2 watt)	33-210339
35	Resistor (33,000 ohms, 1/2 watt)	33-333339
36	Tubular Condenser (.2 mfd.)	30-4587
37	Resistor (15,000 ohms, 1 watt)	33-315439
38	2nd I. F. Transformer Assemvly	32-3133
39	Mica Condenser (110 mmfd.)	30-1118
40	Tubular Condenser (.006 mfd.)	30-4583
41	Volume Control (2 meg.)	33-5298
42	Resistor (330,000 ohms, 1/2 watt)	33-433339
43	Tone Control and On-Off Switrh	33-5299
44	Resistor (47,000 ohms, 1/2 watt)	33-347339
45	Tubular Condenser (.006 mfd.)	30-4583
46	Tubular Condenser (.002 mfd.)	30-4579
47	Resistor (10.0 meg., 1/2 watt)	33-610339
48	Tubular Condenser (.006 mfd.)	30-4583
49	Resistor (470,000 ohms, 1/2 watt)	33-447339
50	Resistor 220,000 ohms, 1/2 watt)	33-422339
51	Mica Condenser (110 mmfd.)	30-1118
52	Tubular Condenser (.006 mfd.)	30-4610
53	Resistor (1.0 meg., 1/2 watt)	33-510339
54	Resistor (1.5 meg., 1/2 watt)	33-515339
55	Resistor (680,000 ohms, 1/2 watt)	33-468339
56	Tubular Condenser (.006 mfd.)	30-4591
57	Output Transformer	32-8018
58	Cone and Voice Coil Assembly (Speaker Part No. 36-1452-2)	36-4103
59	Field Coil (Replace Spkr. Part No. 36-1452)	
60	Electrolytic Condenser (16 mfd., 300 V.)	30-2319
61	Electrolytic Condenser (16 mfd., 400 V.)	30-2364
62	Resistor (33,000 ohms, 1/2 watt)	33-333339
63	Resistor (150,000 ohms, 1/2 watt)	33-415339
64	Resistor (1.0 meg., 1/2 watt)	33-510339
65	Tubular Condenser (.2 mfd.)	30-4587
66	Tubular Condenser (.003 mfd.)	30-4606

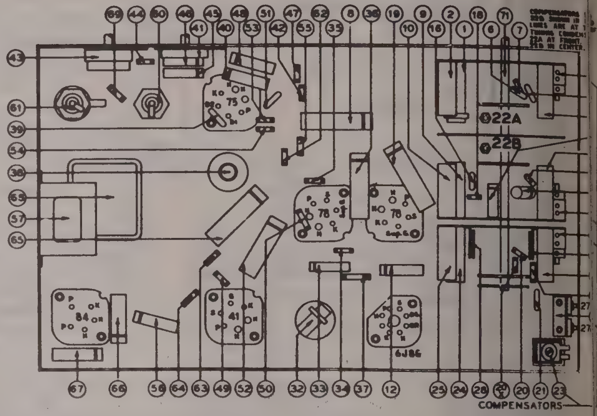


FIG. 1. MODEL 40-725 PART LOCATIONS, UNDERSIDE OF CHASSIS.

SCHE. No.	DESCRIPTION	PART No.
67	Tubular Condenser (.003 mfd.)	30-4606
68	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8006
69	Resistor (150,000 ohms, 1/2 watt)	33-415339
70	Pilot Lamps	34-2064E
71	Wave Switch	42-1504

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1222
Cable and Plug (Power Supply)	L-2289
Special Export Power Plug	L-1367
Cabinet	10417A
Dial	27-5544
Drive Cord Assembly	31-2330

SCHE. No.	DESCRIPTION
	Felt Strip (Bezel Mounting)
	Knob (Tuning)
	Knob (Tuning)
	Knob (Tone Control)
	Knobs (Volume and Wave Switch)
	Pilot Lamp Socket Assembly
	Pointer
	Screws (Bezel Mounting)
	Spring (Drive Cord)
	Spring Clip (Coil Mounting)
	Socket (5 prong, type 84 tube)
	Socket (6 prong, type 78, 41, 75 tubes)
	Socket (Octal, type 6J8G tube)
	Speaker
	Tuning Drum and Coupling
	Vernier Drive (Tuning)

Model 40-755, Code 121 Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Mica Condenser (5 mmfd.)	30-1120
5	Compensator	31-6288
6	Mica Condenser (70 mmfd.)	30-1117
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Tubular Condenser (.05 mfd.)	30-4609
9	R. F. Transformer (Broadcast)	32-3189
10	R. F. Transformer (S. W. 1)	32-3190
11	R. F. Transformer (S. W. 2)	32-3197
12	Tubular Condenser (.05 mfd.)	30-4519
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (10,000 ohms, 1 watt)	33-310439
15	Tubular Condenser (.05 mfd.)	30-4609
16	Compensator	31-6288
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Resistor (22,000 ohms, 1/2 watt)	33-322339
20	Mica Condenser (70 mmfd.)	30-1117
21	Mica Condenser 250 mmfd.)	30-1119
22	Resistor (33,000 ohms, 1/2 watt)	33-333339
23	Compensator	31-6289
24	Oscillator Transformer (Broadcast)	32-3254
25	Oscillator Transformer (S. W. 1)	32-3094
26	Oscillator Transformer (S. W. 2)	32-3102
27	Compensator (2 sections)	31-6287
28	Tracking Condenser (1850 mmfd.)	31-6310
29	Compensator	31-6288
30	Resistor (3300 ohms, 1/2 watt)	33-233339
31	Tracking Condenser (3300 mmfd.)	31-6311
32	Tuning Condenser Assembly	31-2386
33	1st I. F. Transformer Assembly	32-3187
34	Tubular Condenser (.01 mfd.)	30-4572
35	Resistor (1.000 ohms, 1/2 watt)	33-210339
36	Resistor (33,000 ohms, 1/2 watt)	33-333339
37	Tubular Condenser (.5 mfd.)	30-4528
38	Resistor (15,000 ohms, 1 watt)	33-315439
39	2nd I. F. Transformer Assembly	32-3188
40	Mica Condenser (110 mmfd.)	30-1118
41	Tubular Condenser (.006 mfd.)	30-4583
42	Volume Control (2.0 meg.)	33-5298
43	Resistor (330,000 ohms, 1/2 watt)	33-433339
44	Tone Control and On-Off Switch	33-5299
45	Resistor (68,000 ohms, 1/2 watt)	33-347339
46	Tubular Condenser (.006 mfd.)	30-4583
47	Tubular Condenser (.002 mfd.)	30-4579
48	Resistor 10.0 meg., 1/2 watt)	33-610339
49	Tubular Condenser (.006 mfd.)	30-4583
50	Resistor (100,000 ohms, 1/2 watt)	33-410339
51	Resistor (470,000 ohms, 1/2 watt)	33-447339
52	Mica Condenser (250 mmfd.)	30-1119
53	Tubular Condenser (.006 mfd.)	30-4610
54	Resistor (4,700 ohms, 1/2 watt)	33-247339
55	Resistor (27,000 ohms, 1/2 watt)	33-327339
56	Resistor (33,000 ohms, 1/2 watt)	33-333339
57	Resistor (1.0 meg., 1/2 watt)	33-510339
58	Resistor (1.0 meg., 1/2 watt)	33-510339
59	Resistor (470,000 ohms, 1/2 watt)	33-447339
60	Resistor (470,000 ohms, 1/2 watt)	33-447339
61	Resistor (470,000 ohms, 1/2 watt)	33-447339
62	Tubular Condenser (.006 mfd.)	30-4610
63	Tubular Condenser (.006 mfd.)	30-4610
64	Tubular Condenser (.003 mfd.)	30-4582
65	Output Transformer	32-8058
66	Cone and Voice Coil Assembly (Speakker Part No. 36-1453-4) (Speaker Part No. 36-1460-3)	 36-4104 36-4105
67	Field Coil Replace Spkr. Part No. 36-1453 (T Cabinet) Replace Spkr. Part No. 36-1460 (XX Cabinet)	
68	Electrolytic Condenser (16 mfd., 400 V.)	30-2364

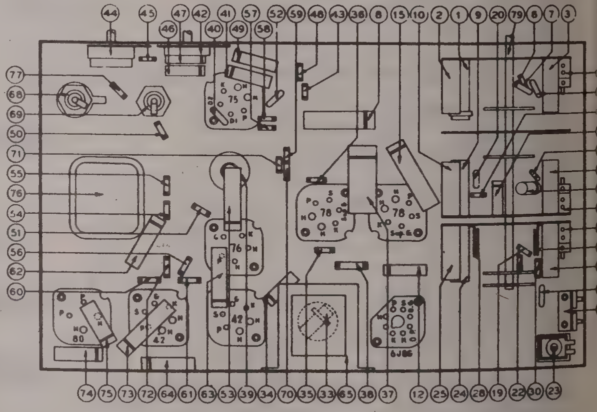


FIG. 2. MODEL 40-755 PART LOCATIONS, UNDERSIDE OF CHASSIS

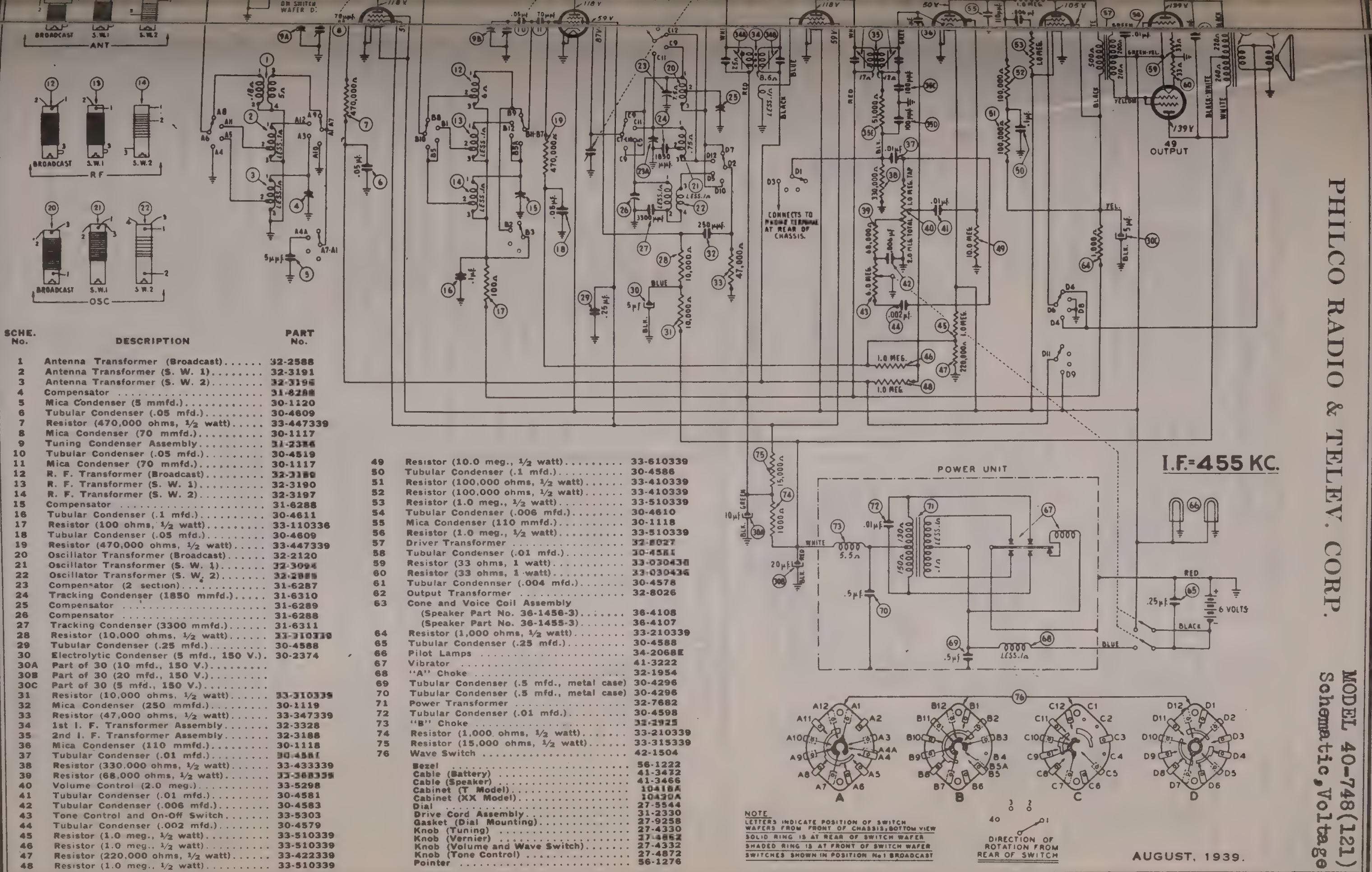
MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
69	Electrolytic Condenser (40 mfd., 300 V.)	30-2366
70	Resistor (39,000 ohms, 1/2 watt)	33-339339
71	Resistor (180,000 ohms, 1/2 watt)	33-418339
72	Resistor (1.0 meg., 1/2 watt)	33-510339
73	Tubular Condenser (.2 mfd.)	30-4587
74	Tubular Condenser (.003 mfd.)	30-4608
75	Tubular Condenser (.003 mfd.)	30-4606
76	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8007
77	Resistor (150,000 ohms, 1/2 watt)	33-415339
78	Pilot Lamps	34-2064E
79	Wave Switch	42-1504
	Bezel	56-1222
	Cable and Plug (Power Supply)	L-2289
	(Special A. C. Export Plug)	L-1367
	Cabinet (40-755T)	10418A
	Cabinet (40-755XX)	10420A

SCHE. No.	DESCRIPTION
	Dial
	Drive Cord
	Felt Strip (Bezel Mounting)
	Knob (Tuning)
	Knob (Tuning)
	Knob (Volume and Wave Switch)
	Knob (Tone Control)
	Pointer
	Socket (5 prong, 76 tube)
	Socket (6 prong, type 78, 42, 75 tubes)
	Socket (4 prong, type 80 tube)
	Socket (Octal, type 6J8G tube)
	Speaker (Model 40-755T)
	Speaker (Model 40-755XX)
	Spring Clip (Coil Mounting)
	Spring (Drive Cord)
	Station Card Holder
	Tuning Drum and Coupling Assembly
	Vernier Drive (Tuning)

PHILCO RADIO & TELEV. CORP.

MODEL 40-748(121)
Schematic, Voltage



SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Compensator	31-8288
5	Mica Condenser (5 mmfd.)	30-1120
6	Tubular Condenser (.05 mfd.)	30-4609
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Mica Condenser (70 mmfd.)	30-1117
9	Tuning Condenser Assembly	31-2386
10	Tubular Condenser (.05 mfd.)	30-4519
11	Mica Condenser (70 mmfd.)	30-1117
12	R. F. Transformer (Broadcast)	32-3189
13	R. F. Transformer (S. W. 1)	32-3190
14	R. F. Transformer (S. W. 2)	32-3197
15	Compensator	31-6288
16	Tubular Condenser (.1 mfd.)	30-4611
17	Resistor (100 ohms, 1/2 watt)	33-110336
18	Tubular Condenser (.05 mfd.)	30-4609
19	Resistor (470,000 ohms, 1/2 watt)	33-447339
20	Oscillator Transformer (Broadcast)	32-2120
21	Oscillator Transformer (S. W. 1)	32-3094
22	Oscillator Transformer (S. W. 2)	32-2885
23	Compensator (2 section)	31-6287
24	Tracking Condenser (1850 mmfd.)	31-6310
25	Compensator	31-6289
26	Compensator	31-6288
27	Tracking Condenser (3300 mmfd.)	31-6311
28	Resistor (10,000 ohms, 1/2 watt)	33-310339
29	Tubular Condenser (.25 mfd.)	30-4588
30	Electrolytic Condenser (5 mfd., 150 V.)	30-2374
30A	Part of 30 (10 mfd., 150 V.)	
30B	Part of 30 (20 mfd., 150 V.)	
30C	Part of 30 (5 mfd., 150 V.)	
31	Resistor (10,000 ohms, 1/2 watt)	33-310339
32	Mica Condenser (250 mmfd.)	30-1119
33	Resistor (47,000 ohms, 1/2 watt)	33-347339
34	1st I. F. Transformer Assembly	32-3328
35	2nd I. F. Transformer Assembly	32-3188
36	Mica Condenser (110 mmfd.)	30-1118
37	Tubular Condenser (.01 mfd.)	30-4581
38	Resistor (330,000 ohms, 1/2 watt)	33-433339
39	Resistor (68,000 ohms, 1/2 watt)	33-368339
40	Volume Control (2.0 meg.)	33-5298
41	Tubular Condenser (.01 mfd.)	30-4581
42	Tubular Condenser (.006 mfd.)	30-4583
43	Tone Control and On-Off Switch	33-5303
44	Tubular Condenser (.002 mfd.)	30-4579
45	Resistor (1.0 meg., 1/2 watt)	33-510339
46	Resistor (1.0 meg., 1/2 watt)	33-510339
47	Resistor (220,000 ohms, 1/2 watt)	33-422339
48	Resistor (1.0 meg., 1/2 watt)	33-510339
49	Resistor (10.0 meg., 1/2 watt)	33-610339
50	Tubular Condenser (.1 mfd.)	30-4586
51	Resistor (100,000 ohms, 1/2 watt)	33-410339
52	Resistor (100,000 ohms, 1/2 watt)	33-410339
53	Resistor (1.0 meg., 1/2 watt)	33-510339
54	Tubular Condenser (.006 mfd.)	30-4610
55	Mica Condenser (110 mmfd.)	30-1118
56	Resistor (1.0 meg., 1/2 watt)	33-510339
57	Driver Transformer	32-8027
58	Tubular Condenser (.01 mfd.)	30-4581
59	Resistor (33 ohms, 1 watt)	33-030436
60	Resistor (33 ohms, 1 watt)	33-030436
61	Tubular Condennser (.004 mfd.)	30-4578
62	Output Transformer	32-8026
63	Cone and Voice Coil Assembly	
	(Speaker Part No. 36-1456-3)	36-4108
	(Speaker Part No. 36-1455-3)	36-4107
64	Resistor (1,000 ohms, 1/2 watt)	33-210339
65	Tubular Condenser (.25 mfd.)	30-4588
66	Pilot Lamps	34-2068E
67	Vibrator	41-3222
68	"A" Choke	32-1954
69	Tubular Condenser (.5 mfd., metal case)	30-4296
70	Tubular Condenser (.5 mfd., metal case)	30-4296
71	Power Transformer	32-7682
72	Tubular Condenser (.01 mfd.)	30-4598
73	"B" Choke	32-2925
74	Resistor (1,000 ohms, 1/2 watt)	33-210339
75	Resistor (15,000 ohms, 1/2 watt)	33-315339
76	Wave Switch	42-1504
	Bezel	56-1222
	Cable (Battery)	41-3472
	Cable (Speaker)	41-3466
	Cabinet (T Model)	10418A
	Cabinet (XX Model)	10420A
	Dial	27-5544
	Drive Cord Assembly	31-2330
	Gasket (Dial Mounting)	27-9258
	Knob (Tuning)	27-4330
	Knob (Vernier)	27-4862
	Knob (Volume and Wave Switch)	27-4332
	Knob (Tone Control)	27-4872
	Pointer	56-1276

NOTE
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW
SOLID RING IS AT REAR OF SWITCH WAFER
SHADED RING IS AT FRONT OF SWITCH WAFER
SWITCHES SHOWN IN POSITION No 1 BROADCAST

DIRECTION OF ROTATION FROM REAR OF SWITCH

AUGUST, 1939.

PHILCO RADIO & TELEV. CORP.

PHILCO - TROPIC MODEL 40-748, CODE 121

SPECIFICATIONS

TYPE CIRCUIT: Model 40-748, code 121 is a 7 tube battery operated radio receiver employing a superheterodyne circuit with 3 tuning ranges for reception of standard, police, and shortwave broadcast stations. Connections are also provided for attaching an external high impedance electric phonograph pick-up. In addition other features of design are automatic volume control, continuously variable tone control, BASS compensation, and a push pull pentode audio output circuit. A vibrator is used for supplying the "B" voltage from the 6 volt storage battery.

POWER SUPPLY: 6 volt storage battery.

TUNING RANGES: 530-1720 K. C. 2.3-7.4 M. C. 7.3-22 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: 6S7EG, R. F. Amplifier; 6D8EG, er; 6S7EG, I. F. Amplifier; 6T7G, Second Detector A. First Audio: 6G6EG, Second Audio; two 49, Output.

AUDIO OUTPUT: 2.5 watts.

AERIAL & GROUND: To obtain maximum performa this receiver, the Philco Safety aerial, Part No. 40-637 be used. A good ground source to the nearest wate any other grounding connection should be used.

CABINET DIMENSIONS: Height, 14⅝"; Width, 20"; Dep

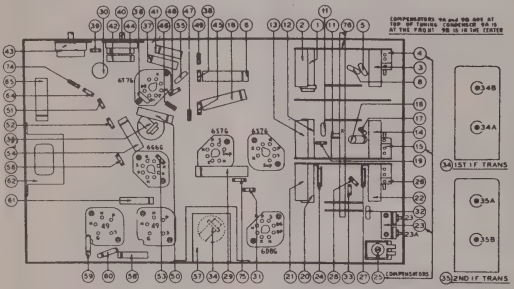

COMPENSATORS 9A and 9B ARE AT TOP OF TUNING CONDENSER 9A IS AT THE FRONT 9B IS IN THE CENTER
6T7G
6S7G
6S7G
6G6G
6D8G
49
49
34B
34A
1ST I F TRANS
35A
35B
2ND I F TRANS
COMPENSATORS
23A

FIG. 1. PART LOCATIONS—UNDERSIDE OF CHASSIS.

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Speaker (T Cabinet)	36-1455
Speaker (XX Cabinet)	36-1456
Spring Clip (Coil Mounting)	28-5002
Spring (Drive Cord)	28-8913
Station Card Holder	56-1273
Socket (5 prong, type 49 tube)	27-6035
Socket (6 prong, vibrator)	27-6036
Socket (Loktal tubes)	27-6058
Shield (Tube, Half)	56-1072
Shield Cap	56-1073
Shield Base	56-1074
Rubber Cushion (Vibrator Mounting)	27-4287
Rubber Washer (Vibrator Unit Mounting)	27-4307
Rubber Corner (Chassis)	27-4564
Tuning Drum and Coupling Assembly	31-2327
Vernier Drive (Tuning)	31-2329

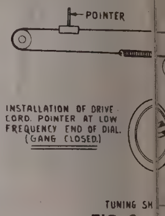

POINTER
INSTALLATION OF DRIVE CORD. POINTER AT LOW FREQUENCY END OF DIAL. (GANG CLOSED.)
TUNING SH

FIG. 2.
INSTALLATION OF DRI

ALIGNMENT OF COMPENSATORS

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTI
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6D8EG Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone-Treble Range Switch "Brdcst"	35A, 35B 34A, 34B	
2	Ant. & Grd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	23, 9B, 9A	Note B
3	Ant. & Grd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	25	Roll Gang
4	Ant. & Grd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	23, 9B, 9A	Note B
5	Ant. & Grd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone-Treble Range Switch "S. W. 1"	23A	Roll Gang
6	Ant. & Grd.	400 ohms	21 M. C.	21 M. C.	Vol. Max. Tone-Treble Range Switch "S. W. 2"	26, 15, 4	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer first mark on the left edge (low frequency end) of the broadca

NOTE C — When adjusting compensator (26) be sure to tu fundamental signal (21 M. C. — second signal from tight po padder) instead of the image signal. If the compensator is adjusted, the image signal will be found by turning the recei 910 K. C. below the fundamental signal.

MODEL S-1722 SETTING UP THE RECEIVER FOR AUTOMATIC TUNING

1 — Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the front of the Receiver and is removed by removing two screws.

2 — Push the Automatic Station Selector button until the word "DIAL" appears in the indicator window. Tune in the station whose call letters are in the first position on the dial (the highest frequency station) and note the program. Push the Automatic Selector button once and this station's call letters will appear at the indicator window.

3 — With a small screwdriver, turn the No. 1 adjusting screw (See Fig. 3) in the lower column, to the right or left until this station is tuned in. Now adjust the corresponding screw in the upper column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by, the loudest point on some stations.

When adjusting for Automatic Tuning on strong local stations the antenna rod should be all the way down and the adjustments made with the car in a shielded area, such as in a steel constructed or under a viaduct. This is necessary in order to obtain a wea so the adjustments can be accurately made.

4 — Press the Automatic Station Selector button until appears again in the indicator window and tune in the statio call letters are in the second position on the automatic dial (t lower frequency). Press the automatic button two times and ad number 2 set of adjusting screws.

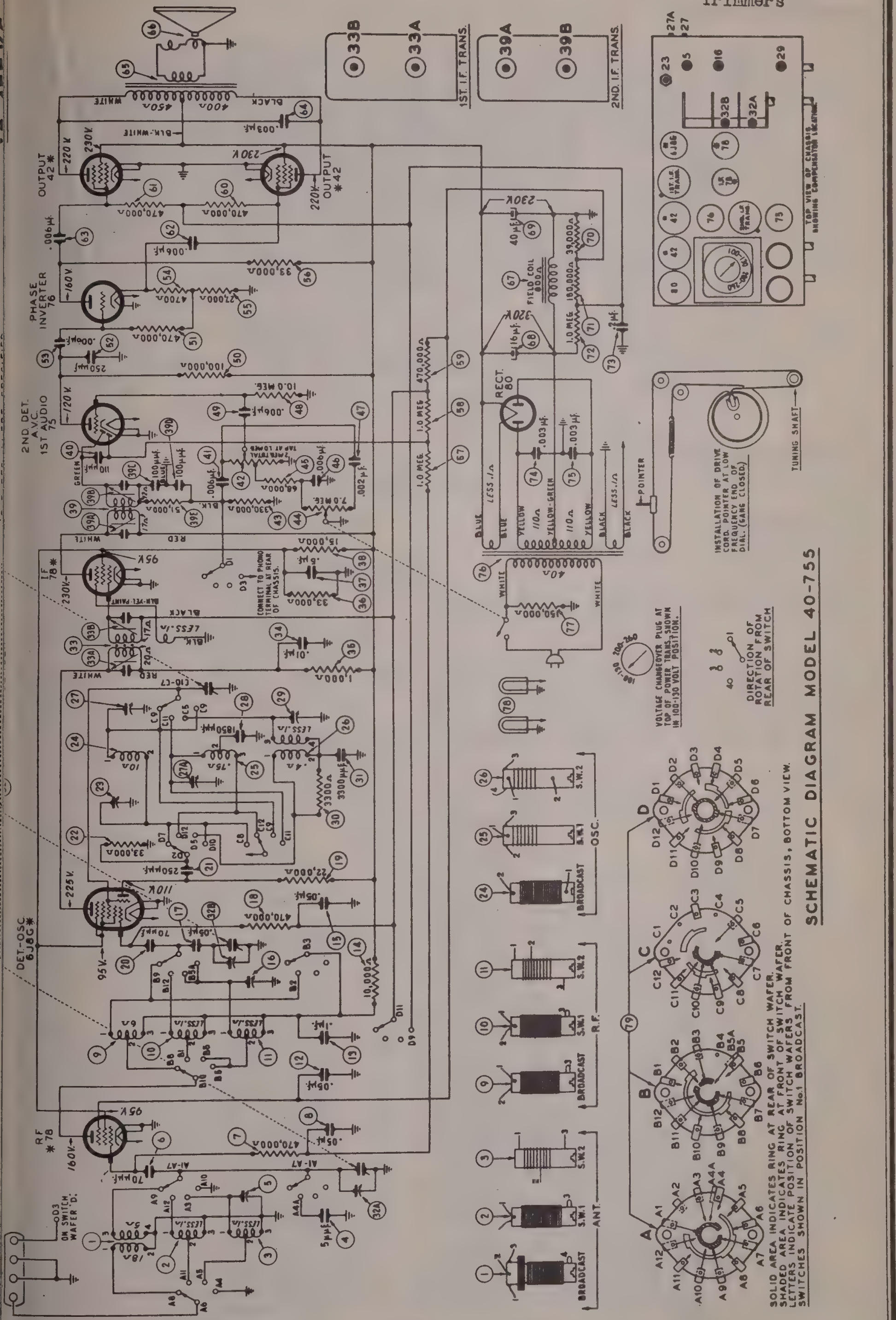
Repeat this procedure until each of the five pairs of adjusting has been tuned to its respective station.

IT IS NECESSARY THAT THE SETTING OF THE ADJ SCREWS BE REPEATED TO BE SURE THEY ARE PRO SET SO THAT MAXIMUM PERFORMANCE MAY BE HAD.

Make all adjustments for maximum reading on the output

PHILCO RADIO & TELEV. CORP.

MODEL 40-755(121)
Schematic, Voltage
Trimmers

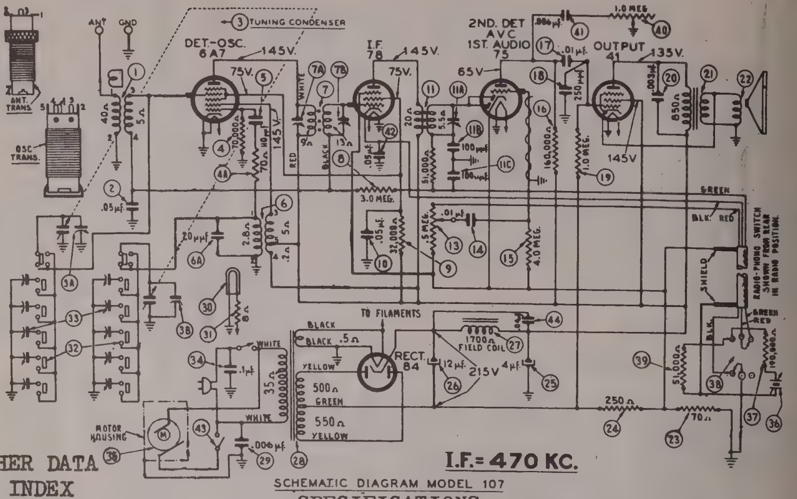


RF *78
DET-OSC 6J8G*
IF 78*
2ND DET. A.V.C. 1ST AUDIO 75
PHASE INVERTER 76
OUTPUT 42*
OUTPUT *42
RECT. 80
1ST I.F. TRANS.
2ND I.F. TRANS.
33A
33B
39A
39B
FIELD COIL 800Ω
ON SWITCH WAFER D.
CONNECT TO PHONO TERMINAL AT REAR OF CHASSIS.
VOLTAGE CHANGEOVER PLUG AT TOP OF POWER TRANS., SHOWN IN 100-130 VOLT POSITION.
DIRECTION OF ROTATION FROM REAR OF SWITCH
INSTALLATION OF DRIVE CORD. POINTER AT LOW FREQUENCY END OF DIAL. (GANG CLOSED.)
POINTER
TUNING SHAFT
TOP VIEW OF CHASSIS SHOWING COMPENSATOR LOCATION
BROADCAST
S.W.1
S.W.2
ANT.
R.F.
OSC.
A
B
C
D
SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER.
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW.
SWITCHES SHOWN IN POSITION No.1 BROADCAST.

SCHEMATIC DIAGRAM MODEL 40-755

MODEL 107(121)
Runs 1,2
Schematic,Voltage
Notes

PHILCO RADIO & TELEV. CORP



SCHEMATIC DIAGRAM MODEL 107

FOR OTHER DATA
SEE INDEX

SPECIFICATIONS

TYPE OF CIRCUIT:
Model 107, code 121 is a combination Automatic Record Changer, Phonograph and Electric push-button tuning radio receiver.

The Record Changer plays eight 10" records automatically and 12" records manually and employs a crystal pick-up.

The Radio Receiver employs a five tube A.C. operated superheterodyne circuit, covering standard broadcast frequencies: 530 to 1720 K.C., Automatic Volume Control, and Pentode Audio Output. Six Electric Automatic Push-Buttons are provided; five push-buttons are used for selecting any one of five stations in the standard broadcast range, and one push-button for changing to manual tuning. The procedure for ing the push-buttons for reception of statio be found in the instructions supplied with ea

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES USED:

6A7 First Detector Oscillator; 78, I.F. Ampl 75, Second Detector, A.V.C., First Audio; 41 Output and 84, Rectifier.

POWER SUPPLY: 115 V., 50 to 60 cycle A.C.

Power Transformers are available for opera 115 V., 25 to 40 cycles A.C.

POWER CONSUMPTION: 57 watts

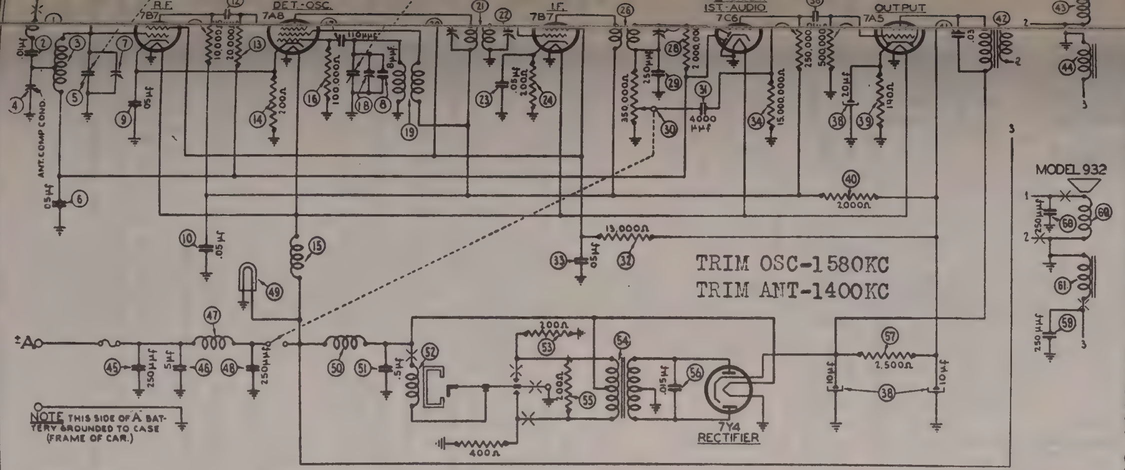
AUDIO OUTPUT: One (1) watt

The aligning instructions for the R.F. and I.F. Compensating condensers will be found under the model 39-7, code 121. (See Philco page 10-2)

Schem. No.	*Description*	*Part No.*
1	Antenna Transformer	32-3039
2	Tubular Condenser (.05 mfd.)	30-4519
3	Tuning Condenser	31-2338
4	Resistor (70,000 ohms, 1/2 watt)	33-370339
4A	Resistor (70 ohms, 1/2 watt)	33-070339
5	Mica Condenser (110 mmfd.)	30-1031
6	Oscillator Transformer	32-2122
6A	Mica Condenser (20 mmfd.)	30-1123
7	1st I.F. Transformer Assy	32-3121
8	Resistor (3.0 meg., 1/2 watt)	33-530339
9	Resistor (32,000 ohms, 1/2 watt)	33-332339
10	Tubular Cond. (.05 mfd.)	30-4444
11	2nd I.F. Transformer Assy	32-2674
12	Resistor (51,000 ohms, 1/2 watt)	33-351339
13	Volume Control (.5 meg.)	33-5254
14	Tubular Condenser (.01 mfd.)	30-4479
15	Resistor (4.0 meg., 1/2 watt)	33-540339
16	Resistor (160,000 ohms, 1/2 watt)	33-416339
17	Tubular Condenser (.01 mfd.)	30-4572
18	Mica Condenser (250 mmfd.)	30-1032
19	Resistor (1.0 meg., 1/2 watt)	33-510339
20	Tubular Condenser (.003 mfd.)	30-4582
21	Output Transformer	32-7980
22	Cone & Voice Coil Assembly	
	Speaker No. 36-1473-3	36-4120
	Speaker No. 36-1440-3	36-4086
23	Resistor (50 ohms, 1/2 watt)	33-050339
24	Resistor (250 ohms, 1/2 watt)	33-125339
25	Electrolytic Cond.	
	(Run 1- 6 mfd., 450 V.)	30-2265
	(Run 2- 10 mfd. 450 V.)	30-2
26	Electrolytic Cond. (12 mfd., 300V.)	30-2
27	Field Coil	
	(replace spkr. #36-1473-3)	
	(replace spkr. #36-1440-3)	
28	Power Trans. (115V., 50-60 cycles.	32-7
29	Condenser (.006 mfd., moulded)	30-4
30	Pilot Lamp	34-2
31	Pilot Lamp Resistor (8 ohms, 1/2wt)	33-9
32	Push Button Switch	42-1
33	Padder Strip Assembly	31-6
34	Tubular Cond. (.1 mfd.)	30-4
35	Phono Motor (110 volt 60 cycle)	35-1
36	Crystal Pick-up (metal case)	35-2
	Crystal Pick-up (bakelite case)	35-2
37	Resistor (190,000 ohms, 1/2 watt)	33-4
38	Radio Phono Switch	42-1
39	Resistor (51,000 ohms, 1/2 watt)	33-3
40	Tone Control (1.0 meg.)	33-5
41	Tubular Cond. (.006 mfd.)	30-4
42	Tubular Cond. (.05 mfd.)	30-4
43	Motor Switch	
44	Tubular Cond. (.04 mfd.)	30-4
	Bezel Assembly (Dial)	56-1
	Bezel Clamp	28-5
	Knobs	27-4
	Manual Tab	27-5
	Push-button	27-4
	Station tab holder	28-5
	Visor Screen	27-5
	Automatic Record Changer 35-1169	

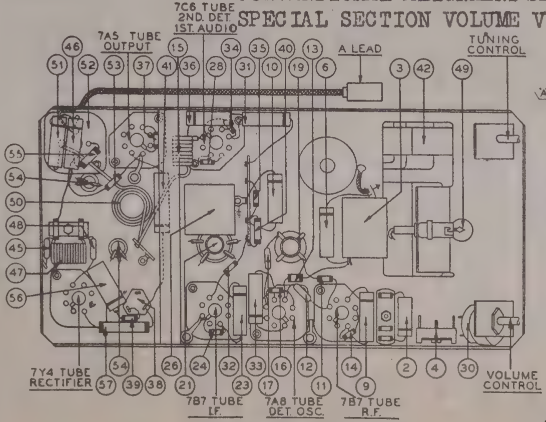
PHILCO RADIO & TELEV. CORP.

MODELS 931,932
Schematic,Chassis Trimmers,Alignment



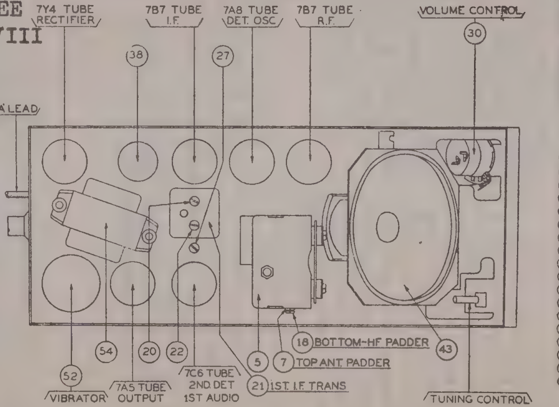
JUNE 29, 1939

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



MODEL 931

*The Model 932 is similar to the Model 931.
Speaker connections for both Models are shown



MODEL 931

No.	Description	Part No.	No.	Description	Part No.
	Pointer (Model 931)	57-0794		Back Strap	28-5998FA3
	Pointer (Model 932)	57-0885		Mounting Strap	57-0812FC36
	Window Crystal	55-0501		Complete Speaker	73-0027
	Tuning and Volume Knob	55-0547		Loktal Socket	55-0575

No.	Description	Part No.
①	Antenna Choke	65-0102
②	Condenser (.01 mfd.)	61-0014
③	Antenna Transformer	[illegible]
⑤	Tuning Condenser	63-0028
⑥	Condenser (.05 mfd.)	30-4444
⑦	First Padder (on Tun. Cond.)	
⑧	Condenser (8 mmfd.)	30-1106
⑨	Condenser (.05 mfd.)	30-4569
⑩	Condenser (.05 mfd.)	30-4569
⑪	Resistor (10,000 ohms)	33-310247
⑫	Condenser (110 mmfd.)	30-1031
⑬	Resistor (20,000 ohms)	33-320247
⑭	Resistor (200 ohms)	33-120346
⑮	Filament Choke	65-0158
⑯	Resistor (100,000 ohms)	33-410247
⑰	Condenser (110 mmfd.)	30-1031
⑱	Second Padder (on Tun. Cond.)	
⑲	Oscillator Transformer	65-0194
⑳	Padder (Pri. 1st I. F. Trans.)	
㉑	First I. F. Transformer	65-0191
㉒	Padder (Sec. 2nd I. F. Trans.)	
㉓	Condenser (.05 mfd.)	30-4569
㉔	Resistor (200 ohms)	33-120346
㉖	Second I. F. Transformer	65-0192
㉗	Padder (Pri. 1st I. F. Trans.)	
㉘	Resistor (2,000,000 ohms)	33-520247
㉙	Condenser (250 mmfd.)	61-0033
㉚	Volume Control (350,000 ohms) and On-Off Switch	67-0020
㉛	Condenser (4,000 mmfd.)	30-4456
㉜	Resistor (13,000 ohms)	33-313247
㉝	Condenser (.05 mfd.)	30-4569
㉞	Resistor (15,000,000 ohms)	33-615247
㉟	Resistor (250,000 ohms)	33-424247
㊱	Condenser (.01 mfd.)	61-0014
㊲	Resistor (500,000 ohms)	33-449247
㊳	Filter Condenser (10-10-20 mfd.)	61-0068
㊴	Resistor (190 ohms)	33-120346
㊵	Resistor (2,000 ohms)	33-220347
㊶	Condenser (.03 mfd.)	30-4449
㊷	Output Transformer (Model 931)	
㊷	Output Transformer (Model 932)	65-0221
㊸	Cone Kit (For 73-0027-1 Speaker)	91-0076
㊹	Field Coil	Not Replaceable
㊺	Condenser (250 mmfd.)	61-0033
㊻	Condenser (.5 mfd.)	61-0054
㊼	"A" Choke	32-1644
㊽	Condenser (250 mmfd.)	61-0033
㊾	Pilot Lamp	34-2039
㊿	Vibrator Choke	65-0204
(51)	Condenser (.5 mfd.)	61-0054
(52)	Vibrator	83-0017
(53)	Resistor (200 ohms)	33-120347
(54)	Power Transformer	65-0185
(55)	Resistor (200 ohms)	33-120347
(56)	Condenser (.015 mfd.)	30-4552
(57)	Resistor (2,500 ohms)	33-225447
(58)	Condenser (250 mmfd.)	61-0033
(59)	Condenser (250 mmfd.)	61-0033
(60)	Field Coil	Not Replaceable
(61)	Cone Kit (Model 932)	
	For 73-0024-3 Speaker	91-0068
	For 73-0024-2 Speaker	91-0028
	For 73-0025-2 Speaker	91-0065
	Drive Cord (16½")	55-0588
	Drive Cord (5¾")	55-0589
	Drive Cord (13¾")	55-0652
	Drive Cord (7⅝")	55-0653
	Dial Assembly (Model 931)	77-0346
	Dial Assembly (Model 932)	77-0358

MODEL 933
ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver.

General — The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1″ wide, 6″ long and .02″ thick. Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

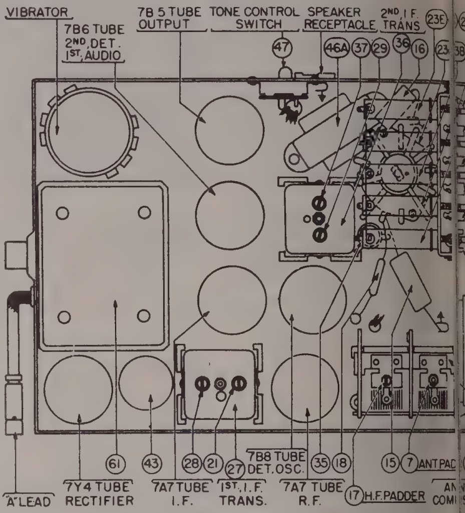


FIGURE 3

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS
	FREQUENCY	CONNECTION		
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Man			
2	470 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.
3	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1580 K.C.
4	1500 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1500 K.C.

Make all adjustments for maximum reading on the output meter.

NOTE 1 Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 30 Condenser in series between the signal generator and the antenna lead.

NOTE 2 When the antenna stage adjustment is made with the Radio installed in the car, the Radio anten must be connected to the car antenna in the usual manner. Connect the signal generator output a wire placed near the car antenna but not connected to it. Also adjust the antenna compensato maximum on a weak signal at approximately 1400 K.C.

MODEL 933 SCHEMATIC

I.F. = 470KC

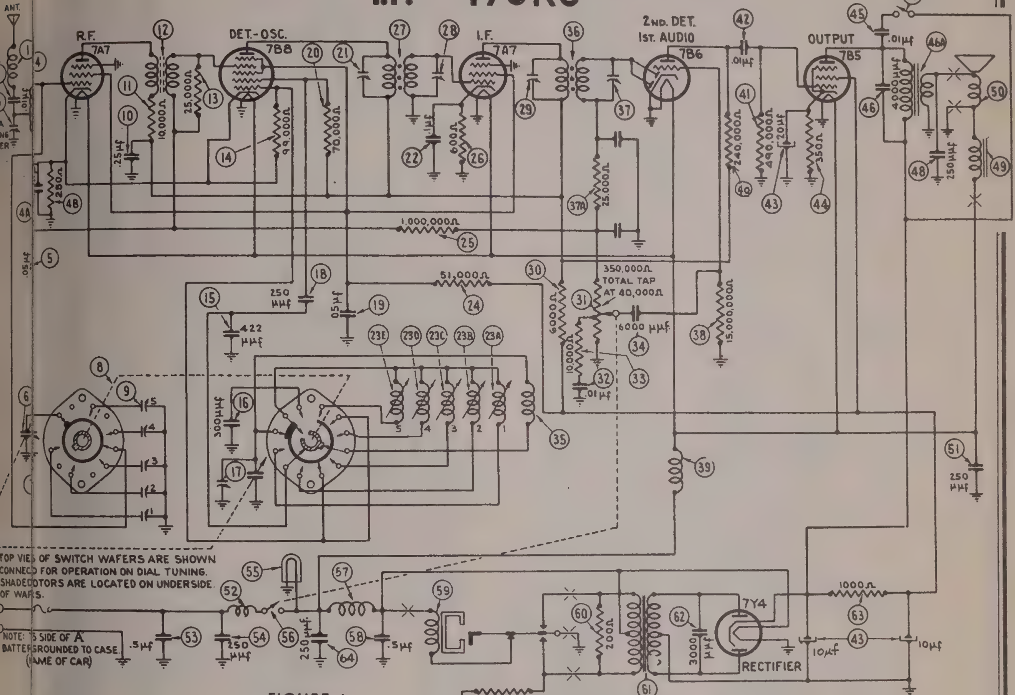


FIGURE 1

PARTS LIST

No.	Description	Part No.
	Anten Choke	65-0184
	Conde r (.01 mfd.)	61-0014
	Anten Compensator	Part of ⑨
	Anten Transformer	65-0182
	Conde r (.01 mfd.)	30-4499
	Resist (250 ohms)	33-125336
	Conde r (.05 mfd.)	30-4444
	Tunin Condenser	63-0024
	First adder (on Tun. Cond.)	
	Wafe Switch	412-1024
	Anten Padder Assy.	77-0286
	Conde er (.25 mfd.)	30-4446
	Resis (10,000 ohms)	33-310237
	R. F Transformer	65-0183
	Resis (25,000 ohms)	33-325337
	Resis (99,000 ohms)	33-399237
	Silve lica Condenser (42 mmfd.)	61-0066
	Silve lica Condenser (30 mmfd.)	61-0003
	Secon Padder (on Tun. Cond.)	
	Cond ser (250 mmfd.)	30-1038
	Cond ser (.05 mfd.)	30-4444
	Resis (70,000 ohms)	33-370337
	Padd (Pri. 1st I. F. Trans.)	
	Cond ser (.1 mfd.)	30-4499
	Oscil or Transformer (1)	65-0169
	Oscil or Transformer (2)	65-0170
	Oscil or Transformer (3)	65-0171
	Oscil or Transformer (4)	65-0172
	Oscil or Transformer (5)	65-0173
	Resis r (51,000 ohms)	33-351257
	Resis r (100,000 ohms)	33-510237
	Resi r (600 ohms)	33-160438
	First . F. Transformer	65-0160
	Padd (Sec. 1st I. F. Trans.)	
	Padd (Pri. 2nd I. F. Trans.)	
	Resi r (6,000 ohms)	33-260337
㉛	Volume Control (350,000 ohms) and On-Off Switch	67-0019
㉜	Condenser (.01 mfd.)	61-0014
㉝	Resistor (10,000 ohms)	33-310237
㉞	Condenser (6,000 mmfd.)	30-4467
㉟	Oscillator Transformer (Dial)	65-0165
㊱	Second I. F. Transformer	65-0161
㊲	Padder (Sec. 2nd I. F. Trans.)	
㊲a	Resistor (25,000 ohms)	33-325237
㊳	Resistor (15,000,000 ohms)	33-615337
㊴	Filament Choke	65-0201
㊵	Resistor (240,000 ohms)	33-424337
㊶	Resistor (490,000 ohms)	33-449237
㊷	Condenser (.01 mfd.)	30-4124
⑬	Filter Condenser (10—10—20 mfd.)	61-0028
㊹	Resistor (350 ohms)	33-135336
㊺	Condenser (.01 mfd.)	30-4381
㊻	Condenser (4,000 mmfd.)	30-4185
㊻a	Output Transformer	65-0162
㊼	Tone Control Switch	42-1406
㊽	Condenser (250 mmfd.)	61-0033
㊾	Field Coil	Not Replaceable
㊿	Cone Kit	
	For 73-0024-3 Speaker	91-0068
	For 73-0024-3 Speaker	91-0028
	For 73-0025-2 Speaker	91-0065
(51)	Condenser (250 mmfd.)	61-0033
(52)	"A" Choke	65-0037
(53)	Condenser (.5 mfd.)	30-4565
(54)	Condenser (250 mmfd.)	61-0033
(55)	Pilot Lamp	34-2040
(56)	On-Off Switch and Volume Control	67-0019
(57)	Vibrator Choke	65-0075
(58)	Condenser (.5 mfd.)	30-4565
(59)	Vibrator	83-0017

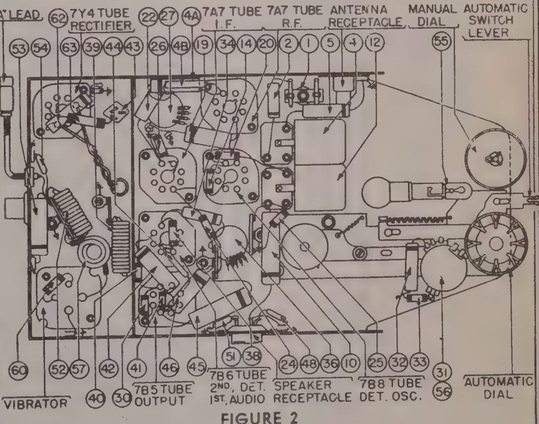


FIGURE 2

No.	Description	Part No.
(60)	Resistor (200 ohms)	33-120337
(61)	Power Transformer	65-0159
(62)	Condenser (3,000 mmfd.)	61-0059
(63)	Resistor (1,000 ohms)	33-210437
(64)	Condenser (250 mmfd.)	61-0033
	Dial Disc. and Drum Assy.	77-0323
	Station Indicator Dial	318-1395
	Dial Tabs	79-0343

No.	Description	Part No.
	Push Button Knob	55-0474
	Loktal Socket	55-0575
	Back Strap	28-5998FA3
	Front Bracket	57-0753FC36
	Fuse	45-2559
	Fuse Lead	77-0235
	Interference Condenser	30-4007
	Distributor Resistor	33-1196

PHILCO AUTO RADIO

INSTALLING THE DIAL CORD ON THE

Chrysler Model C-1708 **Lincoln Models L-1760, L-1761**
Ford Model F-1740 **Studebaker Models S-1722, S-1726**

When installing new dial cords on the custom built radios, follow the procedure given below:

CHRYSLER MODEL C-1708

1. Remove the top cover, bottom cover and front housing.
2. Turn the radio upside down with the control shafts in front.
3. Turn the tuning control shaft CLOCKWISE to the stop position.
4. Hook the spring on one end of the cord.
5. Hook a paper clip through the eyelet of the cord to which the spring is attached and fasten the clip to the dial mounting bracket.
6. Place the long end of the cord over the rear wooden pulley. Wrap seven turns of cord CLOCKWISE around the back portion of the tuning shaft. Pass the cord through the slot in the collar of the shaft and wrap ¾ of a turn CLOCKWISE around the shaft in front of the collar. Run the cord over the front wooden pulley and fasten the other end of the cord to the spring. Then force the cord over the metal pulley at the top of the scale bracket.
7. Place the pointer on the dial cord and slide it to the first line above the 1500 mark.
8. Remove the paper clip and recheck the pointer setting, using a broadcast signal or a Philco Signal Generator. Slide the pointer along the dial cord to the correct frequency.
9. Replace the front housing and the top and bottom covers.

FORD MODEL F-1740 — LINCOLN MODELS L-1760 and L-1761

1. Remove the tuning condenser assembly from the front casting of the radio.
2. Remove the dial and shaft assembly from the tuning condenser bracket.
3. Remove the dial drum from the knob and shaft assembly.
4. Place the tuning condenser unit on the bench with the bracket to the back and the metal pulley facing up. The tuning condenser plates must be in mesh.
5. Connect one end of the cord to the link and hook the link on the right tab on the inside of the pulley. Feed the cord through the slot in the pulley and wrap one turn of cord CLOCKWISE around the pulley, keeping the cord to the right of the guide pin on the tuning condenser.
6. Hold the dial drum with the left hand and wrap two turns of cord COUNTER-CLOCKWISE around the spool, keeping the cord to the left of the pin in the spool. Loop one turn of cord around the pin. Then wrap one turn COUNTER-CLOCKWISE around the spool, keeping the cord to the right of the pin in the spool.
7. Place the knob and shaft on the spool, with the pin on the spool nearest to the knob and with the thin washer on the left side of the knob and the thick washer on the right side. Place the shaft in the grooves on the tuning condenser bracket.
8. Bring the cord COUNTER-CLOCKWISE around the idler pulley on the bracket and wrap five turns of cord CLOCKWISE around the knob shaft. Be sure the washer is against the end of the bracket.
9. Bring the cord CLOCKWISE around the pulley on the tuning condenser and connect the end of the cord to the link on the drum.
10. Hook the closed end of the tension spring to the tab on the left side of the pulley and hook the other end to both ends of the cord where it enters the pulley.
11. Replace the tuning condenser assembly.

STUDEBAKER MODEL S-1722

1. Remove the chassis from the housing.
2. Place the Receiver on the bench, right side up and with the shafts to the front.
3. Turn the tuning condenser plates in mesh.
4. Feed the loop on the short end of the cord through the hole in the back of the tuning shaft and pass the free end of the loop through the loop of the cord. Pull the cord tight.
5. Wrap 1½ turns of cord CLOCKWISE around the end of the tuning shaft and then ¾ of a turn CLOCKWISE around the tuning condenser drum.
6. Fasten the center loop of the cord to one end of the spring and fasten the other end of the spring in the hole in the drum.
7. Pass the long end of the cord around the idler pulley and through the hole in the sub-base.
8. Hold the cord and turn the radio over with the wiring side showing.
9. Wrap one turn of cord CLOCKWISE around the tuning dial drum.
10. Holding the cord with one hand, turn the tuning shaft CLOCKWISE until the stop position is reached.
11. Wrap 1½ turns of cord COUNTER-CLOCKWISE, around the tuning shaft in back of the front flange.
12. Feed the loop of the cord through the hole in the shaft and pass the free end of cord through the eyelet. The cord must have tension after it is assembled.
13. Assemble the Receiver in the housing.

STUDEBAKER MODEL S-1726

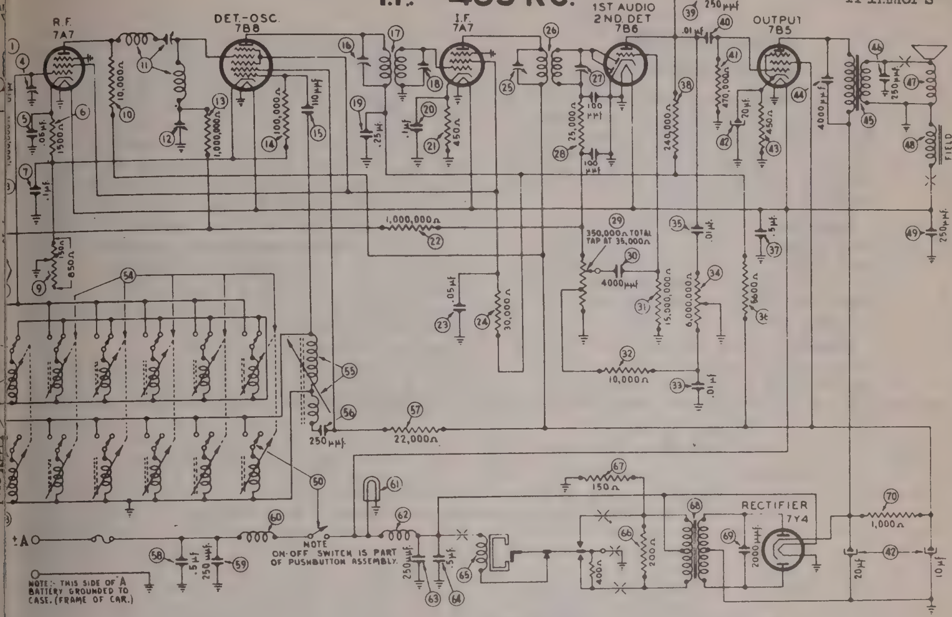
1. Remove the top cover, bottom cover and front housing.
2. Place the Receiver on the bench right side up with the control knobs in front.
3. Turn the tuning shaft clockwise as far as it will go.
4. Loosen the two set screws on the tuning shaft coupling, so that the shaft turns freely.
5. Place the small "U" spring in the slot at the back of the tuning shaft.
6. Hook one of the knotted ends of the cord into one of the hooks on the spring and turn the shaft clockwise until there are eight turns of cord on the shaft between the spring and the front shaft bracket.
7. Hook the remaining end of the cord to the other hook on the spring and turn the shaft counter-clockwise until one turn is wound on the back end of the shaft.
8. Hold the tuning shaft so that it does not turn and place the both cords COUNTER-CLOCKWISE over the two pulleys.
9. Bring the cord under the pointer with the front end of the cord in front of the guide bracket and the back end of the cord in back of the guide bracket.
10. Slide the pointer over to the right end of the guide bracket and place the large "U" spring under the pointer and through the slot, with the hook to the back.
11. With a fine piece of wire as a hook, feed the front end of the cord through the hole in the pointer from the bottom and fasten this loop to the hook on the "U" spring on the pointer.
12. Pull the cord tight and loop it over the pulley on the left end of the pointer guide bracket. Tighten the set screws on the tuning shaft coupling.
13. The pointer can be adjusted to the proper frequency by holding the tuning shaft and sliding the pointer along the guide bracket.
14. Replace the front housing and top and bottom covers.

October, 1939.

MODEL C-1708 Chrysler
Schematic, Chassis
Trimmers

PHILCO RADIO & TELEV. CORP.

I.F. = 455 KC.



No.	DESCRIPTION	PART No.
1	Antenna Choke	65-0I02
2	Condenser (.01 mfd.)	61-0014
3	Resistor (1,000,000 ohms)	33-510154
4	Antenna Padder	63-0035
5	Condenser (.05 mfd.)	30-4444
6	Resistor (1500 ohms)	33-215334
7	Condenser (.1 mfd.)	30-4499
8	Condenser (.05 mfd.)	30-4444
9	Sensitivity Control (1000 ohms)	67-0025
0	Resistor (10,000 ohms)	33-310454
1	Untuned R. F. Assembly	65-0271
2	I. F. Wave Trap Padder	
3	Resistor (1,000,000 ohms)	33-510154
4	Resistor (100,000 ohms)	33-410154
5	Condenser (110 mmfd.)	30-1031
6	Padder (Pri. 1st I. F. Trans.)	
7	First I. F. Transformer	65-0236
8	Padder (Sec. 1st I. F. Trans.)	
9	Condenser (.25 mfd.)	30-4604
0	Condenser (.1 mfd.)	30-4499
1	Resistor (450 ohms)	33-145438
2	Resistor (1,000,000 ohms)	33-510154
3	Condenser (.05 mfd.)	30-4444
4	Resistor (30,000 ohms)	33-330434
5	Padder (Pri. 2nd I. F. Trans.)	
6	Second I. F. Transformer	65-0237
7	Padder (Sec. 2nd I. F. Trans.)	
8	Resistor (25,000 ohms)	33-325154
9	Volume Control (350,000 ohms)	67-0022
0	Condenser (4000 mmfd.)	30-4334
1	Resistor (15,000,000 ohms)	33-615154
2	Resistor (10,000 ohms)	33-310154
3	Condenser (.01 mfd.)	30-4479
4	Tone Control (6,000,000 ohms)	67-0022
5	Condenser (.01 mfd.)	30-4479
6	Resistor (5600 ohms)	33-256334
7	Condenser (.5 mfd.)	61-0054
8	Resistor (240,000 ohms)	33-424354
9	Condenser (250 mmfd.)	61-0033
0	Condenser (.01 mfd.)	30-4169
1	Resistor (470,000 ohms)	33-447154
2	Filter Condenser (10-20-20 mfd.)	61-0072
3	Resistor (450 ohms)	33-145438
4	Condenser (4000 mmfd.)	61-0073
5	Output Transformer	65-0235
6	Condenser (250 mmfd.)	61-0033
7	Cone Kit (For 73-0030-2)	91-0086
	Cone Kit (For 73-0030-3)	91-0085
8	Field Coil	Not Replaceable
9	Condenser (250 mmfd.)	61-0033
0	Push-Button and On-Off Switch	85-0097
1	Inductive Tuning Unit	77-0440
2	Thermol Compensator	61-0080
3	Condenser (428 mmfd.)	61-0082
4	Push-Button Switch and Trans. Assy.	77-0369
5	Oscillator Tracking Coil	65-0229
6	Condenser (250 mmfd.)	61-0033
7	Resistor (22.000 ohms)	33-322454
8	Condenser (.5 mfd.)	30-4491
9	Condenser (250 mmfd.)	61-0033
0	"A" Choke	65-0248
1	Pilot Lamp	34-2039
2	Vibrator Choke	65-0222
3	Condenser (250 mmfd.)	61-0033
4	Condenser (.5 mfd.)	30-4565
5	Vibrator	83-0017
6	Resistor (200 ohms)	33-120354
7	Resistor (150 ohms)	33-115354
8	Power Transformer	65-0234
9	Condenser (2000 mmfd.)	61-0074
0	Resistor (1000 ohms)	33-210434
	Dial	55-0581
	Drive Cord	55-0688
	Pointer	57-0894
	Window Crystal	55-0679
	Tuning and Volume Knob (Motor Parts)	55-0651
	Tuning and Volume Knob (Dodge)	55-0683
	Tuning and Volume Knob (DeSoto)	55-0684
	Tuning and Volume Knob (Chrysler)	55-0685
	Push-Button Knob	55-0713
	Station Tab Window	55-0731
	Station Tab	55-0730
	Tone Control Lever (Ply., Chrys., Dod.)	57-1110FA7
	Tone Control Lever (DeSoto)	57-1110FA17
	Speaker Cable	95-0105
	Antenna Lead	95-0106

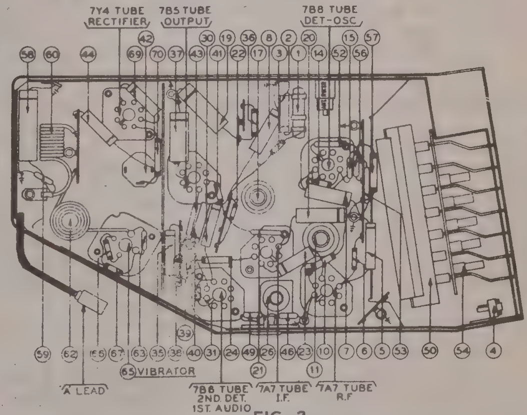
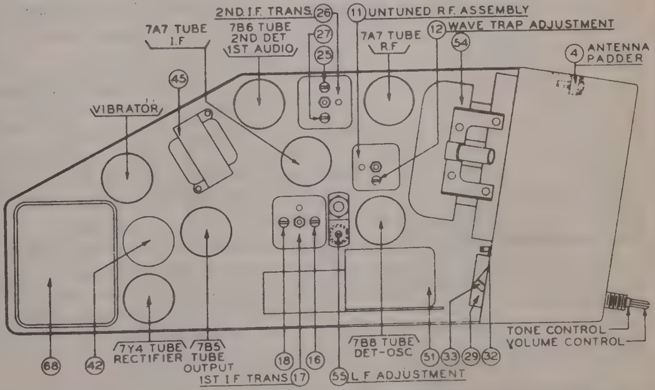


FIG. 2.



FOR ALIGNMENT SEE INDEX

Model C - 1708

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver

General — The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1" wide, 6" long and .02" thick. Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

OPERATIONS	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
	Press the "DIAL" button and stations can be tuned in by "DIAL" tuning				
1	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	㉗ ㉕ ⑱ ㉗ ㉕ ⑱
2	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	⑫ minimu
3	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 1400 K. C.	④
4	580 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 580 K. C.	(55) Note 3
5	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 1400 K. C.	④ Note 4

Make all adjustments for maximum reading on the output meter unless otherwise specified.

NOTE 1 — Turn the tuning control knob clockwise as far as it will go.

NOTE 2 — Connect the Chrysler Antenna lead, Part No. 95-0106, to the antenna receptacle on the radio. Connect a 20 mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 3 — Rotate the tuning control when adjusting the Low Frequency screw (55). Tune to the signal and adjust the screw for maximum output. Turn the tuning co knob slightly, first one way then the other, for maximum put. Repeat this procedure until no further improveme noticed.

NOTE 4 — When the Antenna Stage adjustment is with the Radio installed in the car, the Radio Antenna must be connected to the Cowl Antenna in the usual ma Connect the signal generator output lead to a wire placed the car antenna lead but not connected to it and adjust pa ④ for maximum signal at 1400 K. C.

ALIGNMENT FOR MODEL S-1722

OPERATIONS	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tunin				
2	470 K. C.	To Grid of 78 I. F. Tube	.5 mfd.	Note 2	㉕ ㉓ ⑮ ⑬
3	1580 K. C.	To Antenna Receptacle on Radio	35 mmfd. See Note 1	Note 2	(54)
4	1360 K. C.	To Antenna Receptacle on Radio	35 mmfd. See Note 1	Set tuning condenser at 1360 K. C.	㊼ Note 3

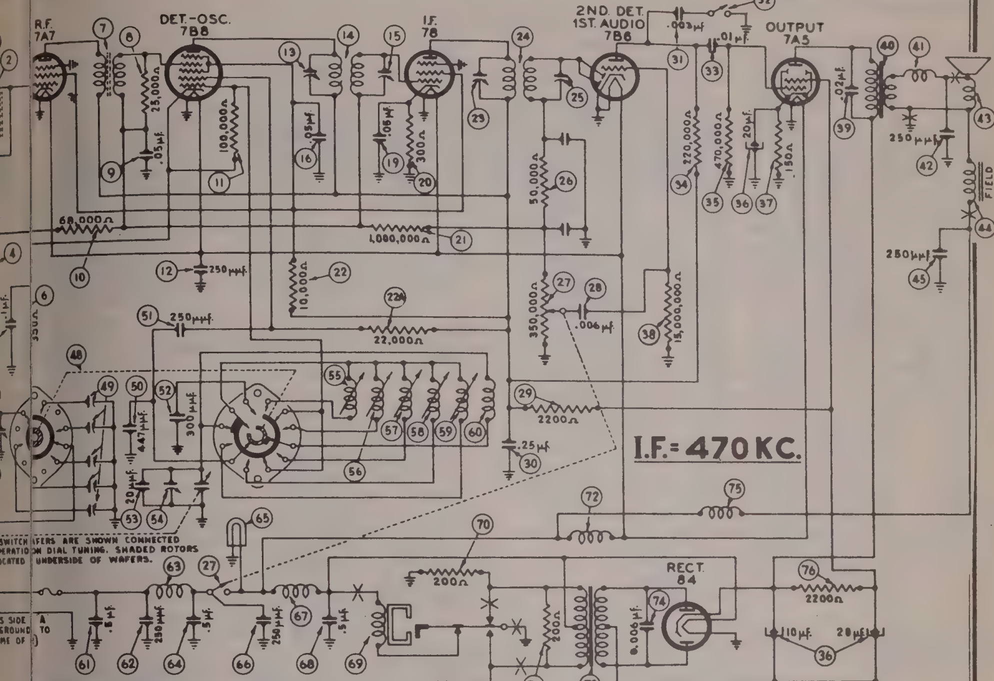
NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 35 mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

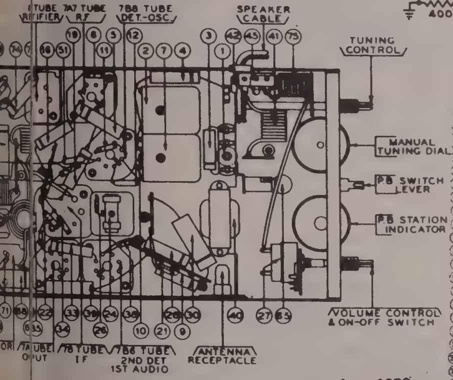
NOTE 3 — When the antenna stage adjustment is made with Radio installed in the car, the Radio antenna lead must be conne to the car antenna in the usual manner. Connect the signal gener output lead to a wire placed near the car antenna but not conne to it.

PHILCO RADIO & TELEV. CORP.

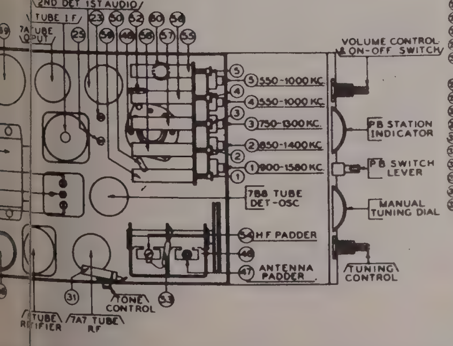
MODEL S-1722
Schematic, Chassis



FOR ALIGNMENT SEE INDEX



October, 1939.

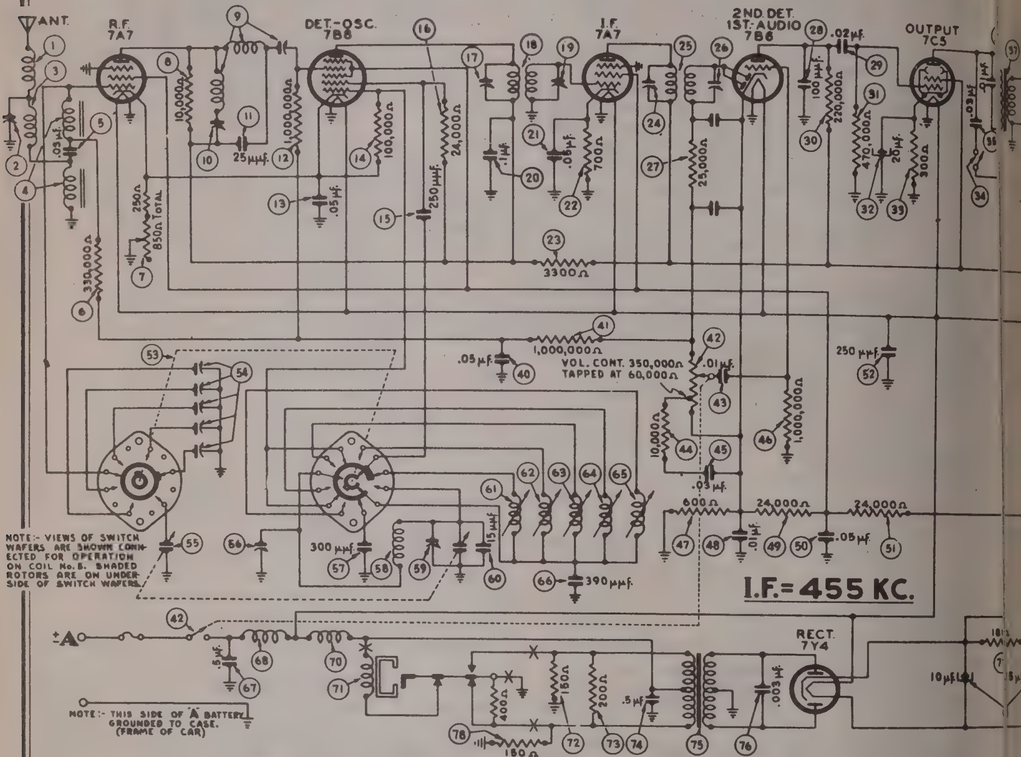


PARTS LIST

No.	Description	Part No.
①	Antenna Choke	65-0102
②	Antenna Transformer	65-0115
③	Condenser (.01 mfd.)	61-0014
④	Condenser (.05 mfd.)	30-4444
⑤	Condenser (.1 mfd.)	30-4499
⑥	Resistor (350 ohms)	33-135334
⑦	R. F. Transformer	65-0114
⑧	Resistor (25,000 ohms)	33-325334
⑨	Condenser (.05 mfd.)	30-4444
⑩	Resistor (68,000 ohms)	33-368354
⑪	Resistor (100,000 ohms)	33-410354
⑫	Condenser (250 mmfd.)	61-0033
⑬	Padder (Pri. 1st I. F. Trans.)	
⑭	First I. F. Transformer	65-0148
⑮	Padder (Sec. 1st I. F. Trans.)	
⑯	Condenser (.05 mfd.)	30-4444
⑲	Condenser (.05 mfd.)	30-4444
⑳	Resistor (300 ohms)	33-130334
㉑	Resistor (1,000,000 ohms)	33-510154
㉒	Resistor (10,000 ohms)	33-310334
㉒a	Resistor (22,000 ohms)	33-322334
㉓	Padder (Pri. 2nd I. F. Trans.)	
㉔	Second I. F. Transformer	65-0214
㉕	Padder (Sec. 2nd I. F. Trans.)	
㉖	Resistor (50,000 ohms)	33-350134
㉗	Volume Control (350,000 ohms) and On-Off Switch	67-0027
㉘	Condenser (6000 mmfd.)	30-4467
㉙	Resistor (2200 ohms)	33-222334
㉚	Condenser (.25 mfd.)	30-4446
㉛	Condenser (3000 mmfd.)	61-0078
㉜	Tone Control Switch	42-1406
㉝	Condenser (.01 mfd.)	30-4169
㉞	Resistor (220,000 ohms)	33-422334
㉟	Resistor (470,000 ohms)	33-447154
㊱	Filter Cond. (10-20-20 mfd.)	61-0076
㊲	Resistor (150 ohms)	33-115334
	Knob Base	28-4184FA8
	Fuel Gauge Resistor	77-0335
	Dial Assembly (Manual)	77-0352
	Dial Assembly (Automatic)	318-1374
	Radio Mounting Bracket	57-0667FA3
	Bezel	57-0670
	Mounting Spacer	57-0729
	Bezel Gasket and Grille Silk	77-0285
	Steering Col. Ground Strap	77-0336
㊳	Resistor (15,000,000 ohms)	33-615154
㊴	Condenser (.02 mfd.)	61-0077
㊵	Output Transformer	65-0221
㊶	Choke	32-1561
㊷	Condenser (250 mmfd.)	61-0033
㊸	Cone and Voice Coil	91-0065
㊹	Field Coil	Not Replaceable
㊺	Condenser (250 mmfd.)	61-0033
㊻	Tuning Condenser	63-0023
㊼	First Padder (On Tun. Cond.)	
㊽	Wafer Switch	412-1023
㊾	Antenna Padder Assembly	77-0262
㊿	Sil. Mica Cond. (447 mmfd.)	61-0047
(51)	Condenser (250 mmfd.)	30-1038
(52)	Sil. Mica Cond. (300 mmfd.)	61-0003
(53)	Condenser (20 mmfd.)	61-0039
(54)	Second Padder (On Tun. Cond.)	
(55)	Oscil. Trans. (550-1000 K.C.)	65-0139
(56)	Oscil. Trans. (550-1000 K.C.)	65-0138
(57)	Oscil. Trans. (750-1300 K.C.)	65-0137
(58)	Oscil. Trans. (850-1400 K.C.)	65-0136
(59)	Oscil. Trans. (900-1580 K.C.)	65-0169
(60)	Oscil. Trans. (manual)	65-0134
(61)	Condenser (.5 mfd.)	61-0084
(62)	Condenser (250 mmfd.)	61-0033
(63)	"A" Choke	32-1644
(64)	Condenser (.5 mfd.)	61-0083
(65)	Pilot Lamp	34-2039
(66)	Condenser (250 mmfd.)	61-0033
(67)	Vibrator Choke	65-0151
(68)	Condenser (.5 mfd.)	61-0083
(69)	Vibrator	83-0017
(70)	Resistor (200 ohms)	33-120354
(71)	Resistor (200 ohms)	33-120354
(72)	Filament Choke	65-0158
(73)	Power Transformer	65-0260
(74)	Condenser (6000 mmfd.)	61-0052
(75)	Choke	32-1438
(76)	Resistor (2200 ohms)	33-222334
	Drive Cord	55-0413
	Speaker	73-0022
	Call Letter Kit	81-0143
	Push-Button	55-0412
	Push-Button	55-0482
	Tuning and Volume Knob	55-0486
	Tuning and Volume Knob	27-4689

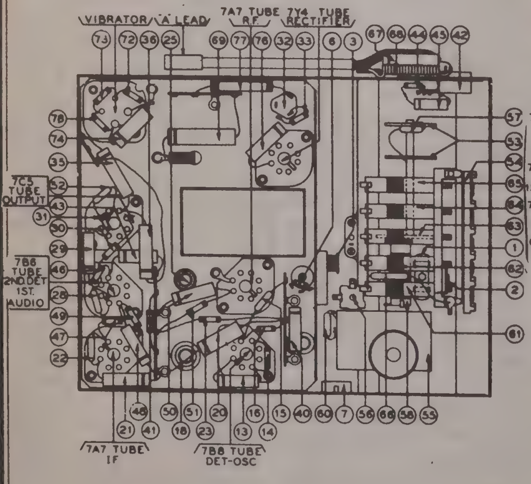
MODEL F-1740 Ford
Schematic, Chassis
Trimmers

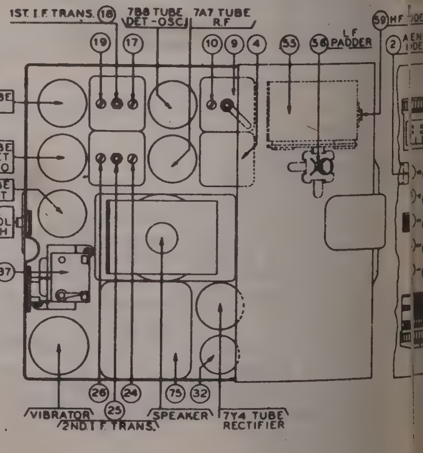
PHILCO RADIO & TELEV. CORP.



NOTE:- VIEWS OF SWITCH WAFERS ARE SHOWN CONNECTED FOR OPERATION ON COIL No. 5. SHADED ROTORS ARE ON UNDERSIDE OF SWITCH WAFERS.

NOTE:- THIS SIDE OF "A" BATTERY GROUNDED TO CASE. (FRAME OF CAR)





MODEL F-1740
Alignment,Tuner
Parts

PHILCO RADIO & TELEV. CORP.

PARTS LIST

No.	Description	Part No.
①	Antenna Choke	65-0283
②	Antenna Padder	Part of (54)
③	Antenna Choke	65-0282
④	Antenna Transforme:	65-0268
⑤	Condenser (.03 mfd.)	61-0064
⑥	Resistor (330,000 ohms)	33-433234
⑦	Sensitivity Control	67-0029
⑧	Resistor (10,000 ohms)	33-310334
⑨	R. F. Transformer	65-0267
⑩	I. F. Wave Trap Padder	Part of ⑨
⑪	Condenser (25 mmfd.)	30-1108
⑫	Resistor (1,000,000 ohms)	33-510234
⑬	Condenser (.05 mfd.)	30-4569
⑭	Resistor (100,000 ohms)	33-410154
⑮	Condenser (250 mmfd.)	61-0034
⑯	Resistor (24,000 ohms)	33-324334
⑰	Padder (Pri. 1st I. F. Trans.)	
⑱	First I. F. Transformer	65-0265
⑲	Padder (Sec. 1st I. F. Trans.)	
⑳	Condenser (.1 mfd.)	30-4455
㉑	Condenser (.05 mfd.)	30-4569
㉒	Resistor (700 ohms)	33-170438
㉓	Resistor (3300 ohms)	33-233334
㉔	Padder (Pri. 2nd I. F. Trans.)	
㉕	Second I. F. Transformer	65-0264
㉖	Padder (Sec. 2nd I. F. Trans.)	
㉗	Resistor (25,000 ohms)	33-325234
㉘	Condenser (100 mmfd.)	30-1031
㉙	Condenser (.02 mfd.)	30-4481
㉚	Resistor (220,000 ohms)	33-422334
㉛	Resistor (470,000 ohms)	33-447154
㉜	Filter Cond. (10-15-20 mfd.)	61-0089
㉝	Resistor (300 ohms)	33-130438
㉞	Tone Control Switch	42-1406-6
㉟	Condenser (.03 mfd.)	30-4447
㊱	Condenser (.01 mfd.)	30-4381
㊲	Output Transformer	65-0279
㊳	Replacement Cone	91-0086
㊴	Field Coil	Not Replaceable
㊵	Condenser (.05 mfd.)	30-4569
㊶	Resistor (1,000,000 ohms)	33-510154
㊷	Vol. Cont. & On-Off Switch	67-0026
㊸	Condenser (.01 mfd.)	61-0014
㊹	Resistor (10,000 ohms)	33-310154
㊺	Condenser (.03 mfd.)	61-0061
㊻	Resistor (1,000,000 ohms)	33-510154
㊼	Resistor (600 ohms)	33-160334
㊽	Condenser (.01 mfd.)	30-4479
㊾	Resistor (24,000 ohms)	33-324334
㊿	Condenser (.05 mfd.)	30-4569
(51)	Resistor (24,000 ohms)	33-324434
(52)	Condenser (250 mmfd.)	61-0033
(53)	Wafer Switch	77-0397
(54)	Antenna Padder Assembly	77-0391
(55)	Tuning Condenser	63-0036
(56)	Low Frequency Padder	63-0037
(57)	Sil. Mica Cond. (300 mmfd.)	61-0003
(58)	Oscillator Trans. (Manual)	65-0252
(59)	H. F. Padder (on Tuning Cond.)	
(60)	Condenser (15 mmfd.)	61-0038
(61)	Oscil. Trans. (900-1580 K.C.)	65-0255
(62)	Oscil. Trans. (900-1580 K.C.)	65-0255
(63)	Oscil. Trans. (750-1300 K.C.)	65-0256
(64)	Oscil. Trans. (580-1050 K.C.)	65-0257
(65)	Oscil. Trans. (580-1050 K.C.)	65-0257
(66)	Sil. Mica Cond. (390 mmfd.)	61,0031
(67)	Condenser (.5 mfd.)	61-0084
(68)	"A" Choke	Part of (71)
(70)	Vibrator Choke	Part of (75)
(71)	Vibrator	83-0017
(72)	Resistor (150 ohms)	33-115334
(73)	Resistor (200 ohms)	33-120334
(74)	Condenser (.5 mfd.)	61-0083
(75)	Power Transformer	65-0278
(76)	Condenser (3000 mmfd.)	61-0059
(77)	Resistor (1800 ohms)	33-218534
(78)	Resistor (150 ohms)	33-115334
	Drive Cord	55-0881
	Indicator Scale (P. B.)	55-0695
	Dial Scale (Manual)	55-0821
	Manual Control Knob	55-0705
	Volume Control Knob	55-0706
	Push-Button	55-0704
	Bezel	55-0754
	Bezel Screws	97-0101
	Interference Condenser	61-0040
	Interference Condenser	61-0092
	Interference Condenser	30-4307
	Hook Bolt	97-0094FA3
	Wing Nut	97-0048FA3
	Gland Nut & Sleeve Assy	77-0459
	Speaker	73-0036-2
	Pilot Lamp	34-2064
	Jumper Plug	57-1121
	Baffle Gasket	55-0707

Model F-1740
ADJUSTMENTS

All adding adjustments are carefully made at the factory nd o narily no readjustments are necessary. However, when eadj ments are required, the procedure given below must e fol wed in detail.

Equ ment — Fully charged heavy duty storage battery or -volt ower pack, 077 or 177 Philco Signal Generator, 027 hilco acuum tube voltmeter and circuit tester and a 27-7059 addi screw driver.

Ger al — The vacuum tube voltmeter can be used as an utpu meter, as a convenient method for obtaining maximum utpu eading. Connect one end of the test lead to the "high" ermi l of the vacuum tube voltmeter and the other end to he ju per on the bottom of the radio. Then connect one end f the ther test lead, from the "plus" terminal of the vacuum ube ltmeter to the radio chassis.

Wi the Radio and signal generator set up for operation at he p scribed frequency, turn the Radio volume control on full nd s the signal generator attenuator so that a half scale eadi is obtained on the output meter. The signal in the peak should be audible but not loud.

All ver plates must be in place on the radio and screwed th housing before attempting to adjust the radio.

OPI A- TI S	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.				
	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 2	㉖ ㉔ ⑲ ⑰ ㉖ ㉔ ⑲ ⑰
	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 2	⑩ Minimum
	1580 K. C.	To Antenna Receptacle on Radio	See Note 1	Note 2	(58)
	1400 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K. C.	②
	580 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K. C.	(56) Note 3
	1580 K. C.	To Antenna Receptacle on Radio	See Note 1	Note 2	(59)
	1400 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K. C.	② Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead part number 95-0120 to the antenna receptacle on the radio, in series with a 20 mmfd. condenser between the antenna lead and the signal generator. Ground the shield pigtail on the antenna lead to the signal generator.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

SETTING UP THE RADIO FOR AUTOMATIC TUNING

Th Antenna and Rotomatic adjustments are easily accessible by emo g the plastic bezel on the top of the radio. This bezel is held by wo s ews.

1 — Turn the radio on and allow it to operate for at least twenty minu before starting any adjustments. All adjustments must be made with e antenna fully extended.

2 — Press the Rotomatic button until the world "Dial" appears on the Roto tic indicator. Tune in a weak station on the manual dial between 300 d 1400 kilocycles. Adjust the **antenna padder** ② (Fig. 3) until maxi m volume is obtained. NOTE: This **adjustment must be made** first fore any Rotomatic adjustments are made; otherwise, mis-tuning will ult.

3 — Select five stations within the frequency range shown under each set o djustment screws in Fig. 3.

4 — With "Dial" showing on the Rotomatic indicator, manually tune n th station to be set up on position No. 1 and identify the program.

5 — Press the Rotomatic button until No. 1 appears on the Rotomatic indicator. Now adjust the top screw at position No. 1 until the station selected is brought in with loudest volume. Then adjust the slotted hex screw at the bottom until maximum volume is obtained. NOTE: Stations of higher frequencies are tuned in by turning the screws to the left or counter-clockwise. Lower frequency stations are tuned by turning to the right or clockwise.

6 — Proceed with setting up the remaining four stations in the same manner as described under Paragraph 4 and 5.

7 — Because there is some detuning of the coils due to the movements of the cores in adjacent coils, **it is necessary** to re-check the adjustments again, going back from Position No. 5 to No. 1 and again re-checking from No. 1 to No. 5. This is important for accurate reception while driving at a distance from the broadcasting stations.

8 — **This final re-checking** of adjustments should be made in an area of low signal strength in your service station or in some known "dead" spot where signals can just **barely be heard.**

1939 FORD ADJUSTABLE ANTENNA
(FOR CLOSED CARS — MODELS 91A AND 99A)

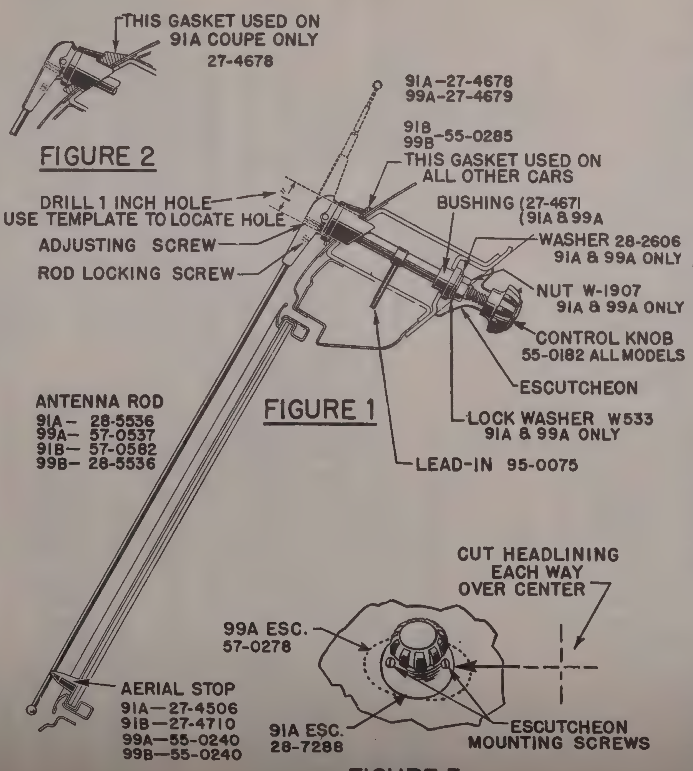


FIGURE 2

FIGURE 1

FIGURE 3

FORD ANTENNA PARTS LIST
(FORD 91A CLOSED CAR)

Ford Part No. 91A18813A — Philco Part No. 91-0038

Part No.	Description	List Price Each	Part No.	Description	List Price Each
*W-55FA1	Nut	per 100 1.20	*27-4679	Gasket	.03
W-533	Lockwasher	per 100 .90	*28-2606	Washer per 100	.50
W-679FA1	Lockwasher	per 100 .45	*28-4696	Wrench	.10
*W-1907	Nut	per 100 4.00	*28-7288	Escutcheon	.25
*W-1988FA8	Screw (Escutcheon Mtg.)	per 100 1.50	*36-4043	Tow Strap	.02
27-4506	Antenna Stop	.06	*55-0182	Knob	.45
*27-4671	Bushing	.15	91-0049	Antenna Assembly	$8.75
27-4678	Gasket	.10	*95-0075	Antenna Lead	1.80

*Used on No. 116 car also.

FORD ANTENNA PARTS LIST
(FORD 91B OPEN CAR)

Ford Part No. 91A18813B — Philco Part No. 91-0051

Part No.	Description	List Price Each	Part No.	Description	List Price Each
*W-55	Nut	per 100 $1.20	28-4696	Wrench	.10
*W-679FA1	Lockwasher	per 100 .45	*55-0182	Knob	.45
W-1774FA8	Screw (Stop Mtg.)	.10	55-0285	Gasket	.03
27-4710	Antenna Stop	.15	55-0810	Threaded Bakelite Bushing	.25
28-2606	Washer	per 100 .50	91-0044	Antenna Assembly	4.25
			*95-0075	Antenna Lead	1.30

*Used on 91A car also.

FORD ANTENNA PARTS LIST
FOR 116 CLOSED CAR (MERCURY) (99A)

Ford Part No. 99A18813A — Philco Part No. 91-0031

Part No.	Description	List Price Each	Part No.	Description	List Price Each
W-55FA1	Nut	per 100 1.20	28-4696	Wrench	.10
W-533	Lockwasher	per 100 .90	36-4043	Tow Strap	.02
W-679FA1	Lockwasher	per 100 .45	55-0182	Knob	.45
W-1907FA1	Nut	per 100 4.00	55-0240	Antenna Stop	.10
W-1988FA8	Screw (Escutcheon Mtg.)	per 100 1.60	57-0278	Escutcheon	.20
27-4671	Bushing	.15	91-0028	Antenna Assembly	$3.75
27-4679	Gasket	.08	95-0075	Antenna Lead	1.80
28-2606	Washer	per 100 .50			

FORD ANTENNA PARTS LIST
FOR 116 OPEN CAR (MERCURY) (99B)

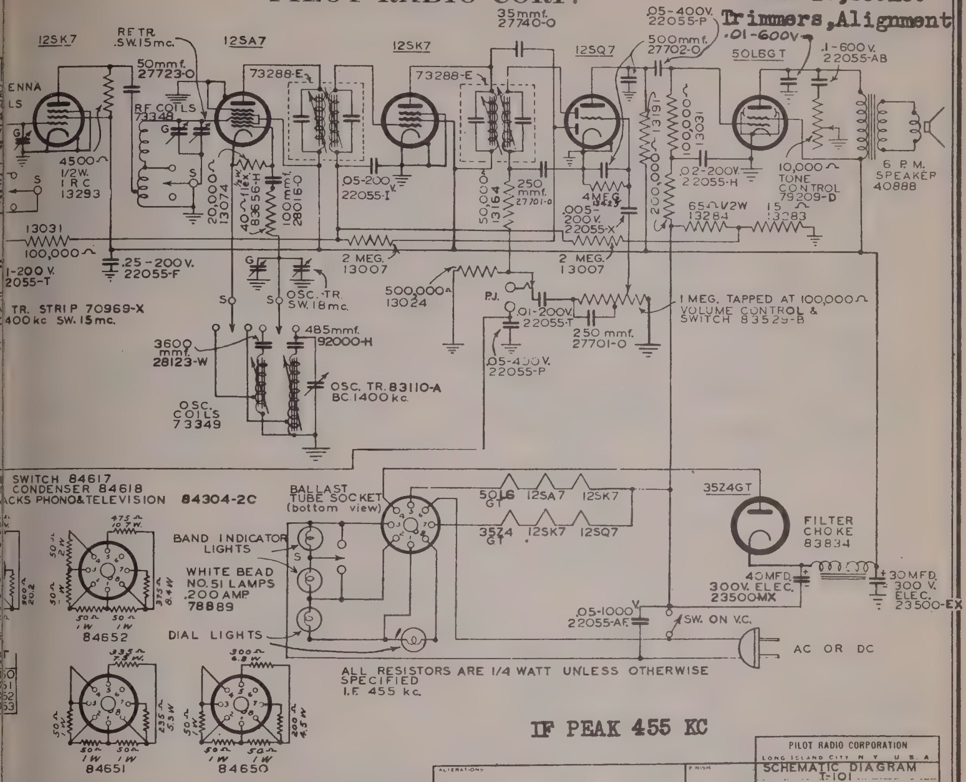
Ford Part No. 99A18813B — Philco Part No. 91-0039

Part No.	Description	List Price Each	Part No.	Description	List Price Each
W-55	Nut	per 100 $1.20	55-0240	Stop	.10
W-679	Lockwasher	per 100 .45	55-0285	Gasket	.08
28-2606	Washer	per 100 .50	55-0810	Threaded Bakelite Bushing	.25
28-4696	Allen Set Screw Wrench	.10	91-0045	Antenna Assembly	4.25
55-0182	Knob	.45	95-0075	Antenna Lead	1.80

Prices subject to change without notice

MODEL T-101
Schematic, Socket
Trimmers, Alignment

PILOT RADIO CORP.



IF PEAK 455 KC

ALTERATIONS | FINISH
CLASSIFICATION T-101
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT
PILOT RADIO CORPORATION
LONG ISLAND CITY N Y U S A
SCHEMATIC DIAGRAM T-101
DATE 3-5-40
DRAWN BY RO
No. 25251

TUNING RANGE

Badcast Band 535 to 1720 kc.; or 561 to 174 meters
Sort Wave Band 5.6 to 19.8 kc.; or 53.6 to 15.2 meters

ANTENNA

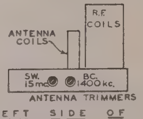
hile this receiver is equipped with the new "Pilo-tenna" for the tion f local stations with good tone quality, it is recommended that d o side antenna of the doublet type be installed for short wave or it badcast band reception and for the reduction of interfering s du to other electrical devices.

hen sing a doublet antenna, connect one lead-in wire to terminal at t e rear of the chassis, and the other lead-in wire to terminal Re ove the connecting link from terminals "D" and "G" and ct t minal "G" to a ground such as a cold water pipe or radiator. or ary single wire antenna is used, connect the lead-in wire to inal "A" on the rear of the chassis. Leave the link between "D" G" erminals and connect a ground wire under terminal "G".

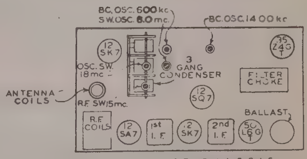
SERVICE NOTES

he l ation of all adjustments used in re-aligning this receiver, and req ncies at which these adjustments should be made, are shown e a ompanying diagram.

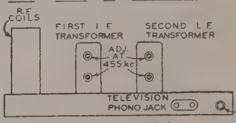
hen ligning the I. F. amplifier, the generator must be connected to rid f the 12SA7 tube through a .1 mfd condenser. When aligning ece r on the Broadcast Band, connect the generator to the Antenna thr gh a .0002 mfd condenser, and on the short wave band use a hm arbon resistor.



LEFT SIDE OF CHASSIS



TOP VIEW OF CHASSIS



REAR VIEW OF CHASSIS

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THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
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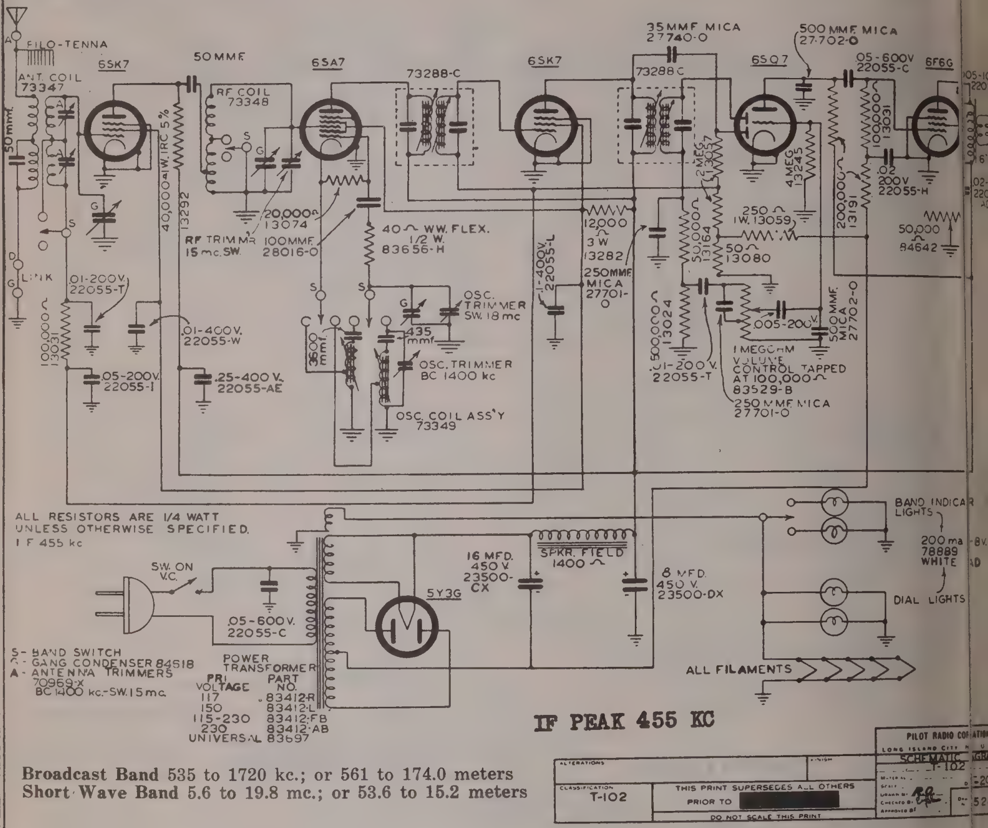
LONG ISLAND CITY N Y U S A
TRIMMER LAYOUT T-101
DATE 3-6-40
DRAWN BY RO
No. 25252

MODEL T-102
Schematic, Socket Alignment, Trimmers

PILOT RADIO CORP.



IF PEAK 455 KC

Broadcast Band 535 to 1720 kc.; or 561 to 174.0 meters
Short Wave Band 5.6 to 19.8 mc.; or 53.6 to 15.2 meters

SERVICE NOTES

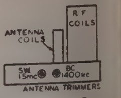
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

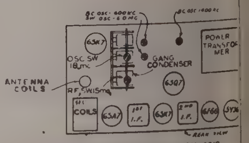
ANTENNA

While this receiver is equipped with the new "Pilo-tenna" for the reception of local stations with good tone quality, it is recommended that a good outside antenna of the doublet type be installed for short wave or distant broadcast band reception and for the reduction of interfering noises due to other electrical devices.

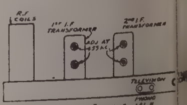
When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the cabinet, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the cabinet. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".



LEFT SIDE OF CHASSIS



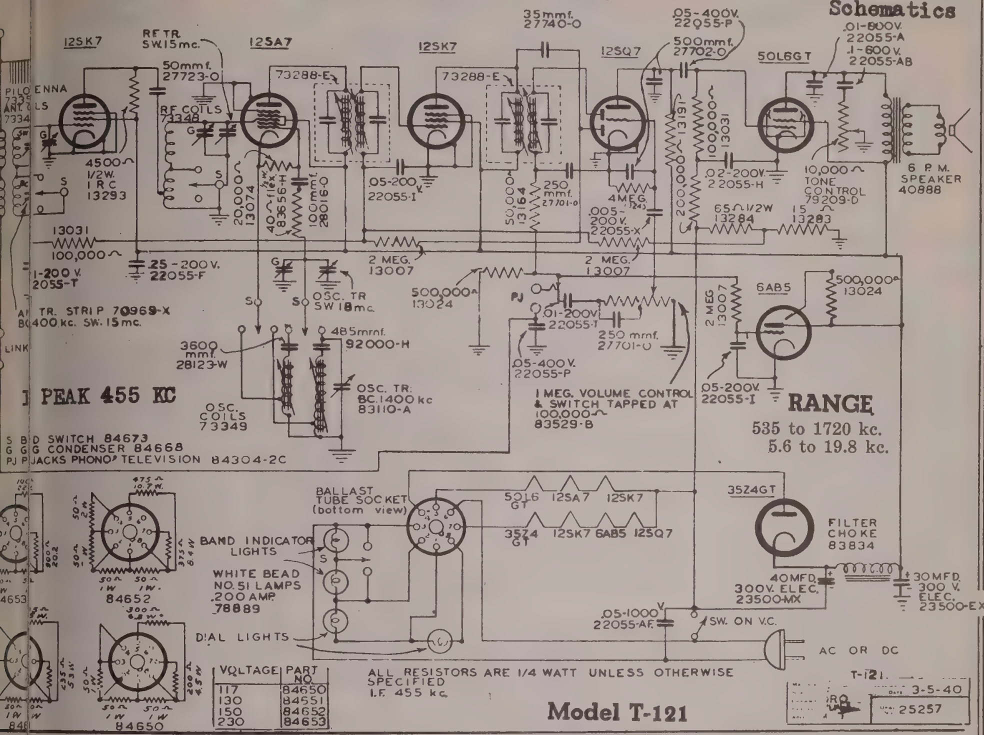
TOP VIEW OF CHASSIS



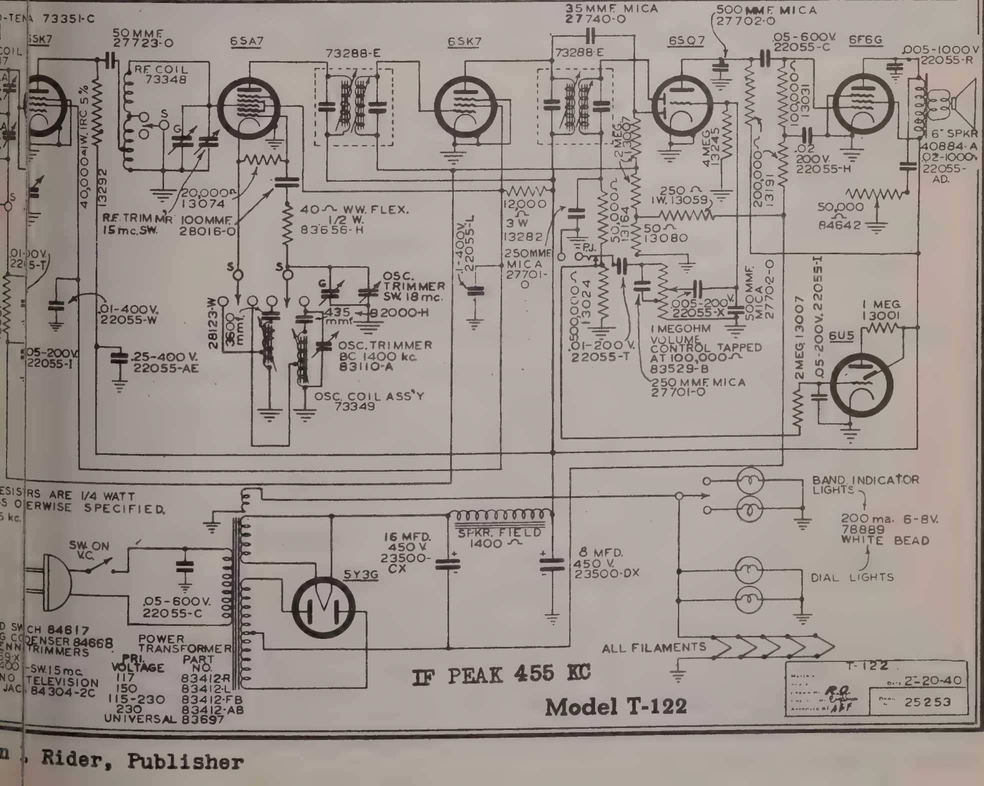
REAR VIEW OF CHASSIS

MODEL T-121
MODEL T-122
Schematics

PILOT RADIO CORP.



Model T-121

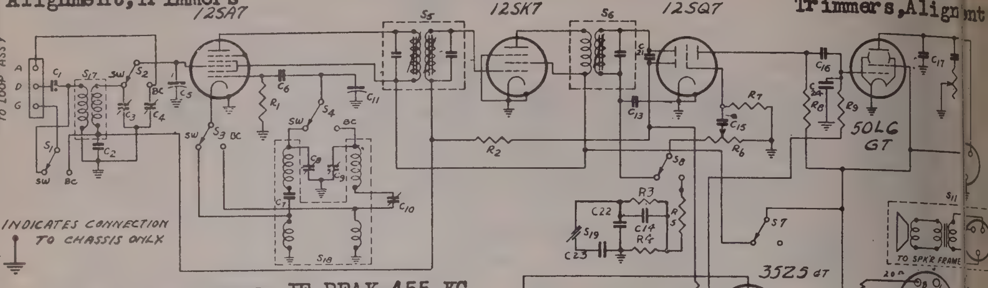


Model T-122

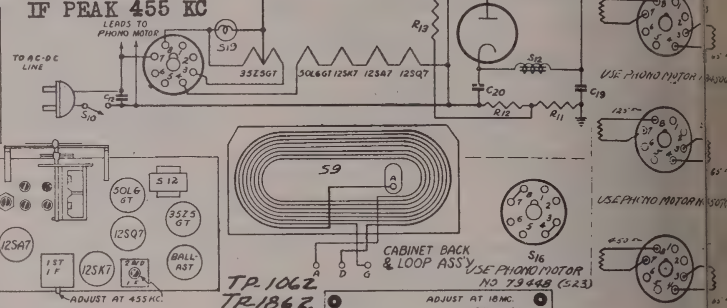
MODEL T-121
MODEL T-122
Alignment, Trimmers

MODELS TP1062, P18
Schematic, Sock
Trimmers, Align

PILOT RADIO CORP.



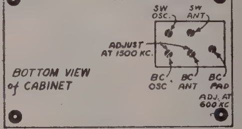
IF PEAK 455 KC



CONDENSERS FOR MODEL TP1062		
C1	22055-W	.01 MFD. , 400 V.
C4	22055-M	1 MFD , 200 V
C3, C4	70969-K	TRIMMER ASSY
C5, C11	84037	GANG CONDENSER
C6	28016-0	.0001 MFD. MICA
C7	27794-W	.005 MFD. MICA.
C8, C9	70969-E	TRIMMER ASS'Y
C10	79431-B	385 MMFD PADDER
C12	22055-AC	.02 MFD , 600 V.
C13	27701-0	.00025 MFD , MICA
C14	22055-AT	.002 MFD. 200 V.
C15	22055 AU	.005 MFD , 400 V.
C16	22055 W	.01 MFD. , 400 V
C17	22055 A	01 MFD. 600 V.
C18	22055-AB	1 MFD . 600 V
C19, C20	23500-E	30 MFD., 300 V. ELEC
C21	27736-0	25 MMFD , MICA
C22	22055-T	01 MFD. 200 V
C23	22055 AB	.1 MFD 600 V
C24	28122-0	.0004 MICA

MISCELLANEOUS FOR MODEL TP1062		
S1 TO S4	84060-C	BAND SWITCH
S5	73192 D	1ST I F. TRANS ASS'Y
S6	73267	2ND I F TRANS. ASS'Y
S7, S8	84060-C	PHONO-RADIO SWITCH
S10		SWITCH ON VOL. CONTROL
S11	40880	8" P.M. SPEAKER
S12	83834	FILTER CHOKE
S13	84429	BALLAST TUBE 130 V.
S14	84430	BALLAST TUBE 150 V.
S15	84431	BALLAST TUBE 230 V
S16	84428	BALLAST TUBE 117 V
S17	73268	S.W. ANT COIL + WIRE ASSY
S18	73266	BC. + S.W. OSC COIL ASSY
S19	72151	DIAL LAMP (BROWN BEAD 150 MA)
S9	84036B	CABINET BACK-LOOP ASSY
S20	84506	PHONO MOTOR FOR 130 V.
S21	84507	PHONO MOTOR FOR 150 V
S22	84508	PHONO MOTOR FOR 230 V
S23	79448	PHONO MOTOR FOR 117 V

RESISTORS FOR MODEL TP1062		
R1	13074	20,000 OHMS, 1/4 WATT
R2, R13	13007	2 MEGOHMS , 1/4 WATT
R3	13031	100,000 OHMS, 1/4 WATT
R4	13117	15,000 OHMS 1/4 WATT
R5	13028	1000 OHM 1/4 WATT.
R6	79429-B	500,000 OHMS, VOL. CONT.
R7	13245	4 MEGOHMS , 1/4 WATT
R8	13147	300,000 OHMS , 1/4 WATT
R9	13024	500,000 OHMS, 1/4 WATT
R10	83447F	100,000 OHMS, TONE CONT.
R11	13283	15 OHMS , 1/4 WATT
R12	13284	65 OHMS. 1/2 WATT



CLASSIFICATION TP1062
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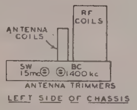
PILOT RADIO CORPORATION
LONG ISLAND CITY N U S
SCHEMATIC WIRING FOR MODEL
DWG NO 2 36

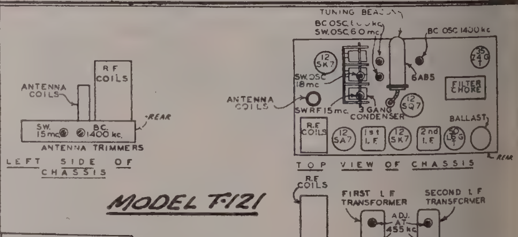


Broadcast Band:

535 to 1720 kc.

Short Wave Band:

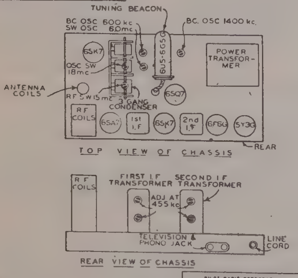
5.6 to 19.8 mc.



MODEL T-121

PILOT RADIO CORPORATION
LONG ISLAND CITY N Y U S A
TRIMMER LAYOUT T-121
DATE 3-15-40
DWG NO 25258

MODEL T-122



T-122
PRIOR TO [redacted]

PILOT RADIO CORPORATION
TRIMMER LAYOUT T-122
3-11-40
25254

MODEL T-121 ANTENNA MODEL T-122

When using a doublet antenna, connect one lead-in wire to te
"A" at the rear of the chassis, and the other lead-in wire to te
"D". Remove the connecting link from terminals "D" and "G
connect terminal "G" to a ground such as a cold water pipe or ra
If an ordinary single wire antenna is used, connect the lead-in w
Terminal "A" on the rear of the chassis. Leave the link betwee
and "G" terminals and connect a ground wire under terminal "

SERVICE NOTES

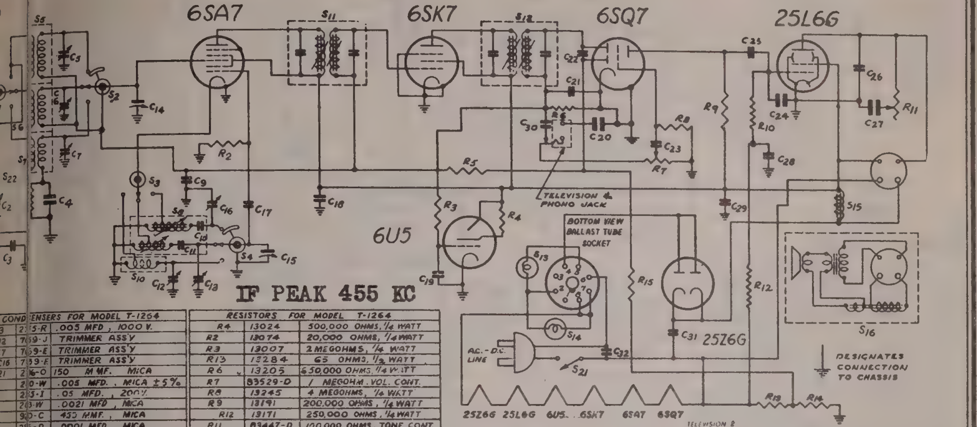
The location of all adjustments used in re-aligning this receive
the frequencies at which these adjustments should be made; are
in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connec
the grid of the *12SA7 tube through a .1 mfd condenser. When al
the receiver on the Broadcast Band, connect the generator to the A
wire through a .0002 mfd condenser, and on the short wave band
400 ohm carbon resistor.

* 6SA7 tube--MODEL T-1

PILOT RADIO CORP.

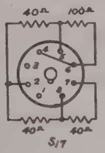
MODEL T1264
MODEL T1351

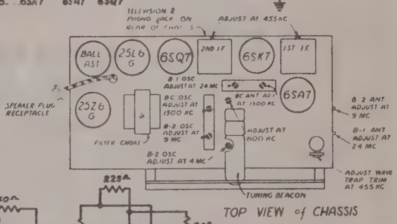


IF PEAK 455 KC

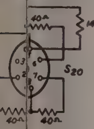
		CONDENSERS FOR MODEL T-1264
3	2 5-R	.005 MFD , 1000 V.
2	7 9-J	TRIMMER ASS'Y
7	7 9-E	TRIMMER ASS'Y
C16	7 9-E	TRIMMER ASS'Y
21	2 6-0	150 MMF. MICA
	2 0-W	.005 MFD. , MICA ±5%
	2 5-I	.05 MFD. , 200V.
	2 3-W	.0021 MFD , MICA
	9 0-C	450 MMF. , MICA
	2 5-0	.0001 MFD. MICA
	2 5-L	.1 MFD , 400 V.
,C30	2 5-T	.01 MFD. ,200 V.
	2 5-P	.05 MFD. , 400 V.
	2 0-0	35 MMF. , MICA
	2 3-X	.005 MFD. , 200 V
	2 2-0	500 MMF. MICA
	2 5-Z	.02 MFD , 400 V.
	22 -AU	.005 MFD. 400 V.
	2 5-A	.01 MFD. , 600 V
	2 5-AB	.1 MFD , 600 V.
	2 EX	30 MFD , 300 V. ELEC
	2 0-EX	30 MFD , 300 V. ELEC.
	2 5-U	.01 MFD , 1000 V.
15	8 5	2 GANG COND.
	7 5	WAVE TRAP TRIM.

RESISTORS FOR MODEL T-1264		
R4	13024	500,000 OHMS, 1/4 WATT
R2	13074	20,000 OHMS, 1/4 WATT
R3	13007	2 MEGOHMS, 1/4 WATT
R13	13284	65 OHMS, 1/2 WATT
R6	13205	650,000 OHMS, 1/4 WATT
R7	83529-D	1 MEGOHM . VOL. CONT.
R8	13245	4 MEGOHMS, 1/4 WATT
R9	13191	200,000 OHMS, 1/4 WATT
R12	13171	250,000 OHMS, 1/4 WATT
R11	83447-D	100,000 OHMS, TONE CONT.
R10	13031	100,000 OHMS, 1/4 WATT
R1	13241	60,000 OHMS, 1/4 WATT
R15, R5	13007	2 MEGOHMS, 1/4 WATT
R14	13283	15 OHMS, 1/4 WATT
MISCELLANEOUS FOR MODEL T-1264		
S1 TO S4	84246	BAND SWITCH
S5	73306	BC ANT. COIL ASS'Y
S6	73307	ANT. COIL ASS'Y B-2
S7	73327	ANT COIL ASS'Y B-1
S8	73309	OSC. COIL ASS'Y BC., B-2
S10	73310	OSC. COIL ASS'Y, B-1
S11	73288-C	1ST. I.F. TRANS. ASS'Y
S12	73288-C	2ND I.F. TRANS. ASS'Y
S13, S14	71282	PILOT LIGHT, .25A. BLUE
S15	83834	FILTER CHOKE, 170 Ω
S16	40855	SPEAKER, 2500 Ω FIELD
S17	81971	BALLAST TUBE 110/125 V
S18	81972	BALLAST TUBE 220/240 V
S20	81576	BALLAST TUBE, 150 V.
S19	84152	BALLAST TUBE, 130 V.
S21	83529-D	SWITCH ON VOL. CONT.

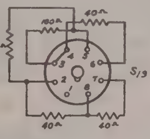


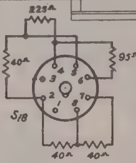


TOP VIEW of CHASSIS



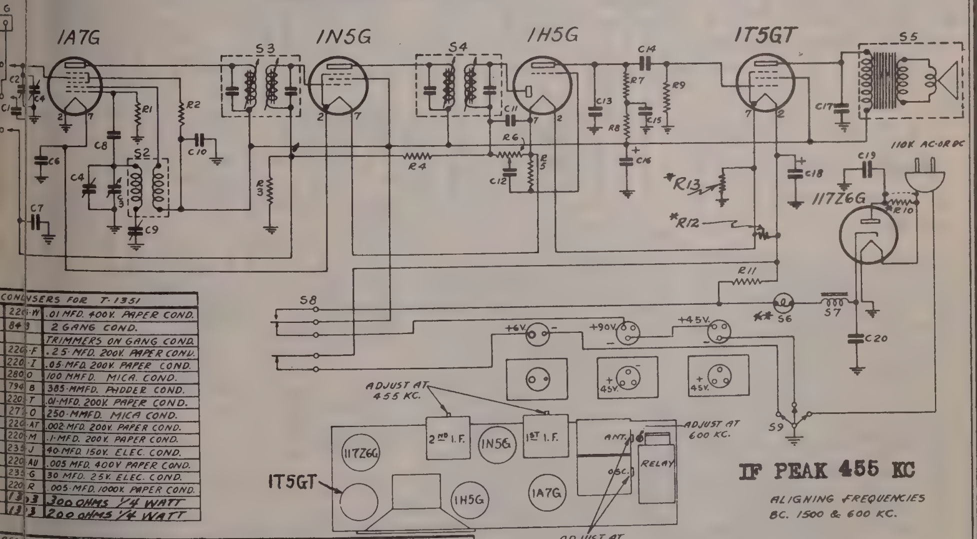
⊕ADDED-C30·01·200,-CO·3136·BR·10·23·39.





ALTERATIONS
② DOUBLET ANT. CONN. ADDED HM 10-12-39
① REVISED.- C.O. BR.-10-18-39
FINISH
CLASSIFICATION
T-1264
THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [redacted]

PILOT RADIO CORPORATION
LONG ISLAND CITY N. Y. U. S. A.
SCHEMATIC WIRING DIAGRAM
MODEL T-1264
MATERIAL
SCALE
DATE
DRAWN BY HM.
CHECKED BY
APPROVED BY
DWG NO 25230-4



		CONDENSERS FOR T-1351
	220 -W	.01 MFD. 400V. PAPER COND.
	84 9	2 GANG COND.
		TRIMMERS ON GANG COND.
	220 -F	.25 MFD. 200V. PAPER COND.
	220 -I	.05 MFD. 200V. PAPER COND.
	280 0	100 MMFD. MICA. COND.
	794 B	385 MMFD. PADDER COND.
	220 -T	.01 MFD. 200V. PAPER COND.
	27 -0	250 MMFD. MICA COND.
	220 -AT	.002 MFD. 200V. PAPER COND.
	220 -M	.1 MFD. 200V. PAPER COND.
	235 J	40 MFD. 150V. ELEC. COND.
	220 -AU	.005 MFD. 400V PAPER COND.
	235 G	30 MFD. 25V. ELEC. COND.
	220 R	.005 MFD. 1000V. PAPER COND.
	13 3	300 OHMS 1/4 WATT
	13 3	200 OHMS 1/4 WATT

IF PEAK 455 KC

ALIGNING FREQUENCIES
BC. 1500 & 600 KC.

	RESISTORS FOR T-1351		MISCELLANEOUS FOR T-1351		
	13	200,000 OHMS 1/4 W. CARBON	S1	73282	ANT. LOOP ASS'Y.
	13	60,000 OHMS 1/4 W. CARBON	S2	73271	OSC. COIL ASS'Y.
	13	1 MEGOHM 1/4 W. CARBON	S3	73288	1ST I.F. TRANS. ASS'Y.
	13 7	2 MEGOHMS 1/4 W. CARBON	S4	73289	2ND. I.F. TRANS. ASS'Y.
	13 4	15 MEGOHMS 1/4 W. CARBON	S5	40874	5" P.M. SPEAKER.
	84 9	1 MEGOHM VOL. CONT. & SW.	**S6	72127	60 MIL. 2V. PILOT LIGHT
	13 1	100,000 OHMS 1/4 W. CARBON	S7		400 OHM COIL ON RELAY
	83 -K	75 OHMS 1 1/2 W. FLEX. RES.	S8	84216	RELAY
	83	1700 OHMS 5 W. WIRE WOUND.	S9		SWITCH ON VOL. CONT.

*R12, R13 ADDED TO LATE SETS.
R10 NOT USED ON LATE SETS.
**S6-72151-150 MIL. 2 V. ON LATE SETS.

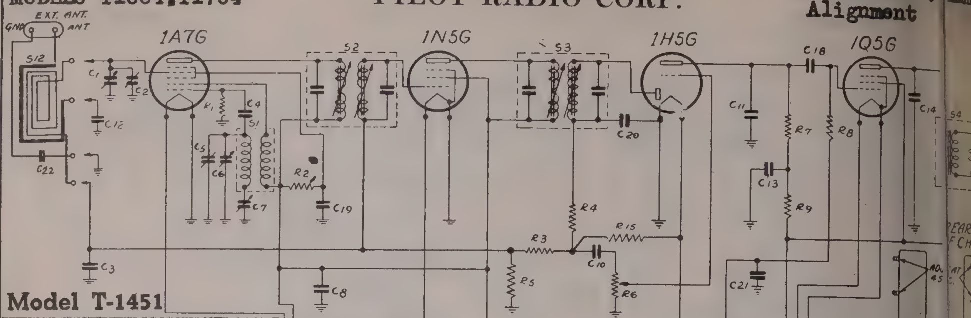
ALTERATIONS
FINISH
CLASSIFICATION
T-1351
THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [redacted]
DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC WIRING DIAGRAM
MATERIAL
SCALE
DATE 7-20-39
DRAWN BY E.F.
CHECKED BY
APPROVED BY
DWG NO 25225.

MODEL T1451
MODELS T1664, T1764

PILOT RADIO CORP.

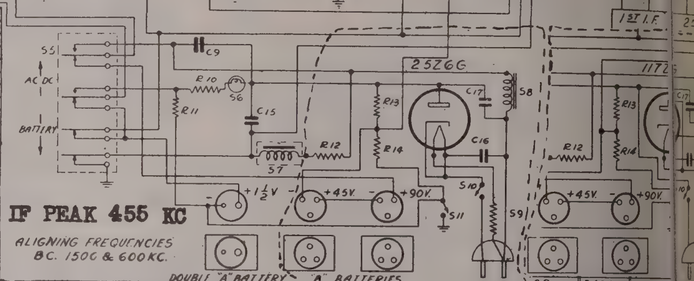
Schematics, Alignment



Model T-1451

RESISTORS FOR MODEL T-1451		
R1	13191	200,000 OHMS 1/4 W CARBON
R2	13241	60,000 OHMS 1/4 W CARBON
R3 R5 R8	13223	3.3 MEGS. 1/4 W CARBON
R4	13164	50,000 OHMS 1/4 W CARBON
R6	84105	2 MEGS VOL CONT & SWITCH
R7	13001	1 MEG. 1/4 W CARBON
R9	13031	100,000 OHMS 1/4 W CARBON
R10	83656-J	50 OHMS 1 W FLEXIBLE
R11	83656 G	25 OHMS .5 W. FLEXIBLE
R12	84116	700 OHMS 8W. W W IRONCLAD
R13	13019	2000 OHMS 1/4 W CARBON
R14	13048	800 OHMS 1/4 W. CARBON
R15	13007	2 MEGS. 1/4 W. CARBON

CONDENSERS FOR MODEL T 1451		
C1 C6	84125	2 GANG COND
C2 C5	70969-J	ANT. & OSC TRIMMER ASS'Y.
C3	22055-I	.05 MFD. 200V PAPER COND.
C4 C11	28016-0	100 MMFD MICA COND.
C7	79431 B	385 MMFD. PADDING COND.
C16	22055-P	.05 MFD. 400V. PAPER COND
C9 C17	23500 J	40 MFD 150V ELEC. COND
C10	22491 E	.01 MFD. 200V. COND.
C12	22055 W	.01 MFD. 400V. PAPER COND.
C13	22055-M	.1 MFD 200V. PAPER COND.
C14	22055-K	.002 MFD 600V PAPER COND.
C15	23500-G	30 MFD 25V. ELEC. COND
C18 C19	22055-T	.01 MFD. 200V PAPER COND.
C20	27701-0	250 MMFD. MICA COND.
C8	22055AK	1.0 MFD. 200V PAPER COND.
C21	23500-B	10 MFD 25V. ELEC COND.
C22	22055-A	.01 MFD 600 V



IF PEAK 455 KC

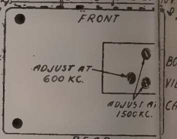
ALIGNING FREQUENCIES
BC. 1500 & 600KC.

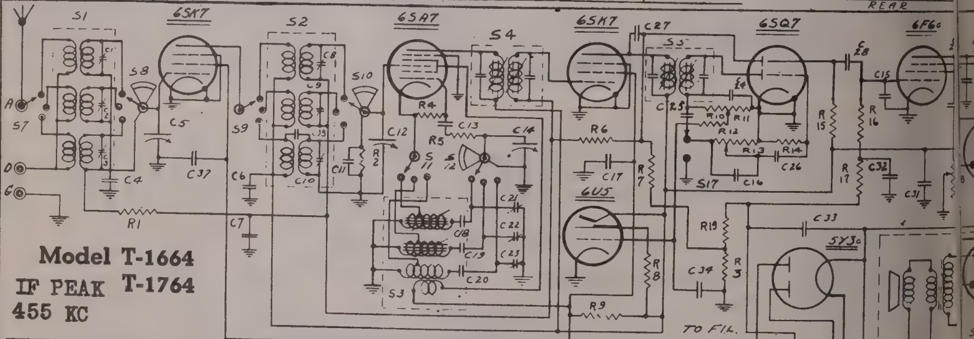
MISCELLANEOUS FOR MODEL T 1450		
S1	73271	OSC. COIL ASS'Y
S2	73277	1ST I.F. TRANS. ASSY
S3	73274	2ND. I.F. TRANS ASS'Y.
S4	40877	5¼ P.M. SPEAKER
S5 S7	84110	RELAY
S6	72151	DIAL LIGHT .15 AMPS.
S8	84115	CHOKE 5 HS 200Ω 100 MA.
S9	84106	LINE CORD 310Ω
S10 S11		SWITCHES ON VOL CONT.
S12	73264	ANT LOOP ASSY

ALTERATIONS & DATE

② C2 C5 WAS 70969-E E.F. 5/16/39
④ R-14 WAS 1200Ω 1Q5G WAS 1C5G E.F. 6-1-39
⑤ C22 ADDED, AND NEW ANT GND CKT A.H. [illegible]
⑥ DROPPED RESISTOR LINE CORD ADD 25Z6G TUBE C.O. #3298 L.B.C.F. 11-15-39

MATERIAL
SCALE
DRAWN BY E.F.
CHECKED BY
APPROVED BY
DATE 5-11-39
DRWG NO 25221-5





Model T-1664
T-1764

IF PEAK 455 KC

RESISTORS FOR MODEL 1660		
R1, R16	13031	100,000 OHMS 1/4 WATT
R2, R8	13001	1 MEGOHM 1/4 WATT
R3	13080	30 OHMS 1/4 WATT
R4	13074	20000 OHMS 1/4 WATT
R5	83656-H	40 OHMS W W FLEX
R6, R7, R12	13007	2 MEGOHMS 1/4 WATT
R9	13282	12000 OHMS 3 WATT
R10 R11	13227	330,000 OHM 1/4 WATT.
R13	83529F	1 MEGOHM. VOL. CONTROL
R14	13245	4 MEGOHMS. 1/4 WATT.
R15	13191	200 000 OHMS 1/4 WATT.
R17	13171	250 000 OHMS 1/4 WATT
R18	83447E	100 000 OHMS, TONE CONTROL
R19	13036	200, OHMS 1 WATT

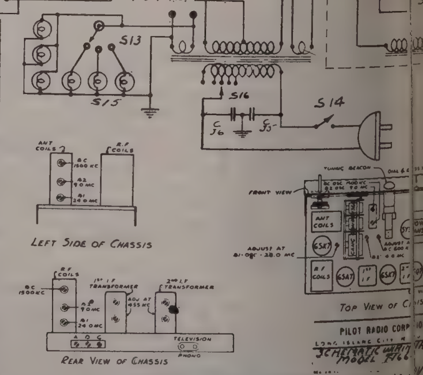
MISCELLANEOUS FOR MODEL 1660		
S1	73312	ANT COIL AND CAN ASSY.
S2	73317	INT. STAGE COIL AND CAN ASSY.
S3	73322	OSC. COIL AND CAN ASSY
S4	73192	1ST IF TRANSFORMER ASSY
S5	73193	2ND IF TRANSFORMER ASSY
S6	40849	8 IN SPEAKER
S6	40856B	12 IN SPEAKER
S7 TO S13	84393	BAND SWITCH ASSY
S14		LINE SWITCH ON VOL CONTROL
S15	78889	DIAL LAMPS (WHITE BEAD)
S16	83697	PWR TRANSFORMER - UNIV
S16	83412-R	PWR TRANS. 117 VOLT 50/60 ~
S16	83412-AB	PWR TRANS. 230 VOLT 50/60 ~
S16	83412-FB	PWR TRANS 115V-230V 50/60 ~

ALTERATIONS & DATE

② C2 C5 WAS 70969-E E.F. 5/16/39
④ R-14 WAS 1200Ω 1Q5G WAS 1C5G E.F. 6-1-39
⑤ C22 ADDED, AND NEW ANT GND CKT A.H. [illegible]

CONDENSERS FOR MODEL 1660		
C1, C2, C3		TRIMMERS
C4 C7	22055I	.05 MFD. 200 VOLT
C5, C12, C14	84407	3 GANG CONDENSER
C8, C9, C10		TRIMMERS
C11	22055AY	.001 MFD. 200 VOLT
C13	27723-0	50 MMF MICA
C15	27702-0	500 MMF MICA
C16	27701-0	250 MMF MICA
C17, C37	22055 A	.01 MFD. 600V
C18	32000-C	450 MMF SILVER MICA
C19	27732	.0016 MFD. MICA
C20	28023W	.0038 MFD MICA
C21, C22	70969E	TRIMMERS
C24	28105	150 MMF MICA
C25, C32	22055T	.01 MFD 200V
C26	22055X	.005 MFD. 200V
C27	28114-0	20 MMF MICA
C28	22055AC	.02 MFD 600V
C29	22055V	.03 MFD 1000V
C30	22055R	.005 MFD. 1000V
C31	23500D	8 MFD. 450V ELECT
C33	23500C	16 MFD 450V ELECT
C34	22055T	.01 MFD. 200V
C35, C36	22055U	.01 MFD 1000V.
C38	28120-0	5 MMF MICA
C23	83110-B	TRIMMER
C6	22055C	.05 MFD. 600 VOLT.

MISCELLANEOUS FOR MODEL 1660		
S16	83412 L	PWR TRANS 130V 50/60V
S17	84304	PHONO JACK
S18	FRONT VIEW OF PLUG	
S19	REAR VIEW OF SPEAKER PLUG	



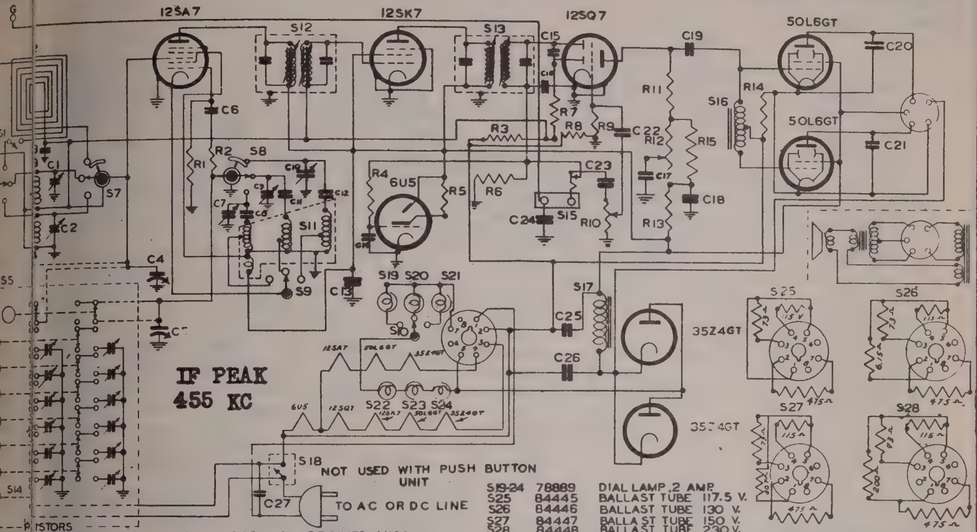
T1660

THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [redacted]
DO NOT SCALE THIS PRINT

PILOT RADIO CORP.
LONG ISLAND CITY
SCHEMATIC WIRING MODEL T166

PILOT RADIO CORP.

MODELS X1584,X1684
MODEL T1854



S18 NOT USED WITH PUSH BUTTON UNIT

TO AC OR DC LINE

S19-24	78889	DIAL LAMP .2 AMP.
S25	84445	BALLAST TUBE 117.5 V.
S26	84446	BALLAST TUBE 130 V.
S27	84447	BALLAST TUBE 150 V.
S28	84448	BALLAST TUBE 230 V.

R ISTORS

13074	0,000 OHMS 1/4 W
83656	H 40 OHMS1/2W WW
13007	MEGOHMS 1/4 W
13024	00,000 OHMS 1/4 W
13205	50,000 OHMS 1/4 W
13288	5 OHMS 1/4 W
13245	MEGOHMS 1/4 W
83529	I MEGOHM VOL.C. & SW
13149	,000 OHMS 1/4 W
83447	100,000 OHM TONE C
13043	50,000 OHMS 1/4 W
13076	50 OHMS 1 W
13031	00,000 OHMS 1/4 W

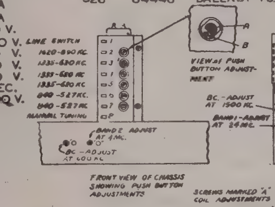
C DENSERS

70969	TRIMMER STRIP ASSBY
22055	.09 MFD. 200 V.
84270	2 GANG CONDENSER
27720	50MFD. MICA
70969	TRIMMER STRIP ASS'Y
28023	.0038 MICA
70969	TRIMMER STRIP ASS'Y
2773	.0016 MFD. MICA
9200-C	450 MMFD. SLVR MICA
2205M	.1 MFD. 200 V.
2205T	.01 MFD 200 V.

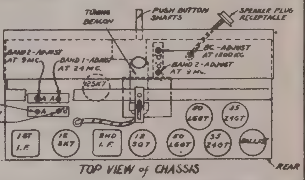
C15	27740-0	35 MMFD. MICA
C16	27786-0	150 MMFD. MICA
C19	22055-P	.05 MFD. 400 V.
C20,21	22055-R	.005 MFD. 1000 V.
C22	22055-X	.005 MFD. 200 V.
C23,24	22055-1	.05 MFD. 200 V.
C25,26	23500-E	30 MFD. 300 V. TUBULAR ELEC.
C27	22055-AF	.05 MFD. 1000 V.

MISCELLANEOUS

S1	72049-2	ANT. SEL. SW.
S2	84252	ANT. L.P. ASS'Y
S3	73315	B-2 ANT. C
S4	73333	B-1 ANT. C
S5	84260	8 P.B. UNIT
S6-10	84246	BAND SW.
S11	73332	OSC. C. ASS'Y
S12	73290	1st I.F. TRFMR
S13	73291	2nd I.F. TRFMR
S14		SW. USED ON X-1584 only
S15	84304 C	PHONO & TV. JK.
S16	84538	C.T. AUDIO CH.
S17	84540	FILTER CHOKE
S18		SW. ON VOL. CONT'L ON X-1584 ONLY



FRONT VIEW OF CHASSIS SHOWING PUSH BUTTON ADJUSTMENTS

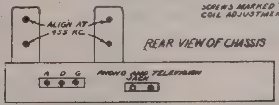


TOP VIEW of CHASSIS

SCREWS MARKED "A" ARE ANTENNA COIL ADJUSTMENTS
SCREWS MARKED "O" ARE OSCILLATOR COIL ADJUSTMENTS

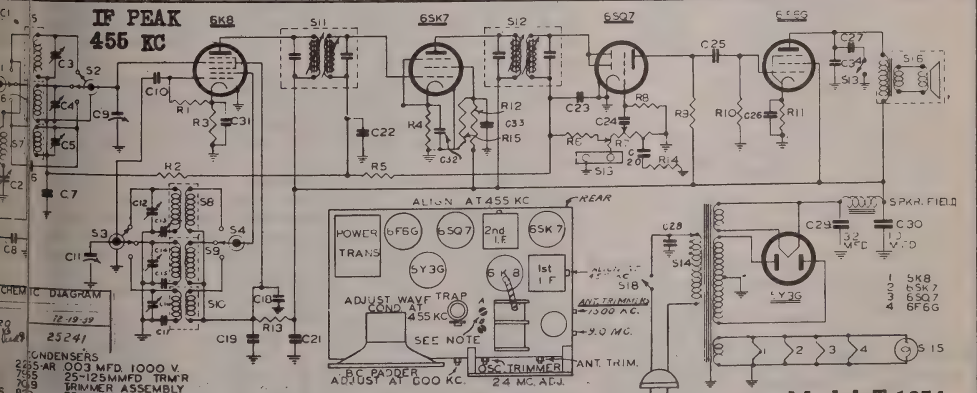
CIRCUIT DIAGRAM
Material
Scale
Drawn By RO
Checked By
Approved By
Date 12-12-39
Dwg. No. 25240

THIS PRINT SUPERSEDES ALL OTHERS



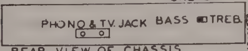
REAR VIEW OF CHASSIS

Models X-1584—X-1684



SCHEMATIC DIAGRAM
12-19-39
25241

OSC. TRIMMERS
NOTE A 1500 KC
B 9.0 MC.



REAR VIEW OF CHASSIS

CONDENSERS

2255-AR	.003 MFD. 1000 V.
7955	25-125MMFD TRM'R
7069	TRIMMER ASSEMBLY
830	TRIMMERS
2397	.00001 MFD. MICA
2255-1	.05 MFD. 200V.
2255-R	.005 MFD. 1000V.
7964	2 GANG CONDENSER
2223-0	50 MMFD. MICA
7069-E	TRIMMER ASSEMBLY
7931-B	PADDER 300-500 MMFD.
2204-W	.002 MICA
2234 W	.006 MICA
2255 P	.05 MICA 400 V.
2500D	8 MFD. 450 V. ELEC.
2055-1	.05 MFD. 200 V.
2055-L	.1 MFD 400 V.
2201-C	.00025 MFD. MICA
2255-W	.01 MFD. 400 V.
2200-B	10 MFD. 25 V. ELEC.
2255-AD	.02 MFD. 1000 V.
2255-P	.05 MFD. 400 V.
2044	32-10 MFD 450 V. ELEC.
2255-1	.05 MFD. 200V.

RESISTORS

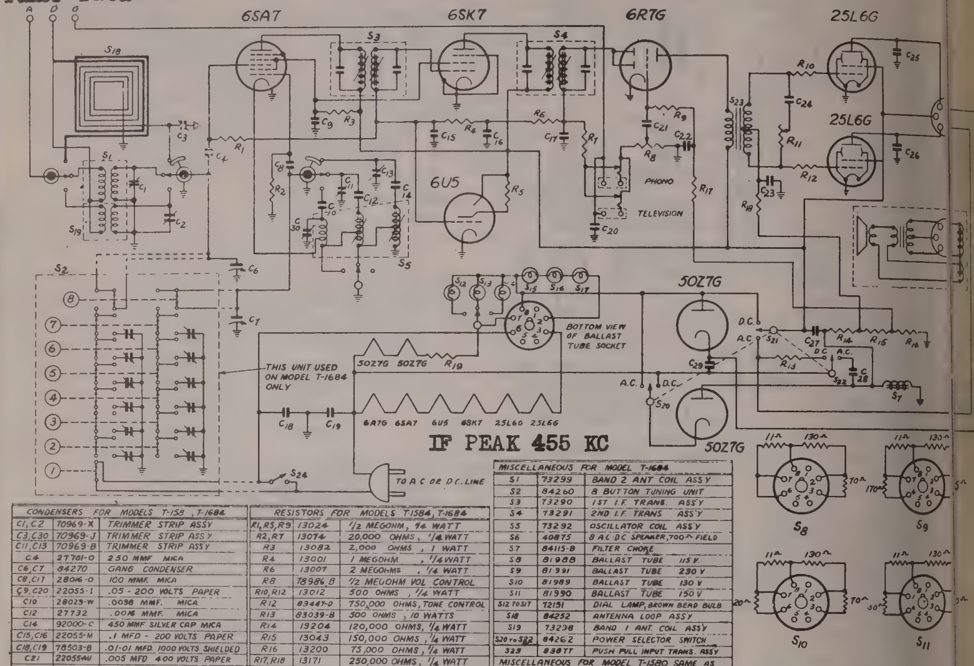
R1&6	13164	50000 OHMS 1/4 WATT
R2	13031	100,000 OHMS 1/4 WATT
R5	13007	2 MEGOHMS 1/4 WATT
R3 &4	13003	300 OHMS 1/4 WATT
R7	83529-E	1 MEGOHM VOLUME CONTROL
R8	13245	4 MEGOHMS 1/4 WATT
R9	13171	250,000 OHMS 1/4 WATT
R10	13024	500,000 OHMS 1/4 WATT
R11	13214	500 OHMS 1 WATT
R12	13062	50,000 OHMS 1/2 WATT
R13	13289	30,000 OHMS 2 WATT
R14	13074	20,000 OHMS 1/4 WATT
R15	13164	50,000 OHMS 1/4 WATT

Model T-1854

MISCELLANEOUS

S1,2,3,4	83104	BAND SWITCH
S5,7	73175	ANTENNA COIL ASSEMBLY BC & B1
S6	73154	ANTENNA COIL ASSEMBLY B2
S8,10	73176	OSCILLATOR COIL ASSEMBLY BC & B1
S9	73156-B	OSCILLATOR COIL ASSEMBLY B2
S11	73288-B	1st I.F. TRANSFORMER ASSEMBLY
S12	73288-B	2nd I.F. TRANSFORMER ASSEMBLY
S13	72049	TONE CONTROL SWITCH
S14	83412-R	POWER TRANSF. 117 VOLTS } 50-60 CYCLES
S14	83412-AB	POWER TRANSF 230 VOLTS } 50-60 CYCLES
S14	83412-FB	POWER TRANSF. 115-230 V } 50-60 CYCLES
S14	83412-L	POWER TRANSF 150 VOLTS } 50-60 CYCLES
S14	83697	POWER TRANSF UNIVERSAL } 50-60 CYCLES
S15	71282	PILOT LIGHT BLUE BEAD
S16	40884	6 INCH SPEAKER 1400 OHM FIELD
S17	71119	WAVE TRAP COIL ASSEMBLY
S18	83529-E	SWITCH ON VOLUME CONTROL
S19	84304-C	PHONO. & TELEV JACK

PILOT RADIO CORP.



IF PEAK 455 KC

CONDENSERS FOR MODELS T-158 , T-1684		
C1, C2	70969-X	TRIMMER STRIP ASSY
C3, C30	70969-J	TRIMMER STRIP ASS'Y
C11, C13	70969-B	TRIMMER STRIP ASS'Y
C4	27701-0	250 MMF MICA
C6, C7	84270	GANG CONDENSER
C8, C17	28016-0	100 MMF. MICA
C9, C20	22055-I	.05 - 200 VOLTS PAPER
C10	28023-W	.0038 MMF. MICA
C12	27732	.0016 MMF. MICA
C14	92000-C	450 MMF SILVER CAP MICA
C15, C16	22055-M	.1 MFD - 200 VOLTS PAPER
C18, C19	78503-B	.01-01 MFD. 1000 VOLTS SHIELDED
C21	22055AU	.005 MFD 400 VOLTS PAPER
C25, C26	22055-R	.005 MFD 1000 VOLTS PAPER
C22, C23	22055-F	.25 MFD. - 200 VOLTS PAPER
C27	23500-E	30 MFD. - 300 VOLTS SMALL TUB.
C28, C29	23500-J	40 MFD - 150 VOLTS ELECTRO.
C24	22055-W	.01 400 VOLTS PAPER

RESISTORS FOR MODELS T-1584, T-1684		
R1, R5, R9	13024	1/2 MEGOHM, 1/4 WATT
R2, R7	13074	20,000 OHMS, 1/4 WATT
R3	13082	2,000 OHMS , 1 WATT
R4	13001	1 MEGOHM , 1/4 WATT
R6	13007	2 MEGOHMS , 1/4 WATT
R8	78986 B	1/2 MEGOHM VOL CONTROL
R10, R12	13012	500 OHMS , 1/4 WATT
R12	83447-0	750,000 OHMS, TONE CONTROL
R13	83039-B	500 OHMS , 10 WATTS
R14	19204	120,000 OHMS, 1/4 WATT
R15	13043	150,000 OHMS , 1/4 WATT
R16	13200	75,000 OHMS , 1/4 WATT
R17, R18	13171	250,000 OHMS, 1/4 WATT
R19	83656 M	110 OHMS 2 WATTS

RESISTORS FOR MODEL T-1584		
R8	83529-D	1 MEGOHM VOL. CONTROL WITH SWITCH S24

MISCELLANEOUS FOR MODEL T-1684		
S1	73299	BAND 2 ANT COIL ASS'Y
S2	84260	8 BUTTON TUNING UNIT
S3	73290	1ST I.F. TRANS. ASS'Y
S4	73291	2ND I.F. TRANS ASS'Y
S5	73292	OSCILLATOR COIL ASS'Y
S6	40875	8 A.C. DC SPEAKER, 700 ^ FIELD
S7	84115-B	FILTER CHOKE
S8	81988	BALLAST TUBE 115 V.
S9	81991	BALLAST TUBE 230 V
S10	81989	BALLAST TUBE 130 V
S11	81990	BALLAST TUBE 150 V
S12 TO S17	72151	DIAL LAMP, BROWN BEAD BULB
S18	84252	ANTENNA LOOP ASS'Y
S19	73298	BAND 1 ANT. COIL ASS'Y
S20 TO S22	84262	POWER SELECTOR SWITCH
S23	838TT	PUSH PULL INPUT TRANS. ASS'Y
MISCELLANEOUS FOR MODEL T-1580 SAME AS FOR MODEL T-1680 EXCEPT FOLLOWING		
S2		NOT USED

ALTERATIONS

FINISH

CLASSIFICATION
T-1584
T-1684

THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [redacted]

DO NOT SCALE THIS PRINT

PILOT RADIO CORPO
LONG ISLAND CITY N Y
SCHEMATIC CIRCUIT D
MODEL T-1584, MODE 684
MATERIAL
SCALE
DATE -39
DRAWN BY HM
CHECKED BY
APPROVED BY
DWG NO 23 6

PUSH BUTTON CONTROLS:

The purpose of the topmost button (No. 1) is to shut off the ow of the receiver. The following 6 push buttons are available fo ny stations on the broadcast band in the tuning ranges designated elo The lowest button (No. 8) is to be pressed when you wish to ope e t manual tuning control.

To set the 6 station buttons (No. 2 to 7) to various stations f t broadcast band, the operations noted below should be followed.

1. Remove the two screws above and below the push buttons wooden cover plate and lift off the plate. This will disclose the ad sti screws.

2. With a screw driver inserted in the larger of the two re opposite the buttons, turn either right or left until the desired ati is tuned in. Then make the final adjustment with the small scre

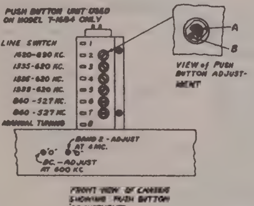
The limiting wave lengths between which the various buttons adjusted are as follows: (buttons numbered from top to bottom)

Button No. 1—"OFF" power switch
Button No. 2—from 1620 kc. to 890 kc. and "ON" power swi
Button No. 3—from 1335 kc. to 620 kc. and "ON" power swi
Button No. 4—from 1335 kc. to 620 kc. and "ON" power swi
Button No. 5—from 1335 kc. to 620 kc. and "ON" power swi
Button No. 6—from 840 kc. to 527 kc. and "ON" power swi
Button No. 7—from 840 kc. to 527 kc. and "ON" power swi
Button No. 8—Manual Tuning and "ON" power switch

3. In the instruction envelope you will find a card with perf at call letters for most of the broadcasting stations.

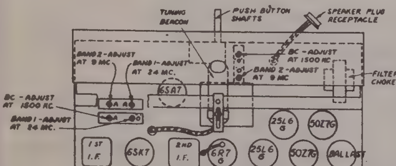
Remove the desired one and insert it in the head of the push tt whose shaft is next to the screw which has been adjusted to that s io

4. After all push buttons have been set, replace the front wod plate.

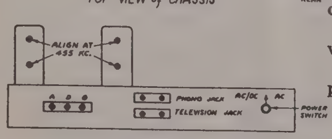


FRONT VIEW OF CHASSIS SHOWING PUSH BUTTON ADJUSTMENTS

SCREWS MARKED "A" ARE ANTENNA COIL ADJUSTMENTS
SCREWS MARKED "O" ARE OSCILLATOR COIL ADJUSTMENTS

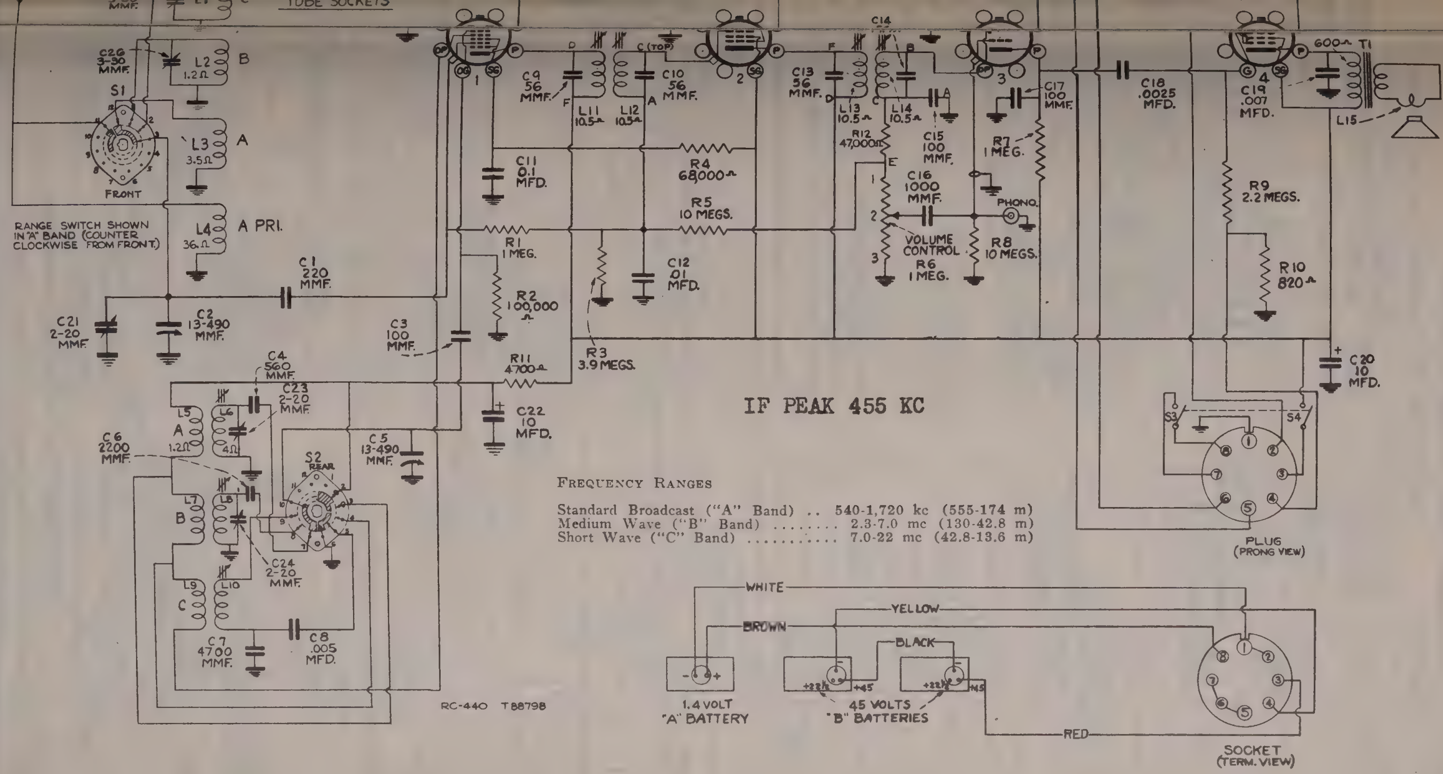


TOP VIEW of CHASSIS



REAR VIEW of CHASSIS

RCA MFG. CO., INC.



IF PEAK 455 KC

Frequency Ranges

Standard Broadcast ("A" Band) ..	540-1,720 kc	(555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc	(130-42.8 m)
Short Wave ("C" Band)	7.0-22 mc	(42.8-13.6 m)

Model 4QB Schematic Diagram

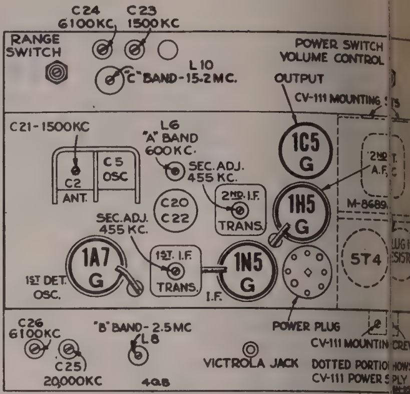
Precautionary Lead Dress:

1. Dress C3 (100 mmfd.) edgewise to chassis.
2. Dress the 1A7-G grid cap lead clear of chassis.
3. Dress green wire from C2 (antenna section of gang) to range switch away from chassis and other wires.
4. Dress blue lead from terminal "E" of 2nd I-F transformer around terminal "D", away from the 1H5-G and 1C5-G sockets, and close to the chassis.
5. Dress C16 (1,000 mmfd.) from grid of 1H5-G tube to volume control, and the green lead to the 1H5-G grid cap away from other wires.
6. Dress the red wire from the power plug to the power switch on the volume control away from the 1H5-G socket.
7. Blue lead from "C" band oscillator coil to 1A7-G No. 6 contact must be dressed away from chassis.
8. All tube shields must be tight.

MODEL 4QB
Alignment, Socket
Trimmers, Voltage
Chassis Wiring

RCA MFG. CO., INC.
Model 4QB Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	1N5-G I-F grid cap, in series with .01 mfd.	455 kc	"A" band, quiet point at high-frequency end	L14 and L13 (2nd I-F Trans.)
2	1A7-G 1st-Det. grid cap, in series with .01 mfd.			L12 and L11† (1st I-F Trans.)
3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (152.5°) "A" band	Preset L6 (osc.) core 5/16-in. out. Peak C23 (osc.) and C21 (ant.)
4		600 kc	600 kc (33°) "A" band	L6 (osc.)**
5		Repeat steps 3 and 4		
6		6.1 mc	6.1 mc (151°) "B" band	Preset L8 (osc.) core ⅜-in. out. Peak C24 (osc.)* and C26 (ant.)
7		2.5	2.5 mc (29.5°) "B" band	L8 (osc.)**
8		Repeat steps 6 and 7		
9	Antenna lead, in series with 300 ohms	15.2 mc	15.2 mc (122°) "C" band	L10 (osc.)
10		20 mc	20 mc (155.5°) "C" band	C25 (ant.)†† Rock gang
11	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (152.5 kc) "A" band	C23 (osc.)



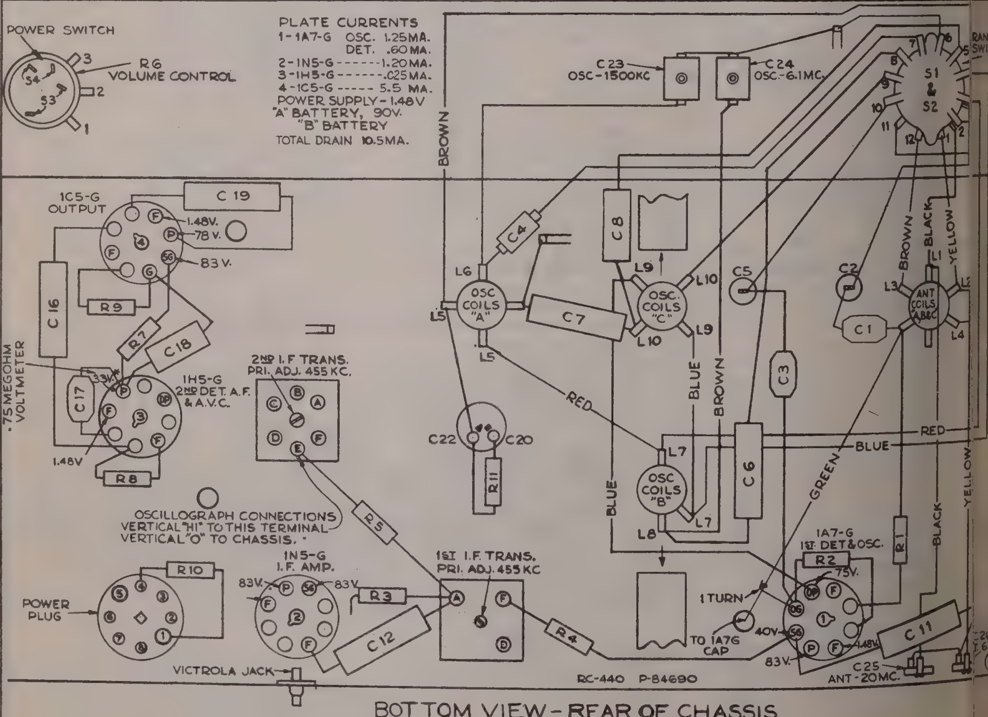
Model 4QB Top View

*Use minimum capacity peak if two peaks can be obtain

**Rock gang slightly for peak output.

†Do not readjust L13 or L14 when test-osc. is applied 1A grid.

††Use maximum capacity peak if two peaks can be obta d.



Model 4QB R-F Wiring Diagram and Socket Voltages

Voltages shown above are for battery operation.

MODEL 4QB4 MODEL 4QB
Alignment Notes,Drive Cord
MODEL CV-111 Power Supply
Schematic,Voltage,Notes

RCA MFG. CO., INC.

ral Alignment Data for Models 4QB and 4QB4

(Ref to specific "Alignment Procedure" for each model)

de-F' **Alignment** is the preferable method. Connections for
llogr h are shown in the chassis drawing.

it M **er Alignment.** — If this method is used, connect the
cross he voice coil, and turn the receiver volume control to
m.

Oscil **or.**—For all alignment operations, connect the low side
est-o llator to the ground terminal, and keep the output as
possil to avoid a-v-c action.

ratio **Scale on Indicator-Drive-Cord Drum.**—The tuning dial
ned the cabinet and cannot be used for reference during
nt, t efore a calibration scale is attached to the rear of the
hich mounted on the shaft of the gang condenser. The set-
the g g condenser is read on this scale, which is calibrated in
The orrect setting of the gang in degrees, for each align-
quen ' is given in the alignment table.

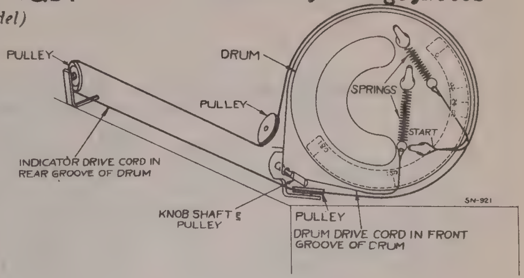
e fir step in r-f alignment, check the position of the drum.
deg : mark on drum scale should be in an approximately
al p tion when the plates are fully meshed. The distance
e ed of the chassis to the drum must not exceed ⅛-inch.
m held to the shaft by means of a set screw, which
tigh ned securely when the drum is in the correct position.

er fo **Calibration Scale.**—Improvise a pointer for the calibra-
le by astening a piece of wire to the gang condenser frame,
d the ire so that it points to the "0" mark on the calibration
hen : plates are fully meshed.

ndic **or Adjustment.**—After fastening the chassis in the
atta the dial indicator to the drive cable with indicator
580 mark, (last mark at end of "A" scale) and gang
r ful meshed. The indicator has a spring clip for attachment
able.

CV-111 A-C POWER SUPPLY UNIT

wer Rating	105-125/200-250 volts, 50-60 cycles, 65 watts
ctifier Tube	RCA-5T4
llast Resistor Tube	Type 86892-3
al Lamp	Mazda 44, 6.3 volts, 0.25 amp.
mensions (inches)	5 x 3¼ x 6⅝
t Weight	5 lbs.


PULLEY
DRUM
PULLEY
SPRINGS
START
INDICATOR DRIVE CORD IN REAR GROOVE OF DRUM
KNOB SHAFT & PULLEY
PULLEY
DRUM DRIVE CORD IN FRONT GROOVE OF DRUM
SN-921

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator
(Drum shown with gang in maximum-capacity position)

POWER OUTPUT RATING

	Undistorted	Maximum
With Battery Supply..	0.13 watt	0.23 watt
With A-C Supply.....	0.20 watt	0.46 watt

LOUDSPEAKER

Type	5-inch permanent-magnet dynamic
Voice-coil Impedance	3 ohms at 400 cycles

BATTERIES REQUIRED

One 1½-volt "A" battery, and
Two 45-volt "B" batteries, or
One 1½-90-volt battery pack.

BATTERY DRAIN

"A"	.25 amp.
"B"	10.5 ma.

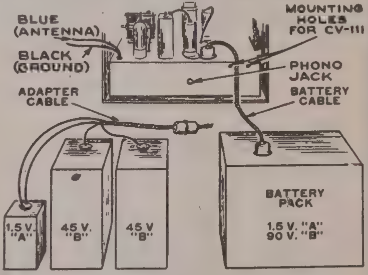
Miscellaneous Data

Corections:

ur-wi cable with a plug at each end is provided for making
ion f m. the 8-prong connector on chassis to a plug-in 1½-90
-B" attery pack.
sep ate "A" and "B" batteries are used, it is necessary to
adap r cable with a socket on one end and three plugs on
er e connected as shown in the accompanying sketch.
sep te "A" and "B" batteries that have terminals instead
-in c nectors, remove the three plugs on the adapter cable
nect he leads to the battery terminals, following the color
own the schematic diagram.

Atchment:

k is ovided on the rear of chassis for connecting a Victrola
ent to the audio-amplifying circuit. The cable from the
. At hment should be terminated in a Stock No. 31048
fit jack.



Separate "A" and "B" batteries or an "A-B" battery pack may be used.

CV-111 A-C Power Supply Unit

ls 4 3 and 4QB4 may be operated on 105-125/200-250
0-60 ycle a-c power supply, by installing a CV-111 power
unit the chassis, as follows:

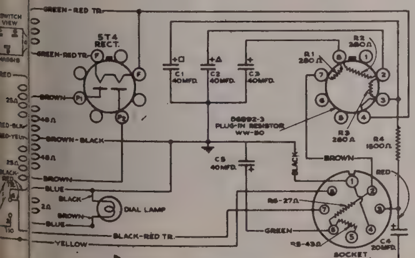
emov he battery cable plug from the power plug on chassis.

t the ine power switch (on side of CV-111) to the correct
sitior or the a-c voltage that is to be used.

ace CV-111 on top of the radio chassis as shown in
tted es in the top view. Press the dial light clip on the
oject at low-frequency end of dial assembly. Insert the
prong ocket (on cable from CV-111) into the power plug on
assis.

sten e power unit to the chassis. The front of the unit
s tw projections which fit into slots on the front of the
chassis. Two projections on the rear of the unit have holes for fastening to the rear of the chassis with self-tapping screws.

5. **Caution:** Before connecting to the a-c supply, make certain that all tubes are firmly seated in their sockets. Always disconnect the a-c supply before removing or replacing tubes.
6. Reverse the a-c power plug for minimum hum.



Model CV-111 Power Unit

Socket Voltages, with CV-111 Power Supply Unit
(Line Supply Voltage, 117, or 234 volts)

Tube	1A7-G		1N5-G	1H5-G	1C5-G
Function	1st-Det.	Osc.	I. F.	2nd Det., A. F.	Output
Filament Voltage	1.3		1.3	1.3	1.28
Plate Voltage	95	85	95	40**	92
Screen Voltage	45		95		95
Plate Mils.	0.4	1.5	1.5	.03	9
Screen Mils.	.7		.35		1.75
Bias					6.1

Total "B" current, 15 mils. Total filament current, 146 mils.
**With 750,000 ohm voltmeter.

Model 6Q4

STOCK No.	6Q4 DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC 441-A)	
34502	Arm—Operating arm between knob shaft and range switch shaft	.25
10194	Ball—Steel ball	.02
31767	Board—Antenna-Ground board	.20
33821	Capacitor—Trimmer capacitor—4 sections, 3 of 2-10 mmfd. and 1 of 3-30 mmfd. (C18, C19, C20, C21)	.70
12714	Capacitor—Adjustable trimmer—2-12 mmfd. (C9, C11)	.50
33818	Capacitor—Trimmer capacitor—2 sections of 2-20 mmfd. each (C12, C15)	.30
33822	Capacitor—Trimmer capacitor—4 sections, of 3-30 mmfd each (C1, C2, C3, C44)	.90
33762	Coil—Antenna coil A-B-C Band (L1, L2, L3, L4)	1.20
32823	Coil—Antenna coil X Band (L5, L6)	1.00
33763	Coil—Detector coil A-B-C Band (L11, L12, L13, L14)	1.60
33765	Coil—Detector coil X Band (L15)	.65
33764	Coil—Oscillator coil A-B-C Band (L7, L8, L9)	.80
32931	Coil—Oscillator coil X Band (L10)	.75
33756	Condenser—Variable tuning condenser (C4, C8, C23)	5.50
33816	Control—Tone control (S7, S8)	2.50
33814	Control—Volume control and power switch (R9, S9)	2.00
32634	Cord—Condenser drive cord	.10
32635	Cord—Indicator drive cord	.24
32713	Core—Core and stud for oscillator coils	.35
33770	Drive—Planetary tuning drive less balls, shafts, and shaft retainer	.90
33773	Drum—Variable tuning condenser drum and hub	.90
33185	Gear—Gear and hub for volume control and switch	.50
11891	Lamp—Pilot Lamp Mazda No. 44	.17
33767	Link—Operating link between knob shaft and range switch	.60
12471	Plate—Cushion socket mounting plate assembly less socket	.15
14281	Resistor—68 ohms, ½ watt (R1, R17)	.20
31388	Resistor—390 ohms, 1 watt (R10)	.22
13716	Resistor—2,200 ohms, ½ watt (R8)	.20
33489	Resistor—15,000 ohms 2½ watt (R5)	.55
13998	Resistor—22,000 ohms, ½ watt (R7)	.20
12454	Resistor—33,000 ohms, ½ watt (R3)	.20
17440	Resistor—56,000 ohms, 1 watt (R16)	.22
12285	Resistor—470,000 ohms, ½ watt (R12, R13)	.20
13730	Resistor—1 meg., ½ watt (R2, R4)	.20
12679	Resistor—2.2 meg., ½ watt (R6)	.20
13601	Resistor—10 meg., ½ watt (R11)	.20
34037	Retainer—Retaining washer for range switch shaft	.02
33772	Shaft—Range switch shaft	.35
33768	Shaft—Shaft and gear for tone control	.55
33771	Shaft—Tuning shaft	.15
14278	Socket—Single contact socket and plate for phonograph input	.25
12896	Capacitor—15 mmfd. (C43)	.35
13545	Capacitor—39 mmfd. (C16)	.35
12723	Capacitor—56 mmfd. (C24)	.35
12720	Capacitor—100 mmfd. (C42)	.35
32239	Capacitor—110 mmfd. (C26)	.30
30232	Capacitor—200 mmfd. (C6)	.35
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)	.35
33760	Capacitor—220 mmfd. (C25, C27, C28)	.30
33235	Capacitor—580 mmfd. (C13)	.40
12811	Capacitor—3,600 mmfd. (C10)	.60
31405	Capacitor—6,000 mmfd. (C7)	.75
5107	Capacitor—.0025 mfd. (C34, C36)	.20
33584	Capacitor—.005 mfd. (C35, C38, C39)	.25
32787	Capacitor—.05 mfd. (C30)	.20
4839	Capacitor—0.1 mfd. (C29, C33, C45)	.30
33014	Capacitor—Comprising 3 sections of 10 mfd, and 1 section of 20 mfd. (C37, C40, C41, C46)	1.90
31251	Socket—Tube socket	.25
31418	Spring—Condenser drive cord spring	.05
13638	Spring—Indicator drive cord spring	.08
33769	Spring—Planetary tuning drive spring	.15
33758	Switch—Range switch (S1, S2, S3, S4, S5, S6)	2.45
33759	Transformer—First i-f transformer (L16, L17, C25, C26)	2.25
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, R7)	2.50
31734	Transformer—Power transformer 110 volts, 25 cycle (T1)	10.35
31733	Transformer—Power transformer 110 volts, 60 cycle (T1)	4.75
31735	Transformer—Power transformer 105/130-140/160-200/250 volts, 50/60 cycle (T1)	10.80
	SPEAKER ASSEMBLIES (RL 79A-2)	
32907	Cap—Dust cap	.02
33966	Coil—Field coil (L23)	1.70
32906	Coil—Neutralizing coil (L22)	.25
33777	Cone—Cone complete with voice coil, suspension and dust cap (L21)	1.00
5118	Plug—3 prong male speaker plug	.25
32905	Transformer—Output transformer (T2)	1.35
	MISCELLANEOUS ASSEMBLIES	
33799	Dial—Dial scale	1.65
34295	Dial—Glass dial scale (Greek)	1.50
33797	Frame—Dial frame assembly complete less dial scale	2.20
34571	Knob—Range switch knob	.25
34570	Knob—Tone control knob	.25
34136	Knob—Tuning or volume control knob	.30
33774	Mounting—Speaker mounting hardware	.30
4982	Spring—Retaining spring for knob Stock No. 34136	.05
14270	Spring—Retaining spring for knob Stock No. 34570	.05
34138	Spring—Retaining spring for knob Stock No. 34571	.05

Model 6Q8

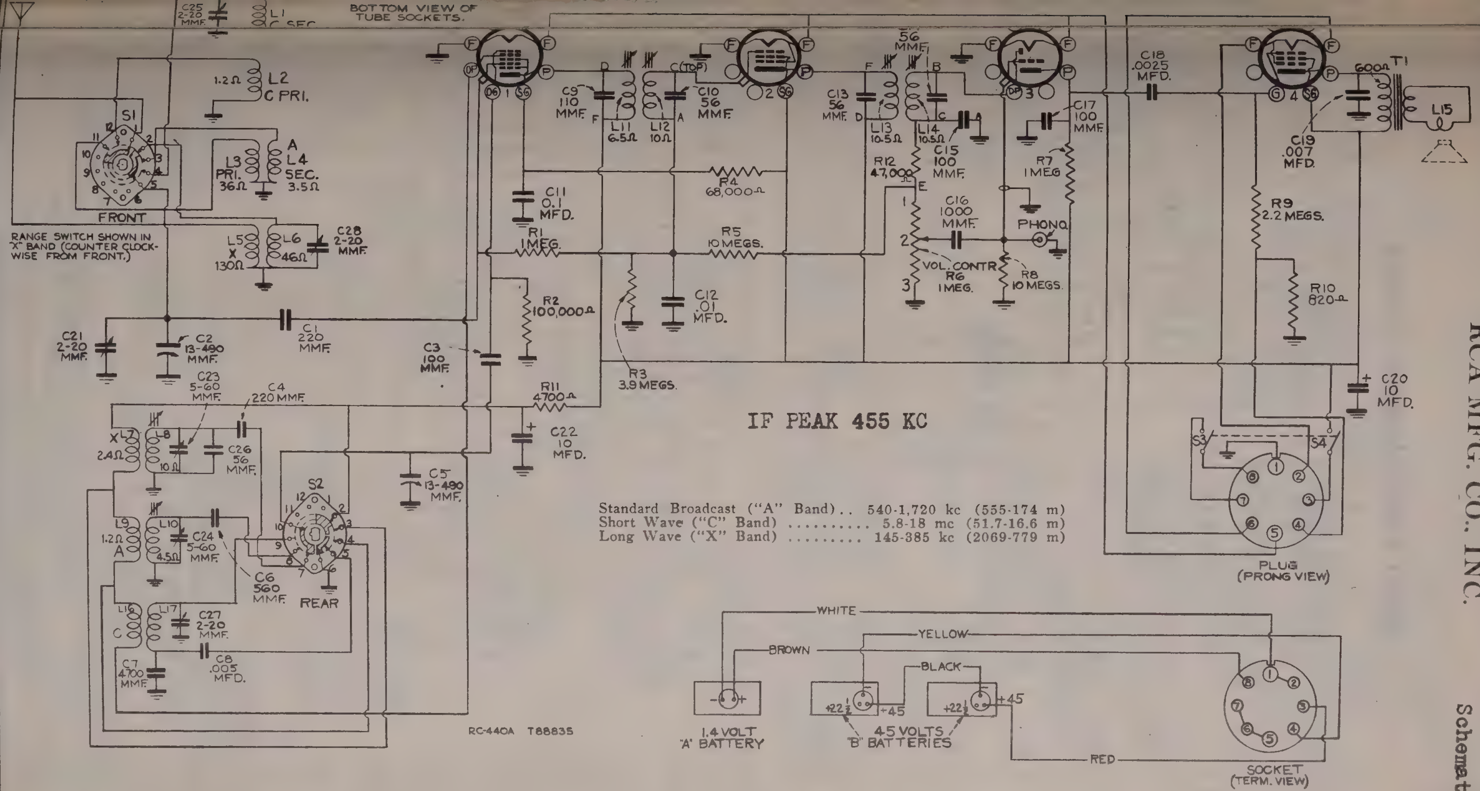
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC—414—B)	
32830	Capacitor—2-gang trimmer, each section 2-20 mmfd. (C26, C27)	.40
32829	Capacitor—3-gang trimmer, each section 5-60 mmfd. (C5, C6, C8)	.55
12948	Capacitor—33 mmfd. (C28)	.35
30949	Capacitor—56 mmfd. (C14, C15)	.25
12723	Capacitor—56 mmfd. (C4)	.35
14282	Capacitor—109 mmfd. (C12, C13)	.30
32238	Capacitor—110 mmfd. (C18)	.30
30232	Capacitor—200 mmfd. (C9)	.35
12694	Capacitor—220 mmfd. (C3)	.35
12952	Capacitor—330 mmfd. (C19)	.35
32853	Capacitor—580 mmfd. (C7)	.35
13895	Capacitor—5600 mmfd. (C10)	.70
4838	Capacitor—.005 mfd. (C20, C21, C29)	.25
5148	Capacitor—.007 mfd. (C22)	.20
14393	Capacitor—.01 mfd. (C16)	.30
4839	Capacitor—0.1 mfd. (C17)	.30
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C23, C24, C25)	1.45
32822	Coil—Antenna coil—A,C bands (L1, L2, L3, L4)	1.35
32823	Coil—Antenna coil—X band (L5, L6)	1.00
32707	Coil—Oscillator coil—A,C bands (L7, L8)	.95
32931	Coil—Oscillator coil—X band (L9)	.75
32817	Condenser—2-gang variable (C1, C2, C11)	2.60
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud assembly for oscillator coil	.35
32838	Dial—Glass dial scale	.65
32835	Drum—Variable condenser drive drum complete	.55
11891	Lamp—Dial lamp	.17
32953	Plate—Dial back plate and pointer—less dial scale	1.60
5119	Plug—3-contact female for speaker cable	.25
32834	Pulley—Drive cord pulley and mounting bracket (1 pulley)	.25
32951	Pulley—Drive cord pulleys and mtg. bracket (3 pulleys)	.45
30681	Resistor—470 ohms, 1 watt (R10)	.22
31389	Resistor—12,000 ohms, 3½ watts (R3)	.50
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
5132	Resistor—47,000 ohms, 1/10 watt (R5)	.15
12285	Resistor—470,000 ohms, ½ watt (R7)	.20
12013	Resistor—1 meg., 1/10 watt (R11)	.15
13730	Resistor—1 meg., ½ watt (R1)	.20
11668	Resistor—5.6 meg., ½ watt (R4)	.20
13601	Resistor—10 meg., ½ watt (R8)	.20
14343	Retainer—Retaining ring for holding tuning knob shaft	.03
32932	Shaft—Tuning knob shaft	.30
31365	Socket—Dial lamp socket	.30
32950	Socket—Magic Eye socket and bracket	.50
31251	Socket—Octal base tube socket	.25
14278	Socket—Phonograph input socket	.25
31418	Spring—Tension spring for drive cord	.05
32930	Switch—Range switch	1.20
32827	Switch—Voltage changeover switch (S4)	.35
14376	Transformer—First i. f. transformer (L10, L11, C12, C13)	2.45
32825	Transformer—Second i. f. transformer (R5, L12, L13, C14, C15, C18)	2.50
32910	Transformer—Power transformer 105-120 volts, 25-50 cycles (T1)	6.20
32911	Transformer—Power transformer 105-120 volts, 50-60 cycles (T1)	4.10
32852	Transformer—Power transformer 105-120, and 200-240 volts, 50-60 cycles (T1)	4.50
32928	Volume control and power switch (R6, S1)	2.50
	SPEAKER ASSEMBLIES (RL—79—2)	
32907	Cap—Speaker cone center dust cap	.02
32903	Coil—Speaker field coil (L14)	1.25
32906	Coil—Speaker hum neutralizing coil (L15)	.25
32934	Cone—Speaker cone and voice coil (L16)	1.65
5118	Plug—3-prong male for speaker	.25
32933	Speaker complete	5.50
32905	Transformer—Output transformer (T2)	1.35
	MISCELLANEOUS ASSEMBLIES	
32838	Dial—Dial scale and crystal	.65
32937	Knob—Range switch knob (small)	.20
33029	Knob—Tone control and switch knob (small)	.15
32935	Knob—Tuning knob (large)	.25
32936	Knob—Volume control knob (large)	.25
4982	Spring—Retaining spring for knob Stk. 32935	.05
14270	Spring—Retaining spring for knob Stk. Nos. 32936 or 32937	.05

Model 6Q4X

STOCK No.	6Q4X DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-442)	
10194	Ball—Steel ball	.02
33947	Ballast—Ballast resistor tube—Type 86892-4	2.50
12896	Capacitor—15 mmfd. (C43)	.35
13545	Capacitor—39 mmfd. (C16)	.35
12723	Capacitor—56 mmfd. (C24)	.35
12720	Capacitor—100 mmfd. (C31, C42)	.35
32239	Capacitor—110 mmfd. (C26)	.30
30232	Capacitor—200 mmfd. (C6)	.35
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)	.35
33760	Capacitor—220 mmfd. (C25, C27, C28)	.30
33235	Capacitor—580 mmfd. (C13)	.40
12811	Capacitor—3,600 mmfd. (C10)	.60
31405	Capacitor—6,000 mmfd. (C7)	.75
33818	Capacitor—Trimmer capacitor—2 sections of 2-20 mmfd. each (C12, C15)	.30
33822	Capacitor—Trimmer capacitor—4 sections of 3-30 mmfd. each (C1, C2, C3, C44)	.90
33821	Capacitor—Trimmer capacitor—4 sections, of 3 2-10 mmfd. each and 1 of 3-30 mmfd. (C18, C19, C20, C21)	.70
5107	Capacitor—.0025 mfd. (C36)	.20
33584	Capacitor—.005 mfd. (C34, C35)	.25
4937	Capacitor—.01 mfd. (C38, C47, C48)	.25
4870	Capacitor—.025 mfd. (C39)	.20
32787	Capacitor—.05 mfd. (C30, C33, C46, C51)	.20
4839	Capacitor—0.1 mfd. (C29, C45, C49)	.30
12714	Capacitor—Trimmer capacitor—2-12 mfd. (C9, C11)	.50
33824	Capacitor—Comprising 2 sections of 40 mfd., 1 of 10 mfd. and 1 of 20 mfd. (C37, C40, C41, C50)	2.30
33762	Coil—Antenna coil—A-B-C bands (L1, L2, L3, L4)	1.20
32823	Coil—Antenna coil—X band (L5, L6)	1.00
33764	Coil—Oscillator coil—A-B-C bands (L7, L8, L9)	.80
32931	Coil—Oscillator coil—X band (L10)	.75
33763	Coil—Detector coil—A-B-C bands (L11, L12, L13, L14)	1.60
33765	Coil—Detector coil—X band (L15)	.65
33756	Condenser—Variable tuning condenser (C4, C8, C23)	5.50
33951	Control—Volume control and power switch (R9, S10)	2.00
32634	Cord—Variable tuning condenser drive cord	.10
32635	Cord—Indicator drive cord	.24
32713	Core—Core and stud assembly for oscillator coils	.35
33770	Drive—Planetary tuning drive complete, less shafts	.90
33773	Drum—Variable tuning condenser drum	.90
33185	Gear—Gear and hub for volume control and power switch	.50
33768	Gear—Shaft and gear for tone control	.55
31480	Lamp—Pilot lamp	.20
33767	Link—Operating link between knob, shaft and range switch	.60
33825	Plug—2-prong male plug for power input	.10
32709	Reactor—Filter reactor (L23)	1.40
33947	Resistor—Ballast resistor tube—Type 86892-4	2.50
33953	Resistor—Flexible resistor (R18, R19)	.20
14281	Resistor—68 ohms, ½ watt (R1)	.20
30880	Resistor—150 ohms, ½ watt (R10)	.20
14076	Resistor—820 ohms, ½ watt (R17)	.20
12194	Resistor—1,800 ohms, ½ watt (R16)	.20
13714	Resistor—5,600 ohms, ½ watt (R8)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R7)	.15
12454	Resistor—33,000 ohms, ½ watt (R3)	.20
12264	Resistor—220,000 ohms, ½ watt (R12, R13)	.20
13730	Resistor—1 megohm, ½ watt (R2, R4)	.20
12679	Resistor—2.2 megohm, ½ watt (R6)	.20
13601	Resistor—10 megohm, ½ watt (R11)	.20
33180	Retainer—Planetary drive retaining ring	.02
33771	Shaft—Tuning knob shaft	.15
33772	Shaft—Range switch shaft	.35
31365	Socket—Lamp socket	.30
33742	Socket—Phonograph input socket	.20
30956	Socket—Speaker socket	.30
31251	Socket—Tube socket	.25
13638	Spring—Indicator drive cord spring	.08
33769	Spring—Planetary tuning drive spring	.15
33758	Switch—Range switch (S1, S2, S3, S4, S5, S6)	2.45
33816	Switch—Tone control, and phono. switch (S7, S8)	2.50
33759	Transformer—First i-f transformer (L16, L17, C25, C26)	2.25
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, C31, R7)	2.60
33826	Transformer—Output transformer (T2)	1.80
33947	Tube—Ballast resistor tube—Type 86892-4	2.50
	SPEAKER ASSEMBLIES (84659-1)	
33962	Cone—Cone, voice coil and center suspension assembled in metal housing (L21)	2.10
33828	Speaker—Speaker complete	5.25
	MISCELLANEOUS ASSEMBLIES	
32836	Cord—Power cord complete with male and female connectors	1.00
34296	Dial—Glass dial scale (English)	1.50
34503	Dial—Glass dial scale (Arabic)	1.85
33797	Frame—Dial frame assembly complete, less dial	2.20
34136	Knob—Tuning or volume control knob	.30
34570	Knob—Tone control knob	.25
34571	Knob—Range switch knob	.25
33774	Mounting—Speaker hardware mounting	.30
4982	Spring—Retaining spring for knob, Stock No. 34136	.05
14270	Spring—Retaining spring for knob, Stock No. 34570	.05
34138	Spring—Retaining spring for knob, Stock No. 34571	.05

Model 8Q1

STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES (RC337)	
13216	Board—Antenna and ground terminal board	.25
12717	Board—Phonograph input terminal board	.22
31303	Bracket—Band indicator mounting bracket—less indicating strip, spring, and cord	.40
31785	Cable—Indicator pointer drive cable	.50
30766	Cap—Rubber cap for Magic Eye	.15
12714	Capacitor—Trimmer 2-12 mmfd. (C3, C5, C8, C14, C40)	.50
14392	Capacitor—4.7 mmfd. (C39)	.35
13200	Capacitor—10 mmfd. (C7, C18)	.35
31791	Capacitor—16 mmfd. (C2)	.30
31270	Capacitor—100 mmfd. (C22, C23, C26, C27)	.35
12724	Capacitor—120 mmfd. (C20, C33)	.35
13003	Capacitor—180 mmfd. (C28)	.35
12694	Capacitor—220 mmfd. (C12)	.35
12952	Capacitor—330 mmfd. (C1, C15)	.35
31790	Capacitor—530 mmfd. (C10)	.40
31792	Capacitor—4,000 mmfd. (C41)	.60
31405	Capacitor—6,000 mmfd. (C17)	.75
4838	Capacitor—.005 mfd. (C34, C37)	.25
14393	Capacitor—.01 mfd. (C29, C35)	.30
4870	Capacitor—.025 mfd. (C30)	.20
4886	Capacitor—.05 mfd. (C24)	.20
4839	Capacitor—0.1 mfd. (C11, C16)	.30
12484	Capacitor—0.25 mfd. (C25, C31, C36)	.30
5212	Capacitor—16 mfd. (C32)	1.35
31818	Clip—Magic Eye mounting clip	.15
31780	Coil—Antenna coil (L1, L2, L3, L4)	1.90
31782	Coil—Oscillator coil—"A" band only (L7)	.80
31783	Coil—Oscillator coil—"B" and "C" bands only (L5, L6)	1.05
31781	Coil—R-f coil (L8, L9, L10, L11)	2.15
31774	Condenser—3-gang variable tuning condenser (C4, C13, C19)	5.80
31278	Cord—Band indicator cord	.12
31786	Cord—Variable condenser drive cord	.25
31787	Drive—Two-speed drive and mounting bracket	1.95
31808	Drum—Variable condenser drive cord drum	.80
31304	Indicator—Band indicator strip	.15
11891	Lamp—Dial lamp	.17
31817	Plate—Cushion socket mounting plate—less socket	.10
5040	Plug—4-contact female plug for speaker cable	.30
14404	Plug—7-contact male plug for power input	.35
31788	Pulley—Two-speed drive pulley	.20
31280	Pulley—Indicator pointer drive cord pulley (large)	.10
31373	Pulley—Indicator pointer drive cord pulley (small)	.08
31430	Resistor—8,200 ohms, 1½ watt (R13)	.22
13302	Resistor—10,000 ohms, 1/10 watt (R21)	.15
13045	Resistor—18,000 ohms, ½ watt (R7)	.20
14167	Resistor—27,000 ohms, 2 watt (R22)	.25
11300	Resistor—33,000 ohms, 1/10 watt (R4)	.15
12719	Resistor—82,000 ohms, 1/10 watt (R20)	.15
14560	Resistor—100,000 ohms, ½ watt (R11, R12)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R10)	.15
12199	Resistor—270,000 ohms, ½ watt (R18)	.20
13005	Resistor—390,000 ohms, 1/10 watt (R19)	.15
12013	Resistor—1 meg., 1/10 watt (R1, R2, R5)	.15
5131	Resistor—2.2 meg., 1/10 watt (R6)	.15
14887	Retainer—Indicator drive cord pulley retainer	.01
4669	Screw—No. 8-32 x ⅜-in. square head set screw for pulley, Stock Nos. 31272 and 31788, and drum, Stock No. 31808	.03
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye socket	.45
31251	Socket—Octal base tube socket	.25
31279	Spring—Band indicator tension spring	.03
13638	Spring—Tension spring for pointer drive cable, or variable condenser drive cord	.08
31775	Switch—Range switch (S1, S2, S3, S4)	1.65
31807	Tone Control and power switch (R17, S5, S6)	1.50
31267	Transformer—First i-f transformer (L12, L13, C22, C23)	2.20
31268	Transformer—Second i-f transformer (L14, L15, C26, C27)	2.05
31450	Volume Control (R9)	1.50
	SPEAKER ASSEMBLIES (RL63H-3)	
31825	Cap—Speaker cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L17)	.30
12012	Coil—Speaker field coil (L18)	2.90
31310	Cone—Speaker cone and voice coil (L16)	1.75
31302	Plug—4-contact male plug for speaker	.25
31824	Speaker complete	10.45
14355	Transformer—Output transformer (T1)	2.00
	MISCELLANEOUS ASSEMBLIES	
31800	Dial—Dial scale and crystal	.90
31831	Escutcheon—Dial scale escutcheon—less dial scale and crystal	2.00
31801	Indicator—Indicator pointer and carriage	.65
31802	Knob—Station selector, tone control, volume control or range switch knob	.15
31287	Rod—Pointer carriage slide rod	.15
31306	Screen—Dial color screen and light diffuser	.48



IF PEAK 455 KC

Standard Broadcast ("A" Band) . .	540-1,720 kc	(555-174 m)
Short Wave ("C" Band)	5.8-18 mc	(51.7-16.6 m)
Long Wave ("X" Band)	145-385 kc	(2069-779 m)

Model 4QB4 Schematic Diagram

Precautionary Lead Dress:

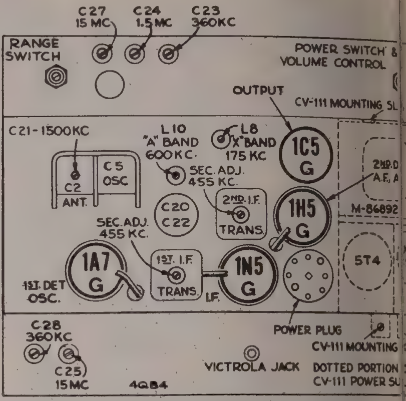
1. Dress C3 (100 mmfd.) edgewise to chassis.
2. Dress the 1A7-G grid cap lead clear of chassis.
3. Dress green wire from C2 (antenna section of gang) to range switch away from chassis and other wires.
4. Dress blue lead from terminal "E" of 2nd I-F transformer around terminal "D", away from the 1H5-G and 1C5-G sockets, and close to the chassis.
5. Dress C16 (1,000 mmfd.) from grid of 1H5-G tube to volume control, and the green lead to the 1H5-G grid cap away from other wires.
6. Dress the red wire from the power plug to the power switch on the volume control away from the 1H5-G socket.
7. Blue lead from "C" band oscillator coil to 1A7-G No. 6 contact must be dressed away from chassis.
8. All tube shields must be tight.

MODEL 4QB4
Alignment, Trimmers
Chassis Wiring, Socket
Voltage

RCA MFG. CO., INC.

Model 4QB4 Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	1N5-G I-F grid cap, in series with .01 mfd.	455 kc	"A" Band, Quiet Point at high-frequency end	L14 and L13 (2nd I-F Trans.)
2	1A7-G 1st-Det. grid cap, in series with .01 mfd.			L12 and L11 (1st I-F Trans.)†
3	Antenna lead, in series with 200 mmfd.	1,500 kc (200 m)	1,500 kc (152.5°) "A" Band	Preset L10 (osc.) core 5/16-in. out Peak C24 (osc.) and C21 (ant.)
4		600 kc (500 m)	600 kc (33°)	L10 (osc.)**
5		Repeat steps 3 and 4.		
6		360 kc (833 m)	360 kc (161°) "X" Band	Preset L8 (osc.) core ⅛-in. out Peak C23 (osc.) and C28 (ant.)
7		175 kc (1,710 m)	175 kc (55°) "X" Band	L8 (osc.)**
8		Repeat steps 6 and 7.		
9	Antenna lead, in series with 300 ohms	15 mc	15 mc (146°) "C" Band	C27 (osc.)* C25 (ant.)††
10	Antenna lead, in series with 200 mmfd.	1,500 kc (200 m)	1,500 kc (152.5°) "A" Band	C24 (osc.)



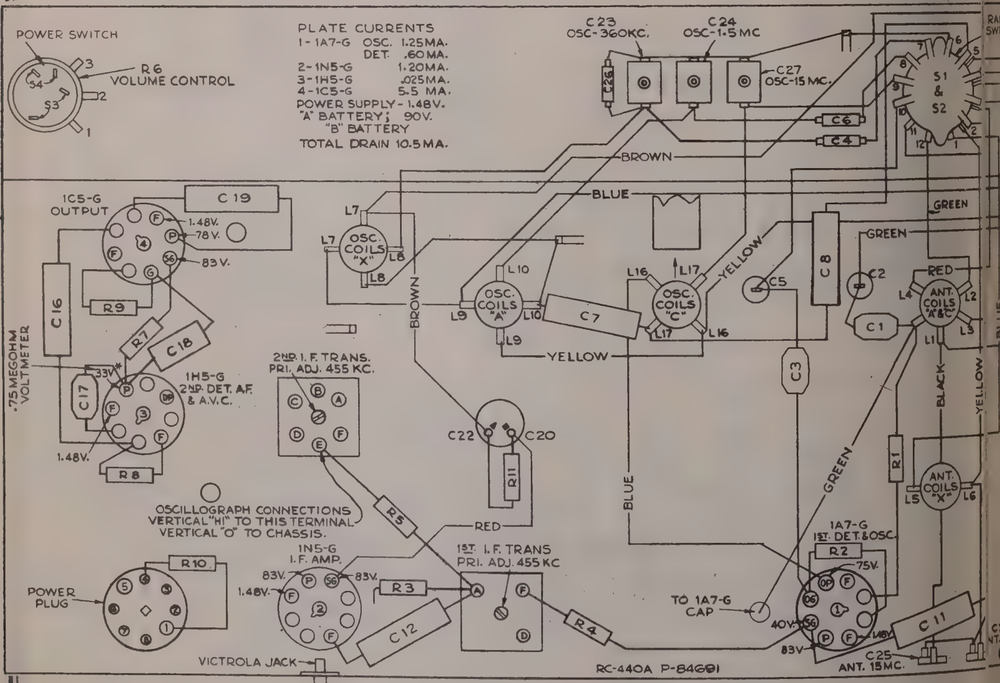
Model 4QB4 Top View

*Use minimum capacity peak if two peaks can be obtain

**Rock gang slightly for peak output.

†Do not readjust L13 or L14 when test-osc. is applied 1A
grid.

††Use maximum capacity peak if two peaks can be obta d.



BOTTOM VIEW - REAR OF CHASSIS

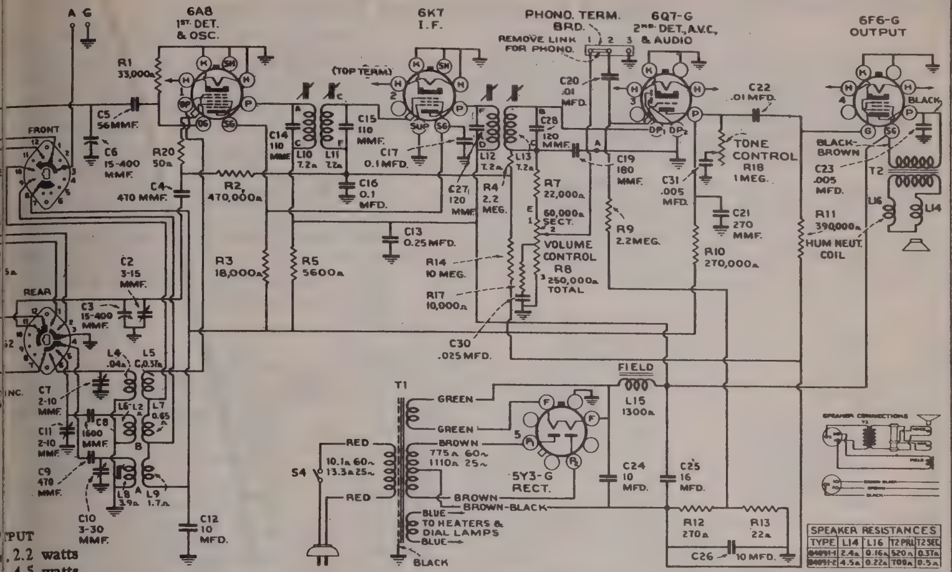
Model 4QB4 R-F Wiring Diagram and Socket Voltages

Voltages shown above are for battery operation.

ema ic
ssi Wiring

RCA MFG. CO., INC.

MODEL 5Q1
(Formerly 95FT)



SPEAKER RESISTANCES				
TYPE	L14	L16	T2 PRI.	T2 SEC.
84091-1	2.4Ω	0.16Ω	520Ω	0.37Ω
84091-2	4.5Ω	0.22Ω	700Ω	0.5Ω

R O PUT
storte . 2.2 watts
num . 4.5 watts

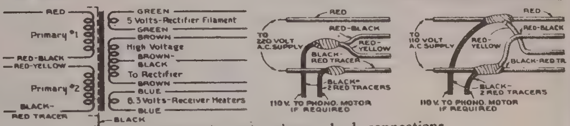
R S PLY RATINGS
g A . . . . 105-125 volts, 50-60 cycles, 75 watts.
g B . . . . 105-125 volts, 25-60 cycles, 75 watts.
g C 5-125/200-250 volts, 50-60 cycles, 75 watts.

SPEA ER . . . . 6-inch electrodynamic

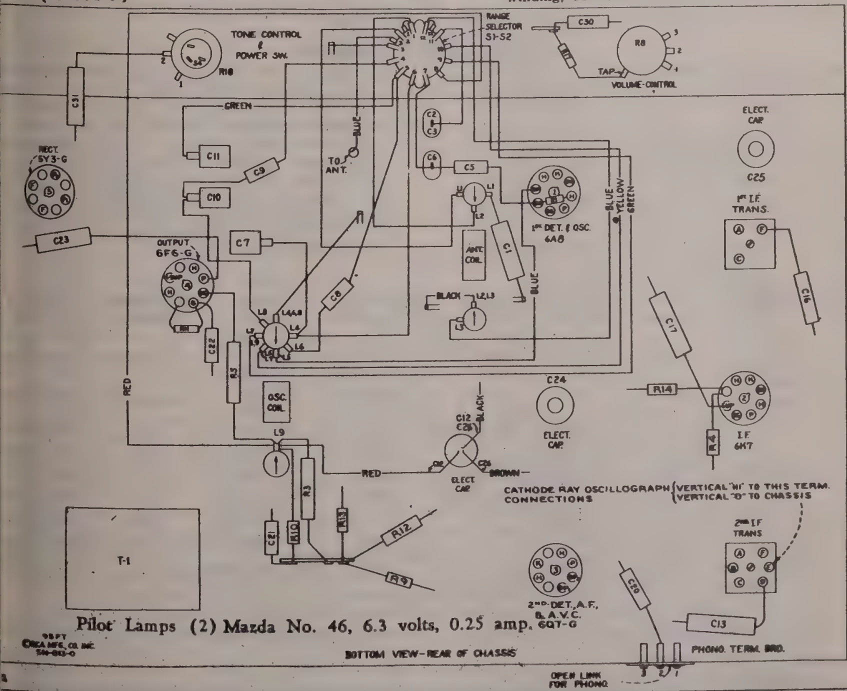
. . . . { 84091-1 / 84001-3 } 2.6 ohms at 400 cycles

Imp dance { 84091-2 / 84001-6 } 4.7 ohms at 400 cycles

IF PEAK 455 KC



Schematic and primary lead connections for 110-220 volt power transformer (Stock No. 30607). Resistance of each primary winding, 10 ohms: High-voltage secondary winding, 386 ohms total.



Pilot Lamps (2) Mazda No. 46, 6.3 volts, 0.25 amp.

BOTTOM VIEW-REAR OF CHASSIS

Edi a

MODEL 5Q1
Voltage,Alignment
Socket,Trimmers,Notes

RCA MFG. CO., INC.

General Description and Service Data

This receiver uses a three-band superheterodyne circuit in a table-type cabinet. Features of design include magnetite-core adjusted i-f transformers and low frequency "A" oscillator tracking; automatic volume control; phonograph terminal board; aural-compensated volume control; continuously variable tone control; dustproof electrodynamic loudspeaker and an edge-illuminated, straight-line dial.

Loudspeaker.—Centering of the loudspeaker voice coil is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place with ambroid upon completion of adjustment.

Precautionary Lead Dress.—(1) Keep leads from (short as possible. (2) Dress yellow and green leads range selector to oscillator coil between front apron range selector. (3) Dress blue lead from oscillator cc oscillator plate away from other parts. Maintain or length and size of the following: (4) bus lead from an coil L1 to range selector and (5) lead from oscillator to chassis.

Phonograph Attachment.—A terminal board is prov for connecting a phonograph into the audio amplifying cuit. RCA Victor Models R-93, R-93-A, R-93-B, R-9 R-93-2, or R-94 Record Players should be connecte follows: Open link between terminals 1 and 2 on tern board. Connect yellow wire in Radio-Record switch cab terminal 1, green to terminal 2, and shield extensio terminal 3. Tape unused red and blue leads separately. nect a 2-conductor twisted cable between the Record P binding posts and the screw terminals on Radio-Re switch.

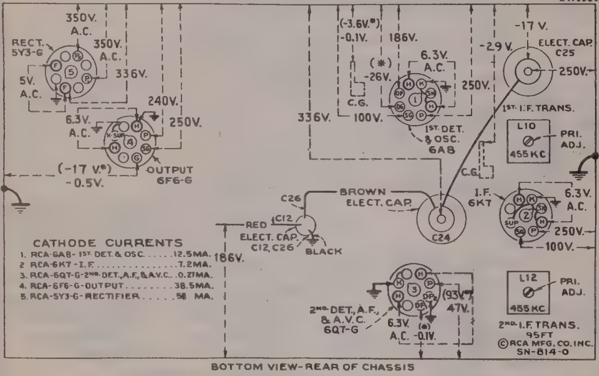
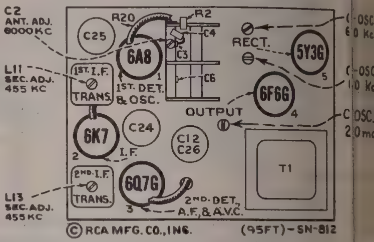


Figure 4—Radiotron Socket Voltages and Trimmer Locations



L8, 600 kc osc. adjustment is accessible through le in rear apron

Figure 1—Radiotron, Component Part, and Tr ner Locations

* **Note:** Values with star (*) are operating voltages.
Values not starred are actual measured voltages.

Measurements made to chassis unless otherwise indicated.

Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

Values should hold within approximately ± 20% for 117-volt 60-cycle supply.

Alignment Procedure

With the gang tuning-condenser plates in full-mesh position, adjust the pointer to the low-frequency (end) calibration mark on the dial scale. The pointer is soldered in place on the drive cable.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment op tions. Regulate the output of the test oscillator so that mi mum signal is applied to the receiver to obtain an obse able output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which m be connected between the "high" test-oscillator output a the point of connection to the receiver in order to obt ideal alignment. "No signal, 550-750 kc" means that t receiver should be tuned to a point between 550 and 7 kc where no signal or interference is received from a stati or local (heterodyne) oscillator.

Order of Align-ment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	455 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C11	Max. (peak)*
4	Ant. Term.	300 Ohms	6,000 kc	"B"	6,000 kc	"B" Ant.	C2	Max. (peak)†
5	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C7	Max. (peak)‡
6	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L8	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L8	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† After this adjustment, check for image signal by shifting receiver dial to 5.09 mc.

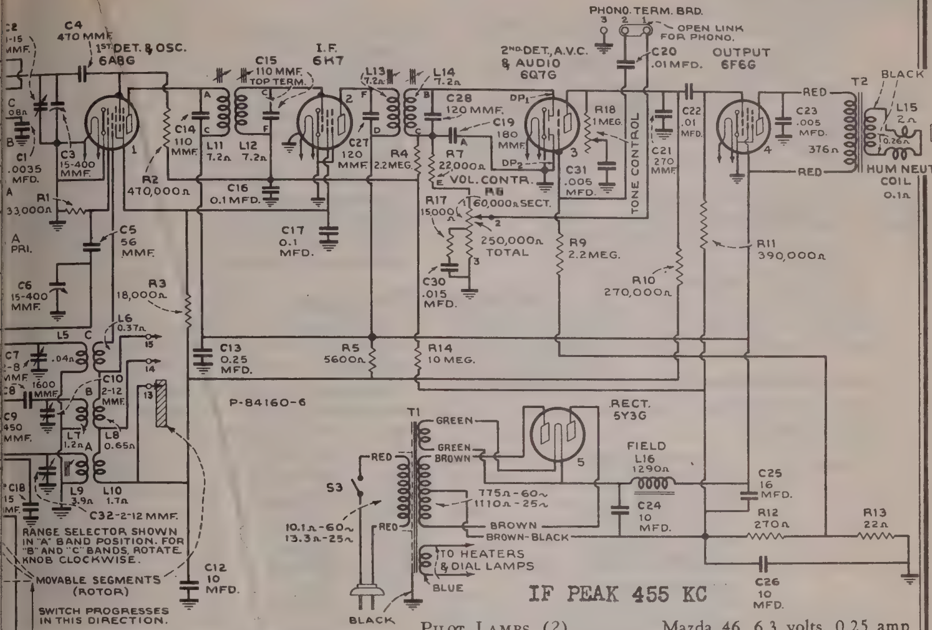
‡ Use maximum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 20.91 mc.

Note that the heterodyne oscillator tracks above the signal frequency on bands "A" and "B," and below the signal frequency on band "C."

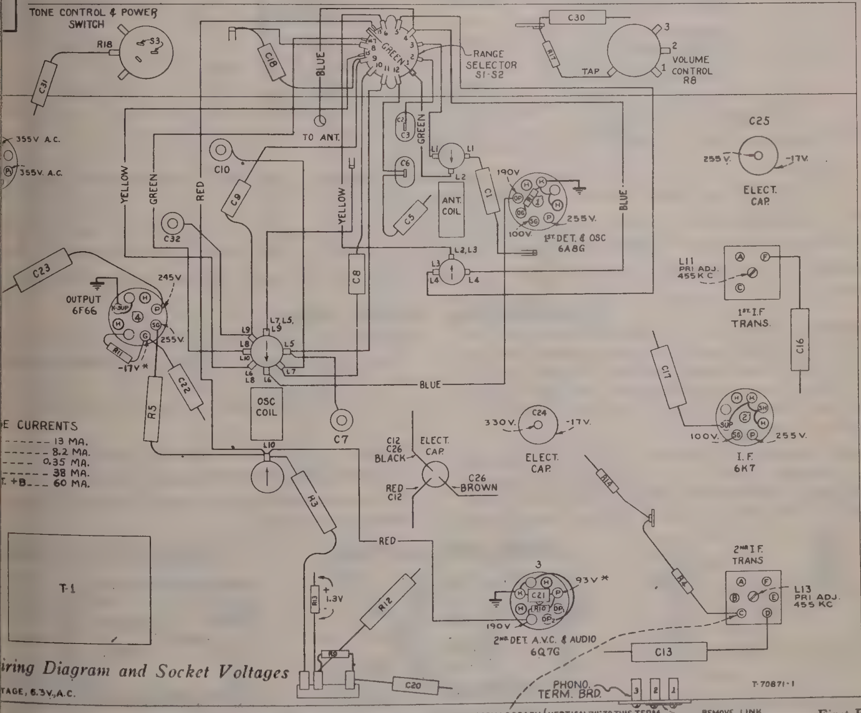
ati Voltage
s ring

RCA MFG. CO., INC.

MODEL 5Q2
Chassis RC325C



Pilot Lamps (2) .... Mazda 46, 6.3 volts, 0.25 amp



F Wiring Diagram and Socket Voltages

BOTTOM VIEW - REAR OF CHASSIS

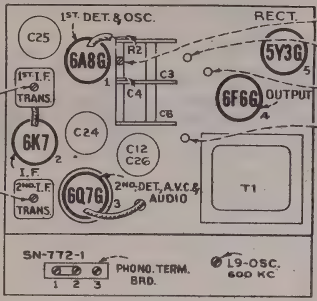
First Edition

urements made to chassis unless otherwise indicated, t tued to quiet point and volume control at mini- Vals should hold within ±20% with 115-volt a-c

*NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 5Q2
Alignment,Socket
Trimmers,Phono.Data

RCA MFG. CO., INC.



POWER OUTPUT RATING	
Undistorted	2.5 wa
Maximum	4.5 wa
LOUDSPEAKER (RL-63F-1)	
Type	8-inch Electrodynan
V.C. Impedance	2.2 ohms at 400 cyc
POWER SUPPLY RATINGS	
Rating A	105-125 volts, 50-60 cycles, 75 wa
Rating B	105-125 volts, 25-60 cycles, 75 wa
Rating C	105-125/200-250 volts, 50-60 cycles, 75 wa
FREQUENCY RANGES	
"Standard Broadcast" (A)	540-1,720 kc (555-174 n
"Medium Wave" (B)	2.3-7.0 mc (130-42.8 n
"Short Wave" (C)	7.0-22.0 mc (42.8-13.6 n
•INTERMEDIATE FREQUENCY	455

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect th low side of the test-oscillator to the receiver chassis, and kee the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser in full mesh the dial pointer should be in line with the left-hand end o the dial scales. The pointer is soldered to the drive cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L13 and L14 (2nd I-F Trans.)
2	6A8-G det. grid cap, in series with .01 mfd.	455 kc		L11 and L12 (1st I-F Trans.)
3	Antenna Terminal in series with 300 ohms	6 mc	6 mc "B" band	C10 (osc.) * C2 (ant.) †
4	Antenna Terminal in series with 300 ohms	20 mc	20 mc "C" band	C7 (osc.) **
5	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L9 (osc.)
6	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C32 (osc.) *
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained.

† After adjusting C2, check to determine that C10 has been adjusted to the correct peak by tuning the receiver to approximately 5.09 mc, where a weaker signal should be received.

** Use maximum capacity peak if two peaks can be obtained. Check to determine that C7 has been adjusted to the correct peak by tuning the receiver to approximately 20.91 mc, where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on "A" and "B" bands, and 455 kc **below** the signal on "C" band.

Miscellaneous Service Data

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover by applying acetone sparingly, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

Victrola Attachment.—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment, such as R-93, R-93A, R-93B, R-93C, R-94, R-94-B. A Stock No. 9824 switch is required to change from radio to Victrola. The connections for this switch are as follows:

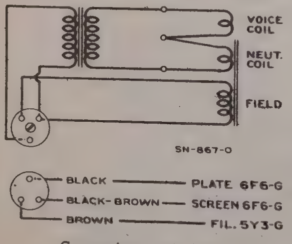
Connect the yellow lead in the switch cable to terminal No. 1.

Connect the green lead in the switch cable to terminal No. 2.

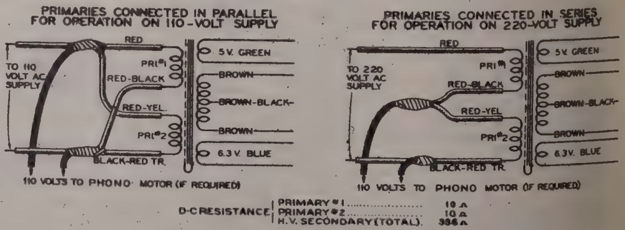
Connect the shielding of the cable to terminal No. 3.

Tape the ends of the blue and the red leads separately.

Connect the Victrola Attachment to the two clip-type connectors on the switch.



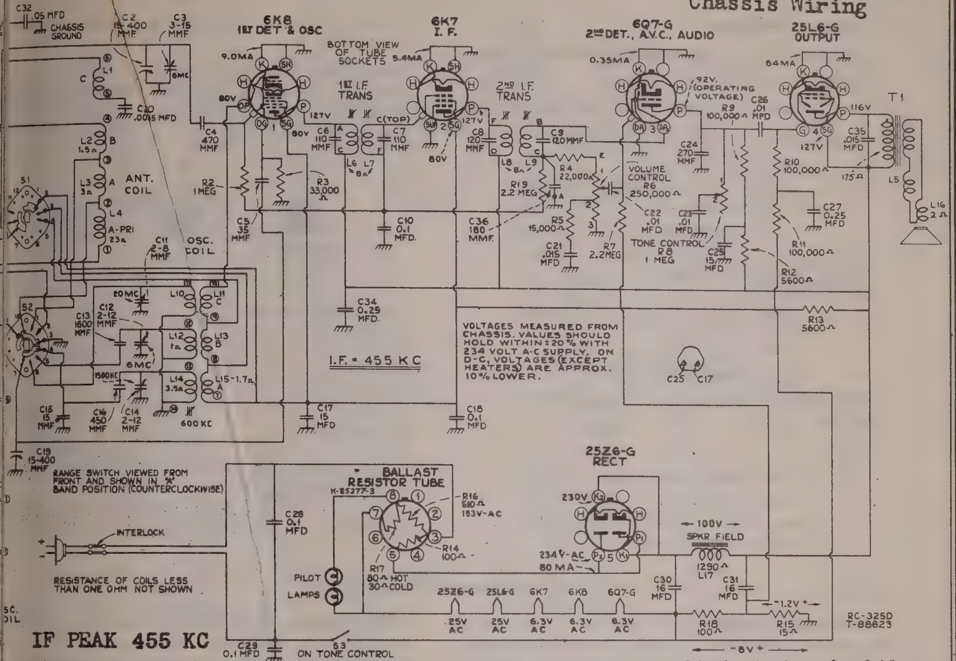
Connections and Colors of Speaker and Cable



Connections of Universal Power Transformer Primary for 220 and 110 Volts

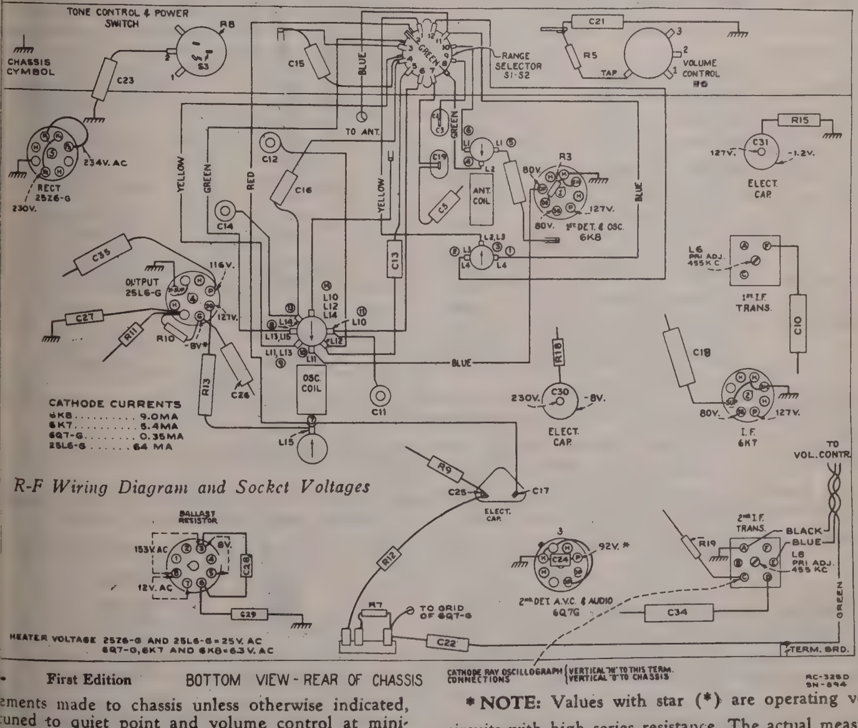
RCA MFG. CO., INC.

MODEL 5Q2X, Ch. RC325D
Schematic, Voltage
Chassis Wiring



IF PEAK 455 KC

Pilot Lamps (2) .... Mazda 47, 6.3 volts, 0.15 amp.



R-F Wiring Diagram and Socket Voltages

BOTTOM VIEW - REAR OF CHASSIS

CATHODE RAY OSCILLOGRAPH CONNECTIONS {VERTICAL "H" TO THIS TERM. VERTICAL "G" TO CHASSIS

RC-325D SN-894

938 - **First Edition**

easurements made to chassis unless otherwise indicated,
tuned to quiet point and volume control at mini-
lues should hold within ±20% with 234-volt a-c
ly.

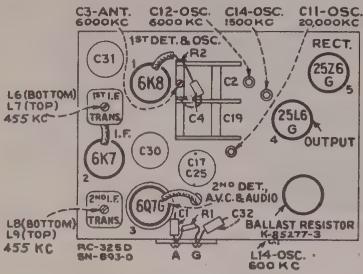
*** NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 5Q2X
Alignment,Socket,Trimmers
Lead Dress

RCA MFG. CO.. INC.

Precautionary Lead Dress.—

1. Leads on C20 ("C" band tracking condenser) must be as short as possible.
2. Dress blue lead from oscillator plate away from all parts.
3. Dress speaker cable away from ballast tube.

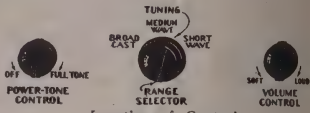


CAUTION: The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

4. Dress C22 (1st A.F. coupling condenser) against re apron.

Power Supply Polarity.—

For operation on d-c, the power plug must be inserted the outlet for correct polarity. If the set does not functio reverse the plug. On a-c, a similar reversal of the plug ma reduce hum.



Location of Controls

POWER OUTPUT RATING

(A-C Operation)

Undistorted	1.7 watt
Maximum	2.7 watt

(D-C Operation)

Undistorted	1.4 watt
Maximum	2.3 watt

LOUDSPEAKER

Type	8-inch Electrodynami
V.C. Impedance	2.2 ohms at 400 cycle

POWER SUPPLY RATINGS

A-C Rating	200-250 volts 50/60 cycles, 115 watt
D-C Rating	200-250 volts direct current, 105 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the ground terminal, and keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser in full mesh, the dial pointer should be in line with the left-hand end of the dial scales. The pointer is soldered to the drive cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L8 and L9 (2nd I-F Trans.)
2	6K8 det. grid cap, in series with .01 mfd.	455 kc		L6 and L7 (1st I-F Trans.)
3	Antenna Terminal in series with 300 ohms	6 mc	6 mc "B" band	C12 (osc.)* C3 (ant.)†
4	Antenna Terminal in series with 300 ohms	20 mc	20 mc "C" band	C11 (osc.)** (Rock In)
5	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L14 (osc.)
6	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C14 (osc.) (Rock In)
7	Repeat steps 5 and 6.			

* Use **minimum** capacity peak if two peaks can be obtained.

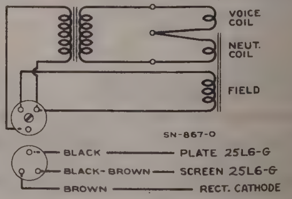
† After adjusting C3, check to determine that C12 has been adjusted to the correct peak by tuning the receiver to approximately 5.09 mc, where a weaker signal should be received.

** Use **maximum** capacity peak if two peaks can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning the receiver to approximately 20.91 mc, where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on "A" and "B" bands, and 455 kc **below** the signal on "C" band.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

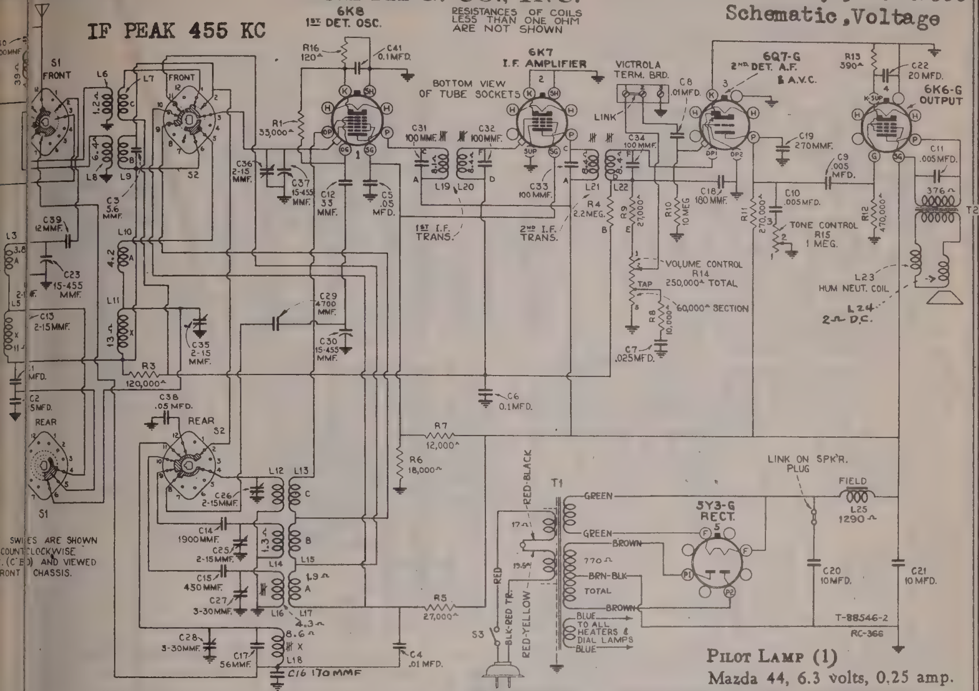
At Right—Connections and Colors of Speaker and Cable



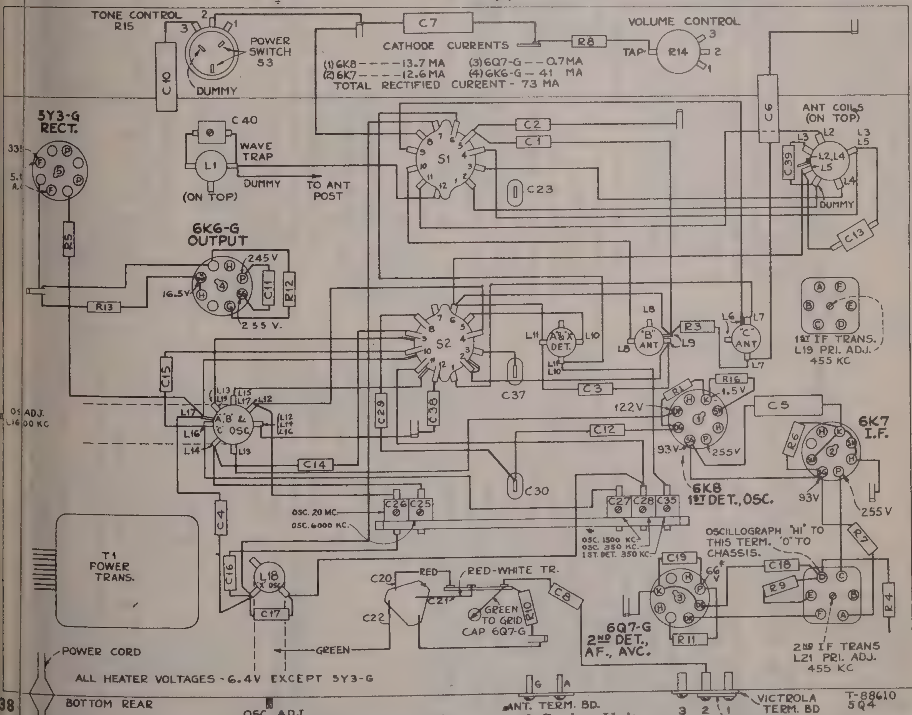
ssi Wiring

RCA MFG. CO., INC.

MODEL 5Q4,Ch. RC366
Schematic,Voltage



Pilot Lamp (1)
Mazda 44, 6.3 volts, 0.25 amp.



R-F Wiring Diagram and Socket Voltages

38 editi asu ments made to chassis unless otherwise indicated, ne o quiet point, volume control at minimum. Values d h d within ±20% with 117-volt a-c supply.

*** NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

POWER OUTPUT RATING
Undistorted...... 2.5 watts
Maximum....... 4.5 watts

LOUDSPEAKER (RL-63H-3)
Type.......... 8-inch Electrodynamic
V.C. Impedance. 2.2 ohms at 400 cycles

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

POWER SUPPLY RATINGS
Rating A........................ 105-125 volts, 50-60 cycles, 75 watts
Rating B........................ 105-125 volts, 25-60 cycles, 75 watts
Rating C........................ 105-125/200-250 volts, 50-60 cycles, 75 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a.v.c. action.

Pre-setting Dial.—With the gang condenser in full mesh, the dial pointer should be in line with the left end of the dial scales. The pointer is soldered to the drive cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following to obtain maximum output
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" band No Station Point between 550-750 kc	L21 and L22 (2nd I-F transformer)
2	6K8 det. grid cap in series with .01 mfd.	455 kc		L19 and L20 (1st I-F transformer)
3	Antenna Terminal in series with 200 mmfd.	455 kc		C40 (wave trap) MINIMUM OUTPUT
4	Antenna Terminal in series with 300 ohms.	6 mc	6 mc "B" band	C25 (osc.) use MINIMUM capacity peak C36 (antenna) use MAXIMUM capacity peak*
5	Antenna Terminal in series with 300 ohms.	20 mc	20 mc "C" band	C26 (osc.) use MINIMUM capacity peak*
6	Antenna Terminal in series with 200 mmfd.	600 kc	600 kc "A" band	L16 (osc.) Rock Gang
7		1,500 kc	1,500 kc "A" band	C27 (oscillator) C24 (antenna)
8		600 kc	600 kc "A" band	L16 (osc.) Rock Gang
9		175 kc	175 kc "X" band	L18 (osc.) Rock Gang
10		350 kc	350 kc "X" band	C28 (oscillator) C35 (1st det.) C13 (antenna)
11		175 kc	175 kc "X" band	L18 (osc.) Rock Gang

* Check to determine that trimmer has been adjusted to correct peak by tuning receiver approximately 910 kc lower, where a weaker signal should be heard.

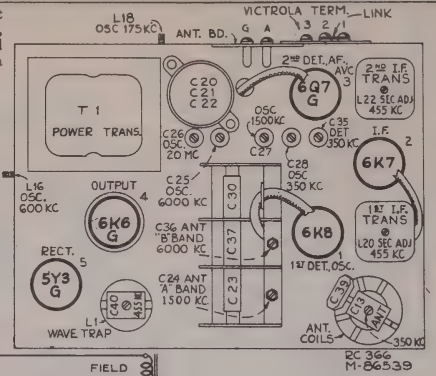
Note: Oscillator tracks **above** the signal on all bands.

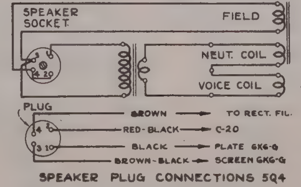
Precautionary Lead Dress.—

1. Dress blue lead from L7 to terminal 1 on range switch S2 clear of coils and other wires.
2. Dress bus from L12 to contact 4 on range switch S2 clear of other wiring.
3. Dress leads on C29 from gang to range switch short and clear of bus wires.

underside of chassis.

5. Dress all plus B leads to terminal board under electrolytic between the board and the rear apron.
6. Dress blue lead from 6Q7-G plate to terminal 6 on 6K6-G close to chassis and in front of terminal board (under electrolytic).
7. Dress blue lead from antenna terminal close to top of [illegible] clear of self-tapping screws in corners of chassis.

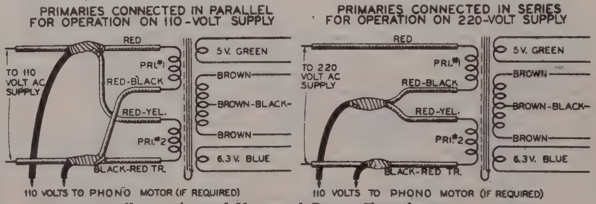




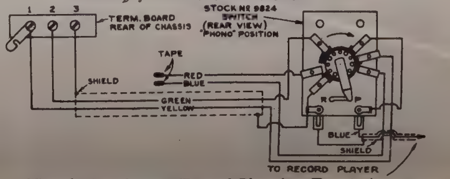
Connections of Loudspeaker and Cable

SPEAKER PLUG CONNECTIONS 5Q4

D-C RESISTANCE
PRIMARY #1 .... 17 Ω
PRIMARY #2 .... 19.5 Ω
H.V. SECONDARY (TOTAL) .... 770 Ω



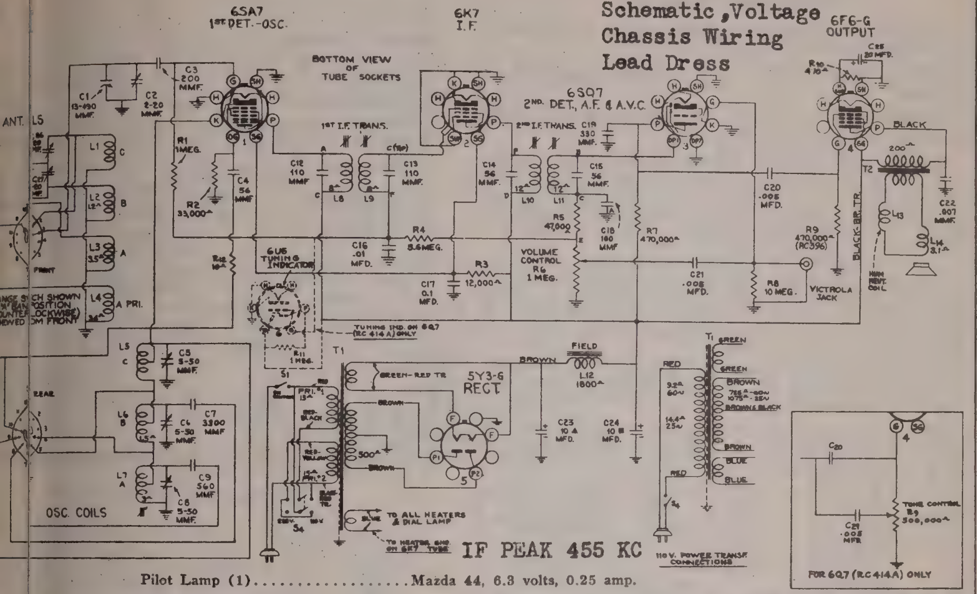
Connections of Universal Power Transformer Primary for 220 and 110 Volts


1
2
3
TERM. BOARD REAR OF CHASSIS
STOCK No 9824 SWITCH (REAR VIEW) "PHONO" POSITION
TAPE
SHIELD
RED
BLUE
GREEN
YELLOW
R
P
BLUE
SHIELD
TO RECORD PLAYER

Victrola Attachment (Record Player).—Terminals are provided on the rear of the chassis for convenient connection to [illegible] and R-94 series. A stock No. 9824 switch may be used to change from radio to record player as shown at right.

RCA MFG. CO., INC.

MODELS 5Q5,5Q5A to 5Q5E incl.
5Q55,5Q56. Chassis RC-396
6Q7 Chassis RC-414A
Schematic,Voltage
Chassis Wiring
Lead Dress



Pilot Lamp (1).................................Mazda 44, 6.3 volts, 0.25 amp.

Precautionary Lead Dress

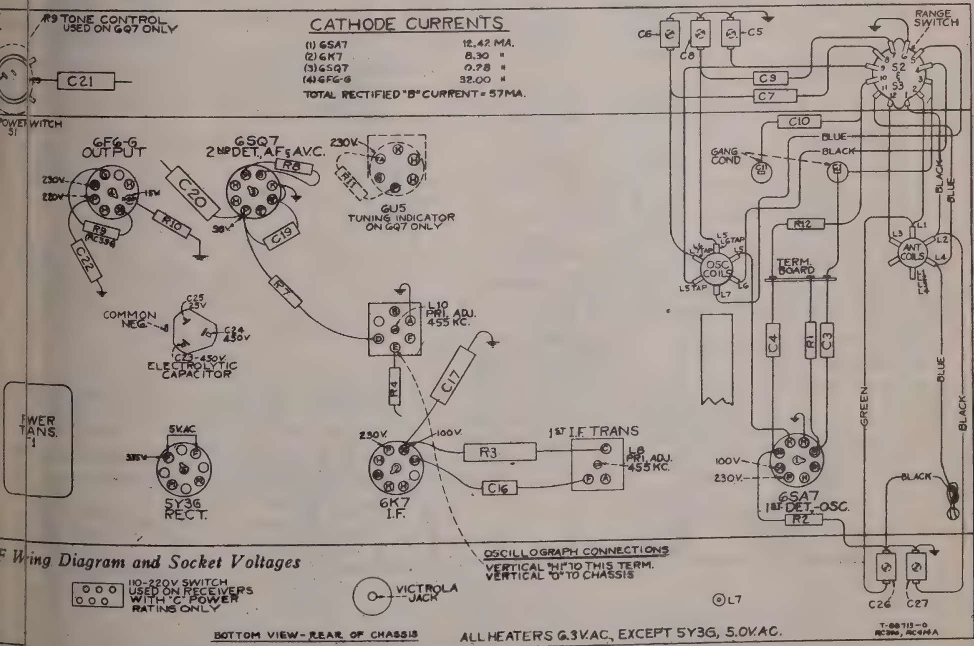
ad fr 2nd I.F. (E) to volume control should be kept close chass

F. coi eads should be kept short and away from coil.

ads t 6,000 mmf. (C10) should be as short as possible and dens dressed away from chassis, bearing against 10 ohm 12) istor.

Victrola Attachment.—A jack is provided on the rear of chassis for connection to a Victrola Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.



CATHODE CURRENTS

(1) 6SA7	12.42 MA.
(2) 6K7	8.30 "
(3) 6SQ7	0.78 "
(4) 6F6-G	32.00 "

TOTAL RECTIFIED "B" CURRENT = 57MA.

F Wing Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ± 20% with 117-volt a-c supply.

*NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

First Edition

MODELS 5Q5,5Q5A to 5Q5E
5Q55,5Q56,6Q7

RCA MFG. CO.. INC.

Alignment,Trimmers,
Drive Cords,Notes

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the ground terminal, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45 degree mark on the drum scale (see "Drum Drive and Indicator Cord Assembly" drawings) must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅜-inch. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead (blue) in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead (blue) in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.) * C26 (ant.)
7		6 mc	6 mc (149°) "B" Band	C6 (osc.) * C27 (ant.)
8	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

* Use minimum capacity peak if two peaks can be obtained.
† Rock gang condenser slightly while adjusting L7.
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.

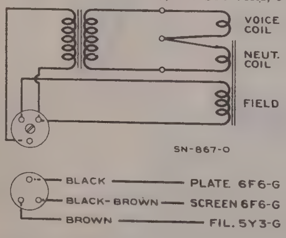
Note.—Oscillator tracks 455 kc above signal on all bands.

LOUDSPEAKER

Type (5Q5, 5Q55, 5Q56)	RL-78-2	5-inch Electrodynamic
(6Q7)	RL-79-2	6-inch Electrodynamic
Voice-Coil Impedance		3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 70 watts
Rating B	105-125 volts, 25-60 cycles, 70 watts
Rating C	105-125/200-250 volts, 50-60 cycles, 70 watts



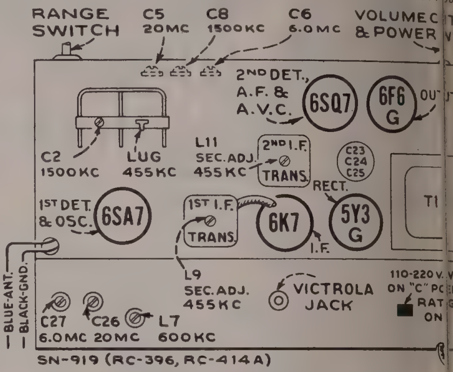
Connections and Colors of Speaker and Cable

POWER OUTPUT RATING

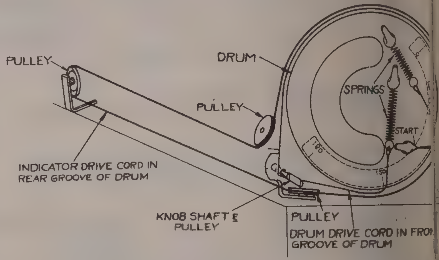
Undistorted	watt
Maximum	watt

FREQUENCY RANGES

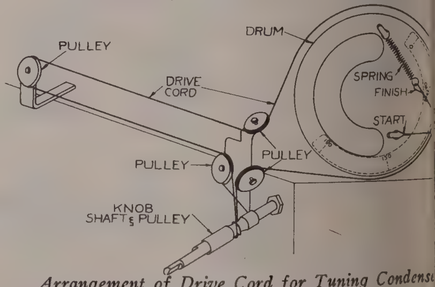
"Standard Broadcast" (A)	540-1,720 kc (555 4 m)
"Medium Wave" (B)	2.3-7.0 mc (130 8 m)
"Short Wave" (C)	7.0-22.0 mc (42.8 6 m)
Intermediate Frequency	55 kc



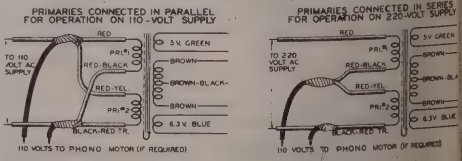
Tube and Trimmer Locations


PULLEY
DRUM
PULLEY
SPRINGS
START
INDICATOR DRIVE CORD IN REAR GROOVE OF DRUM
KNOB SHAFT & PULLEY
PULLEY
DRUM DRIVE CORD IN FRONT GROOVE OF DRUM

Arrangement of Drive Cords for Tuning Conden
Dial Indicator (Models 5Q5, 5Q55 and 5Q
Drum Shown with Gang at Maximum Capac



Arrangement of Drive Cord for Tuning Condens
Dial Indicator (Model 6Q7)
Drum Shown with Gang at Maximum Capaci

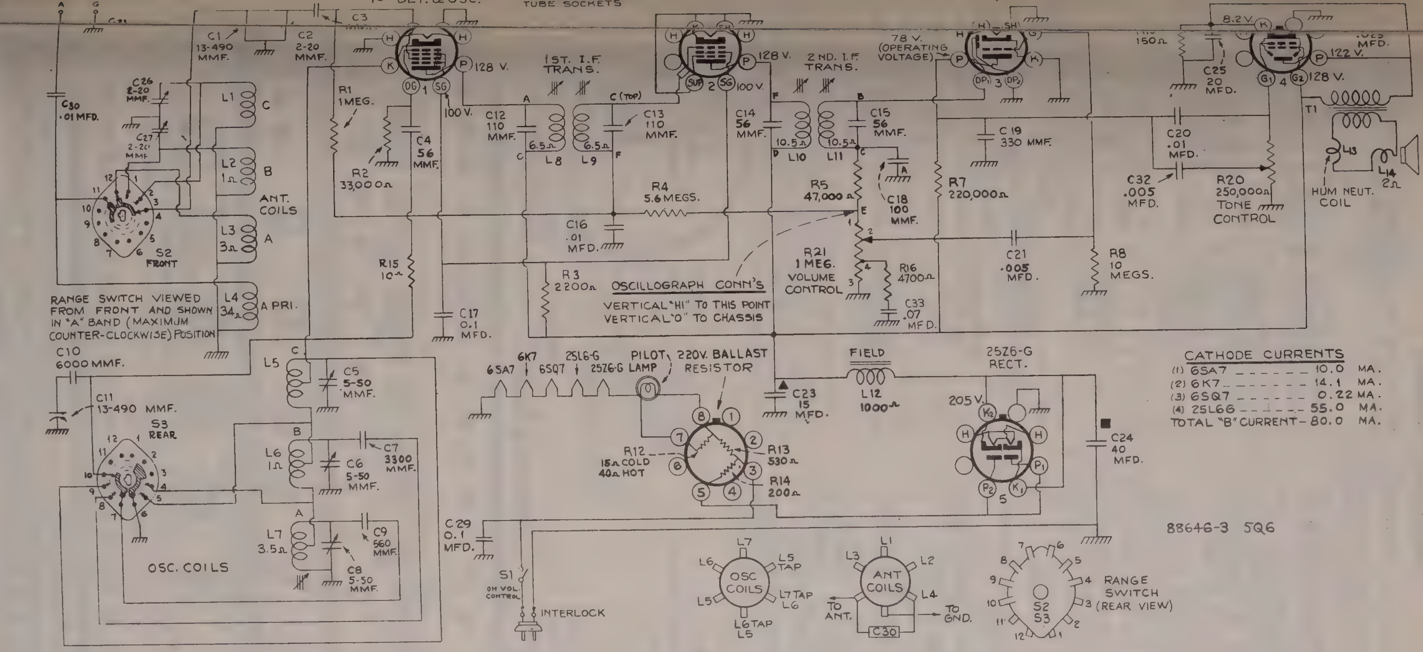

PRIMARIES CONNECTED IN PARALLEL FOR OPERATION ON 110-VOLT SUPPLY
RED
TO 110 VOLT AC SUPPLY
PRI. #1
RED-BLACK
RED-YEL.
PRI. #2
BLACK-RED TR.
5V. GREEN
BROWN
BROWN-BLACK
BROWN
6.3V. BLUE
110 VOLTS TO PHONO MOTOR (IF REQUIRED)
PRIMARIES CONNECTED IN SERIES FOR OPERATION ON 220-VOLT SUPPLY
TO 220 VOLT AC SUPPLY
110 VOLTS TO PHONO MOTOR (IF REQUIRED)

D-C Resistance
- Primary No. 1 .... 13 oh
- Primary No. 2 .... 15 oh
- H. V. Secondary (Total) .... 500 oh

Connections of Universal Power Transformer Primary f
220 and 110 Volts

RCA MFG. CO., INC.

MODEL 5Q6, Chassis RC-477A
Schematic, Voltage



First Edition
1939

Frequency Ranges

Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)	7.0-22 mc (42.8-13.6 m)
Intermediate Frequency	455 kc

General Description

Model 5Q6 is a three-band, table-type superheterodyne receiver housed in a plastic cabinet. It is designed for operation on 210-250 volts, 50-60 cycles AC, or 210-250 volts DC.

Features of design include: New type single-ended tubes (6SA7 and 6SQ7); magnetite core I-F transformers; magnetite core oscillator adjustment for "A" band; automatic volume control; bass compensation; electrodynamic loudspeaker; high-frequency tone control; straight-line dial; tropic-proof construction; streamline moulded cabinet.

Power Supply Polarity:

For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, a similar reversal of the plug may reduce hum.

Tube Complement

(1) RCA-6SA7	Detector-Oscillator
(2) RCA-6K7	I-F Amplifier
(3) RCA-6SQ7	2nd Detector, A.V.C., and A-F Amplifier
(4) RCA-25L6-G	Power Output
(5) RCA-25Z6-G	Rectifier

Pilot Lamp	Mazda No. 47, 6.3 volts, 0.15 amp.
Ballast Tube	RCA Stock No. 32849 for 210-250 volt operation.

Power Output Rating
(210-250 Volt Operation)

Undistorted	1.5 watts
Maximum	2.7 watts

Loudspeaker (84557-2)

Type	5-inch
V. C. Impedance	2.2 ohms at 400 cycles

Power Supply Ratings

210-250 volts, 50-60 cycles	125 watts
210-250 volts, direct current	125 watts

MODEL 5Q6,Chassis RC-477A
Alignment,Trimmers,Socket
Drive Cord,Notes

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground lead (black), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indic r has spring clip for attachment to the cable.

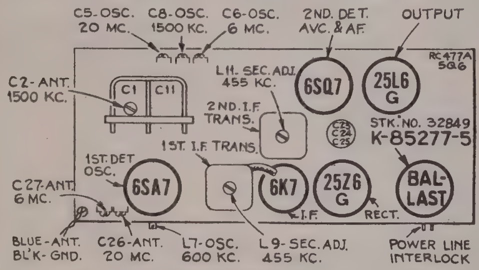
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjus e fol- lowing max peak tput
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 a L11 (2n F. tra)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 a L9 (1st F. tra
3	Antenna lead in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (.) C8 (.)
5	Repeat steps 3 and 4			
6	Antenna lead in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 ( )* C26 (t.)
7		6 mc	6 mc (148°) "B" Band	C6 ( )* C27 (.)
8	Antenna lead in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 ( )

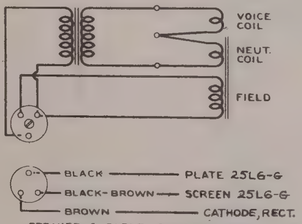
* Use minimum capacity peak if two peaks can be obtain

† Rock gang condenser slightly while adjusting L7.

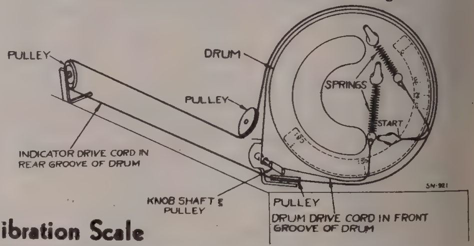
** Make test-oscillator connection to lug on tuning c lens stator (oscillator section) in series with .01 mfd. condenser.

Note.—Oscillator tracks 455 kc above signal on all bands.

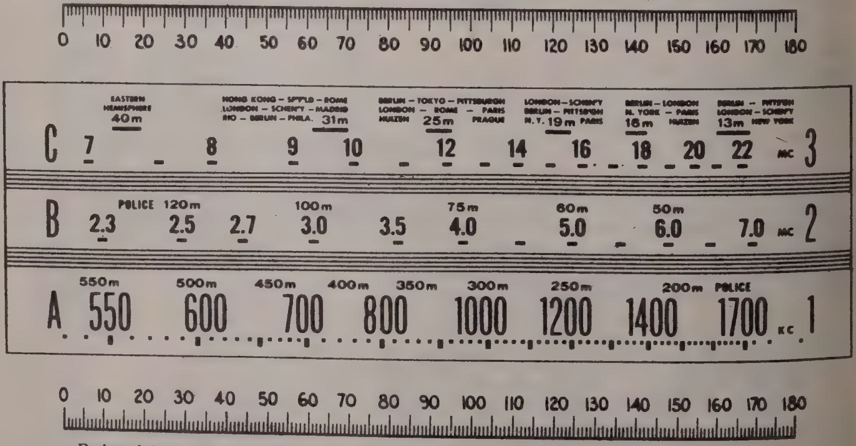




SPEAKER & CABLE CONNECTIONS


PULLEY
DRUM
PULLEY
SPRINGS
START
INDICATOR DRIVE CORD IN REAR GROOVE OF DRUM
KNOB SHAFT & PULLEY
PULLEY
DRUM DRIVE CORD IN FRONT GROOVE OF DRUM
SN-921

Calibration Scale



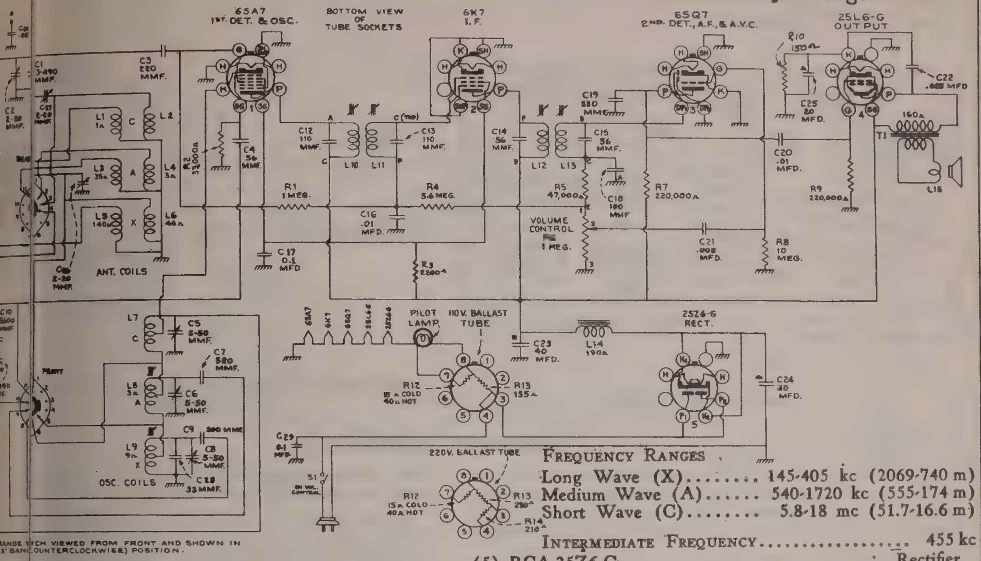
Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to ap mately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

ssi Wiring,Lead Dress

RCA MFG. CO. INC.

MODEL 5Q8,Chassis RC-396B
Schematic,Voltage



FREQUENCY RANGES

Long Wave (X)........	145-405 kc	(2069-740 m)
Medium Wave (A)......	540-1720 kc	(555-174 m)
Short Wave (C)........	5.8-18 mc	(51.7-16.6 m)

INTERMEDIATE FREQUENCY.................. 455 kc

(5) RCA-25Z6-G.......................... Rectifier

Ballast Tubes...... RCA Stock No. 32544 for 105-125 volt operation; RCA Stock No. 32850 for 210-250 volt operation.

LOT AMP.......... Mazda No. 47, 6.3 volts, 0.15 amp.

WER UTPUT RATING

10-2 Volt Operation)	
ndistcted........................	1.5 watts
axim............................	2.7 watts
05-1 Volt Operation)	
ndistcted........................	1.7 watts
axim............................	2.9 watts

LOUDSPEAKER

Type..	5-inch
V. C. Impedance.................	3.0 ohms at 400 cycles

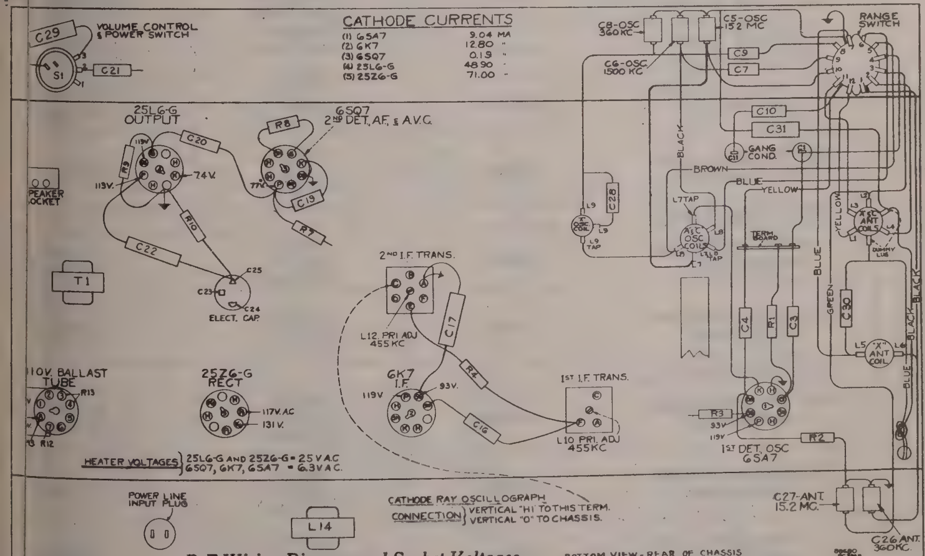
POWER SUPPLY RATINGS

105-125 volts, AC-DC........................	65 watts
210-250 volts, AC-DC........................	125 watts

autiary Lead Dress:

Lead rom 2nd I-F transformer to volume control should be k pt close to the chassis and dressed against front apro

2. C-10 should be dressed away from the antenna section of the variable condenser (C-1).



R-F Wiring Diagram and Socket Voltages

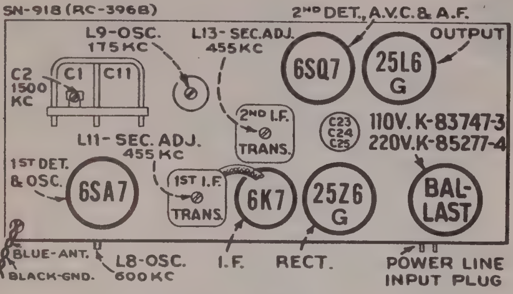
eas ements made to chassis unless otherwise indicated, n se tuned to quiet point and volume control at mini- n. alues should hold within ±20% with 117-volt a-c bly.

*** NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

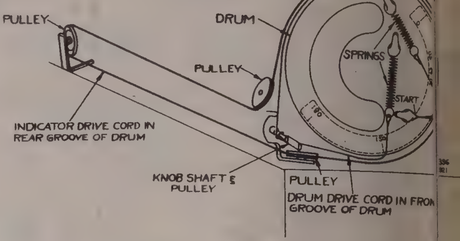
First Edition —1939—

MODEL 5Q8,Chassis RC-396B
Alignment,Trimmers
Drive Cord , Socket

RCA MFG. CO., INC.



Tube and Trimmer Locations


PULLEY
DRUM
PULLEY
SPRINGS
START
180
150
INDICATOR DRIVE CORD IN REAR GROOVE OF DRUM
KNOB SHAFT & PULLEY
PULLEY
DRUM DRIVE CORD IN FRON GROOVE OF DRUM
396 921

Arrangement of Drive Cords for Tuning Condenser a Dial Indicator

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for eacl ligr ment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position f th drum. The 135° mark on the drum scale must be tica and directly under the center of the gang-condense sha when the plates are fully meshed. The drum is held th shaft by means of one set screw, which must be tig ene securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer th calibration scale by fastening a piece of wire to the ang condenser frame, and bend the wire so that it points th 0° mark on the calibration scale when the plates a full meshed.

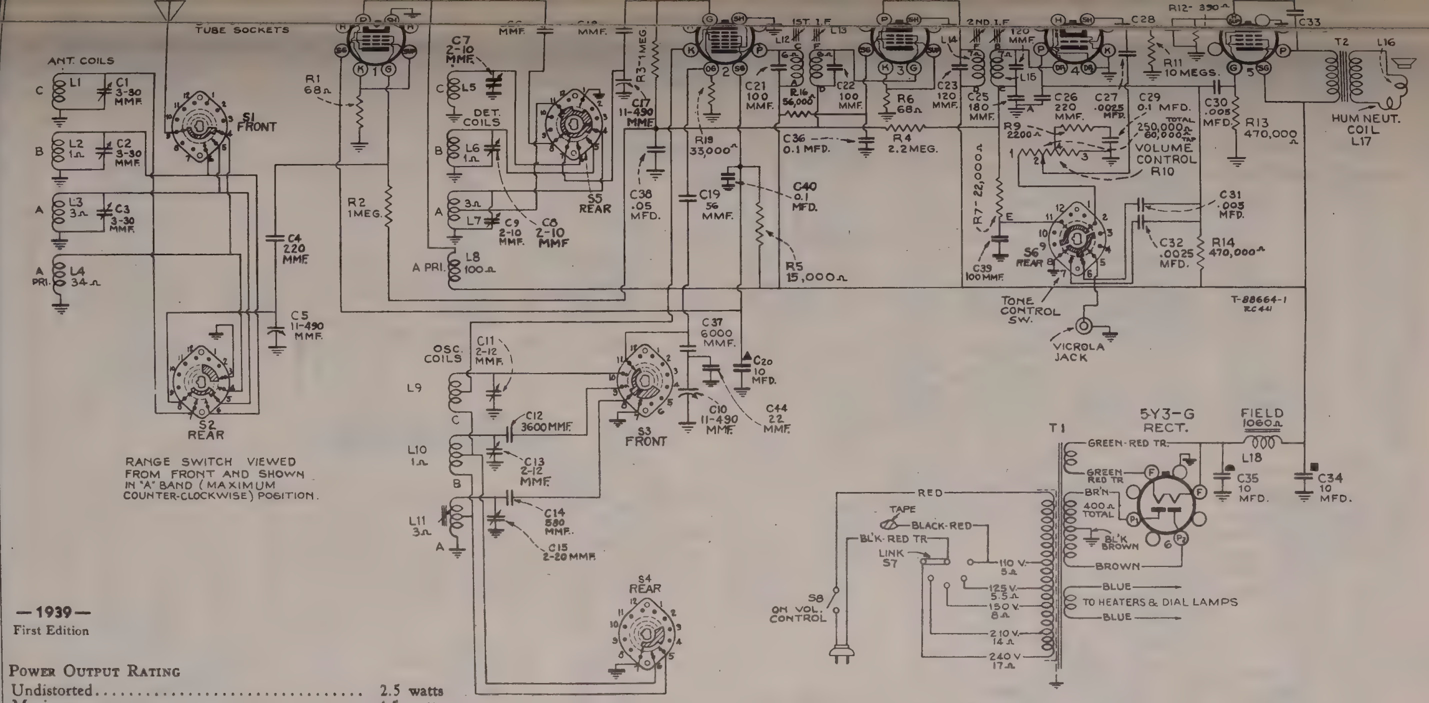
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the followin for max. peak outpu
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.) C2 (ant.)
4	Ant. terminal in series with 200 mmf.	600 kc	600 kc (33°) "A" Band	L8 (osc.)
5	Repeat steps 3 and 4			
6	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.) C26 (ant.)
7	Ant. terminal in series with 200 mmf.	175 kc	175 kc (53.3°) "X" Band	L9 (osc.)
8	Repeat steps 6 and 7			
9	Ant. terminal in series with 300 ohms	15.2 mc	15.2 mc (147.2°) "C" Band	C5 (osc.)* C27 (ant.)
10	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.)
11	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.)

*Use minimum capacity peak if two can be obtained. Check to determine that C5 is adjusted to correct peak by tu receiver to approximately 14.29 mc where a weaker signal should be received.

NOTE: Oscillator tracks above signal on all bands.

RCA MFG. CO. INC.

MODEL 6Q1, Chassis RC-441
Schematic



RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "A" BAND (MAXIMUM COUNTER-CLOCKWISE) POSITION.

—1939—
First Edition

Power Output Rating

Undistorted	2.5 watts
Maximum	4.5 watts

Loudspeaker (RL-79A-2)

Type	6-inch electrodynamic
V.C. Impedance	3.4 ohms at 400 cycles

Power Supply Ratings

Rating A	105-125 volts, 50-60 cycles, 75 watts
Rating B	105-125 volts, 25-60 cycles, 75 watts
Rating C	105-130, 140-160, 200-250 volts, 40-60 cycles, 75 watts

Frequency Ranges

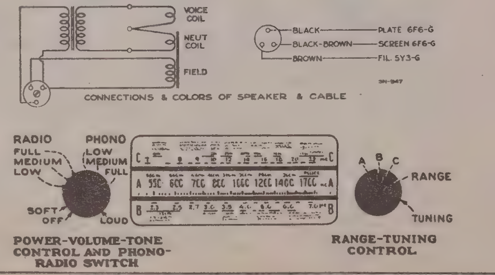
Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)	7.0-22.0 mc (42.8-13.6 m)

Intermediate Frequency	455 kc

Tube Complement

(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector-Oscillator
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6SQ7	2nd Detector, A.V.C., and A-F Amplifier
(5)	RCA-6F6-G	Output
(6)	RCA-5Y3-G	Rectifier

Pilot Lamps (2)	Mazda No. 44, 6.3 volts, 0.25 amp.



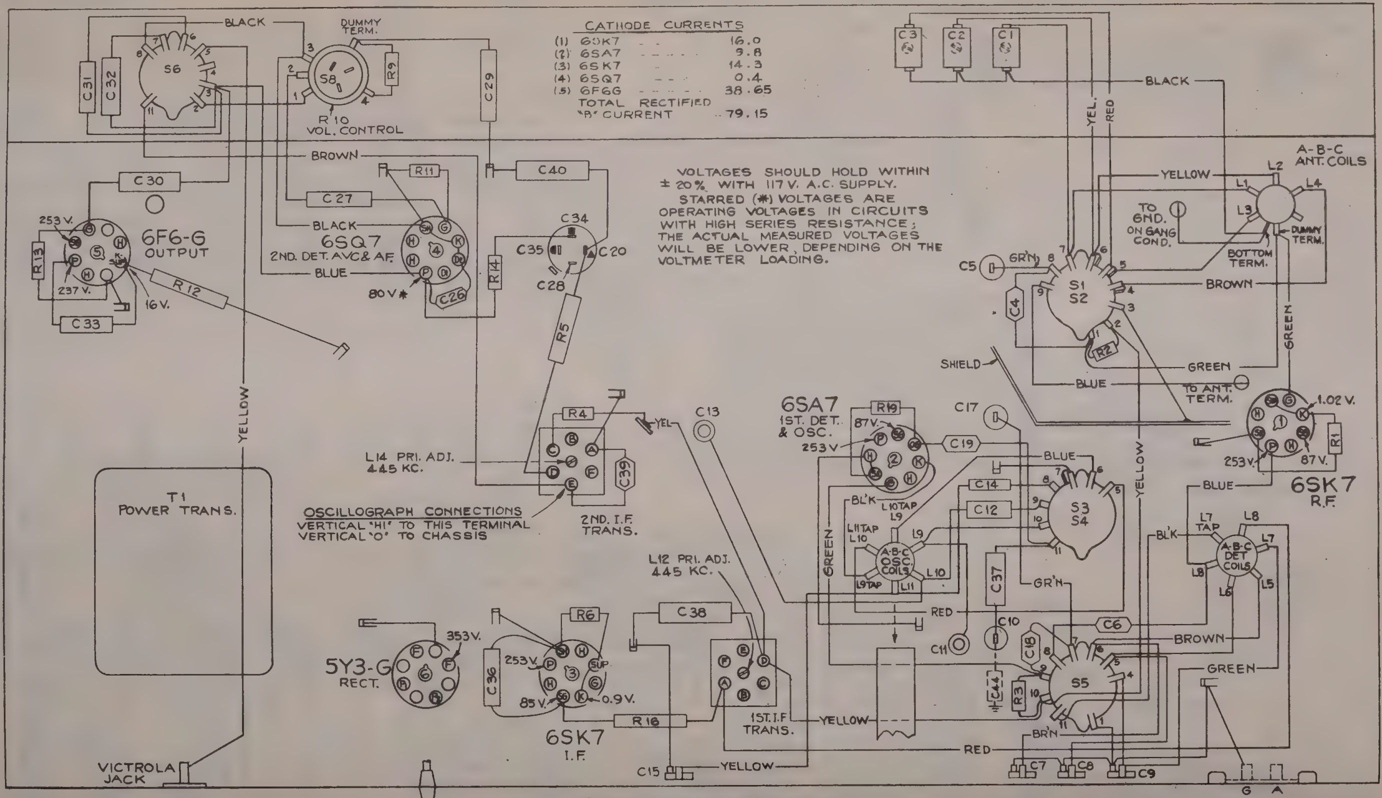
CONNECTIONS & COLORS OF SPEAKER & CABLE

POWER-VOLUME-TONE CONTROL AND PHONO-RADIO SWITCH

RANGE-TUNING CONTROL

MODEL 6Q1,Chassis RC-441
Chassis Wiring,Voltage
Lead Dress

RCA MFG. CO. INC.



BOTTOM VIEW - REAR OF CHASSIS
R-F WIRNG AND SOCKET VOLTAGES

6Q1 (RC441) T-88838

Precautionary Lead Dress:

1. Dress yellow lead from antenna coil to first section of range switch away from adjoining wires.
2. Dress green lead from middle section of gang and green lead from 6SA7 to the rear section of the range switch.
3. Dress brown lead from detector coil to rear section of the range switch away from the detector coil; loop brown lead toward rear apron.
4. Dress black lead from 2nd I. F. transformer "B" to 6SQ7 socket against chassis.
5. Twist power leads together, and dress away from 6SQ7
6. Dress blue lead from 6SK7 (R-F) socket to detector coil away from chassis, ground shields and other wires.
7. Dress black lead from antenna trimmer (C1) to antenna coil away from range switch link action.
8. Dress black speaker lead around output socket toward power transformer, against base.

antenna lead.

RCA MFG. CO., INC.

MODEL 6Q1,Chassis RC-441
Alignment,Trimmers,Socket
Drive Cord and Controls

Alignment Procedure

athc-Ray **Alignment** is the preferable method. Connec- s fohe oscillograph are shown in the chassis drawing.

utp **Meter Alignment.**—If this method is used, connect met across the voice coil, and turn the receiver volume rol maximum.

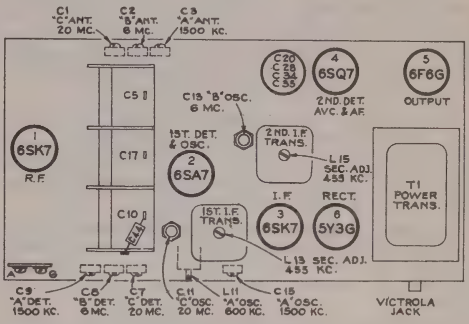
est-**cillator.**—For all alignment operations, connect the side f the test-oscillator to the receiver chassis, and keep outp as low as possible to avoid a-v-c action.

alib**ion Scale on Indicator-Drive-Cord Drum.** — The ng cl is fastened in the cabinet and cannot be used for renc during alignment; therefore, a calibration scale is ched o the rear of the drum which is mounted on the t sh t of the gang condenser. The setting of the gang dens is read on this scale, which is calibrated in degrees. cor ct setting of the gang in degrees, for each align- t fre uency, is given in the alignment table.

s th first step in r-f alignment, check the position of the n. e 180° mark on the drum scale must be vertical, dire y over the center of the gang-condenser shaft when plat are fully meshed. The drum is held to the shaft by ns c two set screws, which must be tightened securely n th drum is in the correct position.

oint **for Calibration Scale.**—Improvise a pointer for the orati scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.

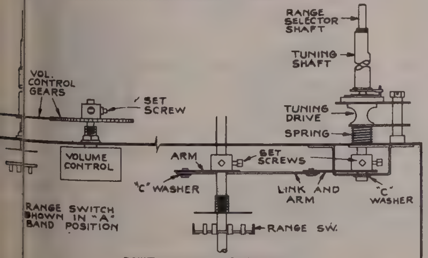


Ste	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L14 and L15 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L12 and L13 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	600 kc	600 kc (148°) "A" Band	L11 (osc.) Rock gang
4		1,500 kc	1,500 kc (28°) "A" Band	C15 (osc.) C9 (det.) C3 (ant.)
5	Repeat steps 3 and 4.			
6	Ant. terminal in series with 300 ohms	6 mc	6 mc (31°) "B" Band	C13 (osc.)* C8 (det.) C2 (ant.)
7		20 mc	20 mc (23°) "C" Band	C11 (osc.)** C7 (det.) C1 (ant.)

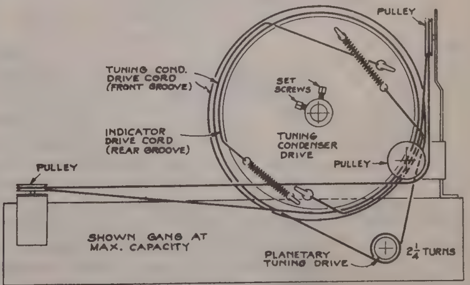
* U **minimum** capacity peak if two can be obtained. Check to determine that C13 has been adjusted to the correct peak unii receiver to approximately 5.09 mc where a weaker signal should be received.

** U **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak unii the receiver to approximately 19.09 mc where a weaker signal should be received.

te.—Oscillator tracks **above** signal on all bands.



BOTTOM VIEW OF CONTROLS



DRIVE CORD ARRANGEMENT

MODEL 6Q4,Chassis RC-441A
Alignment,Trimmers
Drive Cord, Socket

RCA MFG. CO., INC.
Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

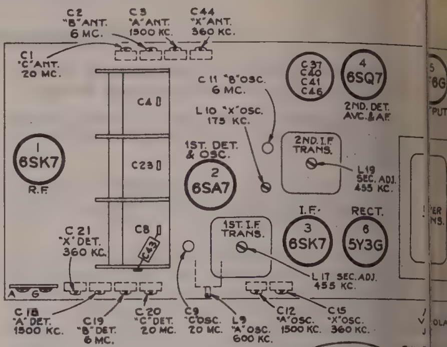
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

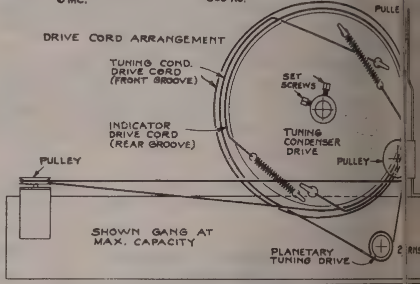
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.




DRIVE CORD ARRANGEMENT
TUNING COND. DRIVE CORD (FRONT GROOVE)
SET SCREWS
INDICATOR DRIVE CORD (REAR GROOVE)
TUNING CONDENSER DRIVE
PULLEY
PULLEY
SHOWN GANG AT MAX. CAPACITY
PLANETARY TUNING DRIVE

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F resp which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for the lowing steps.			
5	Ant. terminal in series with 200 mmfd.	360 kc	360 kc (31.5°) "X" Band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (127.2°) "X" Band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (28°) "A" Band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (148°) "A" Band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6 mc	6 mc (30°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (23°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correc by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correc by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

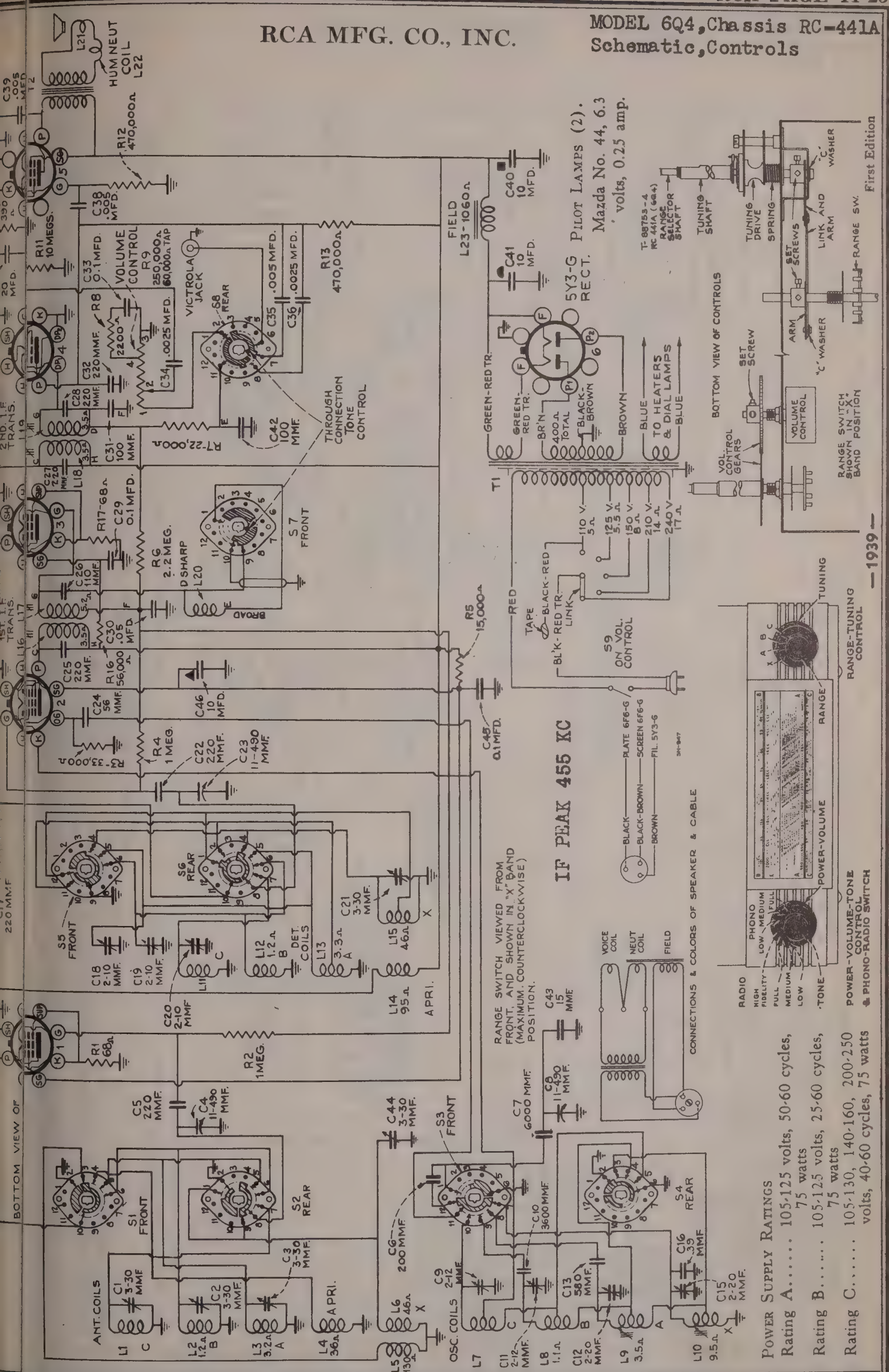
† Preset L10 core approximately ½-inch out before adjusting C15.

†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks **above** signal on all bands.

RCA MFG. CO., INC.

MODEL 6Q4,Chassis RC-441A
Schematic,Controls



5Y3-G RECT.

Pilot Lamps (2). Mazda No. 44, 6.3 volts, 0.25 amp.

IF PEAK 455 KC

Power Supply Ratings

Rating A...... 105-125 volts, 50-60 cycles, 75 watts

Rating B...... 105-125 volts, 25-60 cycles, 75 watts

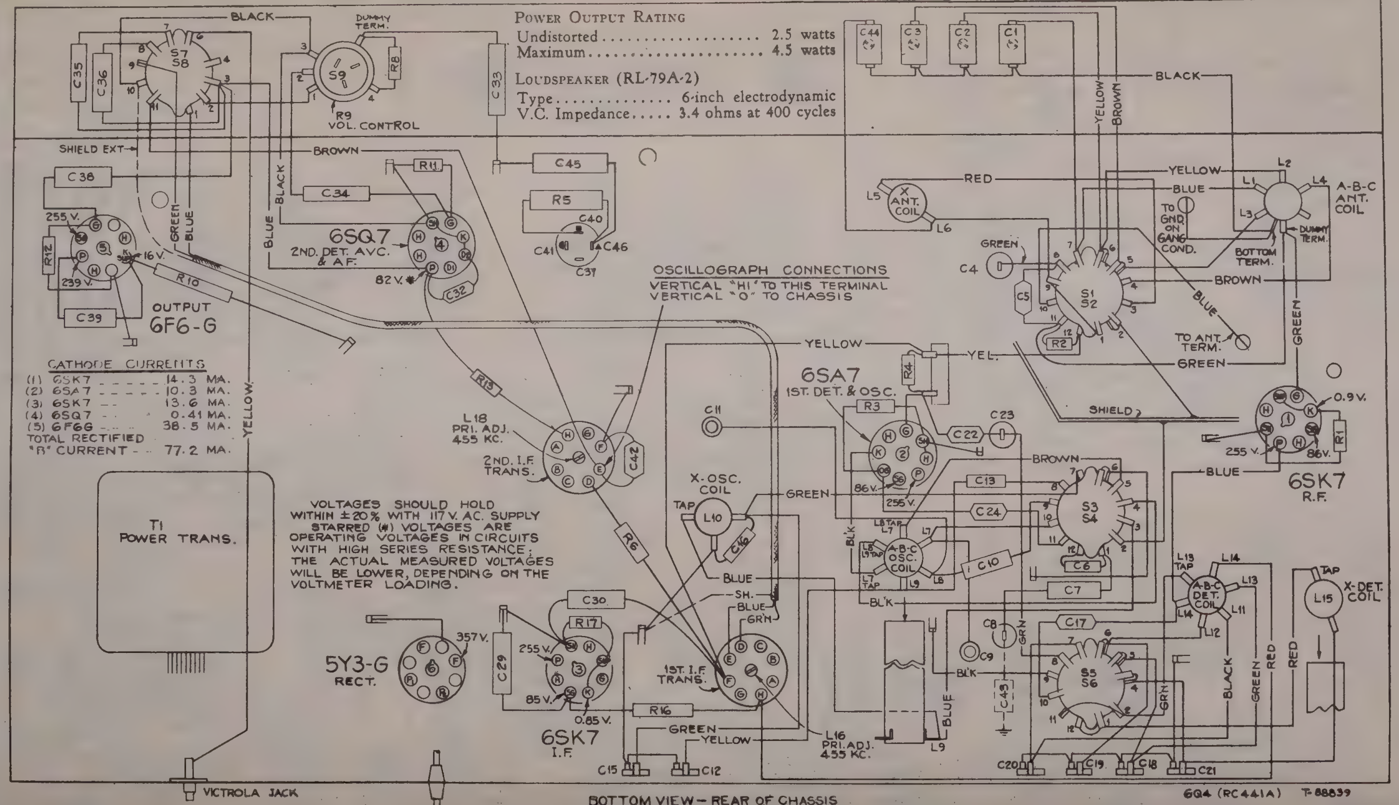
Rating C...... 105-130, 140-160, 200-250 volts, 40-60 cycles, 75 watts

—1939—

First Edition

MODEL 6Q4, Chassis RC-441A
Chassis Wiring, Voltage
Lead Dress

RCA MFG. CO., INC.



POWER OUTPUT RATING
Undistorted .... 2.5 watts
Maximum .... 4.5 watts

LOUDSPEAKER (RL-79A-2)
Type .... 6-inch electrodynamic
V.C. Impedance..... 3.4 ohms at 400 cycles

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS

CATHODE CURRENTS

(1)	6SK7	14.3 MA.
(2)	6SA7	10.3 MA.
(3)	6SK7	13.6 MA.
(4)	6SQ7	0.41 MA.
(5)	6F6G	38.5 MA.
TOTAL RECTIFIED "B" CURRENT		77.2 MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC. SUPPLY STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

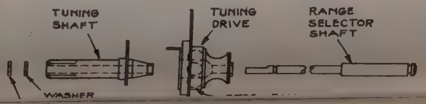
BOTTOM VIEW — REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

Precautionary Lead Dress:

1. Dress black lead from L11 to C20 against terminals 6 and 7 of S6.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.

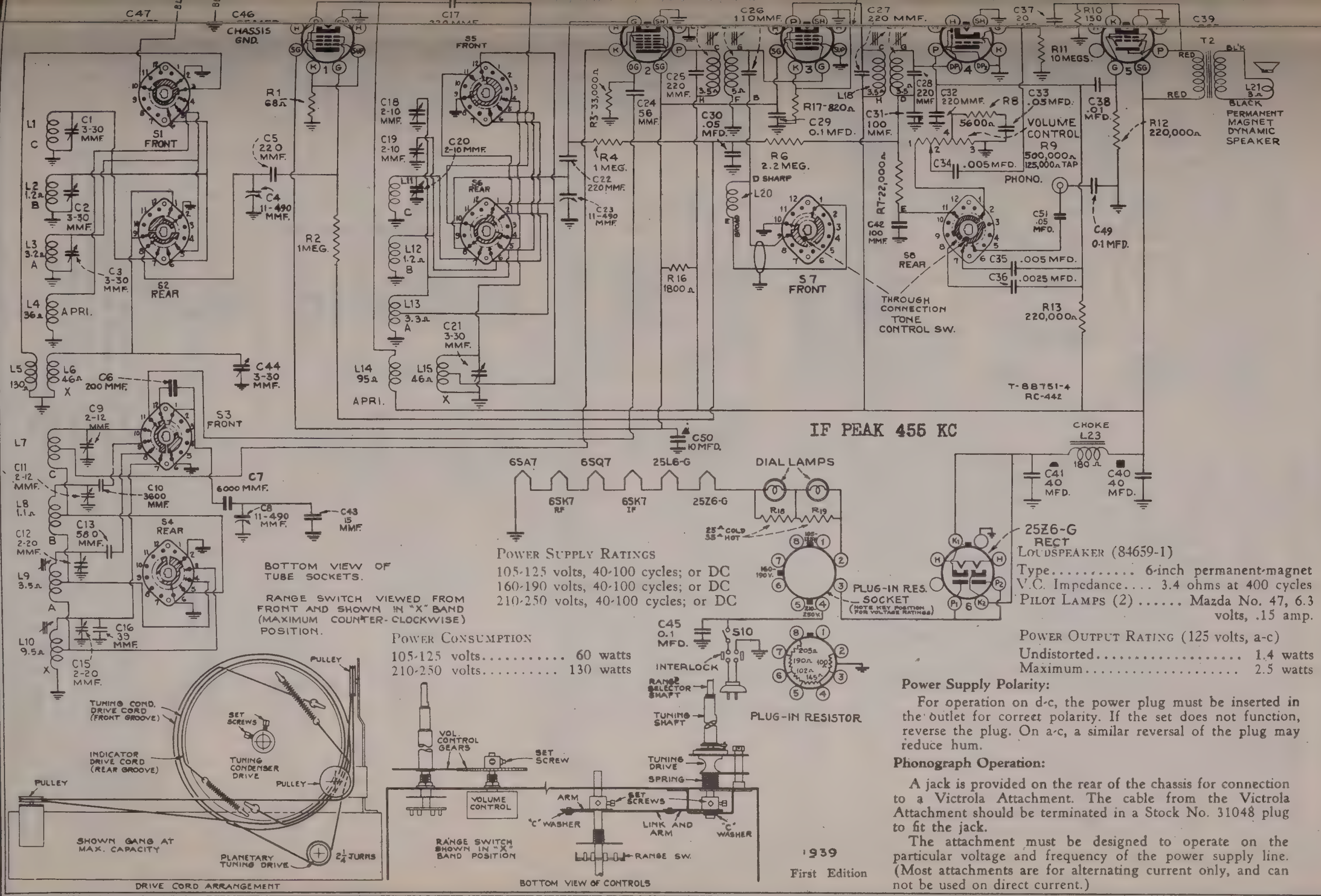
the 6SQ7 socket.

5. Dress the brown lead from terminal E on the 2nd I-F transformer to terminal 11 on S8 close to chassis.
6. Dress the black lead from trimmer (C1) to antenna coil away from the range switch link section.
7. Dress black speaker lead around the output socket toward the power transformer.
8. Keep green lead of 6SK7 R-F grid circuit away from blue



PLANETARY TUNING DRIVE ASS'Y

MODEL 6Q4X,Chassis RC-442
Schematic,Drive Cord
Controls,Phono.Data



Power Supply Ratings

105-125 volts, 40-100 cycles; or DC
160-190 volts, 40-100 cycles; or DC
210-250 volts, 40-100 cycles; or DC

Power Consumption

105-125 volts..........	60 watts
210-250 volts.........	130 watts

Loudspeaker (84659-1)

Type..........	6-inch permanent-magnet
V.C. Impedance....	3.4 ohms at 400 cycles
Pilot Lamps (2)......	Mazda No. 47, 6.3 volts, .15 amp.

Power Output Rating (125 volts, a-c)

Undistorted..................	1.4 watts
Maximum......................	2.5 watts

Power Supply Polarity:

For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, a similar reversal of the plug may reduce hum.

Phonograph Operation:

A jack is provided on the rear of the chassis for connection to a Victrola Attachment. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

The attachment must be designed to operate on the particular voltage and frequency of the power supply line. (Most attachments are for alternating current only, and can not be used on direct current.)

1939

First Edition

MODEL 6Q4X, Chassis RC-442
Alignment, Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

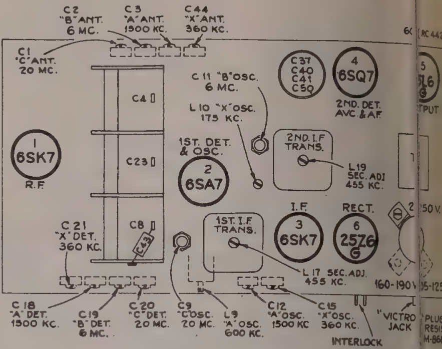
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the black lead and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

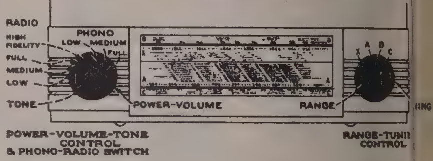
As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.



SEE 6Q4 FOR
PLANETARY TUNING DRIVE ASS'Y



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following fo maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F res nse which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for th ollowing steps.			
5	Ant. terminal in series with 200 mmfd.	360 kc	360 kc (31.5°) "X" Band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (127.2°) "X" Band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (28°) "A" Band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (148°) "A" Band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6 mc	6 mc (30°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (23°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correc by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correc by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

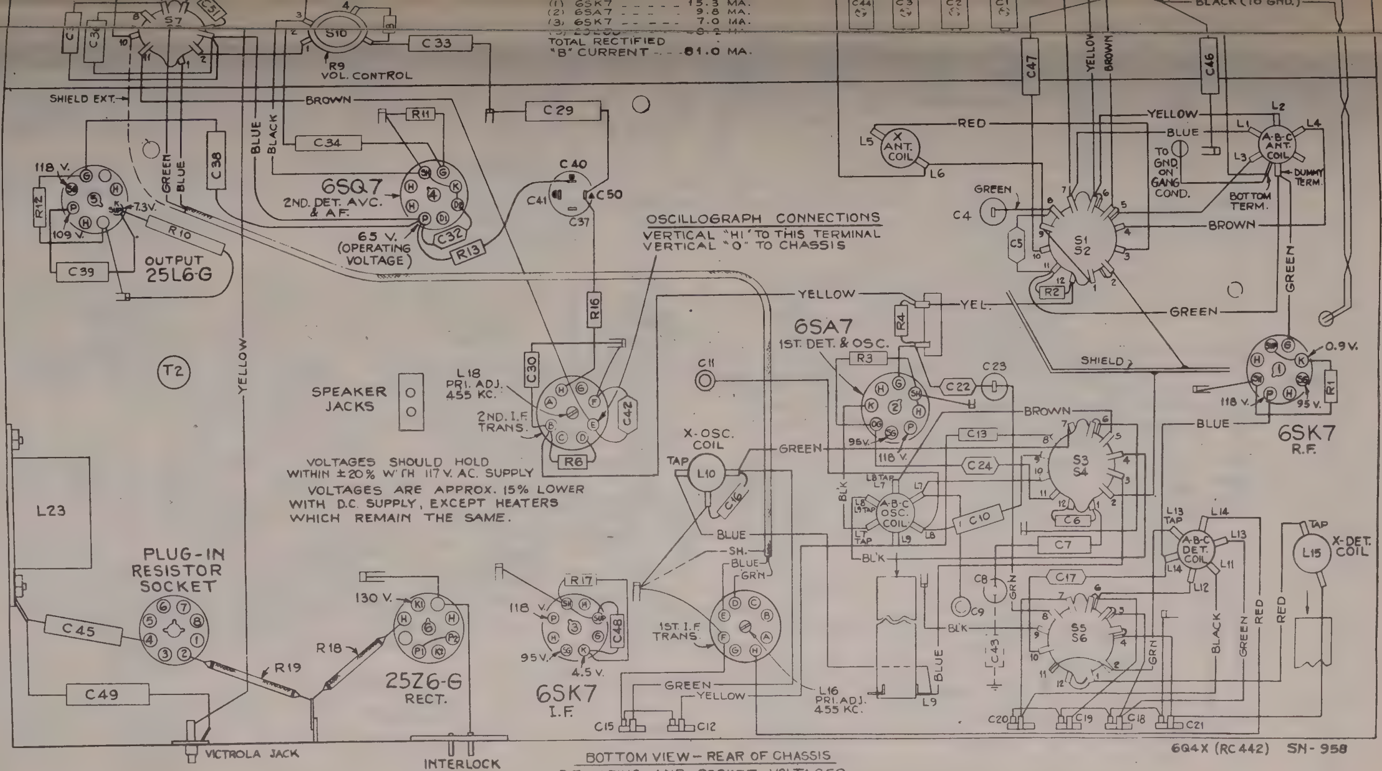
† Preset L10 core approximately ½-inch out before adjusting C15.

†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks **above** signal on all bands.

RCA MFG. CO., INC.

MODEL 6Q4X, Chassis RC-442
Chassis Wiring, Voltage
Lead Dress



OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS

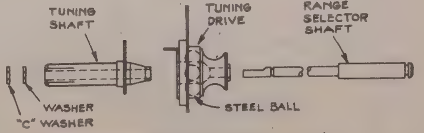
VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC. SUPPLY

VOLTAGES ARE APPROX. 15% LOWER WITH D.C. SUPPLY, EXCEPT HEATERS WHICH REMAIN THE SAME.

BOTTOM VIEW – REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

Precautionary Lead Dress:

1. Dress black lead from L11 to C20 against terminals 6 and 7 of S6.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.
4. Twist the power leads together and dress them away from the 6SQ7 socket.
5. Dress the brown lead from terminal E on the 2nd I-F transformer to terminal 11 on S8 against the chassis.
6. Dress the black lead from trimmer (C1) to antenna coil away from the range switch link action.

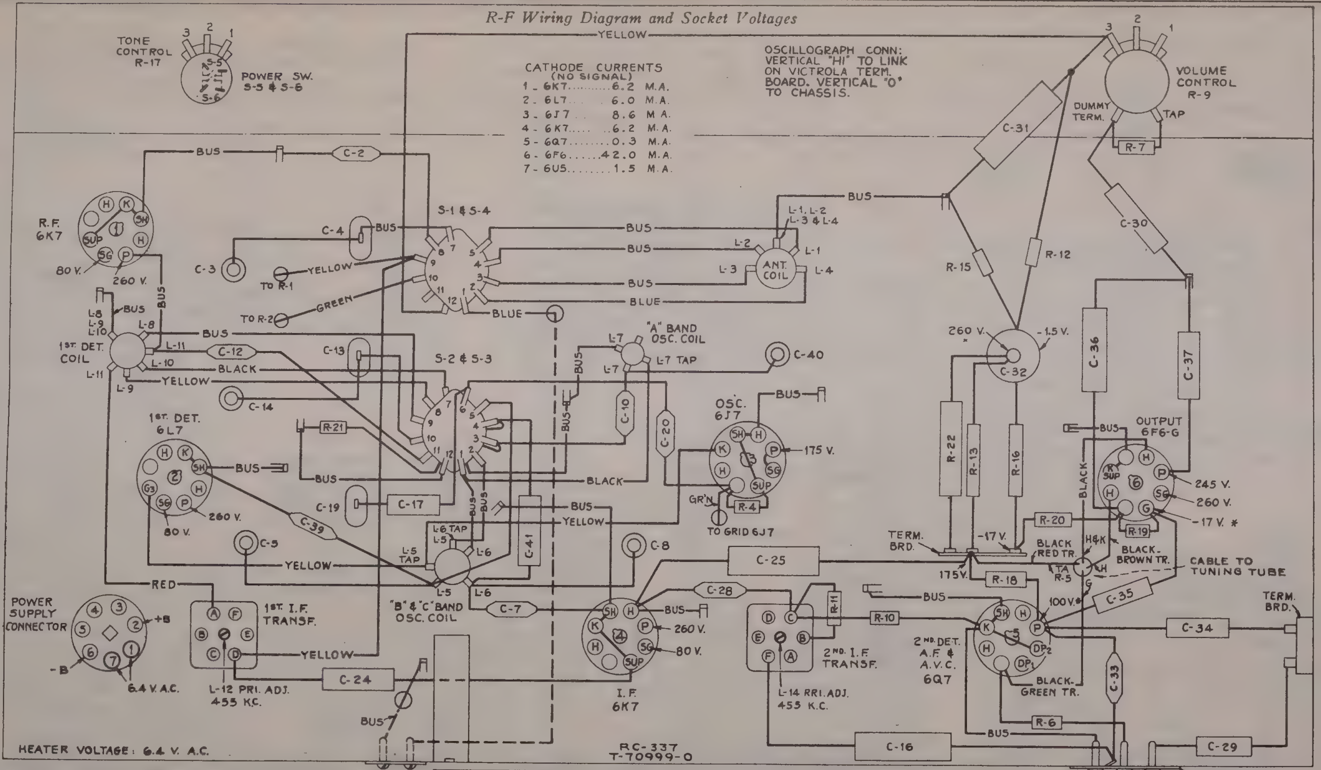


PLANETARY TUNING DRIVE ASS'Y

MODEL 8Q1,Chassis RC-337
Chassis Wiring,Voltage
Lead Dress

RCA MFG. CO., INC.

R-F Wiring Diagram and Socket Voltages

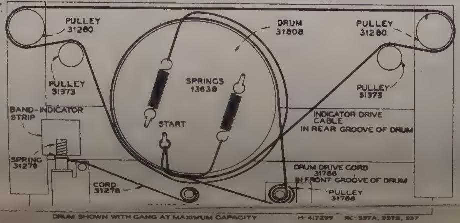


* **NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

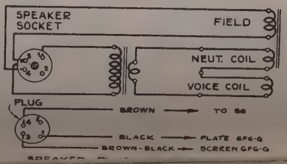
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 117-volt a-c supply.

Precautionary Lead Dress.—

1. Dress the leads from the 1st-detector coil to the range switch away from the trimmer C14.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the


PULLEY 31280
DRUM 31808
PULLEY 31280
PULLEY 31373
SPRINGS 13638
PULLEY 31373
START
BAND-INDICATOR STRIP
INDICATOR DRIVE CABLE IN REAR GROOVE OF DRUM
SPRING 31279
CORD 31278
DRUM DRIVE CORD 31766 IN FRONT GROOVE OF DRUM
PULLEY 31768
DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY
M-417299 RC-337A, 337B, 337

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

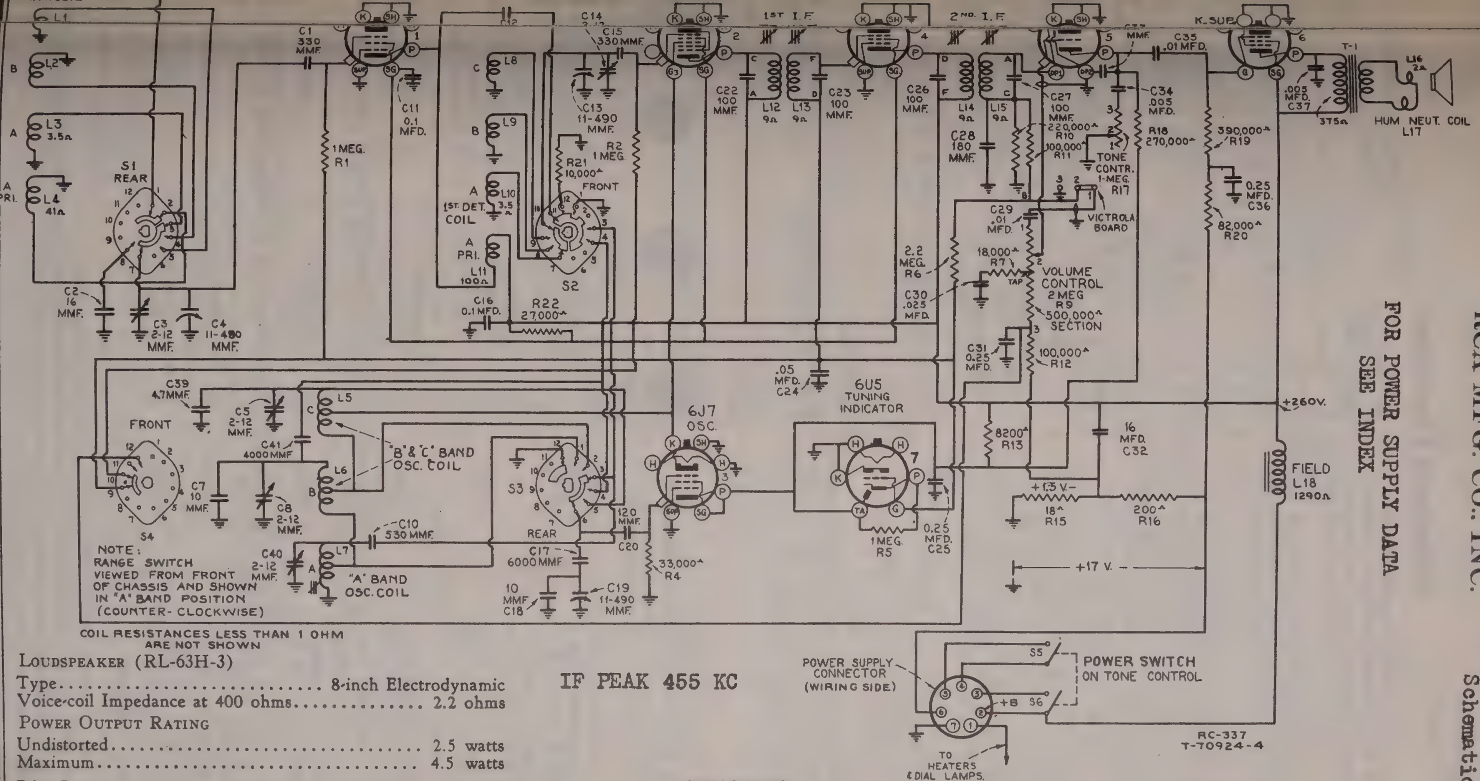


Connections of Loudspeaker and Cable

RCA MFG. CO., INC.

MODEL 8Q1, Chassis RC-337
Schematic

FOR POWER SUPPLY DATA
SEE INDEX



IF PEAK 455 KC

Loudspeaker (RL-63H-3)

Type.............................. 8-inch Electrodynamic
Voice-coil Impedance at 400 ohms.............. 2.2 ohms

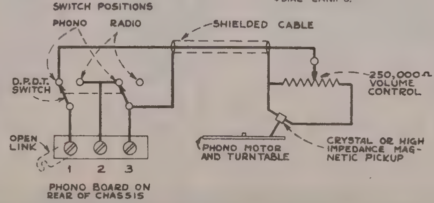
Power Output Rating

Undistorted.............................. 2.5 watts
Maximum.............................. 4.5 watts

Pilot Lamps (2)....... Mazda No. 44, 6.3 volts, 0.25 amp.

Power Supply Ratings

	Volts	Cycles
A-C Ratings		
With PSU 8A Power Supply Unit....	105-125........	50-60
With PSU 8B Power Supply Unit....	105-125	25-60
With PSU 8C Power Supply Unit....	105-130, 140-160, ... 200-225, 225-250	50-60
D-C Ratings		
With PSU 8E Power Supply Unit....	105-125, 210-250	D-C


SWITCH POSITIONS
PHONO
RADIO
SHIELDED CABLE
D.P.D.T. SWITCH
250,000Ω VOLUME CONTROL
OPEN LINK
1
2
3
PHONO BOARD ON REAR OF CHASSIS
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP

Record Player Connections,
Using a Double-Pole,
Double-Throw Toggle Switch

First Edition

RCA MFG. CO., INC.

Alignment Procedure

FOR VICTROLA ATTACHMEN
SEE PAGE 11-40

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

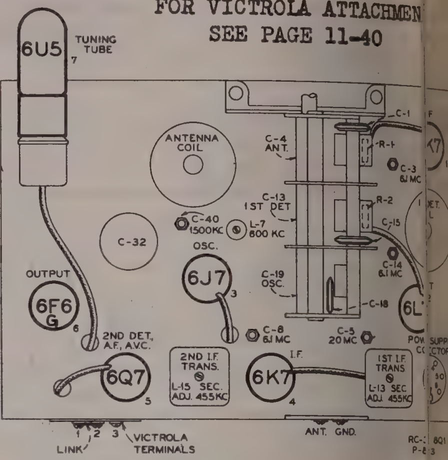
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

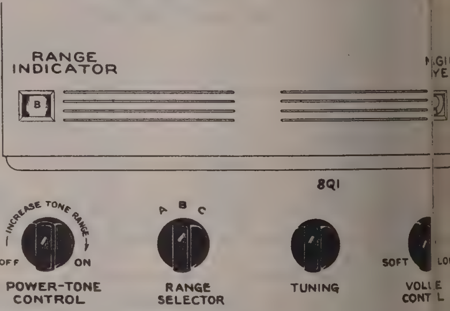
As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end marked on the dial scales, and gang-condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Top View, Showing Location of Tubes and Trimmers



At Right—*Location of Controls*

To turn on the set, turn the power-tone control fully clockwise, past the snap of the switch. This is the full-range tone position. To switch off the set, turn this knob fully counter-clockwise.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the followin for max. peak outpu
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"C" band, Quiet Point.	L14 and L15 (2nd I-F Trans.)
2	6L7 1st-Det. grid cap, in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
3	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C8 (osc.)* C14 (det.)** C3 (ant.)
3A	Check to determine that C8 has been adjusted to the correct peak by turning radio to 5.19 mc where a weaker signal should be received.			
4	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C5 (osc.)*
4A	Check to determine that C5 has been adjusted to the correct peak by turning radio to 19.09 mc where a weaker signal should be received.			
5	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C40 (osc.)
6	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L7 (osc.)†
7	Repeat Step No. 5			

* Use **minimum** capacity peak (plunger out) if two peaks can be obtained.

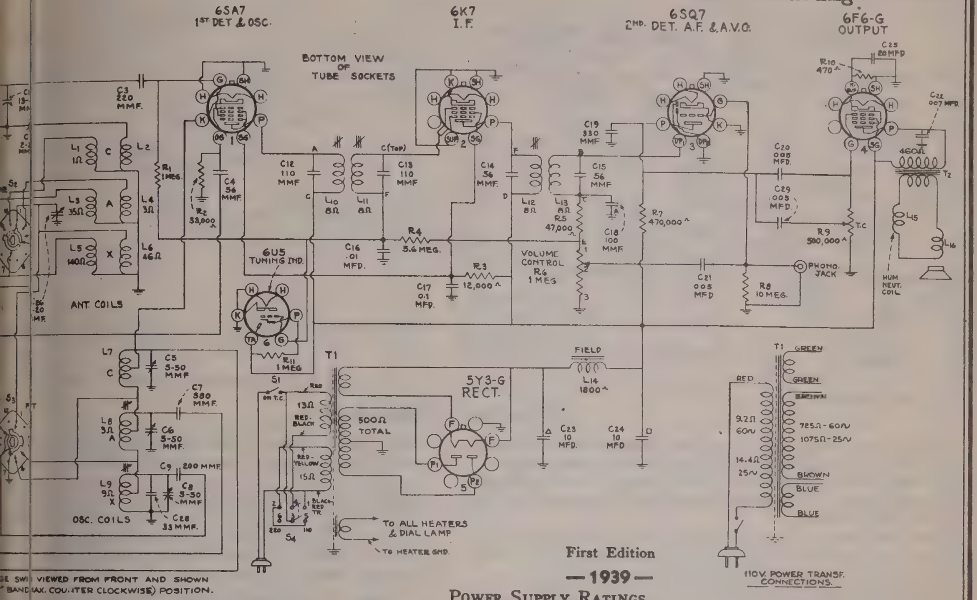
** Rock gang condenser slightly while peaking C14, and use **maximum** capacity peak if two peaks can be obt

† Rock gang condenser slightly while peaking L7 for maximum output.

NOTE: The oscillator tracks 455 kc above the signal on all bands.

RCA MFG. CO., INC.

MODEL 6Q8, Chassis 414B
Schematic, Voltage
Chassis Wiring



First Edition

— 1939 —

LAP .... Mazda No. 44, 6.3 volts, 0.25 amp.

R OUPUT RATING

125 olt Operation)

torte..............................	1.5 watts
num..............................	3.3 watts

POWER SUPPLY RATINGS

Rating A..........................	105-125 volts, 50-60 cycles
Rating B..............	105-125 volts, 25 cycles, 75 watts
Rating C.....	105-125; 200-250 volts, 50-60 cycles, 75 watts

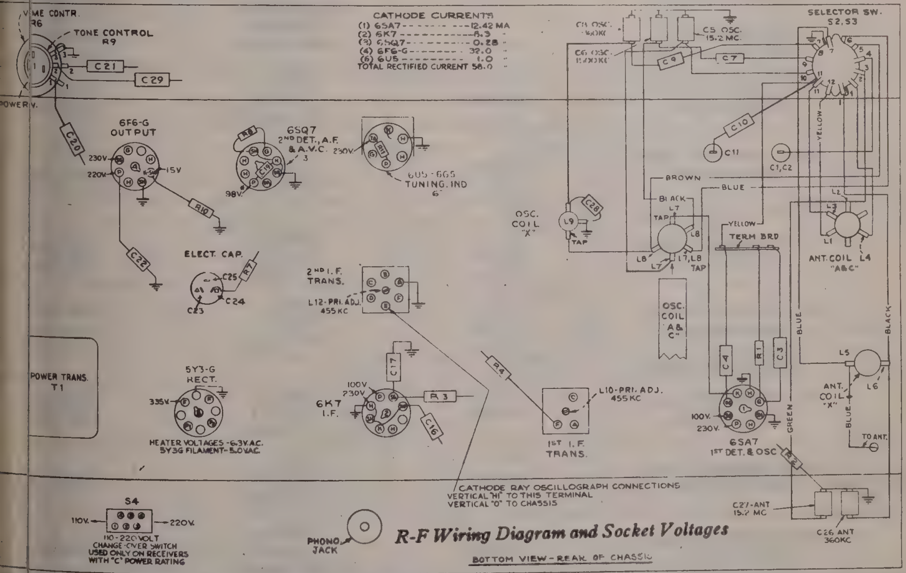
LOUDSPEAKER

Type..............................	6-inch electrodynamic
V. C. Impedance..................	3.4 ohms at 400 cycles

tiona Lead Dress:

ad fr m 2nd I-F transformer to volume control should kep close to the chassis and dressed against front on.

2. C-10 should be dressed away from the antenna section of the variable condenser (C-1).



CATHODE CURRENTS
(1) 6SA7 ---------- 12.42 MA
(2) 6K7 ---------- 8.3 "
(3) 6SQ7 ---------- 0.28 "
(4) 6F6-G ---------- 32.0 "
(6) 6U5 ---------- 1.0 "
TOTAL RECTIFIED CURRENT 58.0 "

R-F Wiring Diagram and Socket Voltages

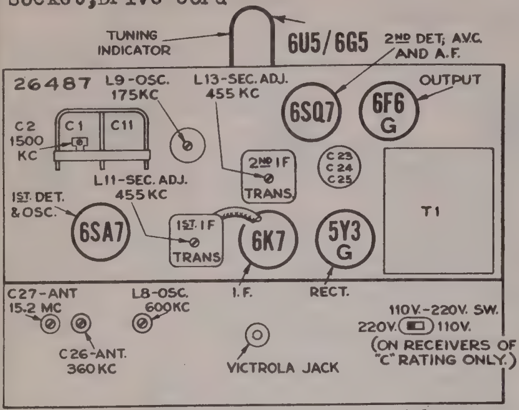
BOTTOM VIEW-REAR OF CHASSIS

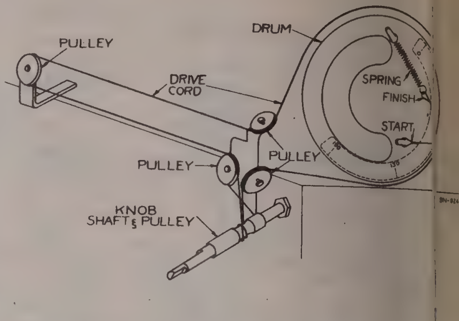
sure ents made to chassis unless otherwise indicated, et t ed to quiet point and volume control at mini- Val s should hold within ±20% with 117-volt a-c

*** NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 6Q8, Chassis RC-414B
Alignment, Trimmers
Socket, Drive Cord

RCA MFG. CO., INC.





Arrangement of Drive Cords for Tuning Condense nd Dial Indicator

At Left—Tube and Trimmer Locations

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each lignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position f the drum. The 135° mark on the drum scale must be tical and directly under the center of the gang-condense shaf when the plates are fully meshed. The drum is held the shaft by means of one set screw, which must be tigened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer the calibration scale by fastening a piece of wire to the ang condenser frame, and bend the wire so that it points the 0° mark on the calibration scale when the plates ar fully meshed.

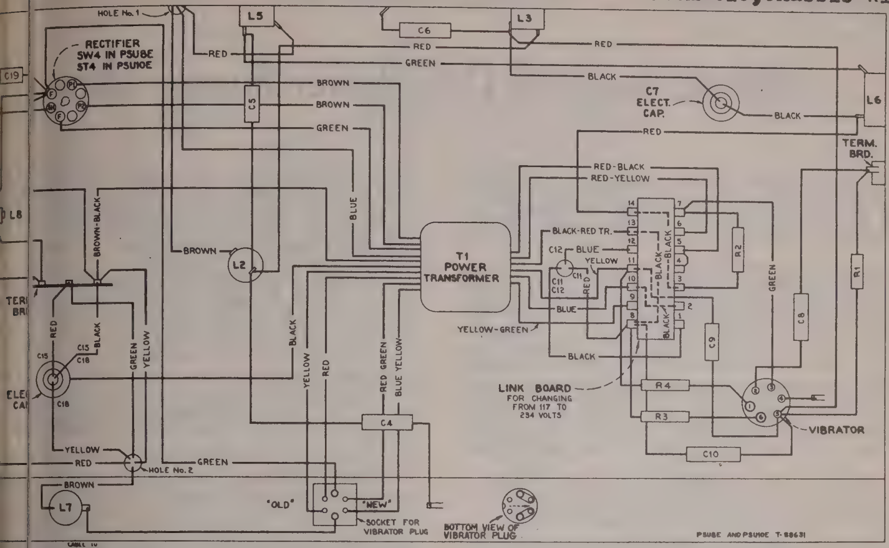
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the followin for max. peak outp
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.) C2 (ant.)
4	Ant. terminal in series with 200 mmf.	600 kc	600 kc (33°) "A" Band	L8 (osc.) Rock Gang
5	Repeat steps 3 and 4			
6	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.) C26 (ant.)
7	Ant. terminal in series with 200 mmf.	175 kc	175 kc (53.3°) "X" Band	L9 (osc.) Rock Gang
8	Repeat steps 6 and 7			
9	Ant. terminal in series with 300 ohms	15.2 mc	15.2 mc (147.2°) "C" Band	C5 (osc.)* C27 (ant.)
10	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.)
11	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.)

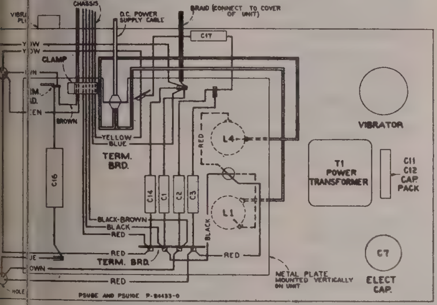
*Use minimum capacity peak if two can be obtained. Check to determine that C5 is adjusted to correct peak by tu receiver to approximately 14.29 mc where a weaker signal should be received.

NOTE: Oscillator tracks above signal on all bands.

RCA MFG. CO., INC.

MODELS PSU 8E,10E
Schematic,Chassis Wiring

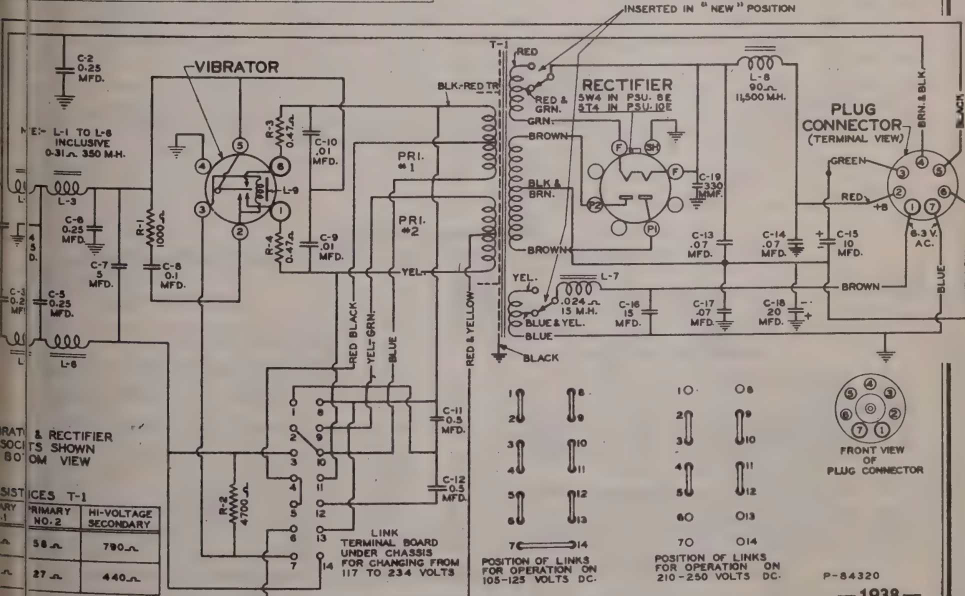




Above—
Bottom View of D-C Power Unit

At Left—
Top View of D-C Power Unit

Below—
Schematic Diagram



—1938—

PSU 8E and 10E D-C Power Supply Units

Each d-c unit is equipped with an 18-inch 7-wire cable, with a 7-contact female receptacle which plugs into a 7-prong male connector on the receiver chassis. The d-c power cord (double conductor) is 6-feet long and is provided with a fused plug. The units are approximately 12⅜-inches long, 5¼-inches wide, and 8⅜-inches high.

GOOD GROUND IS ESSENTIAL.—It is necessary to provide a good ground connection to the receiver chassis. The ground lead should be heavy wire, as short as possible, connected to a water pipe by means of an approved ground clamp. If a water pipe ground is not available, a buried metal plate or screen may be used. This should have an area of approximately 20 square feet and should be buried one or two feet in moist ground. The connection to the plate should be electrically good, mechanically solid, and permanent.

Grounding Power Supply Unit.—A flexible metal braid is connected from the PSU chassis to the case of the unit, and another length of braid extends from the case for connection to the receiver chassis. Loosen one of the self-tapping screws on the rear of the chassis, and attach the braid under this screw. It is important to see that these connections are made correctly at the time of installation.

Magic Wave Antenna Recommended.—In cases where the line or vibrator interference is found to be objectionable, the use of an RCA Magic Wave Antenna (Stock No. 9812) is recommended in conjunction with a good ground as specified above.

Link Board for Changing from 117 to 234 Volts.—A link board is mounted under the chassis of the PSU for making connections to permit operation on 105-125 volts d.c., or on 210-250 volts d.c. The correct position of the links for each voltage range is shown in the schematic diagram. The links must be arranged correctly in the link board for the particular voltage range on which the unit is to be operated, otherwise damage to the receiver may result.

Vibrator Plug.—The heater windings on the power transformer are tapped and connected to a six-contact socket on the rear of the PSU chassis. A plug fits into this socket in two positions only. An arrow on the plug points to markings "NEW" or "OLD" on the case of the unit. When the vibrator is new, the plu
with the arrow pointing to "NEW." In the course of ti
vibrator is worn to an extent where the dial lights bur
instead of with their usual brilliancy, the plug should
and re-inserted with the arrow pointing to "OLD." (
tion, all the turns of the heater windings are connected,
ing the heater voltage up to normal.)

The number of operating hours to the time when it
to turn the plug to "OLD" is not an indication of the
of the vibrator: For example, with high line voltage, t
usually be left at "NEW" for practically the entire u
the vibrator; but with low line voltage, it may be
turn the plug to "OLD" after a time corresponding
fraction of the total life of the vibrator.

Testing.—The simplest way to check PSU 8E or 10
it into a receiver for which it is designed. (First check
of the links for the particular line voltage.) Note whet
lamps in the receiver light with normal brilliancy, and
rectified "B" voltage at the receiver to determine w
normal.

If a receiver is not available, dummy loads may be c
the unit as specified in the table below.

The supply current must be measured with a d-c amn
meter of the ac-dc type, inasmuch as the r.m.s. value
rent is considerably higher than the d-c current. The he
must be measured with an r.m.s. meter (thermo-coupled
an average meter (rectifier type), on account of the s
shape. If an accurate thermo-coupled meter is not av
heater voltage may be checked by observing the brillia
dial lamps in the receiver. They will glow dull or red if
voltage is low.

Precautionary Lead Dress.—(1) Dress all leads on
transformer primary and the buffer capacitors away fro
chokes. (2) Leads to C19 must be as short as possible
rectifier filament leads should be run close to each other,
away from the filter chokes. (4) D-C power cord must
power transformer. (5) Keep antenna and ground leads
PSU and PSU cables.

PSU	Supply Volts DC	Heater Load (ohms)	Rectifier Load (ohms)	Supply Current D-C amps.	Heater Voltage (A.C.)		Rectified Voltage (D.C.)	
					Max.	Min.	Max.	Min.
8E	117	2.2	4,900	0.90	7.85	7.1	400	360
	234	2.2	4,900	0.50	7.85	7.1	400	360
10E	117	1.4	3,400	1.10	7.4	6.6	400	360
	234	1.4	3,400	.65	7.4	6.6	400	360

NOTE: The heater and rectifier dummy load resistors should be capable of handling 50 watts. Connect the heater load across
1 and 7 on the 7-contact plug. Connect the rectifier load resistor across terminals 2 and 6 on the 7-contact plug. Connect a ju
terminal 2 to 3, and from 4 to 5 on this plug. Check position of links before turning power on.

Replacement Parts

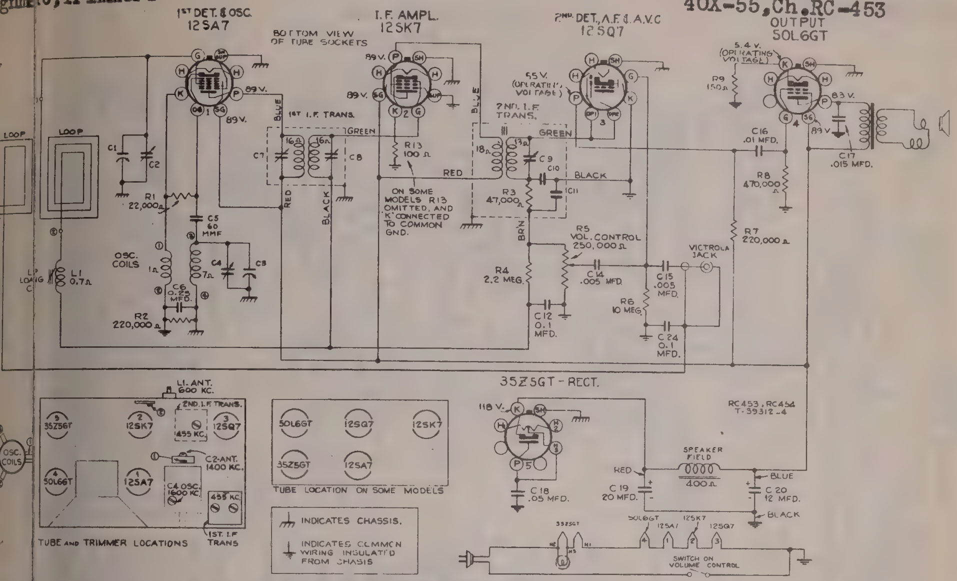
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION
	DC.POWER SUPPLY (PSU-8E and PSU-10E)		32053	Coil—Choke coil (L8)........
12952	Capacitor—330 mmfd. (C19)................	.35	5140	Fuse—5 amp. fuse........
4937	Capacitor—.01 mfd. (C9, C10).............	.25	30557	Plug—Fused plug less fuses and power cord...
14626	Capacitor—.07 mfd. (C13, C14, C17)........	.25	32052	Plug—6-contact power change plug........
4839	Capacitor—0.1 mfd. (C8)................	.30	14409	Plug—7-contact female plug for power supply cable........
12484	Capacitor—0.25 mfd. (C1, C2, C3, C4, C5, C6)	.30	32064	Resistor—0.47 ohms, flexible type (R3, R4)...
32049	Capacitor—Comprising two sections of 0.5 mfd. each (C11, C12)..................	3.20	4687	Resistor—1,000 ohms, ½ watt (R1)........
32048	Capacitor—5 mfd. (C7)..................	1.50	11768	Resistor—4,700 ohms, 2 watt (R2)........
32047	Capacitor—Comprising one section 10 mfd. and one section 20 mfd. (C15, C18)...........	1.55	32051	Socket—6-contact power change socket........
32045	Capacitor—15 mfd. (C16)................	.70	31251	Socket—Tube socket........
32046	Coil—Choke coil (L1, L2, L3, L4, L5, L6)...	.80	14312	Socket—Vibrator socket........
31794	Coil—Choke coil (L7)..................	.65	32062	Transformer—Power transformer (PSU-8E only)
			32063	Transformer—Power transformer (PSU-10E only)........
			32050	Vibrator........

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODELS 9TX-50,9TX-50M
Chassis RC454;40X-52,
40X-55,Ch.RC-453



Co ect the test os lator to—	Tune test-osc. to—	Turn Radio Dial to—	Adjust the following for maximum peak output
Tung Condenser sta r (ant.) in seri with .1 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C7, C8, C9 (1st and 2nd I-F transformers)
Ra ation Loop co isting of 2 turn f wire 18 in. diameter lo ted 4" to 6 et from eceiver	1,650 kc	Full clockwise (out of mesh)	C4 (oscillator)
	600 kc	Resonance on 600 kc signal	L1 (Loop inductance)
	1,400 kc	Resonance on 1,400 kc signal	C2 (Antenna)

Precautionary Lead Dress:

1. Green and blue leads from 1st I.F. transformer must be kept separated.

2. Dress yellow lead from loudspeaker under green lead from hum bucking coil to prevent it from touching the 50L6GT.

POWER SUPPLY RATINGS

A-C Rating .... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating .... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted .... .6 watts
Maximum .... 2.0 watts

LOUDSPEAKER

Type .... 5-inch Electrodynamic

X	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-453, RC-454)	
44	racket—Dial and lamp support (9TX-50, 50M)	.30
47	apacitor—Mica trimmer, 2.5 to 30 mmfd. (C1)	XX
57	apacitor—60 mmfd. (C5)	.35
38	apacitor—.005 mfd. (C14, C15)	.25
37	apacitor—.01 mfd. (C16)	.25
15	apacitor—.015 mfd. (C17)	.20
37	apacitor—.05 mfd. (C18)	.20
39	apacitor—0.1 mfd. (C12, C24)	.30
4	apacitor—0.25 mfd. (C6)	.30
97	apacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd. (C19, C20)	.90
02	oil—Loop loading coil	XX
3	oil—Oscillator coil	XX
8	ondenser—Variable tuning condenser (40X-52, 55)	XX
0	ondenser—Variable tuning condenser (9TX-50, 50M)	XX
5	ontrol—Volume control and power switch (40X-52, 55)	1.50
1	ontrol—Volume control and power switch (9TX-50, 50M)	1.50
4	ord—Tuning condenser drive cord	.10
7	rum—Variable tuning condenser drive drum (40X-52, 55)	.35
6	yelet—Used as pulley for drive cord (9TX-50, 50M)	XX
5	amp—Dial lamp	.15
5	ointer—Dial pointer (9TX-50, 50M)	XX
9	esistor—100 ohms, ½ watt (R13)	.20
8	esistor—150 ohms, ½ watt (R9)	.20
8	esistor—22,000 ohms, ½ watt (R1)	.20
4	esistor—220.000 ohms, ½ watt (R2, R7)	.20

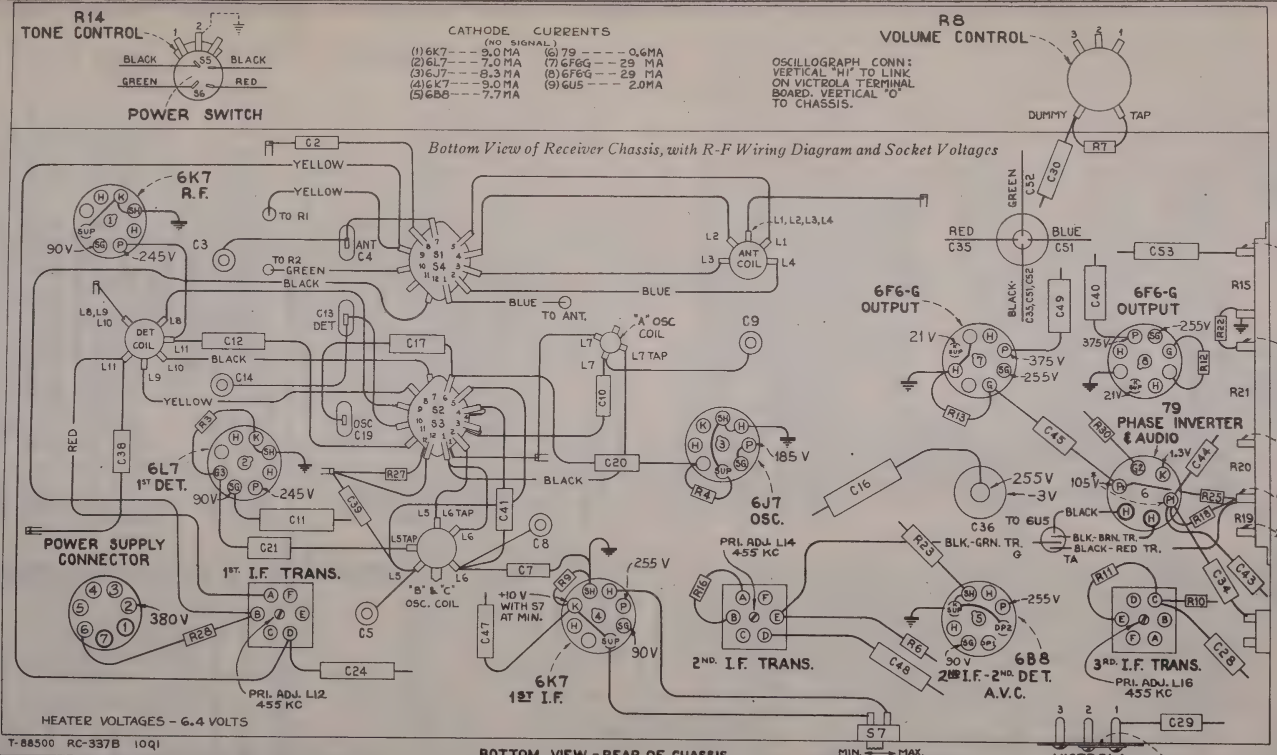
34332	Shaft—Tuning condenser drive shaft (9TX-50, 50M)	XX
34449	Socket—Dial lamp socket	XX
31319	Socket—Tube socket	.25
30585	Spring—Tuning condenser drive cord spring (40X52, 55)	.06
31615	Spring—Drive cord spring (9TX-50, 50M)	.06
34441	Transformer—1st I.F. transformer	XX
34442	Transformer—2nd I.F. transformer	XX
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 megohm, ½ watt (R4)	.20
13601	Resistor—10 megohm, ½ watt (R6)	.20
33061	Shaft—Tuning condenser drive shaft (40X-52, 55)	.20
	SPEAKER ASSEMBLIES 40X-55 (RL86-1)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	XX
34450	Speaker—5" dynamic speaker complete with cone and voice coil less output transformer	XX
35056	Transformer—Output transformer	XX
	SPEAKER ASSEMBLIES (40X-52, 9TX-50 and 9TX-50M) (39223-1)	
35065	Cone—Cone complete with voice coil	XX
34450	Speaker—5" dynamic speaker complete with cone and voice coil less output transformer	XX
34174	Transformer—Output transformer	1.25
	MISCELLANEOUS	
33744	Dial—Dial scale—glass (40X-52, 55)	.50
33289	Dial—Dial scale (9TX-50, 50M)	.40
34016	Knob—Walnut tuning or volume control knob (40X-52, 55)	.15
34015	Knob—Tuning or volume control knob (9TX-50, 50M)	.15

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

XX Price upon application to your RCA Victor Parts Distributor.

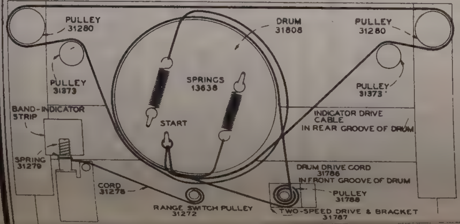
MODEL 10Q1,Chassis RC-337B
Chassis Wiring,Voltage
Drive Cord,Notes

RCA MFG. CO., INC.



Bottom View of Receiver Chassis, with R-F Wiring Diagram and Socket Voltages

BOTTOM VIEW - REAR OF CHASSIS


PULLEY 31280
PULLEY 31373
DRUM 31808
SPRINGS 13638
START
PULLEY 31280
PULLEY 31373
BAND-INDICATOR STRIP
INDICATOR DRIVE CABLE IN REAR GROOVE OF DRUM
SPRING 31279
CORD 31278
RANGE SWITCH PULLEY 31272
DRUM DRIVE CORD 31786 IN FRONT GROOVE OF DRUM
PULLEY 31788
TWO-SPEED DRIVE & BRACKET 31787

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, sensitivity switch at maximum, and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

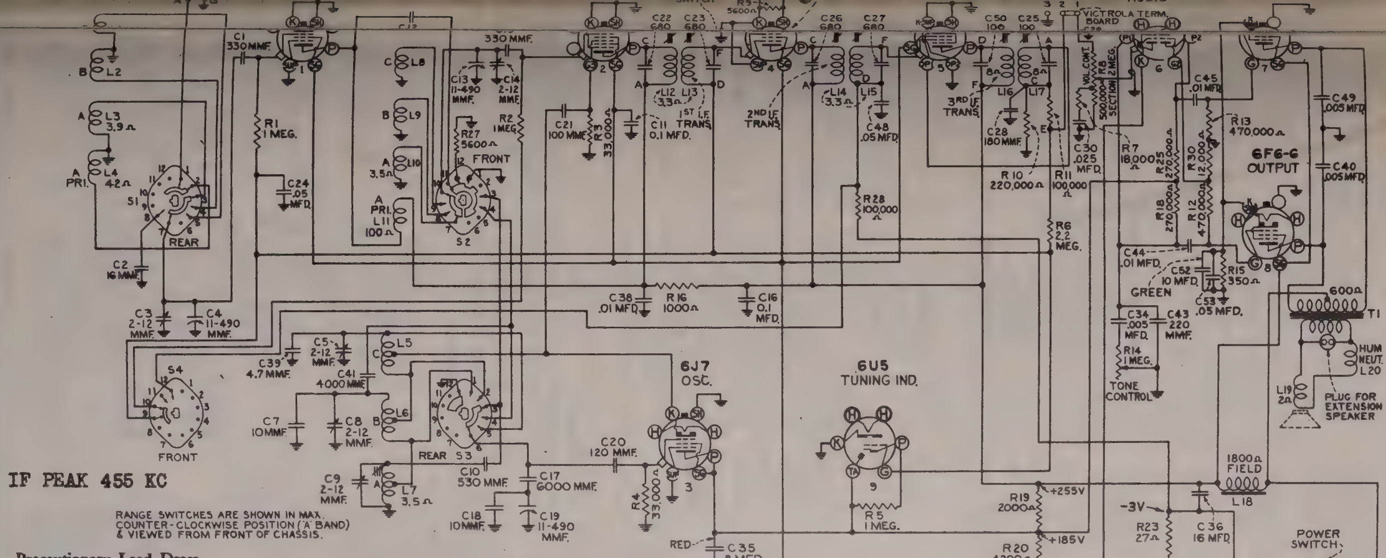
*** NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired. A permanent-magnet dynamic speaker with [illegible] mended. The voice coil of the extension speaker should be connected by means of two-conductor cable (such as is used on electric appliances) to the male plug. This cable may be any desired length up to several hundred feet. With a long run, it is advisable to use heavier cable. An extension speaker with 2-ohm voice coil will receive approximately half the power output of the receiver. With a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased. (A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.) The RCA MI-6248 Alnico 8-inch diameter permanent-magnet dynamic loudspeaker with 2-ohm [illegible] may be housed in the RCA MI-6292 sloping-front walnut-finished-wood housing.

MODEL 10Q1,Chassis RC-377B
Schematic,Lead Dress
Phono. Connections

RCA MFG. CO., INC.

FOR POWER SUPPLY
DATA SEE INDEX



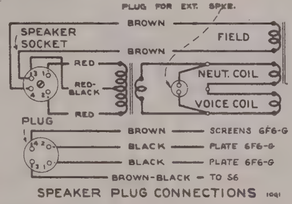
IF PEAK 455 KC

RANGE SWITCHES ARE SHOWN IN MAX. COUNTER-CLOCKWISE POSITION ('A' BAND) & VIEWED FROM FRONT OF CHASSIS.

Precautionary Lead Dress.—

1. Dress the leads from the 1st-detector coil to the range switch away from the trimmer C14.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the range switch close to the chassis.

Connections of Loudspeaker and Cable



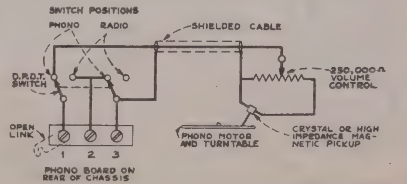
SPEAKER PLUG CONNECTIONS 10Q1

Victrola Attachment (record player).

SEE NEXT PAGE

Stock No. 9824 switch

In the event that a Stock No. 9824 switch is not available, a double-pole, double-throw toggle switch may be used, connecting it as shown in the second diagram below.



SWITCH POSITIONS
PHONO
RADIO
SHIELDED CABLE
D.P.D.T. SWITCH
250,000Ω VOLUME CONTROL
OPEN LINK
1
2
3
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP
PHONO BOARD ON REAR OF CHASSIS

LOUDSPEAKER (RL-63H-4)
Type............................ 8-inch electrodynamic
Voice-coil Impedance at 400 cycles..............2.2 ohms

POWER OUTPUT RATING
Undistorted.................................. 10 watts
Maximum...................................... 12 watts

Pilot Lamps (2)......... Mazda No. 44, 6.3 volts, 0.25 amp.

RCA-5U4-G (In PSU 10A, 10B, 10C A-C power supply unit)........................... Rectifier
RCA-5T4 (In PSU 10E D-C power supply unit)........................... Rectifier

POWER SUPPLY RATINGS

	Volts	Cycles
A-C Ratings		
With PSU 10A Power Supply Unit	105-125	50-60
With PSU 10B Power Supply Unit	105-125	25-60
With PSU 10C Power Supply Unit	105-130, 140-160 200-225, 225-250	50-60
D-C Ratings		
With PSU 10E Power Supply Unit	105-125, 210-250	D-C

MODEL 10Q1,Chassis RC-377B
Alignment,Trimmers,Socket
Victrola Attachment

RCA MFG. CO., INC.

MODEL 8
Record

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale vertical, and directly over the center of the gang-c shaft when the plates are fully meshed. The surfa drum must be flush with the end of the gang-c shaft. The drum is held to the shaft by means o screws, which must be tightened securely when the d the correct position.

Pointer for Calibration Scale.—Improvise a pointe calibration scale by fastening a piece of wire to t condenser frame, and bend the wire so that it poin "180°" mark on the calibration scale when the p fully meshed.

Dial-Indicator Adjustment.—After fastening the c the cabinet, attach the dial indicator to the drive ca indicator at the left-hand end marked on the di and gang-condenser fully meshed. The indicato spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the follow for max. peak out
Leave sensitivity switch open (minimum sensitivity) for all alignment operations.				
1	6B8 2nd I-F grid cap, in series with .01 mfd.	455 kc	"C" band Quiet Point.	L16 and L17 (3rd I-F Trans.
2	6K7 1st I-F grid cap, in series with .01 mfd.			L14 and L15 (2nd I-F Trans.
3	6L7 1st Det. grid cap, in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
4	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C8 (osc.)* C14 (det.)† C3 (ant.)
5	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C5 (osc.)††
6	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C9 (osc.)
7	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L7 (osc.)‡
8	Repeat Step No. 6			

* Use **minimum** capacity peak if two peaks can be obtained.

† Rock the gang condenser slightly, and use the **maximum** capacity peak if two peaks can be obtained with tr C14. Check to determine that C8 has been adjusted to the correct peak by turning the receiver to 5.19 mc where a weaker signal should be received.

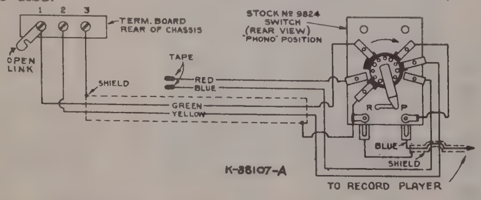
†† Use **minimum** capacity peak if two peaks can be obtained. Check to determine that C5 has been adjusted correct peak by turning the receiver dial to 19.09 mc (29.5°), where a weaker signal should be received.

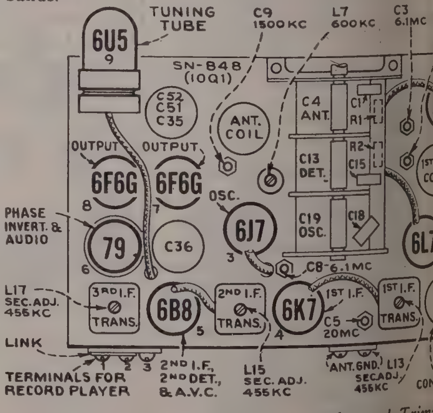
‡ Rock gang condenser slightly while peaking L7 for maximum output.

NOTE: Oscillator tracks 455 kc **above** the signal on all bands.

USED ALSO WITH MODEL 8Q1

Victrola Attachment (Record Player).—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment (record player) such as the RCA R93 and R94 series. A stock No. 9824 switch may be used to change from radio to record player. The connections of this switch are shown. In the event that a No. 9824 switch is not available, a double-pole double-throw toggle switch may be used.

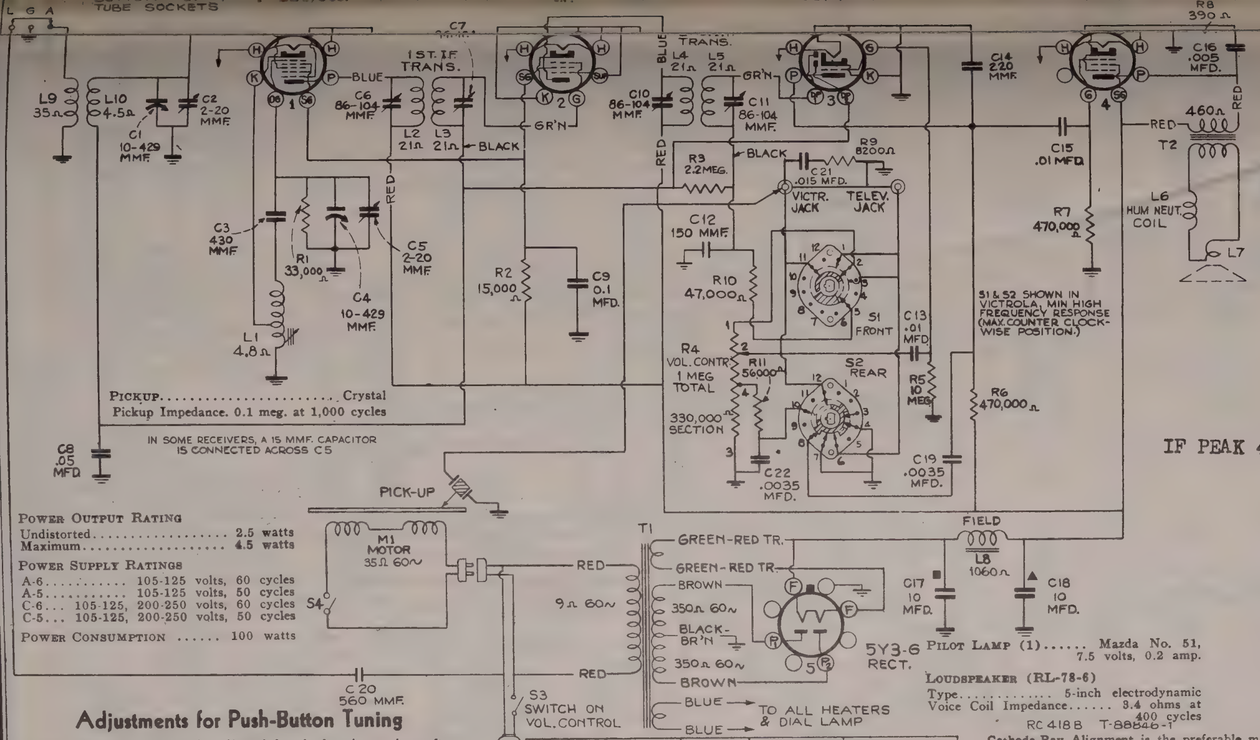




Top View, Showing Location of Tubes and Trim

MODEL U10,Chassis RC-418B
Schematic,Alignment,Tuner

RCA MFG. CO., INC.



IF PEAK 455 KC

IN SOME RECEIVERS, A 15 MMF. CAPACITOR IS CONNECTED ACROSS C5

Pickup........................ Crystal
Pickup Impedance. 0.1 meg. at 1,000 cycles

Power Output Rating
Undistorted.................. 2.5 watts
Maximum..................... 4.5 watts

Power Supply Ratings
A-6........... 105-125 volts, 60 cycles
A-5........... 105-125 volts, 50 cycles
C-6... 105-125, 200-250 volts, 60 cycles
C-5... 105-125, 200-250 volts, 50 cycles

Power Consumption ...... 100 watts

Pilot Lamp (1)...... Mazda No. 51, 7.5 volts, 0.2 amp.

Loudspeaker (RL-78-6)
Type............. 5-inch electrodynamic
Voice Coil Impedance...... 3.4 ohms at 400 cycles

RC 418B T-88846-1

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.
2. Turn the accessory switch to "Radio" position and accurately tune in the station for which the first button is to be set.
3. Press in push-button rod No. 1 (left) with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ½ turn after the rod begins to grip or damage to the mechanism may result.
4. Replace the push-button on its shaft.
5. Proceed in a similar manner for the remainder of the push-buttons.
6. Insert the station marker tabs in the recesses above the push-buttons.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna Terminal	455 kc	Quiet Point between 1,720-1,500 kc	C10 and C11 (2nd I-F trans.)
2				C6 and C7 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C2 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.)*
5	Repeat step 3			

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis drawing.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

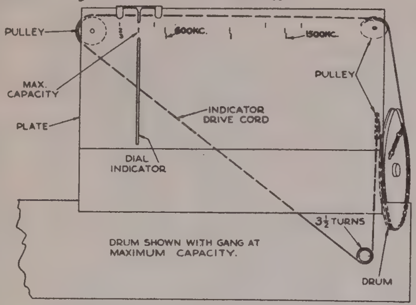
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Note.—Oscillator tracks above signal.

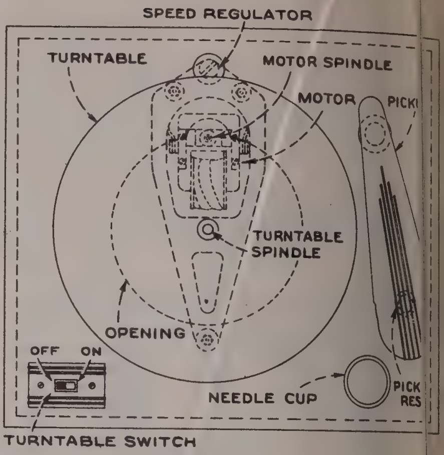
* Rock gang condenser slightly while adjusting L1.

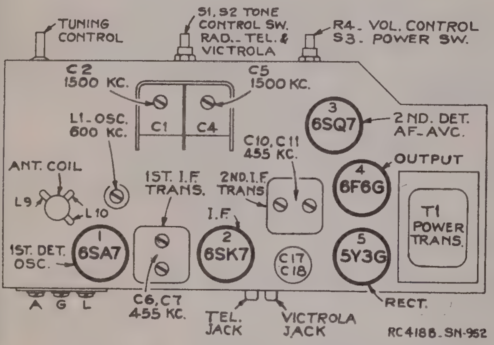
MODEL U10,Chassis RC-418B
Chassis Wiring,Voltage
Socket,Trimmers,Lead Dress
Phono.,Drive Cord Data

RCA MFG. CO., INC.



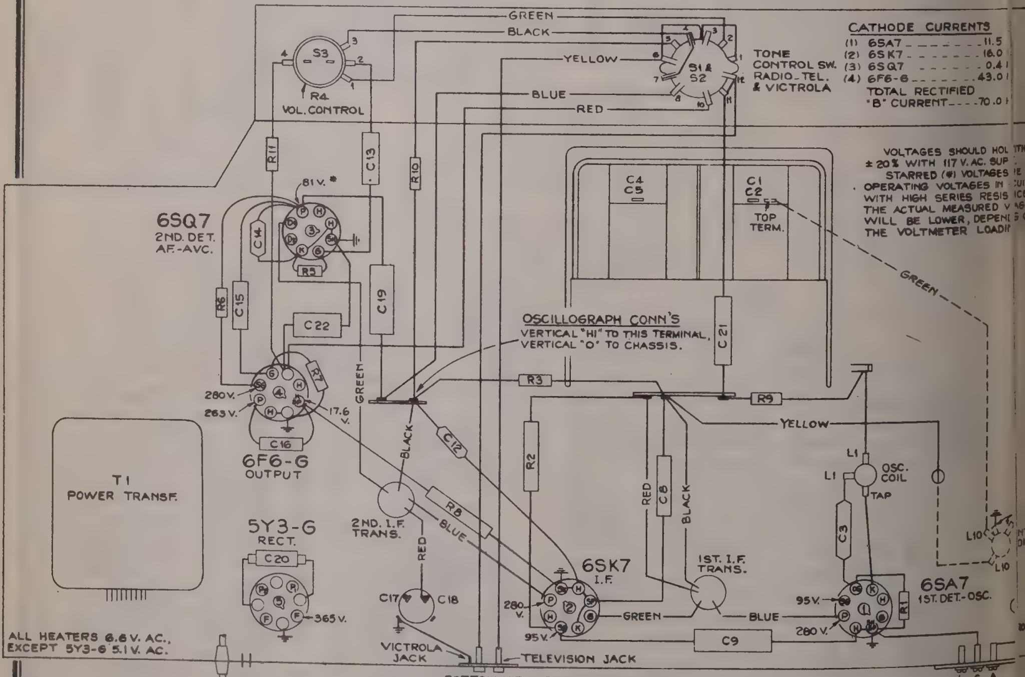
DIAL MECHANISM AND CALIBRATION MARKS.





PRECAUTIONARY LEAD DRESS.—

1. Power cord leads must be dressed up away from 6SQ7 sock and toward end of chassis.
2. Green lead 2nd I.F. to 6SQ7 must be dressed against base
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.
4. Green and blue leads from 1st I.F. transformer must be dress close to base.
5. Red lead from "L" terminal on antenna board to 5Y3G sock must be dressed against base.
6. Green lead from gang to 6SA7 socket must be dressed towa side apron away from other parts.

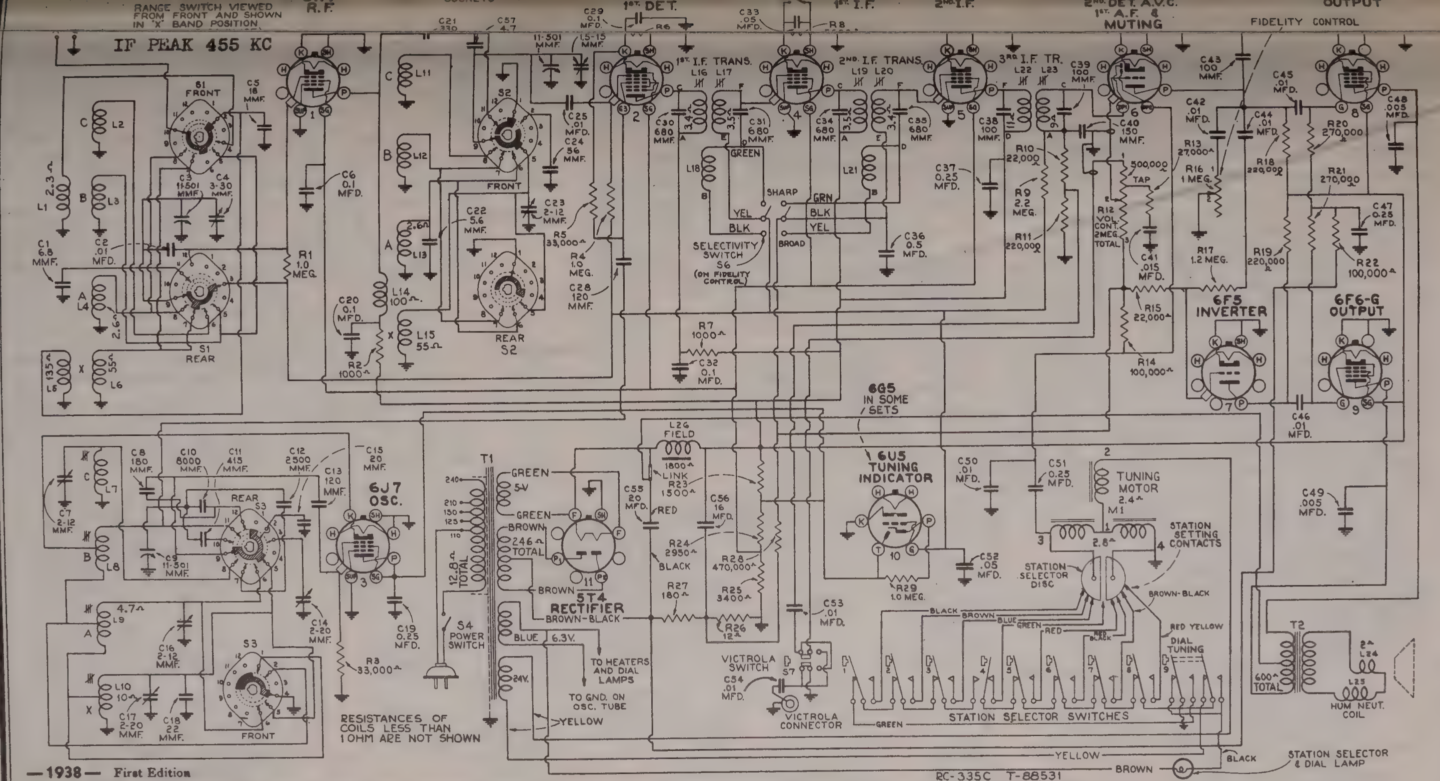


BOTTOM VIEW-REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

RC 418 B T-88847

RCA MFG. CO., INC.

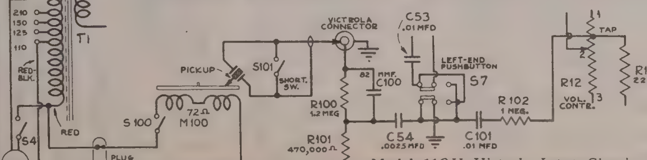
MODELS 11Q4, 11QK Chassis RC-335C
11QU, Chassis RC-335E
Schematic, Changes



RC-335C T-88531

—1938— First Edition

Except for the changes shown the schematic diagram of Model 11QU is the same as Models 11Q4 and 11QK



Model 11QU Victrola Input Circuit

Power Output
Undistorted...... 10 watts Maximum...... 12 watts

Loudspeaker (Electrodynamic)	Model 11Q4	Model 11QK	Model 11QU
Diameter (inches)...........................	8	12	12
Voice-Coil Impedance at 400 cycles (ohms).....	2.2	2.2	2.2

Power Supply Ratings	Models 11Q4, 11QK	Model 11QU
Rating C................ 105-130/140-160/195-250 volts, 50-60 cycles................	120 watts	145 watts (total) 120 watts (radio)

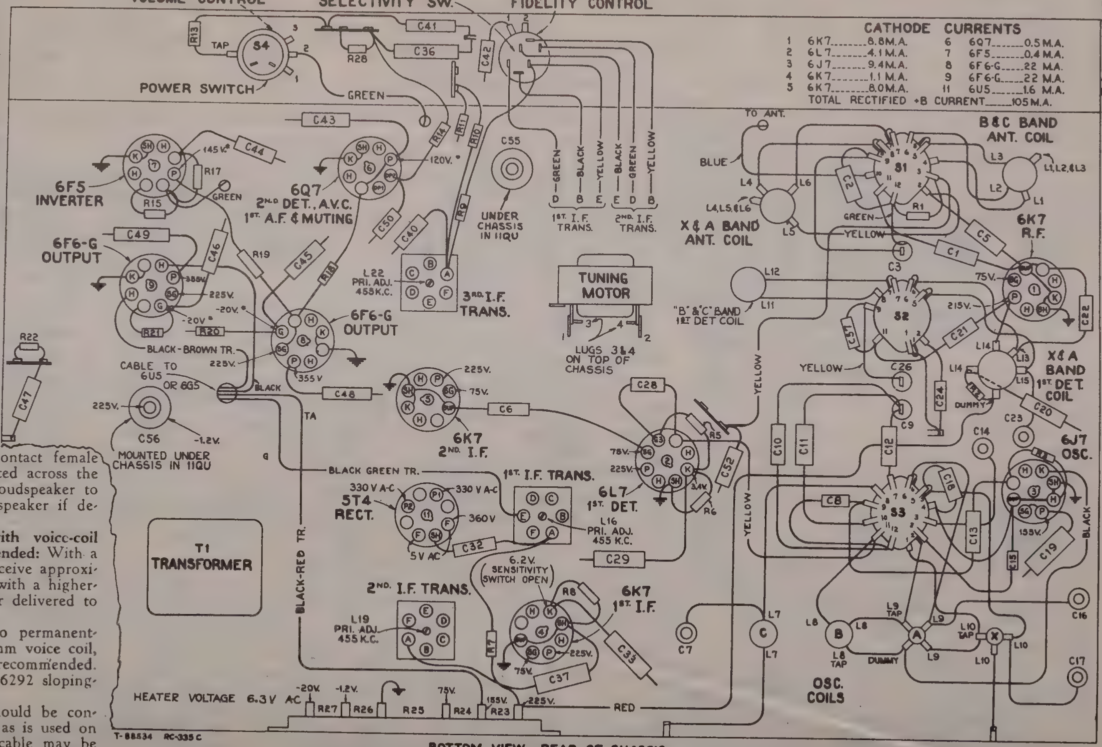
Pilot Lamps (11Q4 and 11QK) One Mazda 47, 6-8 volts, .15 amp.; Two Mazda 44, 6.3 volts, .25 amp.
Pilot Lamps (11QU)........ One Mazda 47, 6-8 volts, .15 amp.; Three Mazda 44, 6.3 volts, .25 amp.

MODELS 11Q4,11QK,11QU
Chassis Wiring,Voltage
Lead Dress,Drive Cord
Speaker Notes

RCA MFG. CO., INC.

R-F Wiring Diagram and Socket Voltages, Models 11Q4 and 11QK

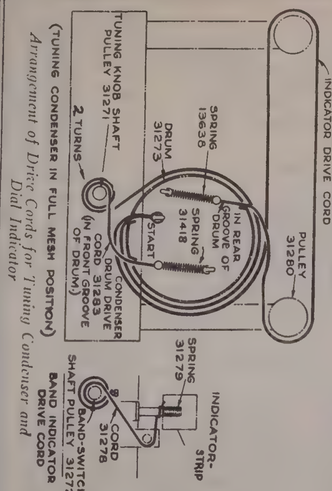
Model 11QU is the same, except for the Victrola connections, which are shown in a separate diagram



	CATHODE	CURRENTS			
1	6K7	8.8M.A.	6	6Q7	0.5M.A.
2	6L7	4.1M.A.	7	6F5	0.4M.A.
3	6J7	9.4M.A.	8	6F6-G	22 M.A.
4	6K7	1.1 M.A.	9	6F6-G	22 M.A.
5	6K7	8.0M.A.	11	6U5	1.6 M.A.

TOTAL RECTIFIED +B CURRENT 105 M.A.

BOTTOM VIEW - REAR OF CHASSIS


INDICATOR DRIVE CORD
PULLEY 31280
IN REAR GROOVE OF DRUM
SPRING 13638
SPRING 31418
DRUM 31273
START
TUNING KNOB SHAFT PULLEY 31271
CONDENSER DRUM DRIVE CORD 31283 (IN FRONT GROOVE OF DRUM.)
2 TURNS
(TUNING CONDENSER IN FULL MESH POSITION)
INDICATOR-STRIP
SPRING 31279
CORD 31278
BAND-SWITCH SHAFT PULLEY 31272
BAND INDICATOR DRIVE CORD

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired.

A **permanent-magnet dynamic speaker, with voice-coil impedance of not less than 2 ohms is recommended:** With a 2-ohm voice coil, the extension speaker will receive approximately half the power output of the receiver; with a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased.

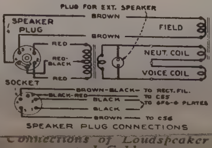
The RCA MI-6248 8-inch diameter Alnico permanent-magnet dynamic loudspeaker, which has a 2-ohm voice coil, and a power-handling capacity of 5 watts, is recommended. This speaker may be housed in the RCA MI-6292 sloping-front walnut-finished wood housing.

The voice coil of the extension speaker should be connected by means of two-conductor cable, such as is used on electrical appliances, to the male plug. The cable may be any desired length, but with a long run, when using a low-impedance extension speaker, it is advisable to use heavy cable.

A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.

*** NOTE: Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.**

Measurements made to chassis unless otherwise indicated, with set tuned to [illegible] at minimum. Values should hold within approximately [illegible]



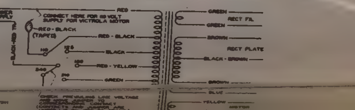
Connections of Loudspeaker

Precautionary Lead Dress.—

1. Dress grid lead of 6K7 R-F away from detector section of gang to prevent oscillation.
2. Observe the following points to permit alignment of "C" band at 20 mc: C10, C11, and C12 from oscillator section of gang must have short leads and be dressed away from the chassis and from the range-switch shield.
3. The ground braids from gang condenser must be flexible to prevent microphonic howling.
4. R10 and R11 should [illegible]
5. Power cord leads must be dressed away from the vol-

A sensitivity switch is mounted at the rear of the receiver.

Universal Power Transformer Connections



RCA MFG. CO., INC.
Alignment Procedure

hode ay **Alignment** is the preferable method. Connec- for t oscillograph are shown in the chassis drawing.

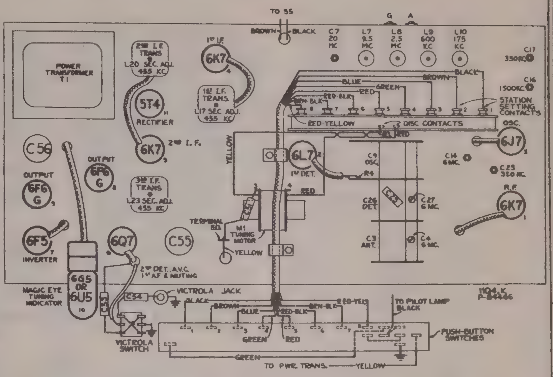
put **eter Alignment.**—If this method is used, connect eter ross the voice coil, and turn the receiver volume l to aximum.

t-Osc ator.—For all alignment operations, connect the de of he test-oscillator to the receiver ground terminal and ep the output as low as possible to avoid a-v-c

bratil Scale on Indicator-Drive-Cord Drum. — The dial fastened in the cabinet and cannot be used for nce ring alignment; therefore, a calibration scale is ed to he rear of the drum which is mounted on the shaft f the gang condenser. The setting of the gang nser read on this scale, which is calibrated in degrees. orrec setting of the gang in degrees, for each align- frequ cy, is given in the alignment table.

the fi t step in r-f alignment, check the position of the Th 0° mark on the drum scale must be vertical, rectl over the center of the gang-condenser shaft when ates e fully meshed. The surface of the drum must sh wi the end of the gang-condenser shaft. The drum l to e shaft by means of two set screws, which must hten securely when the drum is in the correct posi-

nter r Calibration Scale.—Improvise a pointer for the tion cale by fastening a piece of wire to the gang- nser ame, and bend the wire so that it points to the mark n the calibration scale when the plates are fully d.



Top View, Showing Location of Tubes and Trimmers.

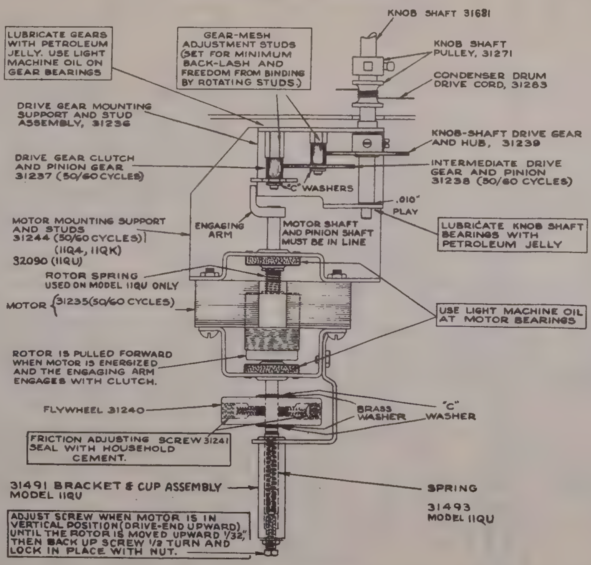
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end mark on the dial scales and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

eps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following to obtain maximum output
1	Turn fidelity control counter-clockwise (sharp), and sensitivity switch at minimum (open).			
2	6K7 2nd I-F grid cap in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L22 and L23 (3rd I-F Trans.)
3	6K7 1st I-F grid cap in series with .01 mfd.			L19 and L20 (2nd I-F Trans.)
4	6L7 1st-det. grid cap in series with .01 mfd.			L16 and L17 (1st I-F Trans.)
5	Turn fidelity switch clockwise (broad) and check I-F response which should be a double-peaked curve. Leave fidelity counter-clockwise (sharp) for all of the following steps.			
6	Antennna Terminal in series with 300 ohms	2.5 mc	2.5 mc ("B") 24½°	L8 (osc.)
7		6.0 mc	6.0 mc ("B") 147°	C14 (osc.) Use minimum capacity peak C27 (det.) Use maximum capacity peak C4 (ant.) Use maximum capacity peak*
8		9.5 mc	9.5 mc ("C") 55°	L7 (osc.)
9		20 mc	20 mc ("C") 153°	C7 (osc.) Use minimum capacity peak*
0	Antennna Terminal in series with 200 mmf.	600 kc	600 kc ("A") 24½°	L9 (osc.) Rock gang
1		1,500 kc	1,500 kc ("A") 151½°	C16 (osc.)
2	Repeat steps 10 and 11.			
3	Antennna Terminal in series with 200 mmf.	175 kc	175 kc ("X") 53½°	L10 (osc.)
4		350 kc	350 kc ("X") 145½°	C17 (osc.) C23 (det.)
5	Repeat steps 13 and 14.			

Chec to determine that the oscillator trimmer has been adjusted to the correct peak by tuning the receiver approximately 910 c lower, where a weaker signal should be received.

NO E: The oscillator tracks 455 kc above the signal on all bands.

Electric Tuning Mechanism


KNOB SHAFT 31681
LUBRICATE GEARS WITH PETROLEUM JELLY. USE LIGHT MACHINE OIL ON GEAR BEARINGS
GEAR-MESH ADJUSTMENT STUDS (SET FOR MINIMUM BACK-LASH AND FREEDOM FROM BINDING BY ROTATING STUDS.)
KNOB SHAFT PULLEY, 31271
CONDENSER DRUM DRIVE CORD, 31263
DRIVE GEAR MOUNTING SUPPORT AND STUD ASSEMBLY, 31236
KNOB-SHAFT DRIVE GEAR AND HUB, 31239
DRIVE GEAR CLUTCH AND PINION GEAR 31237 (50/60 CYCLES)
INTERMEDIATE DRIVE GEAR AND PINION 31238 (50/60 CYCLES)
"C" WASHERS
.010" PLAY
MOTOR MOUNTING SUPPORT AND STUDS 31244 (50/60 CYCLES) (11Q4, 11QK) 32090 (11QU)
ENGAGING ARM
MOTOR SHAFT AND PINION SHAFT MUST BE IN LINE
LUBRICATE KNOB SHAFT BEARINGS WITH PETROLEUM JELLY
ROTOR SPRING USED ON MODEL 11QU ONLY
MOTOR 31235(50/60 CYCLES)
USE LIGHT MACHINE OIL AT MOTOR BEARINGS
ROTOR IS PULLED FORWARD WHEN MOTOR IS ENERGIZED AND THE ENGAGING ARM ENGAGES WITH CLUTCH.
FLYWHEEL 31240
BRASS WASHER
"C" WASHER
FRICTION ADJUSTING SCREW 31241 SEAL WITH HOUSEHOLD CEMENT.
31491 BRACKET & CUP ASSEMBLY MODEL 11QU
SPRING 31493 MODEL 11QU
ADJUST SCREW WHEN MOTOR IS IN VERTICAL POSITION (DRIVE-END UPWARD) UNTIL THE ROTOR IS MOVED UPWARD 1/32" THEN BACK UP SCREW 1/2 TURN AND LOCK IN PLACE WITH NUT.

Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc: This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor: as a result the selector disc is moved slowly back until the insulation line is under [illegible]

Oscillation of Tuning Mechanism

The principal of operation necessitates that the mechanism go through several quick reversals on arriving at the desired station frequency and before reaching a dead stop. Three of four reversals are normal. The number of reversals and consistency of operation depends mainly on the flywheel friction adjustment, however, in some cases the selector disc and station setting contacts are involved. The following suggestions may be helpful where excessive pointer oscillation is experienced.

Oscillation on Certain Buttons Only

(1) Check contact tip of selector assembly for loose fit in body. See that nose of contact is not burned nor distorted out of correct shape. Replace tip if necessary; do not attempt to file the tips.

(2) Clean the insulating gap of selector disc, being sure to remove all [illegible] to assure that clearance exists (approx. .010-in) between it and the disc when stopped in position on the station.

(3) Inspect the insulating gap to see that it has not changed shape due to bending or warping. Replace the disc if cleaning and adjustment fail to give correct operation.

Oscillation On All Buttons

(1) Slow oscillation indicates friction adjustment of flywheel is too tight. Loosen set screw in flywheel slightly.

(2) Rapid oscillation indicates friction adjustment is too loose. Tighten set screw in flywheel slightly.

(3) If definite adjustment cannot be reached, remove spring from behind flywheel set screw and increase its length by stretching; replace and make the necessary adjustments. Install a new spring if necessary.

(4) See that leather friction pad is not binding in its hole, and that it is saturated with lubricant. "Neats-Foot" oil should be used for this purpose.

(5) Incorrect balance of the flywheel sometimes prevents correct adjustment. The standard service replacement flywheel Stock No. 31240 may be used to definitely eliminate this cause.

(6) The number of oscillations varies somewhat with line voltage.

(7) Stability of adjustment is slightly better if made after a brief run-in period.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the beveled operating-end at the left (viewed from rear).

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

Lubrication

Motor bearings and **gear bearings**; use light machine oil.

Gear faces; use "Pure Oil No. 611" or petroleum **jelly.**

Dial-indicator pulleys and rails; use "Castordag" or petroleum jelly.

Selector disc; apply **thin** film of petroleum jelly.

Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

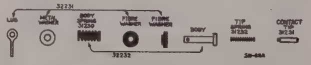
Muting Circuit

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Armchair Control Unit

When a Model G8A Armchair Control is connected to the receiver it duplicates the action of the push-buttons on the front panel when No. 1 button is pressed down. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. If desired one of the other seven station buttons on the set may be used in place of No. 1 button.

This arrangement allows the use of only seven of the eight buttons when tuning in stations at the set, but allows the use of the entire eight buttons on the Armchair Control. In operating the G8A Armchair Control the push-button **must** be held down until the station has been tuned in. Care **must** be taken not to hold two of the station-buttons down **at one** time as both windings of the motor may be **engaged** instantaneously causing the motor to be inoperative **and** overheated.



Component Parts of Station Setting Contact

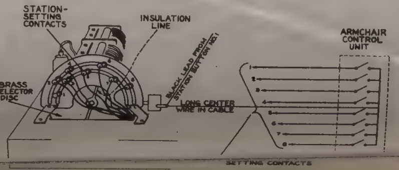
ADJUSTMENTS FOR ELECTRIC TUNING

1. Make a list of the desired eight stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.
4. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1 to the insulating line on the disc at rear of gang. When the pin is correctly centered on the insulating line, the central dial lamp will go completely out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

Station-Setting Contacts and Selector Disc

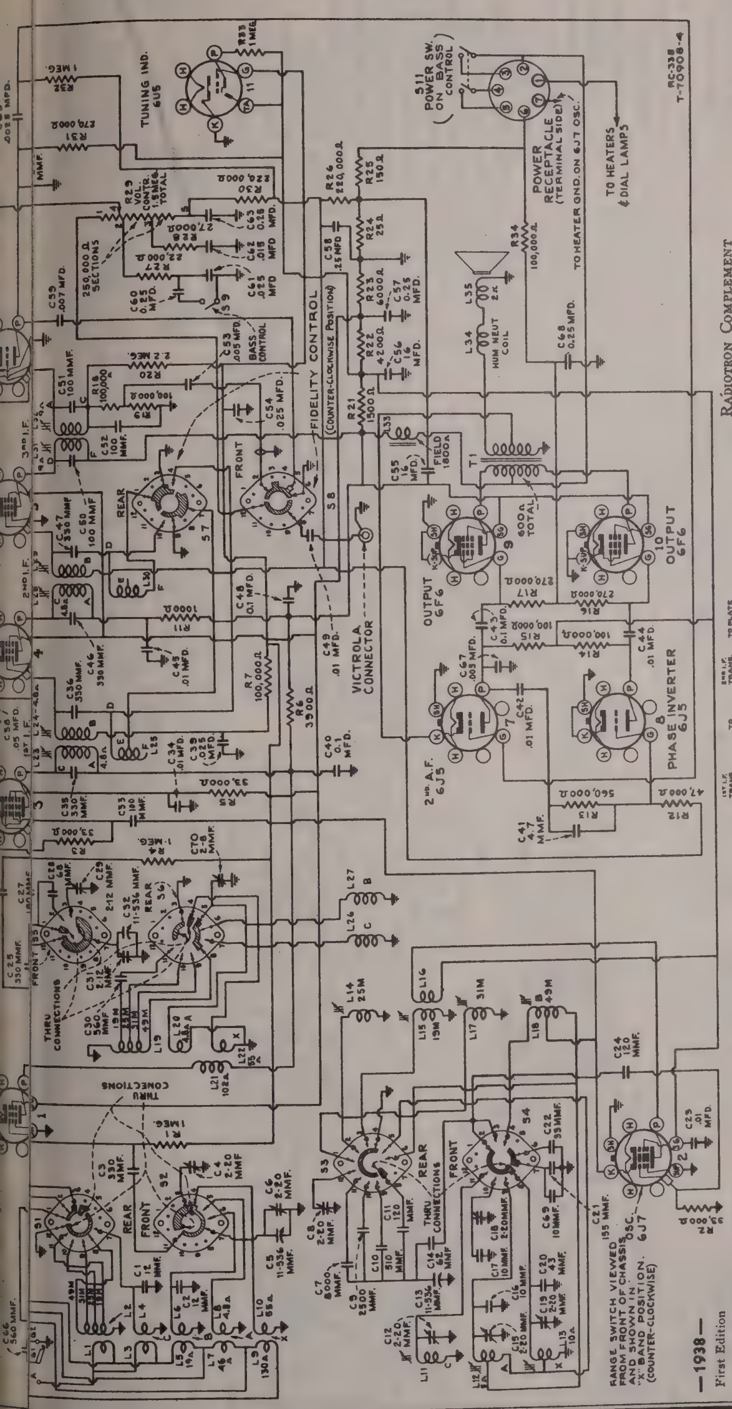
This illustration shows connections for a G8A Armchair Control Unit. This unit is not supplied with the receiver but may be added as an accessory.

Station Button	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	Brown
No. 3	Blue
No. 4	Green
No. 7	Brown-black
No. 8	Red-yellow

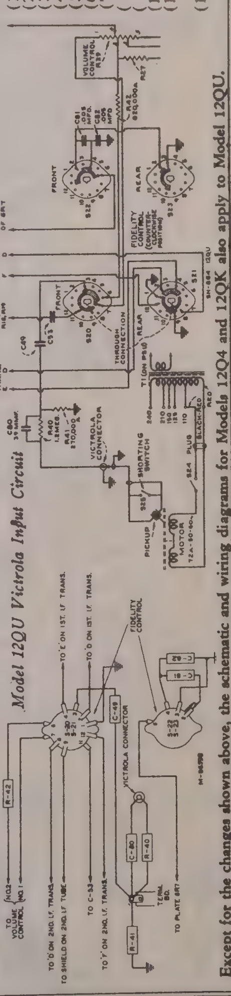


RCA MFG. CO., INC.

MODELS 12Q4,12QK,Chassis RC-338
12QU,Chassis RC-338A
Schematic,Changes



Model 12QU Victrola Input Circuit



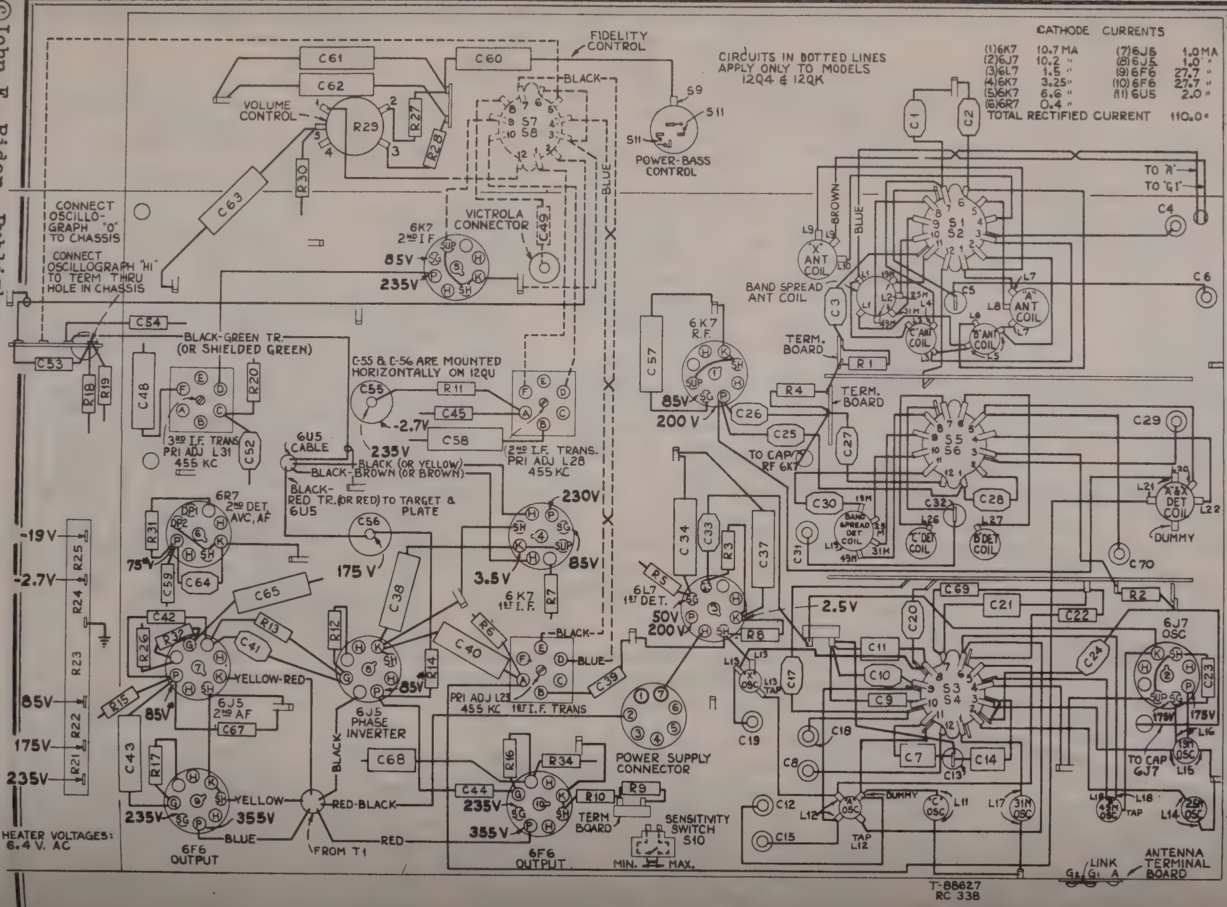
Radiotron Complement

(1)	RCA-6K7	R-F Amplifier
(2)	RCA-6J7	Oscillator
(3)	RCA-6L7	1st Detector
(4)	RCA-6K7	1st I-F Amplifier
(5)	RCA-6K7	2nd I-F Amplifier
(6)	RCA-6R7	2nd Det., A.V.C., and 1st A-F Amplifier
(7)	RCA-6J5	2nd A-F Amplifier
(8)	RCA-6J5	Phase Inverter
(9)	RCA-6F6	Power Output
(10)	RCA-6F6	Power Output
(11)	RCA-5U4-G (In PSU 10A, 10B, 10C A-C power supply unit)*	Rectifier
(12)	RCA-5T4 (In PSU 10E D-C power supply unit) (For use with 12Q4 or 12QK only)	Rectifier

Except for the changes shown above, the schematic and wiring diagrams for Models 12Q4 and 12QK also apply to Model 12QU.

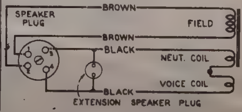
MODELS 12Q4,12QK,12QU
Chassis Wiring,Voltage

RCA MFG. CO., INC.



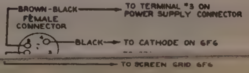
Precautionary Lead Dress.—

1. The following leads should be dressed away from other parts and chassis:
   - a. All leads to the bottom of the tuning gang.
   - b. All capacitor leads to oscillator section of range switch.
   - c. Yellow lead from lug No. 10 on S4 to dummy lug on "A" oscillator coil.
   - d. Yellow lead from pin No. 8 on 6J7 oscillator socket to terminal board.
   - e. Yellow and green leads from "X" detector coil (should be dressed away from each other as well as other parts).
2. Dress all leads away from phono jack and C49.
3. Twisted leads of "B" oscillator coil must be soldered together within ¼-inch of coil tube.
4. The brown, black, and blue leads in back of the oscillator coils should be dressed away from coil windings.
5. R13 and C41 must be dressed away from pin No. 7 of 6J5 (tube No. 7).



R-F Wiring Diagram and Socket Voltages, Models 12Q4 and 12QK

Model 12QU is the same except for the Victrola connections, which are shown in a separate diagram.



with set tuned to quiet point, sensitivity switch at maximum

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RCA MFG. CO., INC.

MODELS 12Q4,12QK,12QU
Socket,Trimmers
Drive Cord Data
Power Supply Notes

FOR POWER SUPPLY
DATA SEE INDEX

Specifications

UEN RANGES
W e ("X" Band) .... 150-400 kc (2,000-750 m)
um ave ("A" Band) .... 530-1,625 kc (566-184.6 m)
t W e 1 ("B" Band) .... 2.3-7.0 mc (130-42.8 m)
t W e 2 ("C" Band) .... 7.0-22 mc (42.8-13.6 m)

49 Meter Spread Band .... 5.92-6.23 mc
31 Meter Spread Band .... 9.48-9.70 mc
25 Meter Spread Band .... 11.68-11.94 mc
19 Meter Spread Band .... 15.08-15.39 mc

RME TE FREQUENCY .... 455 kc

NOGR H (Model 12QU only)
... . Automatic
rd C acity .... Eight 10-inch or seven 12-inch
table Speed .... 78 r.p.m. (adjustable)
Pic p .... Crystal
p I pedance .... 100,000 ohms at 1,000 cycles

r LA PS
Mod s 12Q4 and 12QK .... One 6.3-volt, 0.15-amp., Mazda No. 47; two 6.3-volt, 0.25 amp., Mazda No. 44
Mod 12QU .... One 6.3-volt, 0.15-amp., Mazda No. 47; three 6.3-volt, 0.25 amp., Mazda No. 44

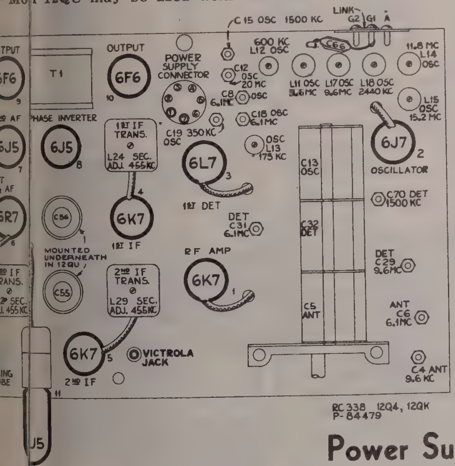
ER O TPUT RATING
stort .... 10 watts
mum .... 12 watts

LOUDSPEAKER (RL-70H-3)
Type .... 12-inch electrodynamic
Voice Coil Impedance at 400 cycles .... 2.2 ohms

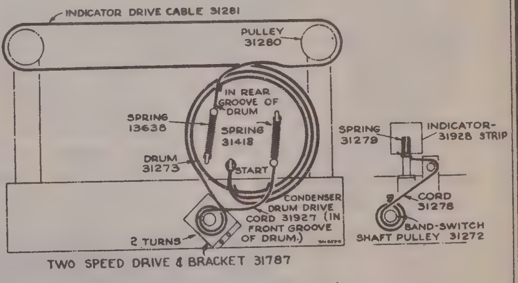
ER S PPLY RATINGS

		12Q4, 12QK	12QU * Radio	12QU * Total
Rati s				
PS 10A Power Supply Unit	105-125 volts, 50-60 cycles	125 watts	125 watts	150 watts
PS 10B Power Supply Unit	105-125 volts, 25-60 cycles	125 watts		
PS 10C Power Supply Unit	105-130, 140-160, 200-250 volts, 50-60 cycles	125 watts	125 watts	150 watts
Rati s				
PS 10E Power Supply Unit	105-125, 210-250 volts D-C	(See text for current consumption ratings)		

* Mo l 12QU may be used with PSU 10A or 10C *only*.



RC 338 12Q4, 12QK
P-84479


INDICATOR DRIVE CABLE 31281
PULLEY 31280
IN REAR GROOVE OF DRUM
SPRING 13638
SPRING 31418
DRUM 31273
START
SPRING 31279
INDICATOR-31928 STRIP
CONDENSER DRUM DRIVE CORD 31927 (IN FRONT GROOVE OF DRUM.)
CORD 31278
BAND-SWITCH SHAFT PULLEY 31272
2 TURNS
TWO SPEED DRIVE & BRACKET 31787

(TUNING CONDENSER IN FULL MESH POSITION)

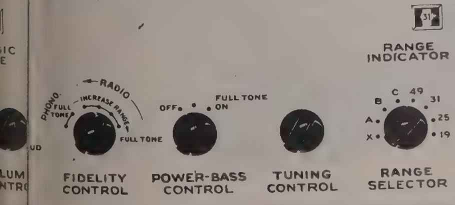
Above—*Arrangement of Drive Cords for Tuning Condenser and Dial Indicator*

At Left—*Location of Tubes and Trimmers*

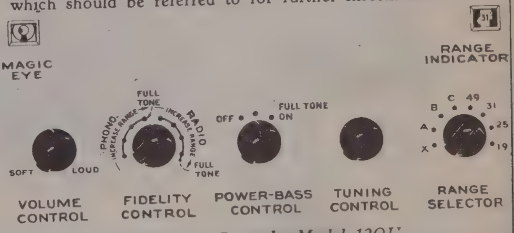
Power Supply Units

odel 12Q4, 12QK, and 12QU have seven-prong con- ors r connection to a separate power supply unit. Units avai ble in different ratings for a.c. and d.c. operation, isted under "Power Supply Ratings" in the electrical ifica ns. It should be noted, however, that Model 12QU be ed with a.c. units PSU 10A or 10C **only**. Vher Model 12Q4 or Model 12QK is used with a d.c. er pply Unit, the measured current drain is 0.7 amperes from a 234 volt supply, and 1.4 amperes from a 117 volt supply. These current values may vary as much as 30% when measured by various types of ammeters, due to the rectangular wave-shape of the vibrator current.

Service data, diagrams, and replacement parts lists for the power supply units are printed in separate service data sheets which should be referred to for further information.



ocation of Controls, Models 12Q4 and 12QK



Location of Controls, Model 12QU

Purpose and Function of Fidelity Control

MODELS 12QK AND 12Q4

Position	For Use On	I-F Channel	Audio Channel
1 (Extreme Counter-clockwise)	Record Player	———	Min. highs
2	Record Player	———	Max. highs
3	Distant Stations	Sharp	Min. highs
4	Distant Stations	Sharp	Max. highs
5	Local and Medium Distant Stations	Medium	Max. highs
6 (Extreme Clockwise)	Local Stations	Broad	Max. highs

MODEL 12QU

Position	For Use On	I-F Channel	Audio Channel
1 (Extreme Counter-clockwise)	Victrola	———	Min. highs
2	Victrola	———	Medium No. 1
3	Victrola	———	Medium No. 2
4	Victrola	———	Max. highs
5	Distant Stations	Sharp	Min. highs
6	Distant Stations	Sharp	Max. highs
7	Local and Medium Distant Stations	Medium	Max. highs
8 (Extreme Clockwise)	Local Stations	Broad	Max. highs

Miscellaneous Service Data

Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the output circuit on the loudspeaker to facilitate the connection of an extension loudspeaker if desired.

A **permanent-magnet dynamic speaker, with voice-coil impedance of not less than 2 ohms is recommended:** With a 2-ohm voice coil, the extension speaker will receive approximately half the power output of the receiver; with a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased.

The RCA MI-6248 8-inch diameter Alnico permanent-magnet dynamic loudspeaker, which has a 2-ohm voice coil, and a power-handling capacity of 5 watts, is recommended. This speaker may be housed in the RCA MI-6292 sloping-front, walnut-finished wood housing.

The voice coil of the extension speaker should be connected by means of two-conductor cable, such as is used on electrical appliances, to the male plug. The cable may be any desired length, but with a long run, when using a low-impedance extension speaker, it is advisable to use heavy cable.

A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.

Victrola Attachment (record player).—A jack located on the top near the front of the chassis is provided for connecting a Victrola Attachment (record player) into the audio amplifying circuit on Models 12Q4 and 12QK. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Antenna Connections.—Three terminals ("A," "G1," and "G2") are provided on the rear of the chassis. Connect the antenna to "A." Connect "G1" to a nearby ground. A link connects "G1" and "G2." In case of electrical interference (especially on "X" band) open the link and connect "G2" separately to ground. This also applies when a d.c. power supply is used.

ALIGNMENT PROCEDURE

Alignment using the Cathode Ray Oscillograph is much the preferable method because of the variable selectivity features of these instruments. The curves shown illustrate the general shape of the i-f selectivity curves for different settings of the fidelity control, when i-f channel is properly aligned. Connections for the oscillograph are shown in the bottom view of the receiver chassis. Use short, unshielded leads to oscillograph, and well-shielded leads from test oscillator. If possible, use 30 or 40 kc sweep frequency for i-f alignment.

Output Meter Alignment.—If this method is used, connect meter across voice coil, and turn receiver volume control to maximum. Disregard steps 5 and 5A of alignment table. However, a listening check should be made to check operation of fidelity control, after receiver has been aligned.

Test Oscillator.—For all alignment operations connect the "Gnd" side of test oscillator to chassis, the high side as indicated in table, and keep output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end calibration marks on the dial scales, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.

this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

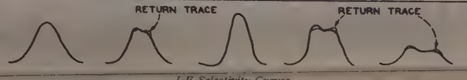
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

Using RCA Stock No. 150 Test Oscillator.—When using this oscillator for spread-band alignment, insert an open-circuit plug in the "EXT. MOD." jack, and set the test-oscillator dial 800 kc lower than the desired frequency for the four lower frequency ranges, and 800 kc higher than the desired frequency for the two high ranges. This provides an unmodulated signal of the desired frequency and the magic eye may be used as an output indicator for this unmodulated signal.

Alignment Table

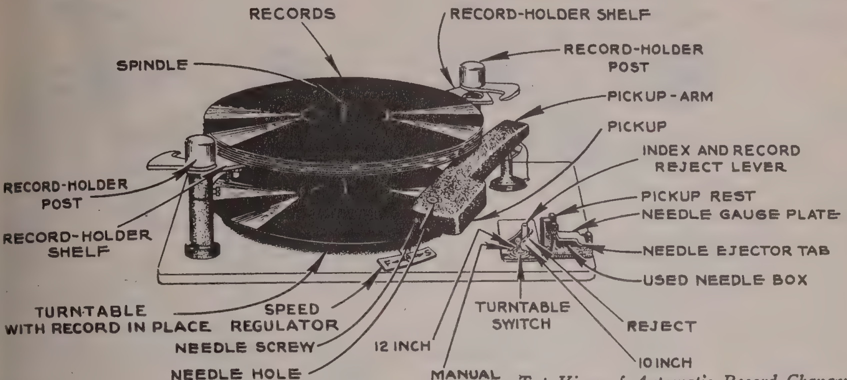
Step	Connect high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust following for maximum peak output	Check Selectivity Curve No.
1	Turn fidelity control to 3rd position from maximum clockwise, sensitivity switch min. (open)				
2	6K7 2nd I.F. grid cap in series with .01 mfd.	455 kc	"A" band Quiet Point between 550-750 kc	L31 and L32 3rd I-F Trans.	1
3	6K7 1st I.F. grid cap in series with .01 mfd.			L28 and L29 2nd I-F Trans.	2
4	6L7 1st-det. grid cap in series with .01 mfd.			L23 and L24 1st I-F Trans.	3
5	Turn fidelity control one position back from full clockwise				4
5A	Turn fidelity control full clockwise				5
6	Turn fidelity control to 3rd position from maximum clockwise for the following operations				
7	Antenna Terminal, in series with 200 mmf.	2,440 kc	"B" band 2.44 mc (16°)	L18 (osc.) †	
8	Antenna Terminal, in series with 300 ohms	6,100 kc	"B" band 6.1 mc (150°)	C18 (osc.) C31 (det.) ** C6 (ant.) **	* NOTE: In step 18 only, the oscillator tracks on low side of signal; use maximum capacity peak (plunger in) if two peaks can be obtained. All other oscillator adjustments use minimum inductance or capacity peak (plunger out), if two peaks can be obtained.
9	Antenna Terminal, in series with 200 mmfd.	600 kc	"A" band 600 kc (36°)	L12 (osc.) Rock Gang	
10		1,500 kc	"A" band 1,500 kc (158°)	C15 (osc.) C70 (det.)	
11		600 kc	"A" band 600 kc (36°)	L12 (osc.) Rock Gang	
12		175 kc	"X" band 175 kc (54°)	L13 (osc.) Rock Gang	
13		350 kc	"X" band 350 kc (147°)	C19 (osc.)	** Use maximum capacity peak if two can be obtained.
14		175 kc	"X" band 175 kc (54°)	L13 (osc.) Rock Gang	
15	Antenna Terminal, in series with 300 ohms	9,600 kc	"C" band 9.6 mc (58.5°)	L11 (osc.) ††	
16		20,000 kc	"C" band 20 mc (157°)	C12 (osc.)	† Before adjusting L18, set C18 so it projects approximately 2 inches above top of chassis.
17		9,600 kc	"31M" band 9.6 mc (100°)	L17 (osc.) C29 (det.) C4 (ant.)	
18*		6,100 kc	"49M" band 6.1 mc (106°)	C8 (osc.)	†† Before adjusting L11, set C12 so it projects approximately 2 inches above top of chassis.
19		11,800 kc	"25M" band 11.8 mc (90°)	L14 (osc.)	
20		15,200 kc	"19M" band 15.2 mc (78°)	L15 (osc.)	



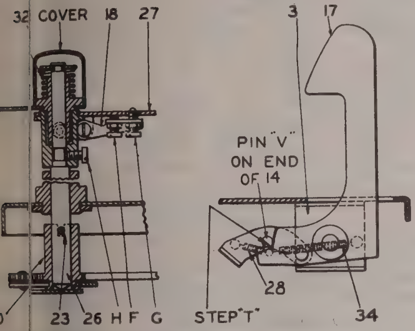
I-F Selectivity Curves

RCA MFG. CO., INC.

MODEL 11QU
MODEL 12QU
Record Changer Assembly

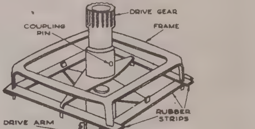


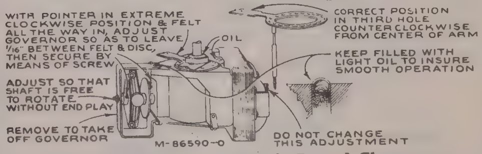
Top View of Automatic Record Changer



etails of Record Shelf Posts, and Locating Lever Assemblies

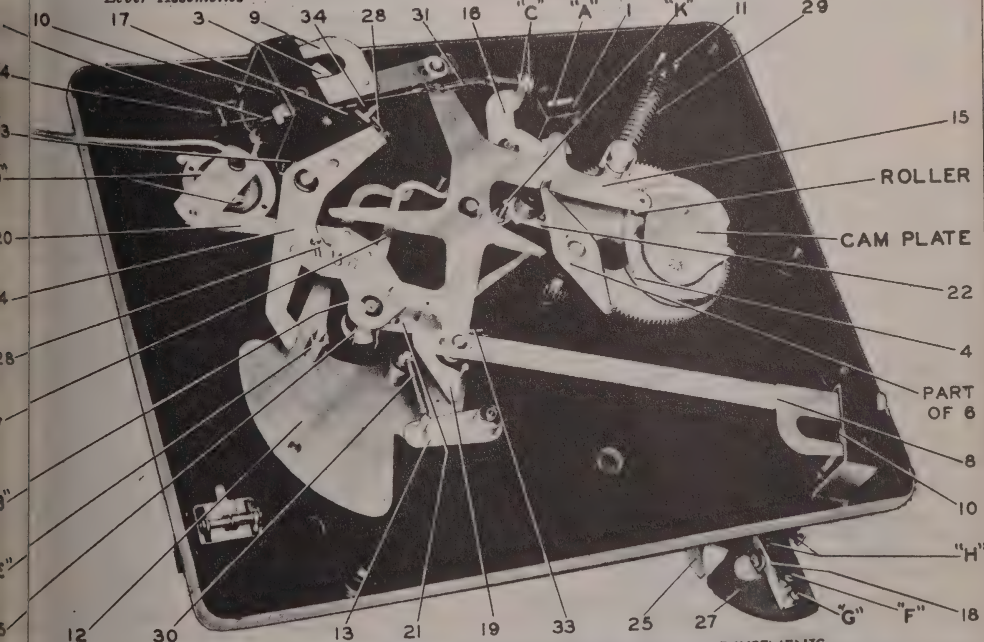
Motor Data and Coupling




WITH POINTER IN EXTREME CLOCKWISE POSITION & FELT ALL THE WAY IN, ADJUST GOVERNOR SO AS TO LEAVE 1/16" BETWEEN FELT & DISC, THEN SECURE BY MEANS OF SCREW
CORRECT POSITION IN THIRD HOLE COUNTER CLOCKWISE FROM CENTER OF ARM
OIL
KEEP FILLED WITH LIGHT OIL TO INSURE SMOOTH OPERATION
ADJUST SO THAT SHAFT IS FREE TO ROTATE WITHOUT END PLAY
REMOVE TO TAKE OFF GOVERNOR
M-86590-0
DO NOT CHANGE THIS ADJUSTMENT

Bottom View of Automatic Record Changer

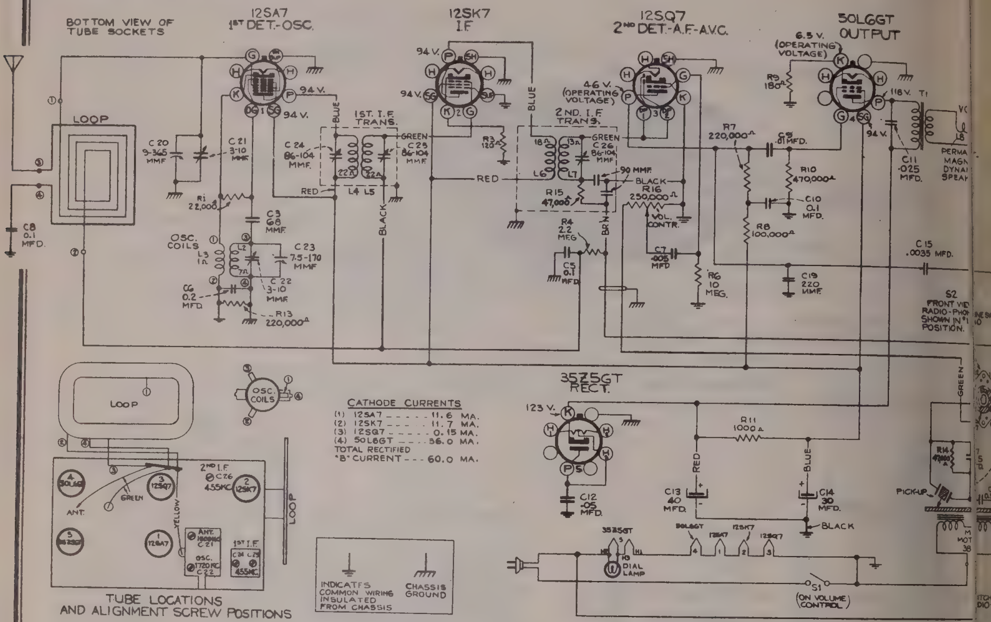
NOTE: Numbers refer to parts—letters refer to adjustments.



See Model RP-139-A for MISCELLANEOUS SERVICE HINTS ADJUSTMENTS

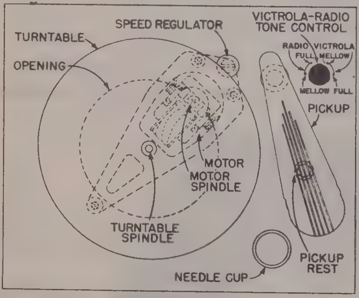
MODEL U9, Chassis RC482B
Schematic, Voltage, Socket
Alignment, Trimmers, Phono.

RCA MFG. CO., INC.



CATHODE CURRENTS
(1) 12SA7 ..... 11.6 MA.
(2) 12SK7 ..... 11.7 MA.
(3) 12SQ7 ..... 0.15 MA.
(4) 50L6GT ..... 36.0 MA.
TOTAL RECTIFIED "B" CURRENT ... 60.0 MA.

TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS



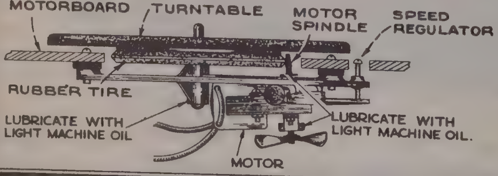
PHONOGRAPH MECHANISM.—

The phonograph motor is self-starting and operates the turntable through friction drive between the motor spindle and the rubber tire on the underside of the turntable.

The rubber driving tire on the turntable should never be removed since it is ground in to be concentric with the spindle. If replacement is required, the entire turntable should be replaced.

The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and saturate the oil retaining felt pads on the motor shaft with S.A.E. 10 oil. This oiling process should be repeated once or twice a year. CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER DRIVING TIRE ON THE TURNTABLE MUST BE KEPT CLEAN AND ENTIRELY FREE FROM OIL AND GREASE AT ALL TIMES.


MOTORBOARD
TURNTABLE
MOTOR SPINDLE
SPEED REGULATOR
RUBBER TIRE
LUBRICATE WITH LIGHT MACHINE OIL
LUBRICATE WITH LIGHT MACHINE OIL.
MOTOR

FREQUENCY RANGE
Standard Broadcast and one Police Band........... 540-1
INTERMEDIATE FREQUENCY..........

PILOT LAMP (1)............ Mazda No. 51, 7.5 volts, 0

LOUDSPEAKER (84843-1 or RL81-2)
Type.................................. 5-inch P M
Voice Coil Impedance..... (84843-1).... 3.4 ohms at 40
(RL81-2).... 4.5 ohms at 40
PICKUP..........
Pickup Impedance.................... 0.1 meg. at 1,00

POWER OUTPUT RATING
Undistorted.......................... 0.7
Maximum.............................. 1.8

POWER SUPPLY RATINGS
A-6.............................. 105-125 volts, 6
A-5.............................. 105-125 volts, 5
POWER CONSUMPTION.............. 5

Alignment Procedure

Output Meter Alignment.—Connect the meter across the and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillat receiver chassis through a 0.01 mfd capacitor, and keep t as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, th should coincide with the left hand mark stamped in the d plate.

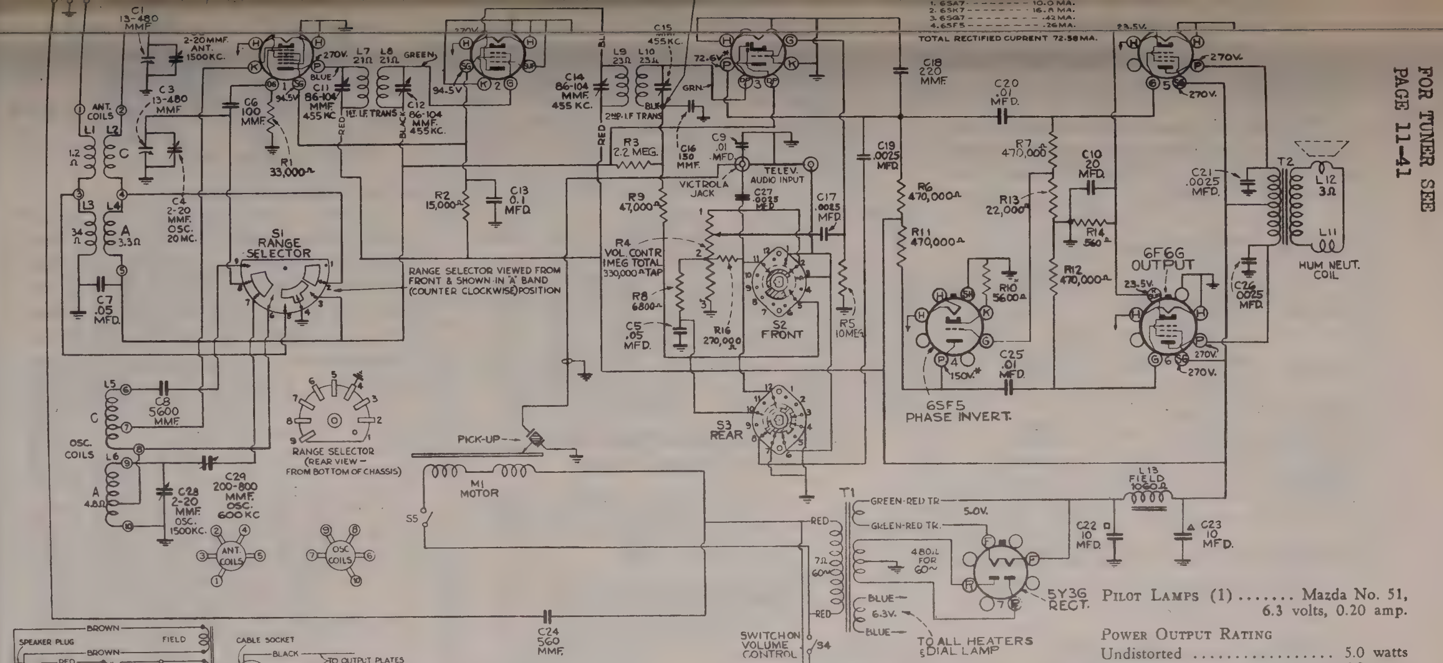
Antenna.—This set is equipped with a built-in loop ant an outdoor antenna is used, it may be connected to the green lead, stapled to the base of the cabinet. The antenna shoul longer than 100 feet including the lead-in. If it is longer, c 100 mmfd. capacitor in series with the lead-in.

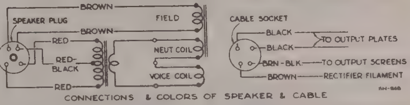
Steps	Connect the high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust th ing for outpu
1	Tuning Cond. stator (det.) in series with 0.01 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C24, C2 (1st and transfor
2	Antenna lead (green) in series with 100 mmfd.	1,720 kc	Full Clockwise (out of mesh)	C22 (o
3		1,500 kc	Resonance on 1,500 kc signal	C21 (a

RCA MFG. CO., INC.

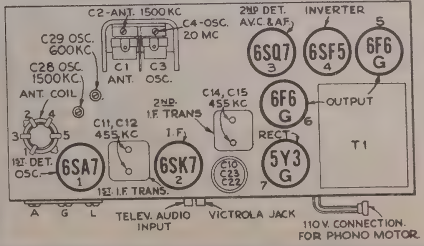
MODEL U12, Chassis RC425A
Schematic, Socket, Trimmers
Lead Dress, Voltage

FOR TUNER SEE
PAGE 11-41





CONNECTIONS & COLORS OF SPEAKER & CABLE



PHONOGRAPH

Crystal Pickup . 100,000 ohms Impedance at 1,000 c.p.s.

Average Output of Pickup .. 1½ volts at 1,000 c.p.s. across 250,000 ohms load

Motor ... Self-starting, Rim drive, Adjustable speed

POWER SUPPLY RATINGS

Rating A-6 ... 105-125 volts, 60 cycles, 110 watts

Rating A-5 .... 105-125 volts, 50 cycles, 110 watts

Rating C-6 ... 105-125, 210-250 volts, 60 cycles, 110 watts

Rating C-5 .... 105-125, 210-250 volts, 50 cycles, 110 watts

FREQUENCY RANGES

Standard Broadcast	540-1,720 kc
Short Wave	5.6-20 mc

INTERMEDIATE FREQUENCY . 455 kc

PILOT LAMPS (1) .... Mazda No. 51, 6.3 volts, 0.20 amp.

POWER OUTPUT RATING

Undistorted	5.0 watts
Maximum	6.0 watts

LOUDSPEAKER (RL-79A-1)

Type	6-inch electrodynamic
V.C. Impedance ...	3.4 ohms at 400 cycles

Power Line Antenna:

This instrument is equipped with a built-in power line antenna. To use this antenna the link on the antenna terminal board should be connected between "A" and "L," thus connecting the antenna input of the receiver through a capacitor to the power line. If an external antenna is used, it should be connected to "A," a ground connection made to "G," and the link removed.

Precautionary Lead Dress.—

1. Dress the Power Line Antenna lead close to the chassis base and near to the back flange.
2. Heater lead from 6F6-G to the 6SQ7-G must be dressed away from the 10 meg. grid leak (R5).
3. AC leads to the power switch must be dressed away from R8 and C5.
4. C17 should be kept as far away from the power switch as possible.

MODEL U12,Chassis RC425A
Alignment,Phono.Data
Parts List,Dial Data

RCA MFG. CO., INC.

CHASSIS ASSEMBLIES
(RC-425A)

33719	Belt—Tuning unit push arm belt	.05
33718	Board—Antenna-ground board	.20
33629	Capacitor—Trimmer capacitor, one section 2-20 mmfd., and one section 300-800 mmfd. (C9, C10)	.60
12720	Capacitor—100 mmfd. (C6)	.35
12725	Capacitor—150 mmfd. (C16)	.35
12694	Capacitor—220 mmfd. (C18)	.35
12537	Capacitor—560 mmfd. (C24)	.35
13895	Capacitor—5,600 mmfd. (C8)	.70
5107	Capacitor—.0025 mfd. (C19, C21, C26)	.20
34459	Capacitor—.0025 mfd. (C17, C27)	.40
4937	Capacitor—.01 mfd. (C9, C20, C25)	.25
32787	Capacitor—.05 mfd. (C7)	.20
4839	Capacitor—0.1 mfd. (C13)	.30
32240	Capacitor—Comprising 2 sections of 10 mfd., and 1 section of 20 mfd. (C10, C22, C23)	1.45
33732	Coil—Antenna coil (L1, L2, L3, L4)	1.45
33733	Coil—Oscillator coil (L5, L6)	.70
33776	Control—Volume control and power switch (R4, S4)	2.00
32634	Cord—Braided silk drive cord	.10
33633	Indicator—Station selector indicator pointer	.20
11765	Lamp—Pilot lamp	.15
33727	Plate—Dial plate assembly—less dial	.90
5119	Plug—4-contact female plug for speaker cable	.25
14439	Resistor—100 ohms, ¼ watt (R15)	.20
17214	Resistor—560 ohms, 2 watts (R14)	.22
13714	Resistor—5,600 ohms, ¼ watt (R10)	.20
12265	Resistor—6,800 ohms, ¼ watt (R8)	.20
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
13998	Resistor—22,000 ohms, ¼ watt (R13)	.20
12454	Resistor—33,000 ohms, ¼ watt (R1)	.20
12412	Resistor—47,000 ohms, ¼ watt (R9)	.20
12199	Resistor—270,000 ohms, ¼ watt (R16)	.20
12285	Resistor—470,000 ohms, ¼ watt (R6, R7, R11, R12)	.20
12679	Resistor—2.2 meg., ¼ watt (R3)	.20
13601	Resistor—10 meg., ¼ watt (R5)	.20
33735	Screw—Push button lock screw	.05
33725	Shaft—Tuning drive shaft	.30
33514	Socket—Phonograph input socket	.25
31364	Socket—Pilot lamp socket	.20
31319	Socket—Tube base socket	.25
31418	Spring—Indicator drive cord spring	.05
33720	Spring—Push arm return spring	.02
33946	Switch—Range switch	.75
33894	Switch—Tone control, phono. or television switch (S2, S3)	1.00
33722	Transformer—First i-f transformer (L7, L8, C11, C12)	1.60
33895	Transformer—Second i-f transformer (L9, L10, C14, C15)	1.50
33619	Transformer—Power transformer—105-125 volts, 25-60 cycles (T1)	6.40
34261	Transformer—Power transformer — 110 volts, 60 cycles	4.00
31575	Transformer—Power transformer—105-125, 200-250 volts, 50-60 cycles (T1)	8.35

MOTOR ASSEMBLIES

33897	Base—Motor base and ball assembled	.80
33902	Motor—Complete motor 105-125 volts, 60 cycle (M1)	3.70
34496	Motor—Complete motor 105-125 volts, 50 cycle (M1)	4.60
33896	Mounting—Motor cradle mounting hardware and retainer	.10

SPEAKER ASSEMBLIES
(RL-79A-1)

32907	Cap—Dust cap	.02
33601	Coil—Field coil (L13)	1.25
32906	Coil—Neutralizing coil (L11)	.25
32934	Cone—Cone complete with voice coil, center suspension and rim gaskets (L12)	1.65
5039	Plug—4-prong male speaker plug	.30
33599	Transformer—Output transformer (T2)	1.35

AUTOMATIC SWITCH ASSEMBLIES

32863	Cam—Cam assembly comprising main and auxiliary cam, hub and set screws	.65
32864	Lever—Actuating lever with roller and mercury switch clip	.45
31118	Screw—No. 10-32 x 5/16 fillister head cone pointed set screw	.06
32868	Spring—Actuating lever tension spring	.05
32867	Spring—Cam tension spring	.05
32865	Support—Switch support and terminal board	.40
32866	Switch—Mercury tube with leads (S5)	1.75
31608	Washer—"C" washer for holding actuating lever	.01

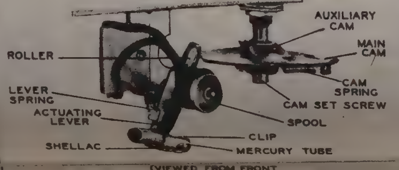
PICKUP ASSEMBLIES

33906	Arm—Pickup arm—shell only	.45
33908	Base—Pickup support arm base and retainer	.35
33905	Crystal—Pickup crystal cartridge	4.25
33907	Support—Pickup support arm complete — less base	.80

MISCELLANEOUS ASSEMBLIES

33731	Button—Push button assembly	.15
31456	Cover—8-protective covers for push button marker	.08
33910	Cup—New needle cup	.30
33909	Cup—Used needle cup	1.00
34270	Dial—Glass dial scale	1.50
33637	Escutcheon—Dial glass escutcheon	.80
13085	Hinge—Cabinet lid hinge	.22
33942	Knob—Tone control or range switch knob	.25
30863	Knob—Tuning or volume control knob	.15
33973	Marker—Push button markers	.45
33901	Mounting—1 set motor mounting hardware	.30
33530	Mounting—Pickup mounting hardware	.10
30870	Plug—2-prong male connectors	.35
31048	Plug—2-conductor male plug for pickup lead	.15
30900	Spring—Retaining spring for knobs, Stock Nos. 30863, 33942 and button No. 33731	.05
31164	Support—Cabinet lid support	.45
33899	Turntable—Complete with rubber drive ring	3.70

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



(VIEWED FROM FRONT

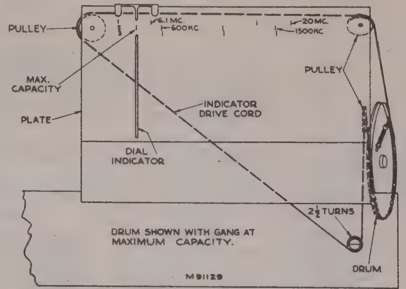
The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1½ inches from the center line of the turntable shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and

CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 kc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.



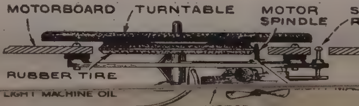
DIAL MECHANISM AND CALIBRATION MARKS.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the mark at the extreme left (low frequency) end of the dial scale.

Step	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet Point between 550-750 kc	C14 and C15 (2nd I-F Trans.)
2				C11 and C12 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C4 (osc.)*
4	Ant. terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C28 (osc.) C2 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C29 (osc.) Rock Gang
6	Repeat step 4			

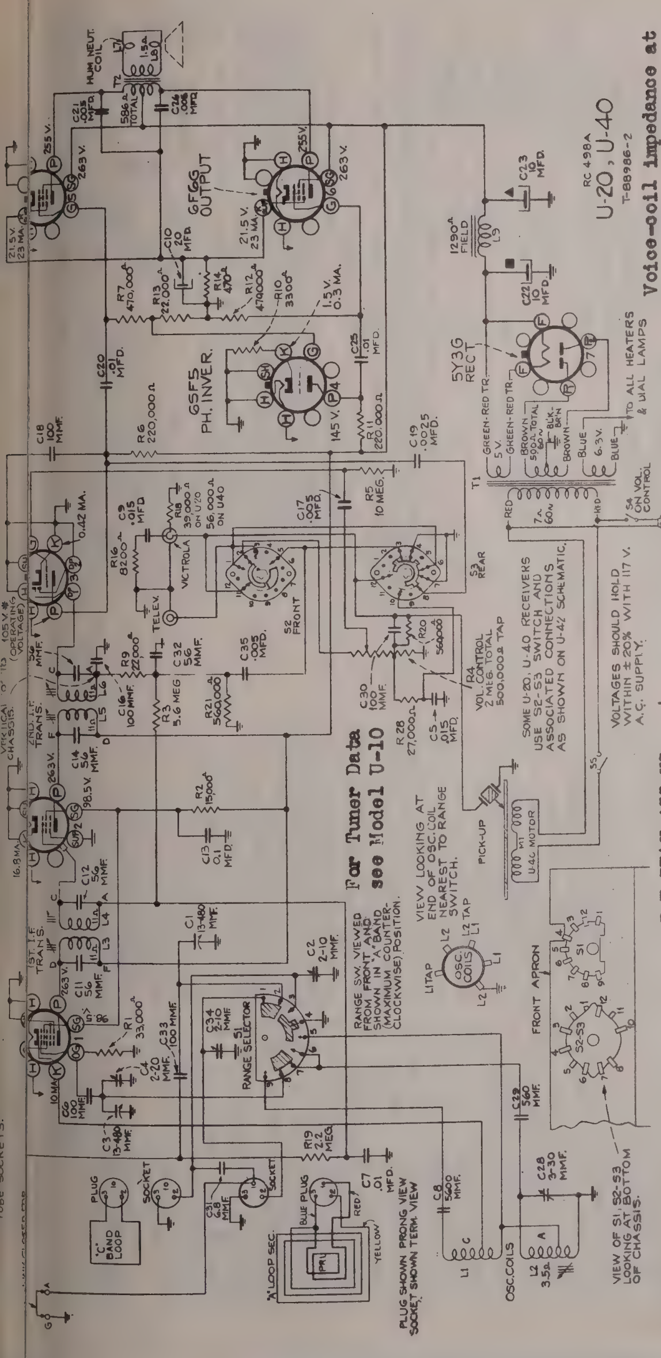
* Use minimum peak if two can be obtained. Check to determine that C4 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note: Oscillator tracks above signal on both bands.



RCA MFG. CO., INC.

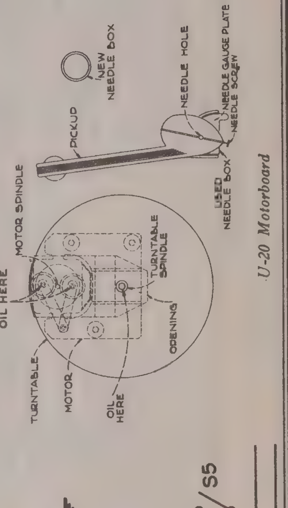
MODELS U20,Chassis RC498
U40,Chassis RC498A
Schematic,Socket



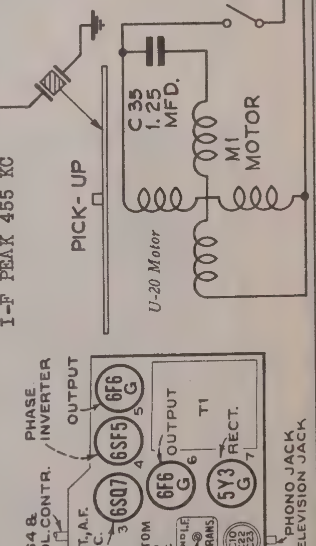
For Tuner Data see Model U-10

Voice-coil impedance at 400 cycles - 2.2 ohms

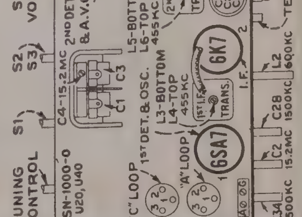
I-F PEAK 455 KC



U-20 Motorboard



U-20 Motor



MODELS U20,Ch.RC498,U40
Ch.RC498A, U42,Ch.RC498B
Alignment,Phono.Speaker
Parts List

RCA MFG. CO., INC.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
33719	Belt—Push button station setting belt (Models U-40, U-42)	.05
34724	Board—"Antenna-Ground" board	.25
30766	Cap—Rubber cap for "Magic Eye" (Model U-42)	.15
34725	Capacitor—Trimmer comprising 1 section of 3-30 mmfd. and 2 sections of 2-10 mmfd. (Models U-20, U-42) (C2, C4, C28)	.60
34852	Capacitor—Trimmer comprising 1 section of 3-30 mmfd. and 2 sections of 2-10 mmfd. (Model U-40) (C2, C4, C28)	.60
14079	Capacitor—6.8 mmfd. (C31)	.35
12723	Capacitor—56 mmfd. (C32)	.35
30949	Capacitor—56 mmfd. (C11, C12, C14, C15)	.25
12720	Capacitor—100 mmfd. (C6, C16, C18, C30, C33)	.35
12537	Capacitor—560 mmfd. (C29)	.35
13895	Capacitor—5,600 mmfd. (C8)	.70
34459	Capacitor—.0025 mfd. (C19)	.20
33564	Capacitor—.005 mfd. (C17, C21, C35)	.25
4937	Capacitor—.01 mfd (C7, C20, C25)	.25
11315	Capacitor—.015 mfd. (C5, C9) (C9 Models U-20 and U-40 only)	.20
32785	Capacitor—.02 mfd. (C9) model U-42 only	.20
4839	Capacitor—0.1 mfd. (C13)	.30
32240	Capacitor—Electrolytic comprising 2 sections of 10 mfd. and 1 section of 20 mfd. (C10, C22, C23)	1.45
34285	Clip—"Magic Eye" clip (Model U-42)	.25
32707	Coil—Oscillator coil (L1, L2)	.95
34721	Control—Volume control and power switch (R4, S4)	2.00
32634	Cord—Tuning condenser drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil (Models U-20, U-42)	.35
34853	Core—Adjustable core and stud for oscillator coil (Model U-40)	.20
33633	Indicator—Station selector indicator	.20
11891	Lamp—Dial lamp	.17
34407	Plate—Dial plate less condenser (Models U-40, U-20)	1.75
34798	Plate—Dial plate complete less tuner and push button (Model U-42)	.35
30868	Plug—2-contact female plug for motor lead (Models U-20, U-40)	.35
34723	Plug—3-contact plug for antenna loop	.15
5040	Plug—4-contact female plug for speaker leads	.30
14404	Plug—7-contact female plug for battery cable (Model U-42)	.35
30546	Resistor—470 ohms, ½ watt (R14)	.20
12312	Resistor—3,300 ohms, ½ watt (R10)	.20
13714	Resistor—5,600 ohms, ½ watt (R16) (Model U-42 only)	.20
14075	Resistor—8,200 ohms, ½ watt (R16) (Model U-20 and U-40 only)	.20
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
13998	Resistor—22,900 ohms, ½ watt (R9, R13)	.20
12738	Resistor—27,000 ohms, ½ watt (R8, R18) (some models U-42 only)	.20
12454	Resistor—33,000 ohms, ½ watt (R1)	.20
12266	Resistor—39,000 ohms, ½ watt (R18) (Model U-20 only)	.20
12286	Resistor—56,000 ohms, ½ watt (R18) (Model U-40 only)	.20
12264	Resistor—220,000 ohms, ½ watt (R6, R11)	.20
12285	Resistor—470,000 ohms, ½ watt (R7, R12)	.20
12486	Resistor—560,000 ohms, ½ watt (R20, R21)	.20
12013	Resistor—1 megohm, 1/10 watt (R22) (U-42 only)	.15
12679	Resistor—2.2 megohm, ½ watt (R19)	.20
11668	Resistor—5.6 megohm, ½ watt (R3)	.20
13601	Resistor—10 megohm, ½ watt (R5)	.20
33735	Screw—Push arm adjusting screw	.05
34411	Shaft—Tuning condenser drive shaft	.20
31364	Socket—Dial lamp socket	.20
34799	Socket—"Magic Eye" socket (Model U-42)	.30
33514	Socket—Phonograph input socket	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
34726	Spring—Push arm return spring .018 dia. wire.	.05
33720	Spring—Push arm return spring (Model U-42).	.02
34720	Switch—Radio, Phono, Television, Tone switch (S2, S3)	1.50
34722	Switch—Range switch (S1)	.95
32263	Transformer—1st i.f. transformer (L3, L4, C11, C12)	2.30
34719	Transformer—2nd i.f. transformer (L5, L6, C14, C15)	1.75
32144	Transformer—Power transformer, 105-120 volts, 50-60 cycles (Models U-40, U-20) (T1)	4.75
33726	Washer—Retaining washer for shaft, Stock No. 34411	.02
	PICKUP AND ARM ASSEMBLIES U-20	
33906	Arm—Pickup arm—shell only	.45
33908	Base—Pickup support arm base and retainer	.35
33905	Crystal—Pickup crystal cartridge	4.25
33907	Support—Pickup support arm complete — less base	.80

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES U-20	
34416	Arm—Drive wheel support arm (long)	xx
34415	Arm—Idler wheel support arm (short)	.50
34516	Armature—Motor armature complete	xx
34515	Bushing—Motor mounting rubber bushings	xx
34413	Capacitor—1.25 mfd., 60 cycle motor starting capacitor for motor, Stock No. 34412 (C35).	1.65
34514	Cover—Bakelite top end shell for motor	xx
34414	Idler—Rubber tired idler or drive wheel	1.20
34412	Motor—105-125 volt, 60 cycle phono. motor—less pulleys, capacitor and motor cradle (M1).	xx
34418	Plate—Motor support plate complete with turntable bearing	1.00
14887	Retainer—Idler wheel retainer spring	.01
34437	Spindle—Turntable spindle	xx
34417	Spring—Idler arm tension spring	xx
	AUTOMATIC SWITCH ASSEMBLIES U-20	
34419	Base—Pickup arm mounting base	.35
32865	Bracket—Switch bracket and terminal board	.40
34308	Cam—Switch cam assembly with spring	.55
32864	Lever—Switch actuating lever, roller, and clip.	.45
34309	Mounting—Pickup arm base mounting (rubber grommet, washers, and nut)	.20
34311	Ring—Retaining ring for pickup arm pivot shaft	.05
14195	Screw—No. 10-32 x 5/16 set screw for switch cam hub	.05
34314	Shaft—Pickup arm pivot shaft—for crystal pickup	.65
34310	Spool—Insulating spool for switch leads	.10
32868	Spring—Switch lever spring	.05
32867	Spring—Tension spring for switch cam	.05
32866	Switch—Mercury tube and leads (S5)	1.75
31608	Washer—Retaining washer for switch lever	.01
	POWER SUPPLY ASSEMBLIES U-42	
30868	Plug—2-contact female plug for motor leads	.35
14409	Plug—7-contact plug for power supply cable	.45
31319	Socket—Tube socket	.25
32144	Transformer—Power transformer, 105-120 volts, 50-60 cycles.	4.75
	SPEAKER ASSEMBLIES (RL-70K1)	
31825	Cap—Dust cap	.02
34705	Cone—Cone complete with voice coil (L8)	1.35
34728	Diffuser—Speaker diffuser	.80
5039	Plug—4-prong speaker plug	.30
34727	Speaker—12-inch dynamic complete with cone and voice coil—less output transformer and plug	9.55
33444	Transformer—Output transformer (T2)	2.00
	MISCELLANEOUS ASSEMBLIES	
33731	Button—Push button	.15
33730	Clamp—Dial clamp (Model U-20)	.15
31456	Cover—Protective cover for markers (Models U-20, U-42)	.08
33910	Cup—Needle cup (Model U-20)	.30
33909	Cup—Used needle cup (Model U-20)	1.00
34730	Dial—Glass dial scale (Models U-40, U-20)	1.50
34867	Dial—Glass dial scale (Model U-42)	1.50
34420	Escutcheon—Dial scale and push button escutcheon	1.80
34583	Frame—"C" band antenna loop frame	.30
34792	Gasket—Rubber gasket for motorboard (Model U-42)	1.10
30698	Hinge—Lid hinge (Model U-20)	.95
34871	Hinge—Door hinge—L.H. for 1 door (Model U-42)	.45
34870	Hinge—Door hinge—R.H. for 1 door (Model U-42)	.45
13103	Jewel—Pilot lamp jewel (Models U-40, U-42)	.15
33434	Knob—Tuning tone control, range switch or volume control and power switch knob	.30
31480	Lamp—Dial lamp (Model U-42)	.20
34800	Loop—"A" band loop antenna (Model U-20).	6.00
34729	Loop—Antenna loop (Model U-40)	5.25
34868	Loop—Antenna loop for "A" band (Model U-42)	5.50
33973	Marker—Station selector push button markers (Model U-20)	.45
34866	Marker—Station markers (Model U-42)	.50
34872	Pin—Complete set of dowel pins for antenna loop (Model U-42)	.25
30870	Plug—2-prong male connector for motor lead (Model U-20)	.35
32641	Plug—3-prong plugs for antenna loops (Model U-20)	.10
32641	Plug—3-prong male plug for loops (Models U-40, U-42)	.10
31048	Plug—Phono plug for pickup lead (Model U-20)	.15
34869	Pull—Door pull (Model U-42)	.35
35172	Rubber—Sponge rubber strip for doors	xx
32870	Screen—Compartment lamp screen (Models U-40, U-42)	1.00
31364	Socket—Dial lamp socket (Model U-42)	.20
14270	Spring—Retaining spring for knob, Stock No. 33434	.05
31470	Spring—Motorboard spring mounting hardware (Models U-40, U-42)	.10
30900	Spring—Retaining spring for button, Stock No. 33731	.05
34423	Support—Lid support (Model U-20)	1.35
34422	Turntable—Phonograph turntable less spindle (Model U-20)	.75

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

xx Price upon application to your RCA Victor Parts Distributor.

Power Output

Undistorted......... 5 watts, Maximum.........6 watts

Power Supply Ratings (U-20)

A-6.............. 105-125 volts, 60 cycles, 110 watts total
A-5.............. 105-125 volts, 50 cycles, 110 watts total
B-2.............. 105-125 volts, 25 cycles, 110 watts total
C-6....... 105-125/210-250 volts, 60 cycles, 110 watts total

Power Supply Ratings (U-40, U-42)

A-6.............. 105-125 volts, 60 cycles, 110 watts total
A-5.............. 105-125 volts, 50 cycles, 110 watts total
B-2.............. 105-125 volts, 25 cycles, 110 watts total
C-6.......... 105-130/140-160/200-250 volts, 60 cycles, 110 watts total

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked.

1. Dress AC switch leads away from 6SF5 tube socket.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "5" below.
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress C-6 and C-33 away from each other.
5. Dress C-17 away from power switch leads.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematics.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

For additional details, refer to booklet "RCA Victor Receiver Alignment."

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads from "C" band loop to chassis
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.

Phonograph Information

The U-20 phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field. However the two rubber tired idler pulleys should have their bearings lubricated occasionally with S.A.E. 10 oil. Care should be taken not to get any oil, grease, or other foreign matter on the rubber tires. These tires and the motor spindle should be cleaned occasionally with quick drying naphtha.

The turntable spindle bearing should also be lubricated occasionally with S.A.E. 10 oil.

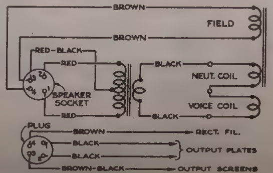
For information regarding the automatic record changers used in models U-40 and U-42 refer to service note No. 41 covering these mechanisms.

Antennas

Each of these receivers is equipped with two loop antennas ("C" band horizontal and fixed, and "A" band vertical and rotatable). During installation the "A" band loop should be rotated to the position giving maximum signal strength and freedom from noise. If desired, an outside antenna and ground can be connected to the terminals provided and when this is done the link between these terminals must be opened. However for loop operation this link must be closed.

Centering Loudspeaker Cone

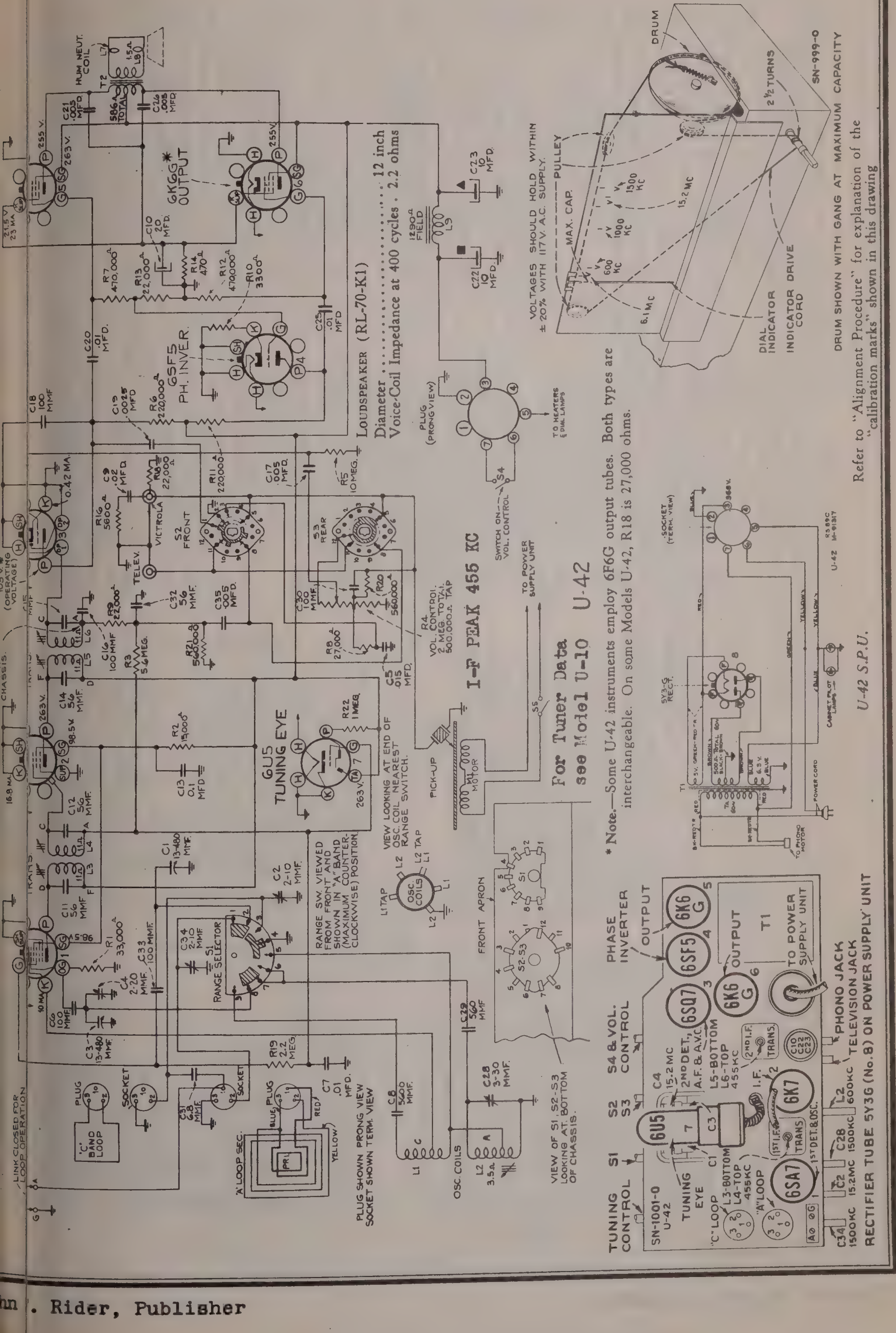
The loudspeaker cone centering support is fastened to the field frame by two screws accessible from the rear of the speaker. The cone can usually be recentered by loosening these screws and moving the support around until the proper position is found without disturbing the dust cover. However, in some cases it may be necessary to remove the front dust cover and insert spacers between the voice coil and pole piece in order to obtain proper centering. A new dust cover should then be installed.



SPEAKER CONNECTIONS U-20, U-40, U-42

RCA MFG. CO., INC.

MODEL U42,Chassis RC498B
Schematic,Trimmers
Socket, SPU Schematic



LOUDSPEAKER (RL-70-K1)
Diameter . . . . 12 inch
Voice-Coil Impedance at 400 cycles . 2.2 ohms

I-F PEAK 455 KC

For Tuner Data see Model U-10

U-42

* Note.—Some U-42 instruments employ 6F6G output tubes. Both types are interchangeable. On some Models U-42, R18 is 27,000 ohms.

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

U-42 S.P.U.

Pilot Lamps (4) .... 1 Mazda 44, 6.3 volts, 0.25 amp.; 3 Mazda 47, 6.3 volts, 0.15 amp.

POWER SUPPLY RATINGS

A-6	105-125 volts,	60 cycles, 115 watts
A	105-125 volts,	50-60 cycles, 115 watts
B-2	105-125 volts,	25 cycles, 115 watts
C-6	100-130/140-160/200-250 volts,	60 cycles, 115 watts
C	100-130/140-160/200-250 volts,	50-60 cycles, 115 watts

POWER OUTPUT

Undistorted .... 5 watts
Maximum .... 5.5 watts

PHONOGRAPH

Type .... Automatic
Record Capacity .... Eight 10-inch or seven 12-inch
Turntable Speed .... 78 r.p.m. adjustable

LOUDSPEAKER (RL-70-H5)

Type .... 12-inch Electrodynamic
Voice Coil Impedance .... 2.2 ohms at 400 cycles

PICKUP

Type .... Crystal
Impedance .... 100,000 ohms at 1,000 cycles
Average Output .... 1.5 volts at 1,000 cycles across 500,000 ohm load

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio-dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Transformer)
2	6A8G det. grid cap, in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Transformer)
3	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (150.5°) "A" band	L9
4		1,500 kc	1,500 kc (28°) "A" band	C25 (osc.) C30 (ant.)
5	Repeat steps 3 and 4.			
6	Antenna Terminal, in series with 400 ohms.	6 mc	6 mc (26.5°) "B" band	C23 (osc.)*
7		20 mc	20 mc (22°) "C" band	C21 (osc.)*
8	Follow "Adjustments for Electric Tuning."			

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The distance from the front of the chassis to the drum must not exceed ⅝-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

*Use minimum capacity peak if two peaks can be obtained, and rock gang condenser slightly while adjusting C23 and C21.

Note.—Oscillator tracks 455 kc above signal on all bands.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, move the dial indicator on the drive cable to the left-hand end mark on dial, with gang condenser fully meshed.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-386-B)	
14517	Board—Antenna ground terminal board	.25
30752	Bracket—Magic Eye mounting bracket	.25
31400	Capacitor—Triple adjustable trimmer, two sections 2-10 mmfd., one section 3-30 mmfd. (C21, C23, C25)	.50
32486	Capacitor—Antenna coil trimmer capacitor bank 20-470 mmfd. (C31, C32, C33, C34, C35, C36)	1.40
12722	Capacitor—18 mmfd. (C1)	.35
13141	Capacitor—47 mmfd. (C13)	.35
12723	Capacitor—56 mmfd. (C3, C46)	.35
12720	Capacitor—100 mmfd. (C39)	.35
14262	Capacitor—109 mmfd. (C5, C6)	.30
12404	Capacitor—120 mmfd. (C7, C8)	.30
13003	Capacitor—180 mmfd. (C37)	.35
14712	Capacitor—180 mmfd. (C2)	.30
32492	Capacitor—530 mmfd. (C24)	.40
31435	Capacitor—750 mmfd. (C26)	.40
4881	Capacitor—3,300 mmfd. (C22)	.60
31405	Capacitor—6,000 mmfd. (C27)	.75
5107	Capacitor—.0025 mfd. (C16)	.20
4838	Capacitor—.005 mfd. (C14, C17, C43)	.25
4858	Capacitor—.01 mfd. (C10, C40, C41, C42)	.25
14393	Capacitor—.01 mfd. (C11, C15)	.30
30882	Capacitor—.05 mfd. (C4, C9, C38)	.20
30867	Capacitor—0.5 mfd. (C20)	.30
32145	Capacitor—4 mfd. (C12)	.70
32142	Capacitor—Comprising two 10 mfd., one 20 mfd. sections (C18, C19, C44)	1.90
31382	Clip—Oscillator coil and core mounting clip	.04
32493	Coil—Antenna coil—A, B, and C bands (L1, L2, L3, L43)	1.35
31951	Coil—Oscillator coil—A, B, and C bands (L4, L5, L7, L9)	1.40
31383	Coil—Oscillator coil—A band (L41, L42)	.30
32487	Coil—Oscillator coil—A band (L39, L40)	.35
31385	Coil—Oscillator coil—A band (L37, L38)	.30
31369	Condenser—2-gang variable tuning condenser (C28, C29, C30)	2.65
31366	Control—Volume control, tone control, and on-off switch (R8, R13, S3)	3.00
32635	Cord—Indicator pointer drive cord	.24
32634	Cord—Variable condenser drum drive cord	.10
30905	Core—Adjustable core and stud for i-f transformer	.35
31386	Core—Adjustable core and stud for oscillator No. 31951	.35

STOCK No.	DESCRIPTION	Unit List Price
31372	Drum—Variable condenser drive cord drum and calibration dial	.65
11891	Lamp—Phono. compartment lamp	.17
31480	Lamp—Dial and "Electric Tuning" lamp	.20
30868	Plug—2-contact female plug for motor cable	.35
5040	Plug—4-contact female plug for speaker cable	.30
31373	Pulley—Drive cord pulley	.08
32143	Resistor—Voltage divider comprising one 11,000 ohm, one 3,000 ohm, one 22 ohm, and one 270 ohm sections (R14, R22, R23, R24)	.90
30545	Resistor—180 ohms, ¼ watt (R8)	.20
5114	Resistor—15,000 ohms, 1 watt (R17)	.22
14284	Resistor—22,000 ohms, 1/10 watt (R4)	.15
12454	Resistor—33,000 ohms, ¼ watt (R2, R12)	.20
12266	Resistor—39,000 ohms, ¼ watt (R7)	.20
14560	Resistor—100,000 ohms, ¼ watt (R25)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ¼ watt (R15, R19)	.20
14983	Resistor—330,000 ohms, ¼ watt (R9)	.20
13479	Resistor—390,000 ohms, ¼ watt (R20, R21)	.20
12486	Resistor—560,000 ohms, ¼ watt (R18)	.20
30963	Resistor—820,000 ohms, ¼ watt (R11)	.20
12013	Resistor—1 meg., 1/10 watt (R16)	.15
13730	Resistor—1 meg., ¼ watt (R1, R26)	.20
30208	Resistor—1.2 meg., ¼ watt (R10)	.20
12679	Resistor—2.2 meg., ¼ watt (R3)	.20
14343	Retainer—Retaining spring for station selector knob shaft	.03
14887	Retainer—Drive cord pulley retainer	.01
4669	Screw—No. 8-32 square head set screw for drum, Stock No. 31372	.03
31368	Shaft—Station selector knob shaft and pulley	.30
3682	Shield—Tube shield	.22
30868	Socket—2-contact female socket for motor power cable	.35
12493	Socket—5-contact female socket for speaker cable	.30
13871	Socket—Magic Eye socket	.45
14278	Socket—Pickup input socket	.25
31261	Socket—Tube socket	.25
31418	Spring—Indicator or drum drive cord tension spring	.05
32461	Switch—Range switch (S1, S2)	1.15
32498	Switch—Station selector push-button switch and Radio-Record switch (S4, S5, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45)	3.85
[illegible]	[illegible] C7, C8, C37, R4, R5)	3.80

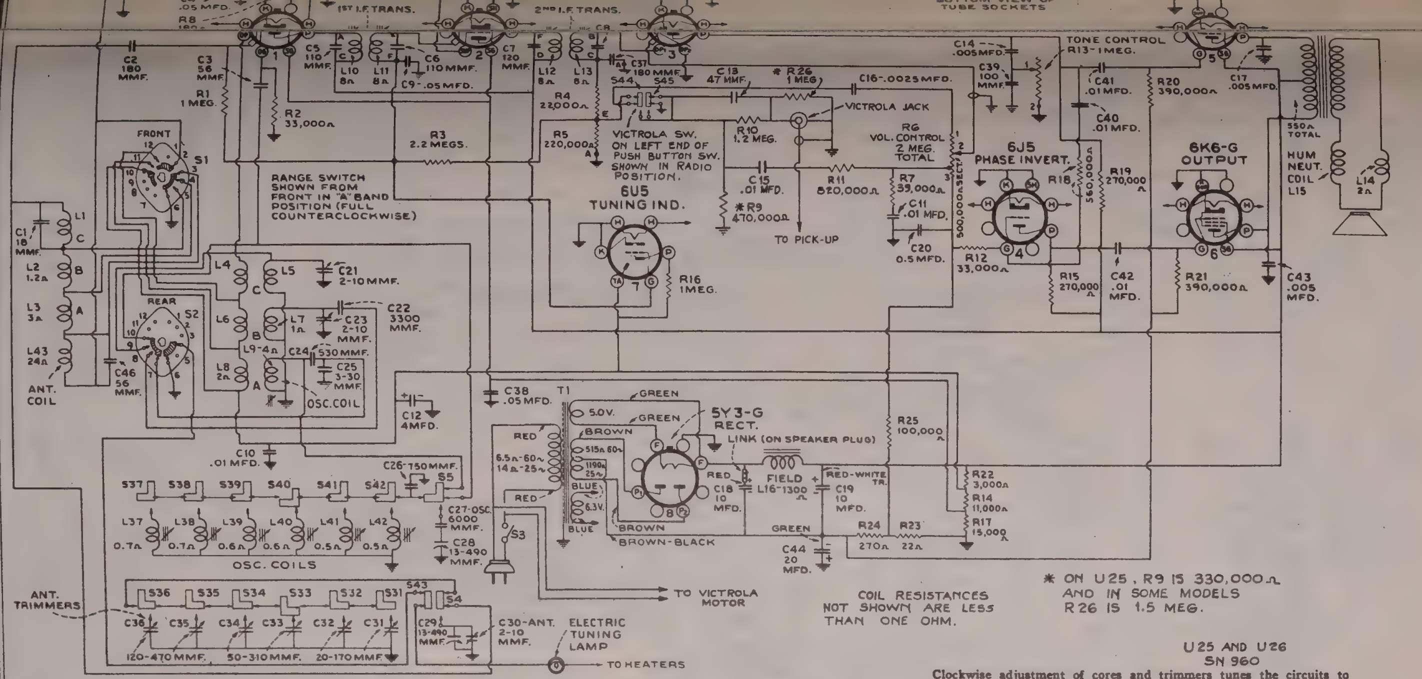
STOCK No.	DESCRIPTION	Unit List Price
31445	Transformer—Power transformer 105-125 volts, 25-60 cycles (T1)	7.80
31446	Transformer—Power transformer 100-130/140-160/200-250 volts, 50-60 cycles (T1)	8.05
32144	Transformer—Power transformer 105-125 volts, 50-60 cycles (T1)	4.75
	OPERATING MECHANISM	
31134	Bracket—Pickup locating lever mounting bracket (3)	.30
32878	Cam—Cam and gear assembly (4)	2.80
6808	Clutch—Trip lever friction clutch assembly (5)	.35
31146	Coupling—Motor coupling complete with turntable drive gear, rubber strips, motor coupling, and drive arm (6)	1.80
31129	Cover—Cap for top of record post	.45
31116	Finger—Trip lever friction finger assembly (7)	.45
31119	Gear—Long arm and rack gear for front left-hand record post (8)	.60
31120	Gear—Short arm and rack gear for rear right-hand record post (9)	.55
31121	Gear—Record post gear (10)	.90
31123	Guide—Main lever spring guide (11)	.40
31114	Lever—Index lever assembly (12)	.75
31137	Lever—Index lever tension spring lever (13)	.30
31138	Lever—Locating lever and pawl assembly (14)	.70
31113	Lever—Main lever assembly (15)	1.35
31140	Lever—Pickup lift cable lever and spring assembly (16)	.55
31135	Lever—Pickup locating lever assembly (17)	.85
31130	Lever—Record separator elevating lever complete with adjustment screws (18)	.80
31132	Lever—Trip detaining lever (19)	.30
31115	Lever—Trip lever assembly (20)	1.85
31131	Lever—Trip regulator lever (21)	.25
31133	Pawl—Trip pawl assembly (22)	.80
31124	Pin—Record post drive pin (23)	.04
14207	Roller—Pickup lift cable roller and bracket assembly (24)	.55
31118	Screw—Cone pointed set screw for trip lever hub or record post shelf	.06
4563	Screw—Pickup lift cable screw and nuts	.04
141[illegible]	Screw—Set screw for flexible coupling	.05
31117	Screw—Special screw to adjust friction clutch tension	.03
31126	Separator—Record separator knife (25)	.75
31122	Shaft—Record separator post shaft (26)	.40
31125	Shelf—Record post shelf assembly (27)	1.25
31141	Spindle—Turntable spindle shaft	1.40
3676	Spring—Cam pawl tension spring on main gear	.04
14190	Spring—Pickup locating lever short spring or locating lever pawl tension spring (28)	.08
32882	Spring—Main lever tension spring (29)	.05
31136	Spring—Index lever tension spring (30)	.05
3666	Spring—Pickup lift cable tension spring (31)	.04
31127	Spring—Record separator pressure spring (32)	.02
14191	Spring—Trip detaining lever tension spring (33)	.04
31875	Spring—Pickup locating lever tension spring (34)	.04
32436	Spring—Locating lever tension spring (35)	.05
31147	Strip—Complete set of rubber strips for flexible coupling	.40
31139	Turntable Assembly—less spindle	3.35
31128	Washers—"C" washer for top of record post	.04
31143	Washers—Turntable thrust washers (1 steel, 1 bronze, 1 felt)	.15
	MOTORBOARD ASSEMBLIES	
31149	Base—Tone arm mounting base	.35
32927	Board—Record changer base complete with all welded and riveted posts and bearings—less all operating parts	6.30
14209	Bumper—Main lever rubber bumper (1)	.08
9848	Cup—Used needle cup, rest, and lid complete	.75
32877	Escutcheon—Index escutcheon	.40
31151	Guide—Pickup lift cable guide (coil spring) (2)	.10
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Needle cup lid tension spring	.04
	MOTOR ASSEMBLIES	
31626	Field—Complete coil and laminations for 25 cycle motor	9.30
31619	Field—Complete coil and lamination for 50-60 cycle motor	7.80
31618	Field—Complete coil and laminations for 60 cycle motor	5.50
31624	Governor—Governor complete for 25 cycle motor	3.05
11703	Governor—Governor complete for 50-60 cycle motor	3.05
31623	Governor—Governor complete for 60 cycle motor	2.80
31448	Motor—105-125 volts, 25 cycles (M1)	23.70
31163	Motor—105-125 volts, 50-60 cycles (M1)	20.50
31157	Motor—105-125 volts, 60 cycles (M1)	17.75

STOCK No.	DESCRIPTION	Unit List Price
30870	Plug—2-contact male plug for motor power cable	.35
31447	Screw—Complete set of motor mounting screws, washers, and spacers—for 25 cycle models only	.40
31158	Screw—Complete set of motor mounting screws, washers, and spacers—for 50-60 cycle models only	.25
31636	Shaft—Turntable spindle shaft and gear for 25 cycle motor	1.90
31634	Shaft—Turntable spindle shaft and gear for 50-60 and 60 cycle motor	1.70
32913	Spring—Governor weight and spring for 25 cycle motor	.25
32914	Spring—Governor weight and spring for 50-60 cycle motor	.30
32912	Spring—Governor weight and spring for 60 cycle motor	.25
32875	Switch—Motor control switch (S6)	.30
	PICKUP AND ARM ASSEMBLIES	
33096	Arm—Pickup arm, less crystal and cable	2.60
32635	Cable—Pickup arm lift cable and clips	.24
32556	Cable—Shielded cable and plug	.75
31156	Crystal—Pickup crystal cartridge and needle screw	4.25
33114	Damper—Viscoloid damper for armature	.15
31160	Screw—Pickup needle screw	.12
31161	Shaft—Pickup pivot arm and shaft assembly	.45
	SPEAKER ASSEMBLIES (RL-70H-5)	
13866	Cap—Dust cap for cone center	.03
12012	Coil—Field coil (L16)	2.90
11469	Coil—Neutralizing coil (L15)	.30
31275	Cone—Speaker cone and voice coil (L14)	1.75
31539	Plug—5-contact male plug for speaker	.25
32146	Speaker complete	12.10
14534	Transformer—Output transformer (T2)	2.10
14357	Washer—Spring washer to hold field coil securely	.06
	MISCELLANEOUS ASSEMBLIES	
12038	Band—Rubber band for Magic Eye	.02
31397	Button—Station selector push-button	.15
13103	Cap—Pilot light jewel	.15
31456	Cover—8 protective covers for push-button markers	.08
31541	Cushion—Motor plate mounting cushions and clamps sufficient for one instrument	.50
32495	Dial—Glass dial scale (Model U25 only)	.75
32494	Dial—Glass dial scale (Model U26 only)	.75
31407	Escutcheon—Magic Eye or Electric Tuning indicator escutcheon	.25
31395	Escutcheon—Tuning dial escutcheon only, less push-buttons and dial scale	1.15
30698	Hinge—Lid hinge complete with screws	.95
4585	Hinge—One upper and one lower door hinge (Model U26 only)	.60
31564	Holder—Needle card holder	.50
31543	Indicator—Electric tuning indicator disc	.25
31392	Indicator—Indicator pointer, carriage and clip	.30
31355	Knob—Range switch knob	.12
14359	Knob—Station selector knob	.20
31391	Knob—Tone control knob	.15
30773	Knob—Volume control knob	.15
31460	Marker—"Dial Tuning" push-button marker (Model U25 only)	.04
31458	Marker—"Dial Tuning" push-button marker (Model U26 only)	.01
31459	Marker—"Victrola" push-button marker (Model U25 only)	.04
31457	Marker—"Victrola" push-button marker (Model U26 only)	.01
31590	Markers—1 set station call letter markers (Model U25 only)	.40
31589	Markers—1 set station call letter markers (Model U26 only)	.35
11210	Screw—Chassis mounting, screws, washers, and lockwashers	.05
31393	Screen—Dial color screen	.40
32870	Screen—Phono. compartment lamp screen	1.00
33083	Spring—Actuating spring for lid support (Model U26 only)	.50
30330	Spring—Retaining spring for knob, Stock No. 31391	.03
14270	Spring—Retaining spring for knob, Stock Nos. 30773 and 31355	.05
4982	Spring—Retaining spring for knob, Stock No. 14359	.05
31470	Spring—Motorboard suspension top spring, bottom spring, screw, and lockwasher (4 req'd)	.10
33081	Support—Right-hand lid support (Model U26 only)	1.90
33082	Support—Left-hand lid support (Model U26 only)	1.90
31478	Support—Lid support (Model U25)	2.20

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

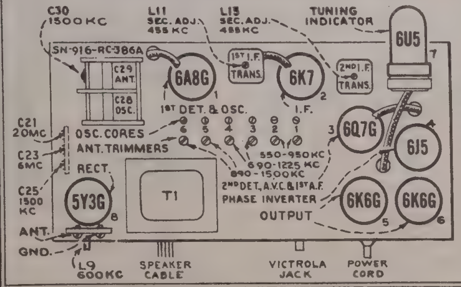
MODELS U25,U26
Chassis RC386B
Schematic,Socket
Trimmers,Tuner
Lead Dress



COIL RESISTANCES NOT SHOWN ARE LESS THAN ONE OHM.

* ON U25, R9 IS 330,000Ω AND IN SOME MODELS R26 IS 1.5 MEG.

U25 AND U26
SN 960



Adjustments for Electric Tuning

These models have eight push buttons. The left-hand button is a Victrola switch. The right-hand button connects the gang condenser for manual tuning. The other six buttons are for electric tuning of six different stations in the standard-broadcast range. The station buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button, and manually tune in the first station on the list.
3. Push in station button No. 1 (second from left) and adjust No. 1 oscillator core (L37) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer (C36) for maximum output on this station.

Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

5. Adjust for each of the remaining five stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

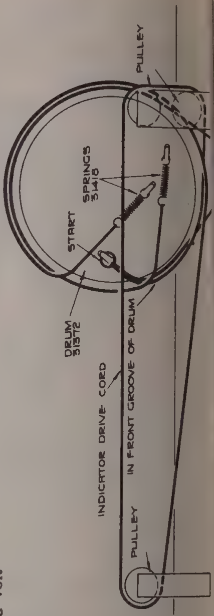
Precautionary Lead Dress.—

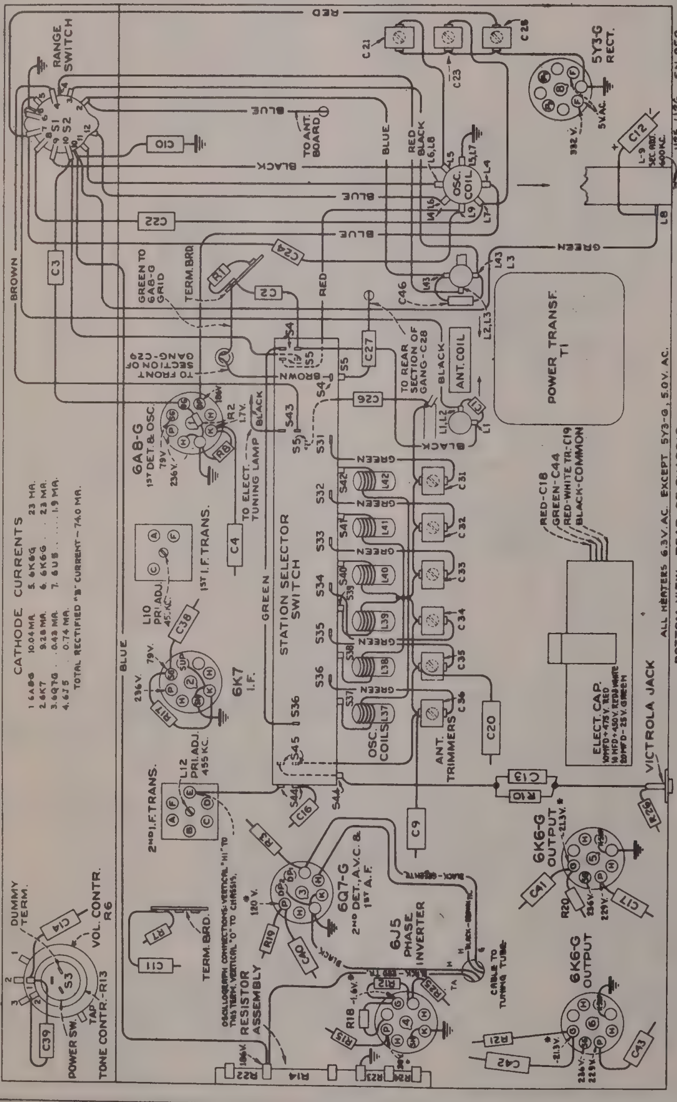
1. Dress red leads from power transformer to power switch (S3), in corner of chassis and away from volume control terminals.
2. Dress brown lead from push-button switch to gang over end of switch, and away from C27 and bus between S5 and range switch.
3. Leads to C27 must be as short as possible.
4. Blue lead from range switch to oscillator coil must be as short as possible and dressed away from other leads. All leads should be dressed away from antenna coil.
5. Leads across back of chassis must be dressed under electrolytic away from Victrola jack.
6. Parts and leads should be dressed away from R22-R14 as it becomes heated.
7. Leads from oscillator coil to trimmers must be dressed away from coil.
8. Green lead from S4 to range switch must be clear of other leads and away from front edge of chassis.

MODELS U25,U26
Chassis RC386B
Chassis Wiring
Voltage,Dial Drive

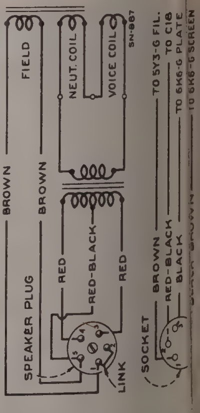
RCA MFG. CO., INC.

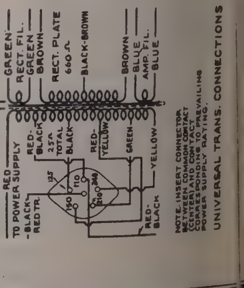
FOR PHONOGRAPH DATA SEE
RCA PAGES 10-51 AND
10-52 in VOLUME X





* NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.





RCA MFG. CO., INC.

ecific ions

OSC-22

—1939 No. 28—
First Edition

Wireless Oscillator

FRE ENCY RANGE........... Approx. 530-625 kc
TUB COMPLEMENT
(1) CA-6SA7............ Modulator—Oscillator
(2) CA-25Z6-G............ Half-Wave Rectifier
(3) ype B-86-A.............. Ballast Resistor

POW R SUPPLY RATINGS
A-C ating.... 105-125 volts, 25-60 cycles, 35 watts
D-C ating.............. 105-125 volts, 35 watts

DIM SIONS
Chas Base.............. 7½-in. x 4½-in x 2½-in.

Pr utionary Lead Dress.—
1. eep 110-volt leads away from oscillator coil.
2. eads to oscillator coil must be short and direct.

RCA Victor Wireless Oscillator is an er un used to convert your Victrola ament, ich as the RCA Victor Model VA- to a w eless record player. This permits o play honograph records through your recei r without any connecting wires the trola Attachment to the Radio ver.

NSTALLATION

tain A Victrola Attachments such as VA-22 e provided with a side shelf in- the c inet for mounting the Wireless ator. ree holes are drilled in the shelf tly s ced for the oscillator mounting to go rough and screw into the holes in SC-22 hassis base. To install the OSC-22 detach he VA-22 power cord from the ic out , then:

Look the back of the VA-22 or similar Victro cabinet and locate the connection from t pickup to the volume control on the sic of the cabinet. This is a length of wire h a connector plug on one end. Discor ect the plug from the bayonet socket nd then loosen the set screw and remov the knob and the volume control on th other end of the wire, together with t wire, from the VA-22 cabinet. It is atta ed to the cabinet by a nut and washe

Moun the OSC-22 on the cabinet shelf with e three mounting screws and washe provided.

Moun the OSC-22 Power Switch and Volun Control unit in the location from which he VA-22 volume control was re- moved using the washer and nut taken from e VA-22 volume control. Be sure that locating pin on the new control is in e correct position. Attach knob on shaft Power Switch and Volume Control unit a tighten up the set screw.

Inser he pickup plug into the connector on th able of the newly installed Volume Contr of the OSC-22.

Inser he plug on the end of the VA-22 powe cord into the power receptacle on the O -22 chassis base.

Inser he plug on the end of the OSC-22 powe cord into the electric outlet.

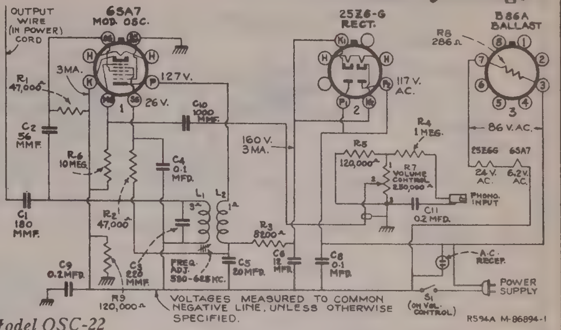
OPERATION

TRO AND MOVING MECHANISM

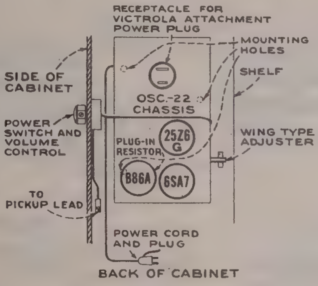
orde to obtain best reproduction, the newly installed Volume Control should first be turned on about 2/3 full and the Volume Control on your radio receiver turned to the point that gives the greatest volume you are likely to require. Then all control of volume may be made with the knob on the Wireless Victrola Attachment. In particularly noisy locations it may be preferable to set the Volume Control of the Wireless Victrola Attachment at about 2/3 full and regulate with the volume control knob on the receiver.

The Victrola Adjustment.—On the back of the OSC-22 chassis is a small adjusting rod to give reproduction at the most convenient point on your radio receiver dial. With your radio receiver in operation, set the Tuning Control to bring the pointer on the Standard Broadcast Scale to a point at the low frequency end between 530 and about 630 kilocycles, 530 is preferable, at which no station can be obtained. Then set your Wireless Victrola Attachment in operation and turn the adjusting rod on the OSC-22 slowly and carefully until the record reproduction is heard at its best.

Antenna Modification.—If, due to your particular special conditions, insufficient volume or excessive noise interference affects record reproduction, a simple remedy is to connect a wire from the Wireless Victrola Attachment to your radio antenna lead. This is easily accomplished by means of a length of wire to cover the distance between the Victrola Attachment and Radio Receiver. One end of this should be wound 3 or 4 turns around the outside of the short wire projecting from the OSC-22 plug on the power cord. The other end of the wire should be wound 3 or 4 turns around the outside of the receiver antenna lead. When an RCA Master Antenna is used, the wire should be wound around the counterpoise lead where it is attached to the A-3 terminal of your radio receiver antenna terminal board.



Model OSC-22
Schematic Diagram



Radio Receiver Controls.—Your radio receiver picks up the record selection as it does a broadcast program. So after the Victrola Adjustment is made, you must tune your radio receiver to the signal from the Wireless Victrola Attachment between 530 and about 630 kilocycles. Do this according to the instructions for operating your particular receiver and turn the Tuning Control to bring the pointer on the dial scale to the low frequency end of the Standard Broadcast band, about 530 to 630 kilocycles, and tune in accurately with the Wireless Victrola Attachment playing a selection. This point is your "Victrola" station. If you have a radio with Push Button Tuning you can set a push button and label it "Victrola." *The push button or switch labeled "Victrola," "Record Player" or "Phono" on RCA Victor Radio Receivers previous to 1939 is of no use with the Wireless Victrola Attachment.*

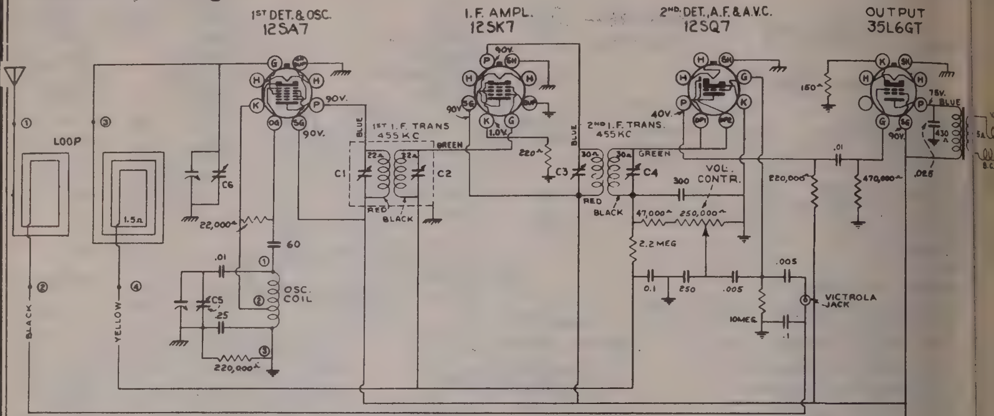
PLAYING

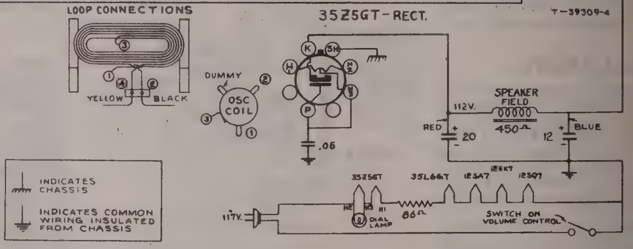
Plug the power cord from the OSC-22 into a convenient house outlet, then to play records proceed as follows:

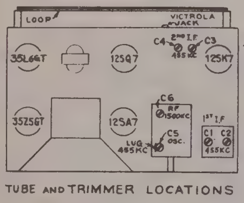
1. Turn on the power to your radio receiver.
2. Set the tuning knob to your new "Victrola" station (530 to 630 kilocycles), or if you have specially adjusted a push button, press it.
3. Turn on power to the Wireless Victrola Attachment.
4. Make the set-up for playing records in accordance with the original instructions accompanying the Victrola Attachment.
5. Turn the Wireless Victrola Attachment Volume Control about 2/3 fully clockwise.
6. Adjust radio receiver Tuning knob to accurately tune in the phonograph selection.
7. Turn Radio Receiver Volume Control to give the loudest reproduction you are likely to require.
8. Adjust the Wireless Victrola Attachment Volume Control to suit.
9. Adjust radio receiver Tone Control if desirable.

— ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE. —

OCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
3793	Ballast—Ballast resistor tube—Type B86A (R8)	.80	33792	Receptacle—A.C. receptacle	.45
2723	Capacitor—56 mmfd. (C2)	.35	33793	Resistor—Ballast resistor tube—Type B86A (R8)	.80
3003	Capacitor—180 mmfd. (C1)	.35	14075	Resistor—8,200 ohms, ¼ watt (R3)	.20
2694	Capacitor—220 mmfd. (C3)	.35	12412	Resistor—47,000 ohms, ¼ watt (R1, R2)	.20
4839	Capacitor—0.1 mfd. (C4, C8)	.30	13734	Resistor—120,000 ohms, ¼ watt (R5, R9)	.20
3834	Capacitor—0.2 mfd. (C9, C11)	.30	13730	Resistor—1 meg., ¼ watt (R4)	.20
2576	Capacitor—Electrolytic, one section 20 mfd., and one section 12 mfd. (C5, C6)	.90	13601	Resistor—10 meg., ¼ watt (R6)	.20
2635	Capacitor—1,000 mfd. (C10)	.50	31251	Socket—Tube socket	.25
2501	Coil—Oscillator coil (L1, L2)	1.00	33793	Tube—Ballast resistor tube—Type B86A (R8)	.80
			33794	Volume control and switch (R7, S1)	1.50







TUBE AND TRIMMER LOCATIONS

— 1939 No. 34 —

Features of design include: New Type single-ended tubes (12SA7, 12SK7, and 12SQ7); edge-lighted dial; dust proof electrodynamic loudspeaker; "Magic Loop"; Television-Victrola Jack; and Beam Power Output.

First Edi

Electrical and Mechanical Specifications

FREQUENCY RANGE	540-1,680 kc
Intermediate Frequency	455 kc

TUBE COMPLEMENT

(1) RCA-12SA7	1st-Detector-Oscillator
(2) RCA-12SK7	I-F Amplifier
(3) RCA-12SQ7	2nd-Detector, 1st A-F, and A.V.C.
(4) RCA-35L6GT	Power Output
(5) RCA-35Z5GT	Half-Wave Rectifier
Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 3 wa
D-C Rating	105-125 volts, direct current, 3 wa

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	wa
Maximum	2 wa

LOUDSPEAKER

Type	4-inch Electro
Cabinet Dimensions (inches)	Height 5-1/16, Width 8½, D
Weight (net)	4¾

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT." terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Victrola Attachment.—A jack is provided on the rear of cabinet for connecting a Victrola Attachment into the audio-amplifying circuit. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

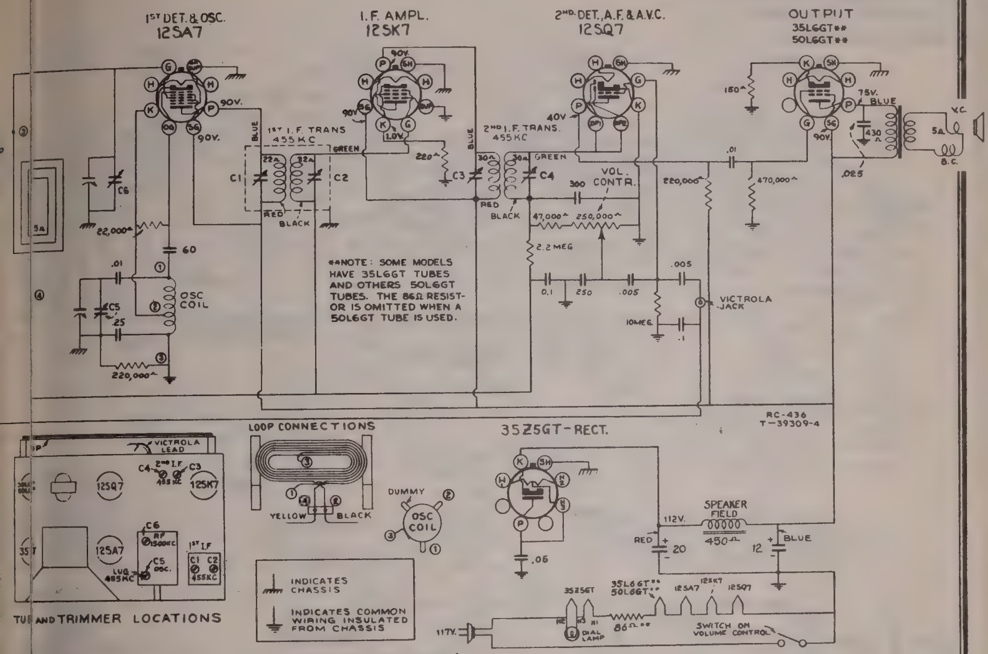
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust t lowing fo peak out
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, (1st and transfor
2	Antenna term. of ant. loop in series with 100 mmfd.	1,680 kc	Full clockwise (out of mesh)	C5 (oscil
3		1,500 kc	Resonance on 1,500 kc signal	C6 (ante

Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other
2. Dress lead from gang condenser to grid of 12SA7 close to and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to ch
4. Dress blue 2nd I-F lead close to chassis and behind socket.

RCA MFG. CO., INC.

MODELS 40X-50 to 40X-57
Chassis RC-436
Schematic,Voltage



TUB AND TRIMMER LOCATIONS

E: Ouput cathode resistor is 120 ohm when 50L6GT tube is used.

settin Dial.—With gang condenser in full mesh, the pointer be hczontal.

nna.-The set is equipped with a built-in loop antenna. If door tenna is used, it may be connected to the "ANT" al on ear of cabinet. It should not be longer than 100 feet, ng le -in. If it is longer, connect a 100 to 200 mmf. ca- in s es with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

K	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-436)	
5	ble—Phono. cable	.30
7	pacitor—60 mmfd.	.35
8	pacitor—250 mmfd.	.35
2	pacitor—300 mmfd.	.35
8	pacitor—.005 mfd.	.25
0	pacitor—.025 mfd.	.20
7	pacitor—.05 mfd.	.20
9	pacitor—.1 mfd.	.30
4	pacitor—.25 mfd.	.30
6	pacitor—Electrolytic, 20-12 mfd.	.90
8	pacitor—Variable tuning	2.25
2	il—Oscillator coil	.60
4	rd—Drive cord	.10
3	um—Drive drum	.40
0	mp—Pilot lamp	.20
3	op—Complete antenna loop	1.20
8	sistor—86 ohms	.15
1	sistor—120 ohms, ½ watt	.20
8	sistor—150 ohms, ½ watt	.20
1	sistor—220 ohms, ½ watt	.20
8	sistor—22,000 ohms, ½ watt	.20
2	sistor—47,000 ohms, ½ watt	.20
4	sistor—220,000 ohms, ½ watt	.20
5	sistor—470,000 ohms, ½ watt	.20
9	sistor—2.2 meg., ½ watt	.20
1	sistor—10 meg., ½ watt	.20
1	aft—Drive shaft	.20
5	ring—Drive cord spring	.06
7	cket—Dial light socket	.30
7	cket—Tube socket	.20
6	ansformer—I-F input transformer	1.25

Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other parts.
2. Dress lead from gang condenser to grid of 12SA7 close to chassis and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to chassis.
4. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

POWER SUPPLY RATINGS
A-C Rating .... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating .... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted .... .6 watts
Maximum .... 2.0 watts

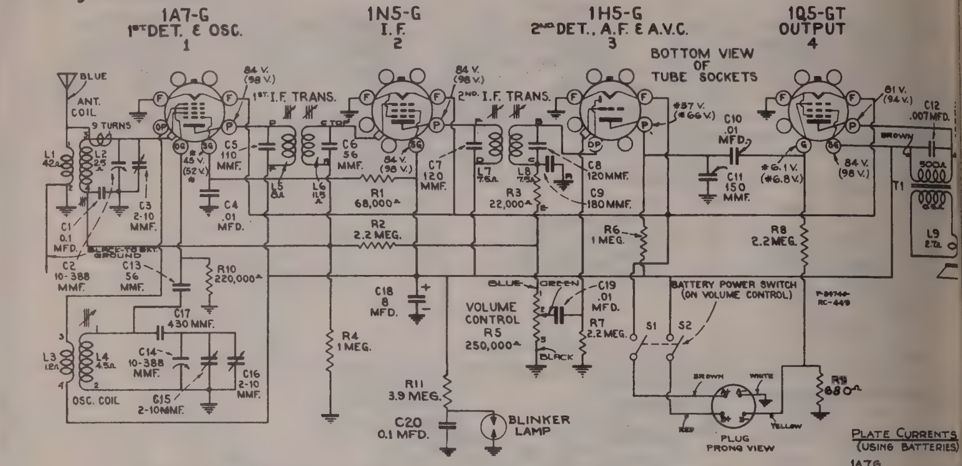
STOCK No.	DESCRIPTION	Unit List Price
32967	Transformer—I-F output transformer	1.05
32545	Volume control	1.50
	SPEAKER ASSEMBLIES (39105-2)	
32963	Speaker—Complete with transformer	3.95
32964	Transformer—Output transformer	1.25

PR ES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS BK41,BT41
Chassis RC-449
Schematic,Voltage
Alignment,Trimmers
Socket,Lead Dress

RCA MFG. CO., INC.

MODEL CV40, S
Schematic

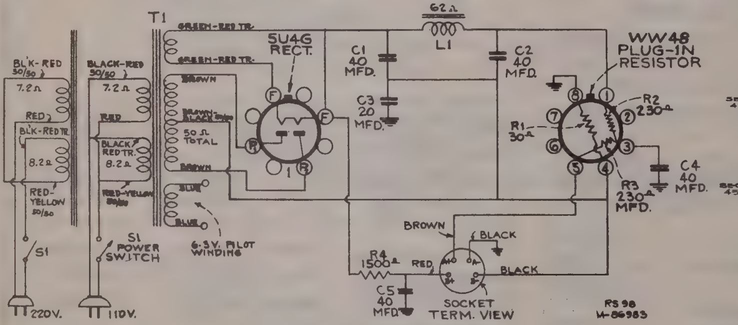


STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

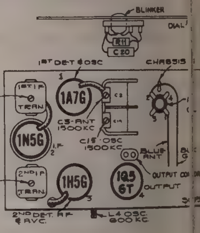
VOLTAGES IN PARENTHESES ARE THOSE OBTAINED BY USING POWER SUPPLY CV-40. WHEN BATTERIES ARE USED VOLTAGES NOT IN PARENTHESES APPLY.

PLATE CURRENTS
(USING BATTERIES)

1A7G
OSC. ----0.85 M.
DET. ----0.49 M.
1N5G ----1.2 M.
1H5G ---- .026 M.
1Q5GT ----6.0 M.



Schematic Diagram—Model CV-40



Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5-G I-F grid cap, in series with 0.01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	1A7-G 1st-det. grid cap in series with 0.01 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	600 kc	600 kc	L4 (oscillator) L2 (antenna)
No. 4	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C15† (oscillator) C3 (antenna)

† Trimmer C16 on gang condenser should be unscrewed one complete turn from tight, before adjusting C15.

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are as follows: Vertical "Hi" to E on the 2nd I-F transformer, Vertical "O" to chassis.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Precautionary Lead Dress

1. Red lead from second i-f transformer to screen terminal of
must be dressed close to and along edge of chassis.
2. Twisted green wire from antenna coil to gang must be 9
and kept clear of rotor.
3. Blue and green leads to volume control must be dressed cl
chassis and between gang and front apron.
4. The opening in the shield of the 1N5-G should be turned
from the chassis and the i-f transformers.
5. Antenna and ground wires shoud be twisted together.

CV-40
Rectifier RCA-5
Plug-in Resistor.................... WW48, Stock No. 8

POWER OUTPUT (Battery Operation)
Undistorted 0.125
Maximum 0.800

LOUDSPEAKER
Type .... Permanent Magnet Dy
Diameter .... BK41, 8 inches; BT41, 5
Voice Coil-Impedance BK41, 2.2 ohms; BT41, 3.0 ohms at 400 c

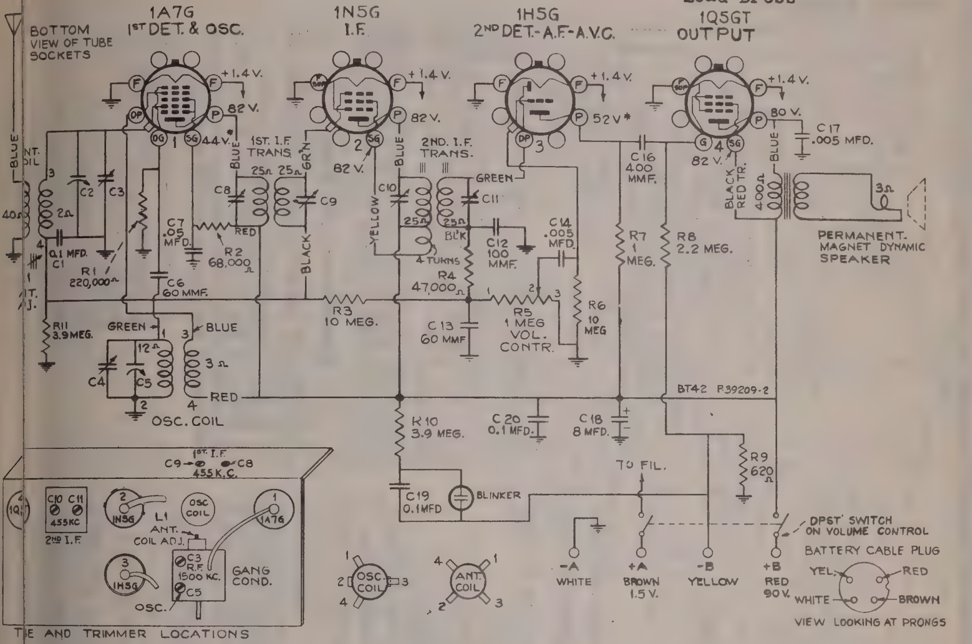
BATTERY REQUIRED
Combination 1½ volt-90 volt A-B Pack

CURRENT CONSUMPTION
"A" at 1.4 volts, 0.25 amp.
"B" at 90 volts, 9.4 ma.
A-C Operation

Use of power unit CV-40 with either Model BK41 or
adapts that receiver for A-C operation.

RCA MFG. CO., INC.

MODEL BT42,Chassis RC408A
Schematic,Voltage,Socket
Alignment,Trimmers
Lead Dress



T[illegible]E AND TRIMMER LOCATIONS

— 1939 No. 32 —

General Description

[illegible]he RCA Victor Model BT-42 is a table type battery operated ra[illegible] receiver.

[illegible]**eatures** of design include: On and off "Economy" Blinker; 4 [illegible]CA 1.4 volt low drain tubes; large horizontal dial; magnetite c[illegible] transformers; automatic volume control; 16 to 1 tuning ratio; 5[illegible]ermanent magnet speaker, and an available converter unit (CV40) to [illegible]onvert the receiver to 110 volt AC operation.

Electrical and Mechanical Specifications

Fr[illegible]uency Range	540-1,720 kc
In[illegible]mediate Frequency	455 kc

R[illegible] TUBE COMPLEMENT

(1[illegible] RCA-1A7-G	1st-Det.—Osc.
(2[illegible] RCA-1N5-G	I-F Amplifier
([illegible] RCA-1H5-G	2nd-Det., A-F, and A.V.C.
(4[illegible] RCA-1Q5-G	Output

BATTERIES REQUIRED
1 "A"—"B" Pack (Eveready No. 748 or equivalent).

CURRENT CONSUMPTION
"A," 0.24 ampere—"B," 10 milliamperes.

POWER OUTPUT

Undistorted	0.15 watt
Maximum	0.25 watt

LOUDSPEAKER

Type	5-inch permanent-magnet dynamic
Voice-coil Impedance	3.3 ohms at 400 cycles

Cabinet Dimensions (inches)	Height 9⅜, Width 17½, Depth 9⅜
Weight—Shipping weight	16 pounds
Tuning Drive Ratio	16 to 1

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the [illegible]eter across the voice coil, and turn the receiver volume control to [illegible]aximum.

Test-oscillator.—For all alignment operations, keep the output as [illegible]w as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser fully out of mesh, [illegible]e indicator should point to the extreme right (high frequency) [illegible]ark on the dial scale.

CAUTION.—When ready to install or replace batteries or tubes to make any repairs or changes, be sure to turn off power switch.

[illegible]teps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn Radio Dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 550 kc End of Dial	C8, C9, C10, C11 (1st and 2nd I-F transformers)
2	Antenna lead (blue) in series with 100 mmfd.	1,500 kc	1,500 kc	C5 (oscillator)
3		600 kc	600 kc	L1 (antenna)*
4		1,500 kc	1,500 kc	C3 (antenna)

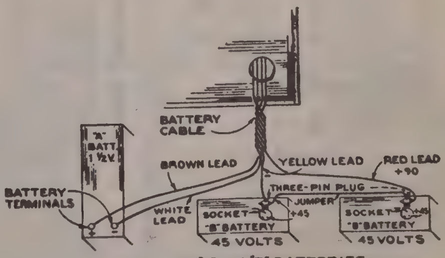
* When adjusting L1 (antenna), trimmer C3 should be in a [illegible]inimum capacity position (unscrewed).

Precautionary Lead Dress.—

1. All filament (brown) and B+ (red) leads must be dressed away from unshielded I.F. coil.

2. Green grid lead of 1A7G tube to be twisted around antenna (blue) lead for capacity coupling.

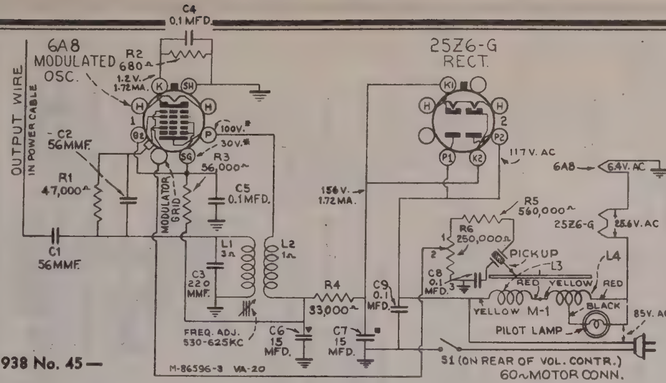
3. Red and brown battery cable leads to be dressed and held against front apron with tape.



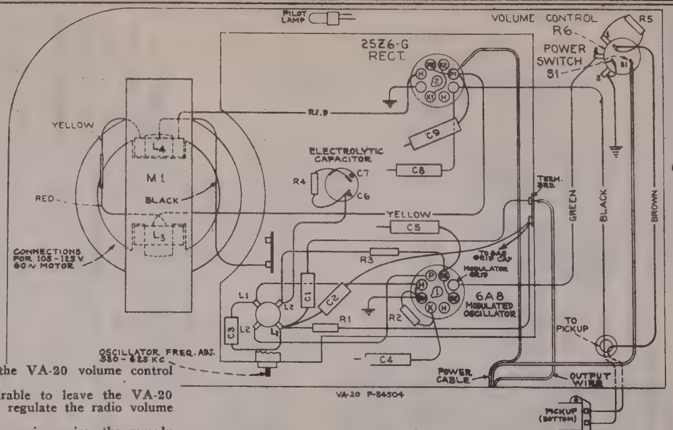
SEPARATE "A" AND "B" BATTERIES

MODEL VA-20,Wireless Record Player Schematic
Set-up Procedure,Notes
Chassis Wiring

RCA MFG. CO., INC.



—1938 No. 45—



General Description

The crystal pickup in Model VA-20 is connected through a volume control to grid No. 1 in an RCA-6A8 tube which functions as a modulated r-f oscillator. The oscillator frequency can be adjusted from 530 to 625 kc by means of a magnetite core in the oscillator transformer, L1-L2. (This is a screwdriver adjustment at the rear of the cabinet.) An output wire is connected to the grid circuit of the oscillator, and is run parallel with the power cable. The output is sufficient to permit operation within approximately 20 feet of a radio receiver.

Electrical and Mechanical Specifications

FREQUENCY RANGE .... 530-625 kc

TUBE COMPLEMENT

(1) RCA-6A8	Modulator-Oscillator
(2) RCA-25Z6-G	Half-Wave Rectifier
Dial Lamp	Mazda 47, 6-8 volts, .15 amp.

POWER SUPPLY RATINGS

A-6	105-125 volts, 60 cycles, 50 watts
A-5	105-125 volts, 50 cycles, 50 watts

MOTOR

Type	Synchronous (Manual Starting)
Turntable Speed	78 r.p.m.

PICKUP

Type	Crystal
Pickup Impedance	100,000 ohms at 1000 cycles
Average Output Voltage	1½ volts at 1000 cycles with 250,000 ohm load.

CABINET DIMENSIONS

Height	3⅜ inches
Width	12⅛ inches
Depth	8¼ inches
Over-All Height	5 inches
Turntable Diameter	7 inches

Weight 7¼ lbs. (net), 9¼ lbs. (shipping)

Set-Up Procedure

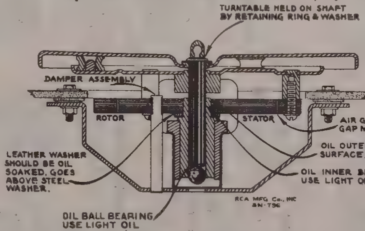
1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-20 to full clockwise position. Start a record on the VA-20. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.

2. Tune the radio receiving set to a quiet point between 530-625 kc.

3. Tune the oscillator in the VA-20 to this frequency ... receiver. Clockwise rotation decreases the frequency; ... is likely to be required, and then use the VA-20 volume control for further adjustment.

5. In noisy locations, it may be desirable to leave the VA-20 volume control turned full clockwise, and regulate the radio volume control for the desired level.

6. If there is insufficient volume, or excessive noise, the remedy is to couple the VA-20 to the radio receiver, by running a piece of insulated wire between the two units: Wrap one end (three or four turns) around the antenna lead-in on the radio, and wrap the other end (three or four turns) around the short wire that projects from the plug on the power cord of the VA-20. With an RCA Master Antenna, wrap the wire around the counter-poise lead where it attaches to the receiver (terminal A3) or to the coupling unit (terminal B).


TURNTABLE HELD ON SHAFT BY RETAINING RING & WASHER
DAMPER ASSEMBLY
ROTOR
STATOR
AIR GAP IS .016 ± .0007" GAP MUST BE UNIFORM.
OIL OUTER BEARING SURFACE, USE LIGHT OIL.
OIL INNER BEARING SURFACE. USE LIGHT OIL.
LEATHER WASHER SHOULD BE OIL SOAKED, GOES ABOVE STEEL WASHER.
OIL BALL BEARING USE LIGHT OIL
RCA MFG. Co., INC SN-756

7. If the radio receiver has push-button tuning, one of the buttons may be set up to tune in the VA-20 oscillator frequency. This button should be marked "Record Player."

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

... stator must be free to deflect in either direction between the limits of the damper spring. The damper spring

Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting upward.

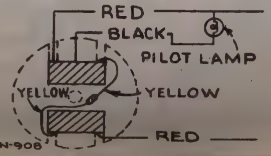
Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.

*Note: Voltages with star (*) are operating voltages in circuits with high series resistance. The actual measured voltage will be lower, depending on the voltmeter loading. Voltages are measured to chassis, unless otherwise indicated. Values should hold within approximately ± 20% with 117-volt a-c supply.

Precautionary Lead Dress

1. The power supply cord must be dressed between chassis and top of cabinet, away from grid of 6A8, and entirely away from 25Z6-G.
2. All leads to oscillator coil must be as short as possible.
3. All motor leads must be dressed away from rotor.
4. Pickup leads must be dressed away from the top grid of 6A8, and kept away from the 25Z6-G.

Caution: Do not remove turntable from motor while power is turned on, as damage to the tubes will result.

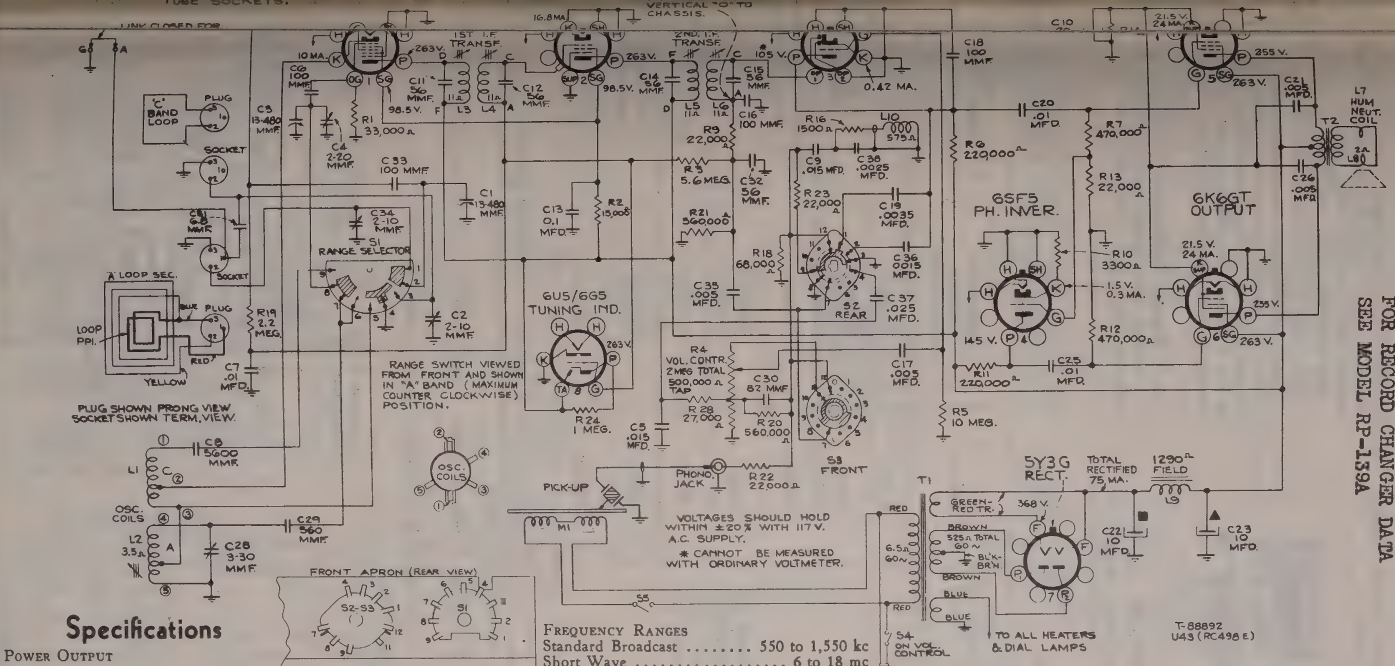


D-C resistance of each coil:

MODEL U-43,Chassis RC498E
Schematic,Voltage,Tuner

RCA MFG. CO., INC.

FOR RECORD CHANGER DATA
SEE MODEL RP-139A



—1940 No. 7—

First Edition

Specifications

Power Output
Undistorted .... 5 watts
Maximum .... 6 watts

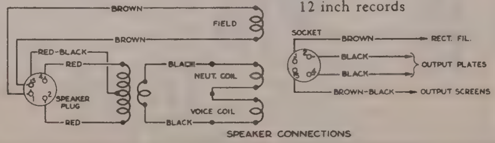
Pilot Lamps (2) ... Mazda No. 44 6.3 volts, 0.25 amps.

Power Supply Ratings
A6 ..... 105-125 volts, 60 cycles, 110 watts
A5 ..... 105-125-volts, 50 cycles, 110 watts
B2 ..... 105-125 volts, 25 cycles, 110 watts
C6 ..... 105-130/140-160/200-250 volts, 60 cycles, 110 watts
C5 ..... 105-130/140-160/200-250 volts, 50 cycles, 110 watts

Frequency Ranges
Standard Broadcast .... 550 to 1,550 kc
Short Wave .... 6 to 18 mc
I-F Frequency .... 455 kc

Loudspeaker (RL70L1)
Type .... 12 inch electrodynamic
Voice Coil Impedance at 400 cycles . 2.2 ohms

Automatic Phonograph
Pickup .... Crystal
Record Capacity ... Eight 10 inch or seven 12 inch records



SPEAKER CONNECTIONS

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Set the radio-phono switch to "radio" position and accurately tune in the station for which the first button is to be set.

3. Press in push-button rod No. 1 (left) with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than 1/4 turn after the rod begins to grip or damage to the mechanism may result.

4. Replace the push-button on its shaft.

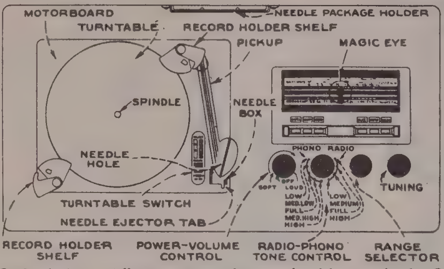
5. Proceed in a similar manner for the remainder of the push-buttons.

6. Insert the station marker tabs in the recesses above the push-buttons.

MODEL U-43,Ch.RC498E
Alignment,Trimmers
Socket,Dial Mechanism

RCA MFG. CO., INC.

Alignment Procedure



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematic.

Output Meter Alignment.—If this method is used the output meter across the voice coil, and turn th volume control to maximum.

Test Oscillator.—For all alignment operations, oscillator output as low as possible to avoid a-v-c actio

Calibration Marks.—The tuning dial is fastene cabinet and can not be used for reference during al Therefore calibration marks have been stamped in on the front of the chassis as shown in the accon drawing. These marks are used for reference duri ment.

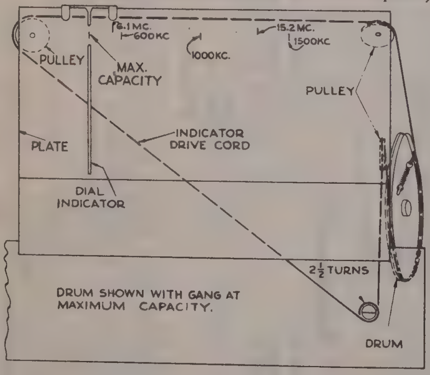
Dial Indicator Adjustment.—With the gang c in full mesh, the indicator should point to the extr (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following maximum peak outp
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads "C" band loop to cha
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

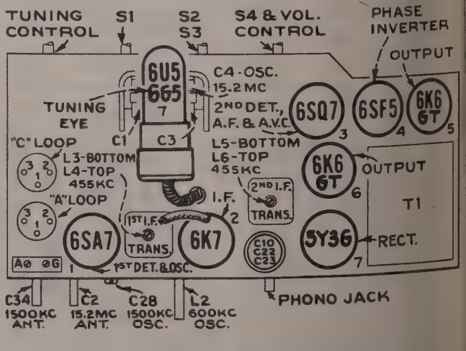
When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads i normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale m on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (mi capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.



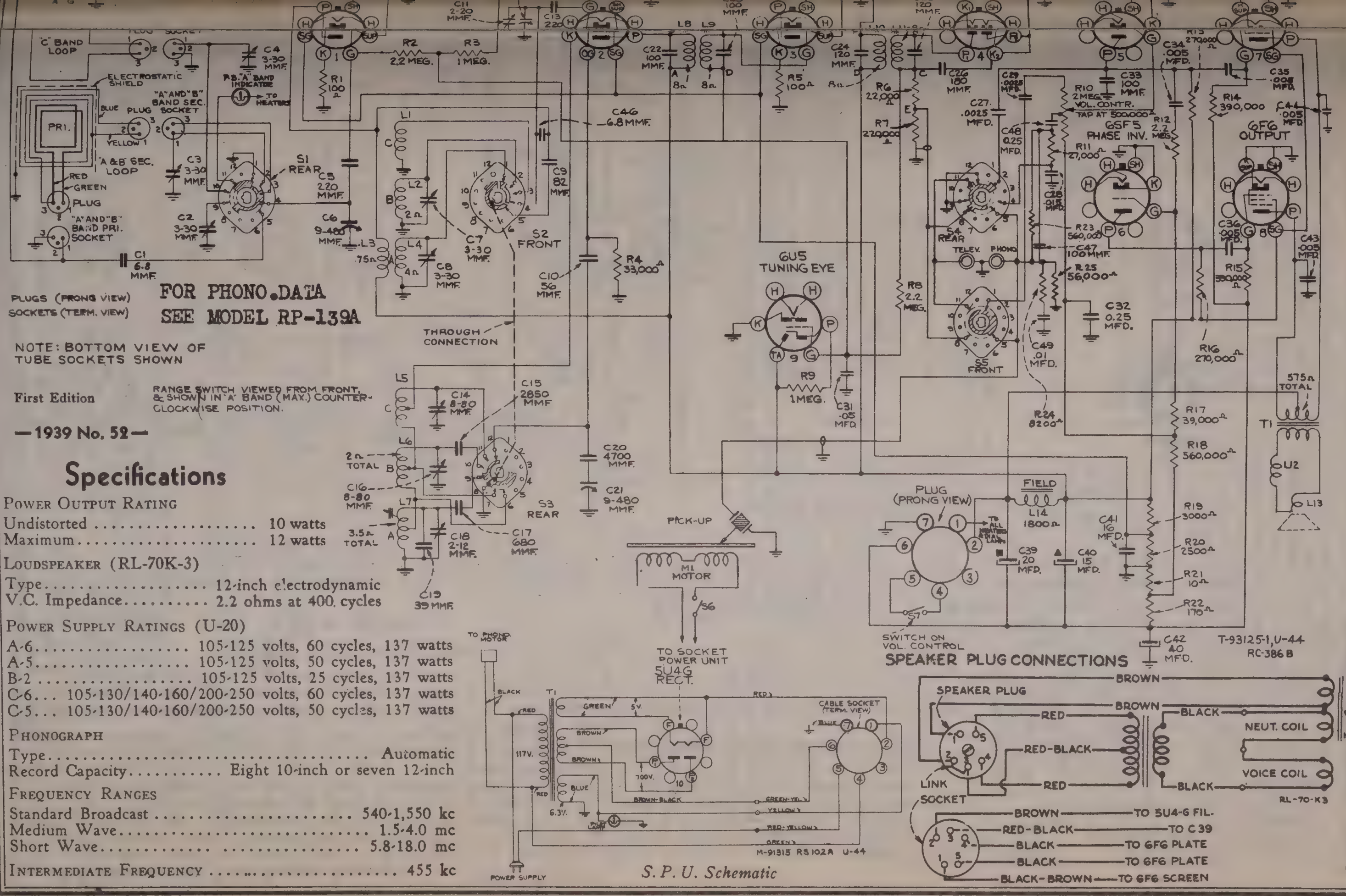
Dial-Indicator and Drive Mechanism



Tube and Trimmer Locations

MODEL U44, Chassis RC486B
Schematic, Speaker Conn.

RCA MFG. CO., INC.



S. P. U. Schematic

PLUGS (PRONG VIEW)
SOCKETS (TERM. VIEW)

FOR PHONO.DATA
SEE MODEL RP-139A

NOTE: BOTTOM VIEW OF TUBE SOCKETS SHOWN

RANGE SWITCH VIEWED FROM FRONT, & SHOWN IN "A" BAND (MAX.) COUNTER-CLOCKWISE POSITION.

First Edition

—1939 No. 52—

Specifications

Power Output Rating	
Undistorted	10 watts
Maximum	12 watts
Loudspeaker (RL-70K-3)	
Type	12-inch electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles
Power Supply Ratings (U-20)	
A-6	105-125 volts, 60 cycles, 137 watts
A-5	105-125 volts, 50 cycles, 137 watts
B-2	105-125 volts, 25 cycles, 137 watts
C-6	105-130/140-160/200-250 volts, 60 cycles, 137 watts
C-5	105-130/140-160/200-250 volts, 50 cycles, 137 watts
Phonograph	
Type	Automatic
Record Capacity	Eight 10-inch or seven 12-inch
Frequency Ranges	
Standard Broadcast	540-1,550 kc
Medium Wave	1.5-4.0 mc
Short Wave	5.8-18.0 mc
Intermediate Frequency	455 kc

MODEL U44,Chassis RC486B
Chassis Wiring,Voltage

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

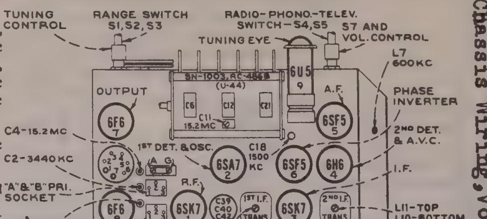
1. Remove station marker tabs; reach through tab holes in escutcheon with small screwdriver and loosen push-button rods.

2. Set the radio-phono-television switch to "radio" position and accurately tune in the station for which the first button is to be set.

3. Press in push-button rod No. 1 with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than 1/4 turn after the rod begins to grip or damage to the mechanism may result.

4. Proceed in a similar manner for the remainder of the push-buttons.

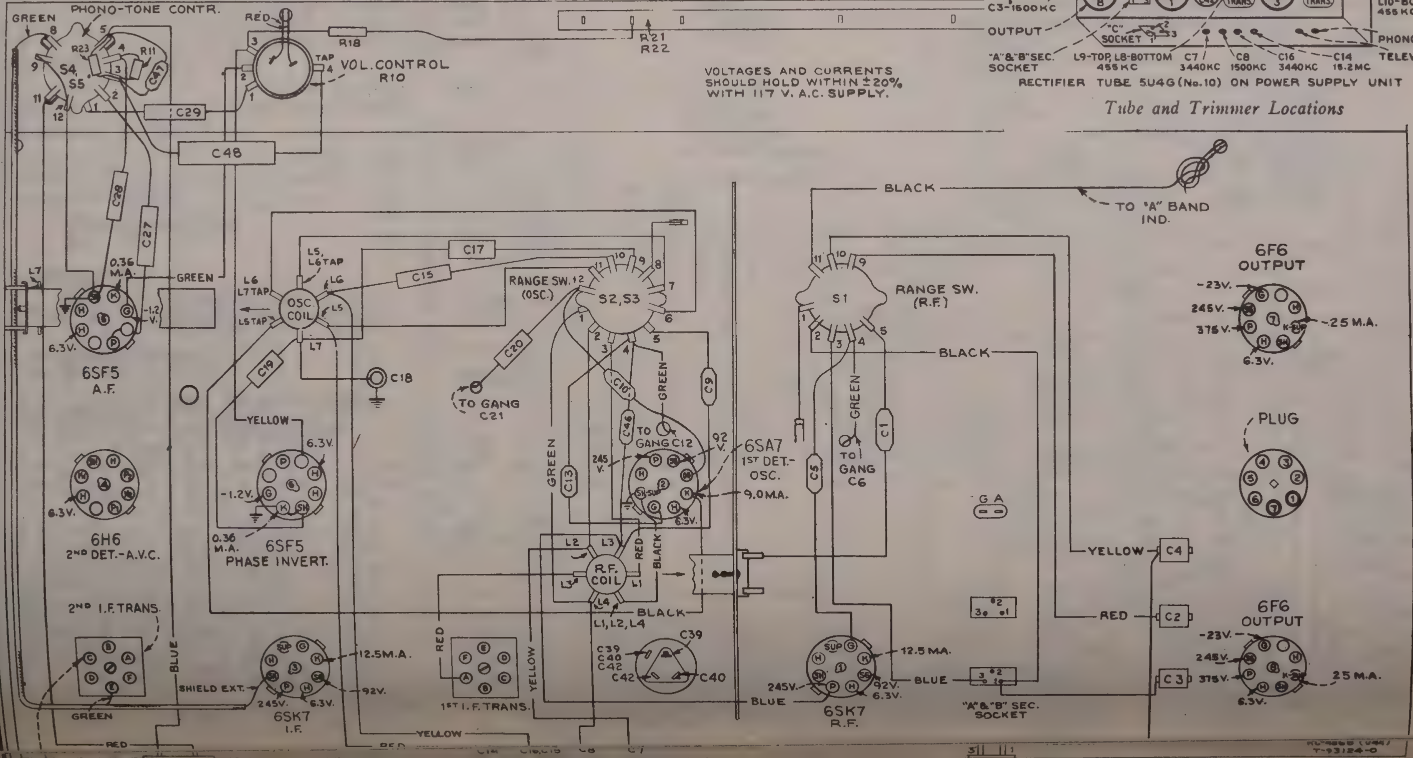
5. Insert the station marker tabs in the recesses adjacent to the push-buttons.



RECTIFIER TUBE 5U4G (No.10) ON POWER SUPPLY UNIT

Tube and Trimmer Locations

VOLTAGES AND CURRENTS SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY.



Antennas

his receiver is equipped with two loop antennas ("C" bd horizontal and fixed, and "A" and "B" band vertical, slded, and rotatable). During installation the "A" and "' band loop should be rotated to the position giving maxinn signal strength and freedom from noise. If desired, an oside antenna and ground can be connected to the termin provided and when this is done the link between these tninals must be opened. However, for loop operation this li must be closed. If such an antenna is used it should be aroximately 100 feet long.

Centering Loudspeaker Cone

The loudspeaker cone centering support is fastened to the field frame by two screws accessible from the rear of the speaker. The cone can usually be recentered by loosening these screws and moving the support around until the proper position is found without disturbing the dust cover. However, in some cases it may be necessary to remove the front dust cover and insert spacers between the voice coil and pole piece in order to obtain proper centering. A new dust cover should then be installed.

Alignment Procedure

fore proceeding with alignment the following lead dress shld be carefully checked:

A.C. leads at volume control dressed away from audio lea.

C-29 dressed close to chassis.

C-48 dressed under volume control.

Dress C-44 and 6F6 plate leads away from antenna lea.

Leads to phono and television jacks dressed close to end of assis.

Red lead from R.F. coil to range switch short and direct as ssible.

Leads to loop sockets dressed away from chassis and oth leads.

Green lead from volume control arm to A.F. grid close to assis.

thode-Ray Alignment is the preferable method. Conneons for the oscillograph are shown in the chassis wiring draing.

tput Meter Alignment.—If this method is used, connect theneter across the voice coil, and turn the receiver volume corol to maximum.

st-Oscillator. — For all alignment operations, keep the sixeps in alignment the low side of the test-oscillator should output as low as possible to avoid a-v-c action. For the first be connected to the receiver chassis. Following step 6, the signal must be radiated (see alignment table).

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point near 600 kc	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	6SK7 R-F grid in series with 0.1 mfd.	15.2 mc	15.2 mc (47°) "C" band	C14 (osc.)* C11 (det.)***
4		3.44 mc	3.44 mc (57°) "B" band	C16 (osc.)** C7 (det.)
5		600 kc	600 kc (200°) "A" band	L7 (osc.) Rock gang
6		1,500 kc	1,500 kc (22°) "A" band	C18 (osc.) C8 (det.)
7	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	15.2 mc "C" band	C4 (ant.)
8		6.1 mc	6.1 mc "C" band	Inductance of "C" band loop†
9		Repeat step 7		
10		3.44 mc	3.44 mc "B" band	C2 (ant.)
11		1,500 kc	1,500 kc "A" band	C3 (ant.)
12		600 kc	600 kc "A" band	L7 (osc.) Rock gang
13		1,500 kc	1,500 kc "A" band	C18 (osc.) C8 (det.)

Note.—For steps 7 to 13 inclusive the chassis must be in the cabinet, all loop leads connected and in their normal posits. The dial indicator pointer must be fastened to the drive cord in such a position that it is at the 530 kc mark on "A" scale wn the gang condenser plates are fully meshed.

* Use **minimum** capacity peak if two can be obtained. Check to determine that C14 has been adjusted to the correct peak buning the receiver to approximately 14.29 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C16 has been adjusted to the correct peak buning the receiver to approximately 2.53 mc where a weaker signal should be received.

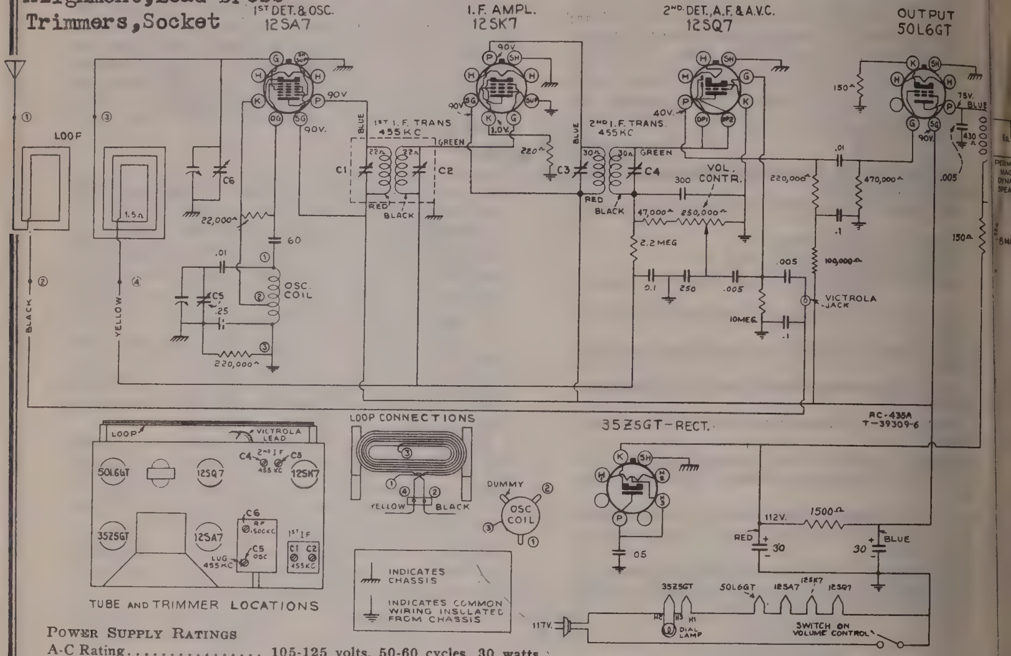
** Use **maximum** capacity peak if two peaks can be obtained and rock gang condenser while adjusting.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer tcther decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the indance and tunes the loop to a lower frequency.

Important.—The oscillator tracks **above** the signal on all bands.

MODELS 45E,45E-m,45E-W
Chassis RC-435A
Schematic,Voltage
Alignment,Lead Dress
Trimmers,Socket

RCA MFG. CO., INC.



Power Supply Ratings

A-C Rating . . . . 105-125 volts, 50-60 cycles, 30 watts
D-C Rating . . . . 105-125 volts, direct current, 30 watts

Power Output (125 volt, 60 cycle supply)

Undistorted . . . . .6 watts
Maximum . . . . 2.0 watts

Loudspeaker

Type . . . . 5-inch permanent magnet dynamic

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that top edge of pointer just touches rivet in dial plate.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the lowing for peak outpu
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3 (1st and 2n transform
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscilla
3		1,500 kc	Resonance on 1,500 kc signal	C6 (anten

Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other
2. Dress lead from gang condenser to grid of 12SA7 clos chassis and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to ch
4. Dress blue 2nd I-F lead close to chassis and behind 12 socket.

STOCK No.	DESCRIPTION	Unit List Price
33296	Spring—Retaining spring for drum	.08
32966	Transformer—First I-F transformer	1.25
32967	Transformer—Second I-F transformer	1.05
33291	Volume control and switch	1.50
	SPEAKER ASSEMBLIES (39213-1)	
33853	Cone—Speaker cone and voice coil	1.75
33851	Speaker complete	4.50
33854	Transformer—Output transformer	1.20
	CHASSIS ASSEMBLIES	
13057	Capacitor—60 mmfd.	.35
12488	Capacitor—250 mmfd.	.35
12952	Capacitor—300 mmfd.	.35
4838	Capacitor—.005 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
12484	Capacitor—0.25 mfd.	.30
33952	Capacitor—Electrolytic, 8 mfd.	.50
33850	Capacitor—Electrolytic, 2 sections 30 mfd. each	1.00
34259	Coil—Oscillator coil	.60
32968	Condenser—Variable tuning condenser	2.25
32634	Cord—Drive cord	.10
33662	Drum—Drive drum	.25
33295	Indicator—Dial pointer	.25

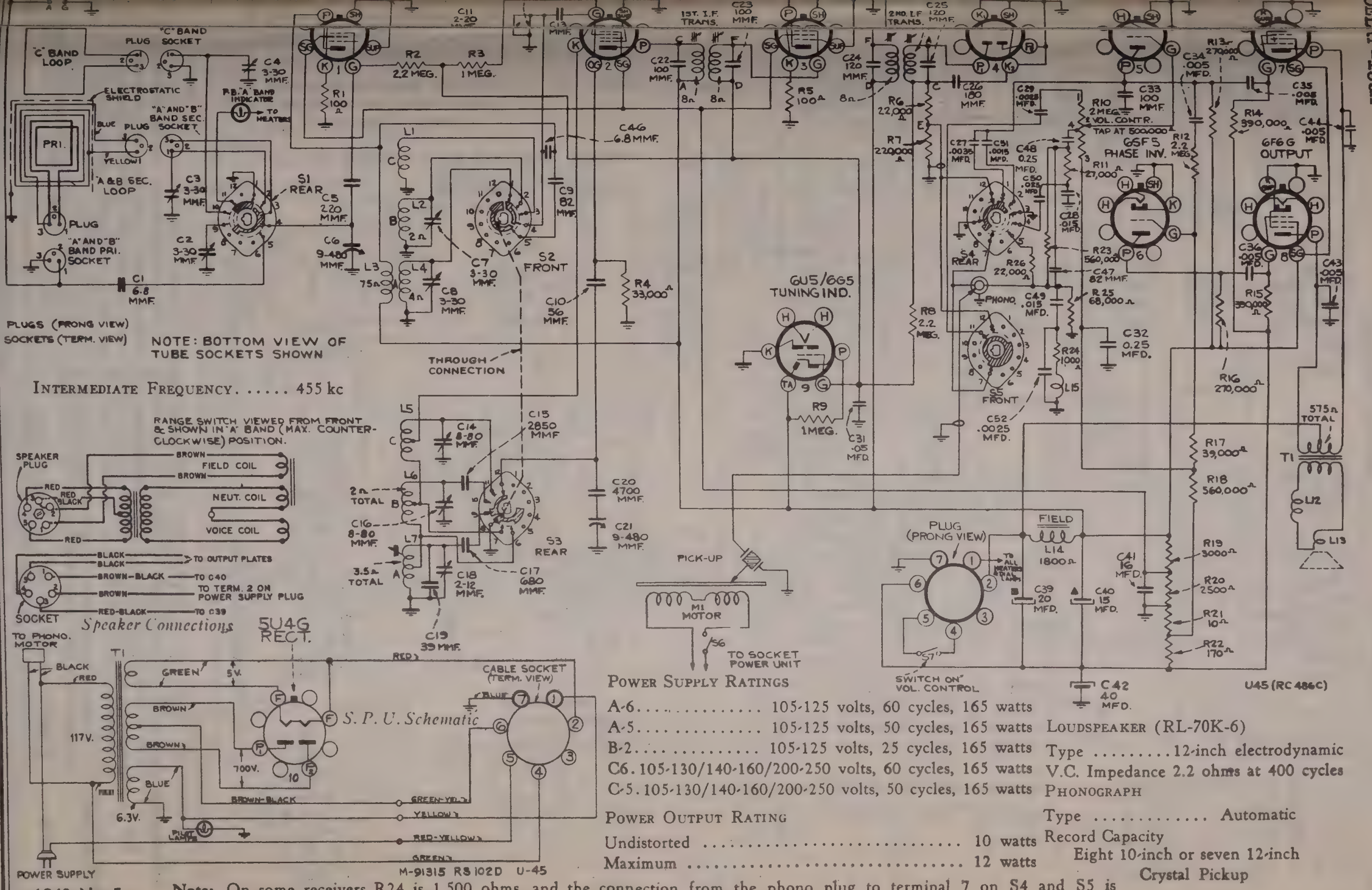
Stock No.	DESCRIPTION	
11765	Lamp—Dial lamp	1
33663	Loop—Antenna loop complete	
33294	Pulley—Drive cord pulley	
13428	Resistor—150 ohms, ½ watt	
14561	Resistor—220 ohms, ½ watt	
3153	Resistor—1,500 ohms, 1 watt	
13998	Resistor—22,000 ohms, ½ watt	
12412	Resistor—47,000 ohms, ½ watt	
14560	Resistor—100,000 ohms, ½ watt	
12264	Resistor—220,000 ohms, ½ watt	
12199	Resistor—270,000 ohms, ½ watt	
12679	Resistor—2.2 meg., ½ watt	
33293	Shaft—Tuning knob shaft and bushing	
33557	Socket—Dial lamp socket	
32537	Socket—Tube socket	
31615	Spring—Drive cord spring	

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

R PHONO. DATA SEE
DEL RP-139A

RCA MFG. CO., INC.

MODEL U45, Chassis RC-486C
Schematic



INTERMEDIATE FREQUENCY...... 455 kc

POWER SUPPLY RATINGS

A-6	105-125 volts, 60 cycles, 165 watts
A-5	105-125 volts, 50 cycles, 165 watts
B-2	105-125 volts, 25 cycles, 165 watts
C6	105-130/140-160/200-250 volts, 60 cycles, 165 watts
C-5	105-130/140-160/200-250 volts, 50 cycles, 165 watts

POWER OUTPUT RATING

Undistorted	10 watts
Maximum	12 watts

LOUDSPEAKER (RL-70K-6)

Type	12-inch electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles

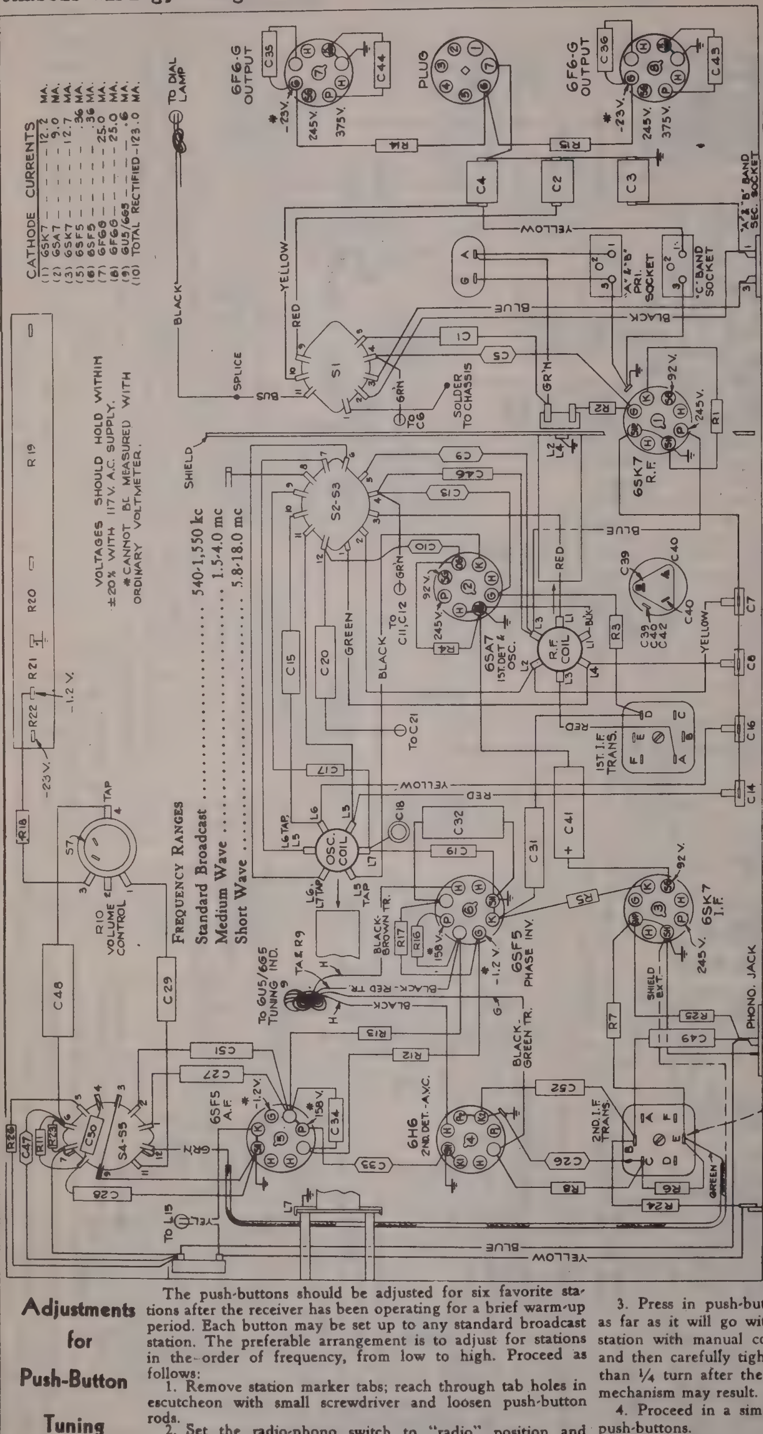
PHONOGRAPH

Type	Automatic
Record Capacity	Eight 10-inch or seven 12-inch
	Crystal Pickup

Note: On some receivers R24 is 1,500 ohms, and the connection from the phono plug to terminal 7 on S4 and S5 is made through a 22,000 ohm resister, R27.

MODEL U45,Chassis RC486C
Chassis Wiring,Voltage

RCA MFG. CO., INC.



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. A.C. SUPPLY.
*CANNOT BE MEASURED WITH ORDINARY VOLTMETER.

CATHODE CURRENTS	
(1) 6SK7	12.2 MA.
(2) 6SA7	9.0 MA.
(3) 6SK7	12.7 MA.
(5) 6SF5	.36 MA.
(6) 6SF5	.36 MA.
(7) 6F6G	25.0 MA.
(8) 6F6G	25.0 MA.
(9) 6U5/6G5	.6 MA.
(10) TOTAL RECTIFIED	123.0 MA.

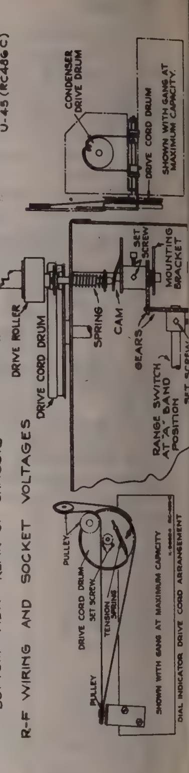
FREQUENCY RANGES

Standard Broadcast .... 540-1,550 kc
Medium Wave .... 1.5-4.0 mc
Short Wave .... 5.8-18.0 mc

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS.

BOTTOM VIEW- REAR OF CHASSIS

R-F WIRING AND SOCKET VOLTAGES


CONDENSER DRIVE DRUM
DRIVE CORD DRUM
SHOWN WITH GANG AT MAXIMUM CAPACITY.
DRIVE ROLLER
DRIVE CORD DRUM
SPRING
CAM
GEARS
SET SCREW
MOUNTING BRACKET
RANGE SWITCH AT "A" BAND POSITION
PULLEY
DRIVE CORD DRUM SET SCREW
TENSION SPRING
PULLEY
SHOWN WITH GANG AT MAXIMUM CAPACITY
DIAL INDICATOR DRIVE CORD ARRANGEMENT

Precautionary Lead Dress:

1. A.C. leads at volume control dressed away from audio leads.
2. C-29 dressed close to chassis.
3. C-48 dressed under volume control.
4. Dress C-44 and 6F6-G plate leads away from antenna leads.
5. Leads to phono jack dressed close to end of chassis.
6. Red lead from R.F. coil to range switch short and direct as possible.
7. Leads to loop sockets dressed away from chassis and
8. Green lead from volume control arm to A.F. grid close

Note: Adjustment of the cam should be such that in "A" band position when push-buttons

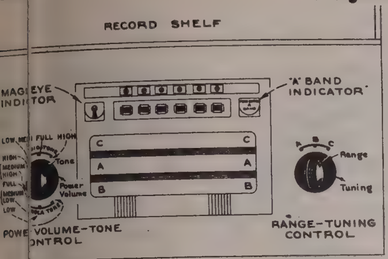
Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Remove station marker tabs; reach through tab holes in escutcheon with small screwdriver and loosen push-button rods.
2. Set the radio-phono switch to "radio" position and accurately tune in the station for which the first button is to be set.
3. Press in push-button rod No. 1 with the screw as far as it will go without undue pressure, hold in, station with manual control if necessary for best rec and then carefully tighten up the rod. Do not tighten than ¼ turn after the rod begins to grip or damage mechanism may result.
4. Proceed in a similar manner for the remainder push-buttons.
5. Insert the station marker tabs in the recesses ad to the push-buttons.

RCA MFG. CO., INC.

Alignment Procedure



Controls

Cathle-Ray Alignment is the preferable method. Con- ection for the oscillograph are shown in the chassis wiring awin

Outt Meter Alignment.—If this method is used, connect e me across the voice coil, and turn the receiver volume ntrol maximum.

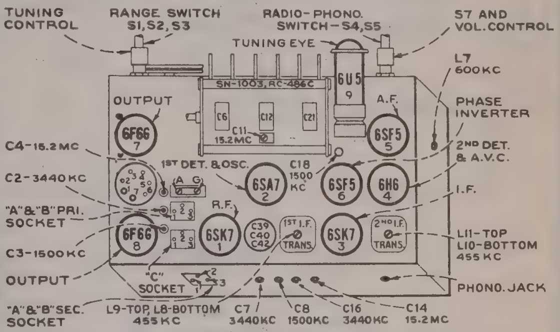
Testscillator. — For all alignment operations, keep the itput low as possible to avoid a-v-c action. For the first x step in alignment the low side of the test-oscillator should conncted to the receiver chassis. Following step 6, the gnal st be radiated (see alignment table).

Calibtion Scale on Indicator-Drive-Cord Drum. — The ning al is fastened in the cabinet and cannot be used for feren during alignment; therefore, a calibration scale is tache to the tuning drum. The setting of the gang con- enser read on this scale, which is calibrated in degrees. he cect setting of the gang in degrees, for each align- ent fquency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.



RECTIFIER TUBE 5U4G (No. 10) ON POWER SUPPLY UNIT

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point near 600 kc	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	6SK7 R-F grid in series with 0.1 mfd.	15.2 mc	15.2 mc (47°) "C" band	C14 (osc.)* C11 (det.)***
4		3.44 mc	3.44 mc (57°) "B" band	C16 (osc.)** C7 (det.)
5		600 kc	600 kc (200°) "A" band	L7 (osc.) Rock gang
6		1,500 kc	1,500 kc (22°) "A" band	C18 (osc.) C8 (det.)
7	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	15.2 mc "C" band	C4 (ant.)
8		6.1 mc	6.1 mc "C" band	Inductance of "C" band loop†
9		Repeat step 7		
10		3.44 mc	3.44 mc "B" band	C2 (ant.)
11		1,500 kc	1,500 kc "A" band	C3 (ant.)
12		600 kc	600 kc "A" band	L7 (osc.) Rock gang
13		1,500 kc	1,500 kc "A" band	C18 (osc.) C8 (det.)

Note.—For steps 7 to 13 inclusive the chassis must be in the cabinet, all loop leads connected and in their normal posi- ns. The dial indicator pointer must be fastened to the drive cord in such a position that it is at the 530 kc mark on "A" scale en the gang condenser plates are fully meshed.

* Use **minimum** capacity peak if two can be obtained. Check to determine that C14 has been adjusted to the correct peak tuning the receiver to approximately 14.29 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C16 has been adjusted to the correct peak tuning the receiver to approximately 2.53 mc where a weaker signal should be received.

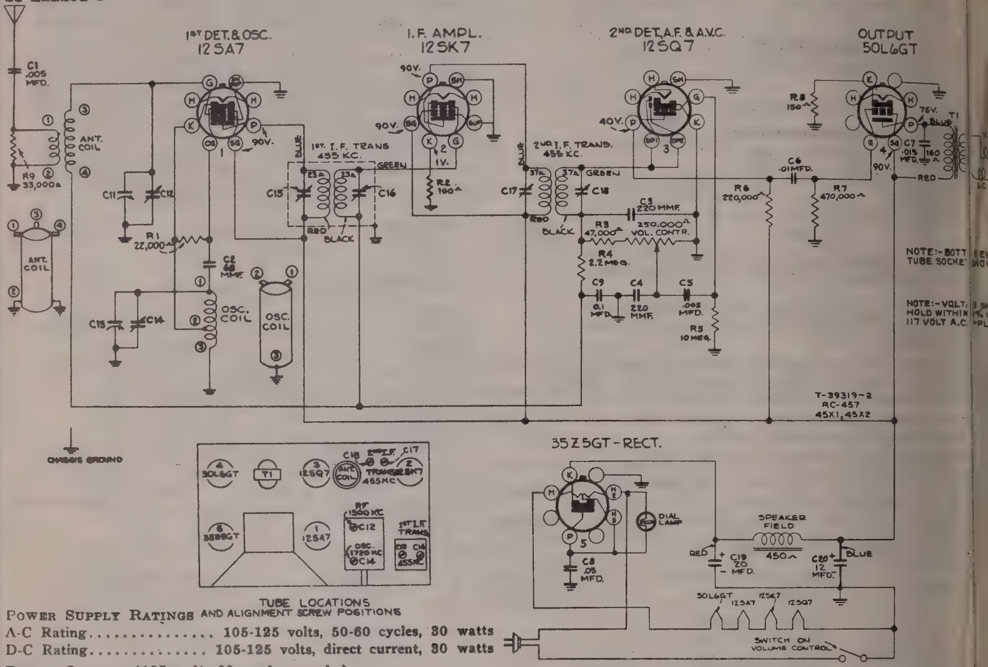
*** Use **maximum** capacity peak if two peaks can be obtained and rock gang condenser while adjusting.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer gether decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the in- ctance and tunes the loop to a lower frequency.

Important.—The oscillator tracks **above** the signal on all bands.

MODELS 45X1,45X2
Chassis RC457
Schematic,Voltage
Alignment,Socket
Trimmers

RCA MFG. CO., INC.



TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS

Power Supply Ratings

A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

Power Output (125 volt, 60 cycle supply)

Undistorted	.6 watts
Maximum	2.0 watts

Loudspeaker

Type	4-inch Electrodynamic

Output Meter Alignment. — Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Power-Supply Polarity. — For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the lowing for peak output
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C15, C16, C1 (1st and 2nd transforme
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C14 (oscilla
3		1,500 kc	Resonance on 1,500 kc signal	C12 (anten

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
13057	Capacitor—68 mmfd. (C2)	.35
12694	Capacitor—220 mmfd. (C3, C4)	.35
33584	Capacitor—.005 mfd. (C1, C5)	.25
4937	Capacitor—.01 mfd. (C6)	.25
30856	Capacitor—.015 mfd. (C7)	.90
32787	Capacitor—.05 mfd. (C8)	.20
4839	Capacitor—0.1 mfd. (C9)	.30
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd and 1 section of 12 mfd.	.90
35115	Coil—Antenna coil	.80
35116	Coil—Oscillator coil	.60
34843	Condenser—Variable tuning condenser	2.20
35113	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35117	Drum—Tuning condenser drive drum	.40
11765	Lamp—Dial lamp	.15
31193	Lead—Antenna lead	.50
14439	Resistor—100 ohms, ¼ watt (R2)	.20
30880	Resistor—150 ohms, ½ watt (R8)	.20
13998	Resistor—22,000 ohms, ¼ watt (R1)	.20
12412	Resistor—47,000 ohms, ¼ watt (R3)	.20
12264	Resistor—220,000 ohms, ¼ watt (R6)	.20
12285	Resistor—470,000 ohms, ¼ watt (R7)	.20
12679	Resistor—2.2 megohms, ¼ watt (R4)	.20
13601	Resistor—10 megohms, ¼ watt (R5)	.20
33305	Shaft—Condenser drive shaft	.25

STOCK No.	DESCRIPTION
35118	Shield—Shield can for I.F. transformer Stock No. 35114
32969	Socket—Dial lamp socket
31319	Socket—Tube socket
30585	Spring—Drive cord tension spring
34846	Transformer—Audio transformer
35114	Transformer—1st I.F. transformer
33301	Transformer—2nd I.F. transformer
	SPEAKER ASSEMBLIES (39105-505)
35120	Cone—Cone complete with voice coil
35119	Speaker—4-inch dynamic speaker complete
	MISCELLANEOUS ASSEMBLIES (RR-572)
35122	Back—Cabinet back for Model 45X1
35125	Back—Cabinet back for Model 45X2
35124	Dial—Glass dial scale
33317	Fastener—Push on fastener
35123	Knob—Ivory tuning or volume control knob for Model 45X2
35121	Knob—Walnut tuning or volume control knob for Model 45X1
35126	Spring—Retaining spring for knobs Stock No. 35121 and 35123

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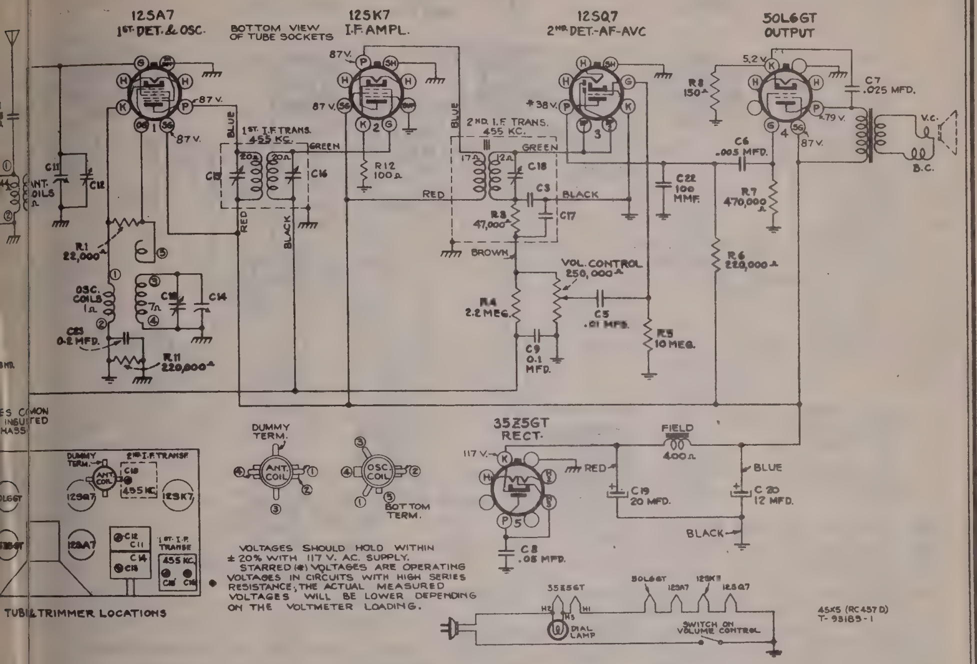
RCA MFG. CO., INC.

MODELS 45X5,45X6
Chassis RC457D
Schematic,Voltage



VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. AC. SUPPLY. STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER DEPENDING ON THE VOLTMETER LOADING.

1940No. 1— Features of design include: New Type single-ended tubes (12SA7, 12SK7, and 12SQ7); edge-lighted dial; dust proof electrodynamic loudspeaker; and Beam Power Output.

First Edition

Electrical and Mechanical Specifications

ENC RANGE	540-1,680 kc
ediat Frequency	455 kc

COM EMENT

CA-1SA7	1st-Detector-Oscillator
CA-1SK7	I-F Amplifier
CA-1SQ7	2nd-Detector, 1st A-F, and A.V.C.
CA-5L6GT	Power Output
CA-3Z5GT	Half-Wave Rectifier
amp 1)	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles. 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	1.0 watts
Maximum	1.25 watts

LOUDSPEAKER

Type	4-inch Electrodynamic
Cabinet Dimensions (inches)	Height 5-1/16, Width 8¼, Depth 4¼
Weight (net)	4 pounds

Alignment Procedure

put eter Alignment.—Connect the meter across the voice nd t the receiver volume control to maximum.

-Osc tor.—For I-F alignment, connect the low side of the cillat to the receiver chassis through a .01 mfd. capacitor, and he o put as low as possible.

-Setti Dial.—With gang condenser in full mesh, the pointer be justed so that it is vertical.

enna -The set is equipped with length of antenna wire. Do nnec the antenna to ground. If an outdoor antenna is used, uld t be longer than 100 feet, including lead-in. If it is co ect a 100 to 200 mmf. capacitor in series with the

er-S ply Polarity.—For operation on d-c, the power plug be i rted in the outlet for correct polarity. If the set does ncti , reverse the plug. On a-c, reversal of the plug may hur

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C18 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C15 and C16 (1st I-F trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C13 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C12 (antenna)

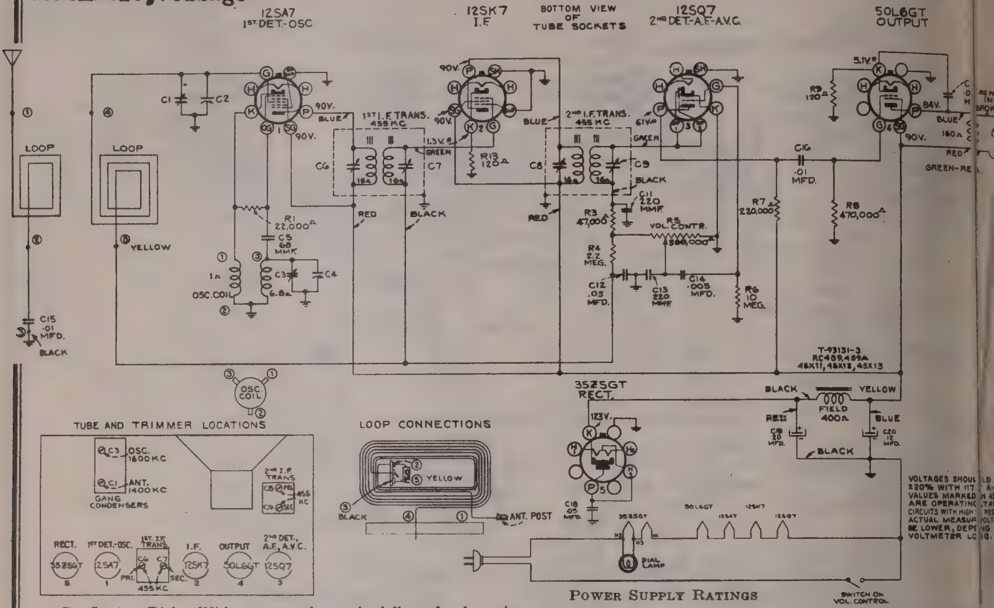
Precautionary Lead Dress

1. Green and blue leads from 1st I.F. transformer should be dressed apart and against chassis.
2. Blue lead of the 2nd I.F. transformer must be dressed against the shield and down between the tube socket and chassis.
3. Dress green diode lead away from 12SQ7 grid resistor and condenser.

MODELS 45X11,45X12
Chassis RC-459
Schematic,Voltage

RCA MFG. CO., INC.

Alignment,Tri
Socket,lead l



Power Supply Ratings

A-C Rating .... 105-125 volts, 50-60 cycles,
D-C Rating .... 105-125 volts, direct current,

Power Output (125 volt, 60 cycle supply)

Undistorted ....
Maximum ....

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that pointer is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 (I-F) grid in series with .01 mfd.	455 kc	Quiet point at 600 kc end of dial	C8, C9 (2nd I-F trans.)
2	Tuning condenser stator (ant.) in series with .01 mfd.			C6, C7 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-459) (RC-459A)	
13057	Capacitor—68 mmfd. (C5)	.35
12694	Capacitor—220 mmfd. (C11, C13)..........	.35
33584	Capacitor—.005 mfd. (C14)..................	.25
4937	Capacitor—.01 mfd. (C15, C16)............	.25
11315	Capacitor—.015 mfd. (C17) (RC-459A).......	.20
30938	Capacitor—.025 mfd. (C17) (RC-459)........	.20
32787	Capacitor—.05 mfd. (C12)..................	.20
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd.	.90
34443	Coil—Oscillator coil	.60
35053	Condenser—Variable tuning condenser less drive drum	2.00

Precautionary Lead Dress

1. Audio coupling capacitor to volume control must b under the terminal board and down against the corner of the

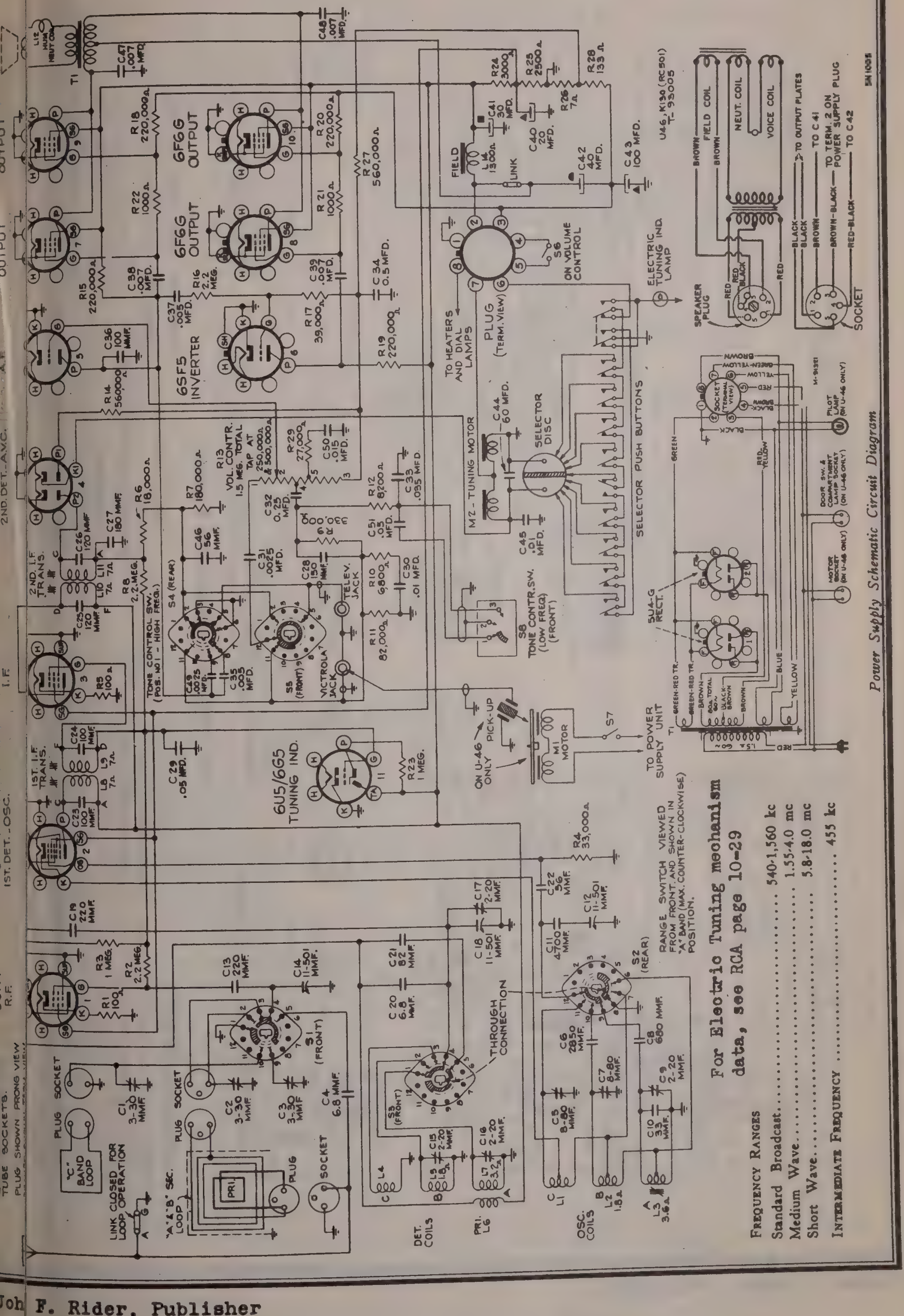
2. The voice coil leads from the output transformer to th must be dressed away from the terminal on the terminal which the above audio coupling capacitor is connected.

3. The output tube bypass condenser must be dressed a the 12SQ7 tube.

STOCK No.	DESCRIPTION
35058	Shaft—Tuning condenser drive shaft..........
34449	Socket—Dial lamp socket ....
31319	Socket—Tube socket ....
30585	Spring—Drive cord tension spring ....
35056	Transformer—Output transformer...........
35054	Transformer—1st I.F. transformer..........
35055	Transformer—2nd I.F. transformer..........
	SPEAKER ASSEMBLIES (39223-2)
35065	Cone—Cone complete with voice coil.........
34174	Transformer—Output transformer...........
	SPEAKER ASSEMBLIES (RL 86-2)
32907	Cap—Dust cap ....
35066	Cone—Cone complete with voice coil.........
34450	Speaker—5-inch dynamic speaker complete with cone and voice coil less output transformer...
35057	Control—Volume control and power switch.....
32634	Cord—Tuning condenser drive cord ....
35063	Drum—Tuning condenser drive drum ....
35062	Indicator—Station selector indicator ....
11765	Lamp—Dial lamp ....
35061	Loop—Antenna loop complete...............
12071	Resistor—120 ohms, ¼ watt (R13)............
32535	Resistor—120 ohms, ½ watt (R9)............
13998	Resistor—22,000 ohms, ¼ watt (R1)..........
12412	Resistor—47,000 ohms, ¼ watt (R3)..........
12264	Resistor—220,000 ohms, ¼ watt (R7).........
12285	Resistor—470,000 ohms, ¼ watt (R8).........
12679	Resistor—2.2 megohms, ¼ watt (R4).........
13601	Resistor—10 megohms, ¼ watt (R6).........
35059	Scale—Dial scale.........................

RCA MFG. CO., INC.

MODELS U46,Chassis RC501
K130,Chassis RC501A
Schematic



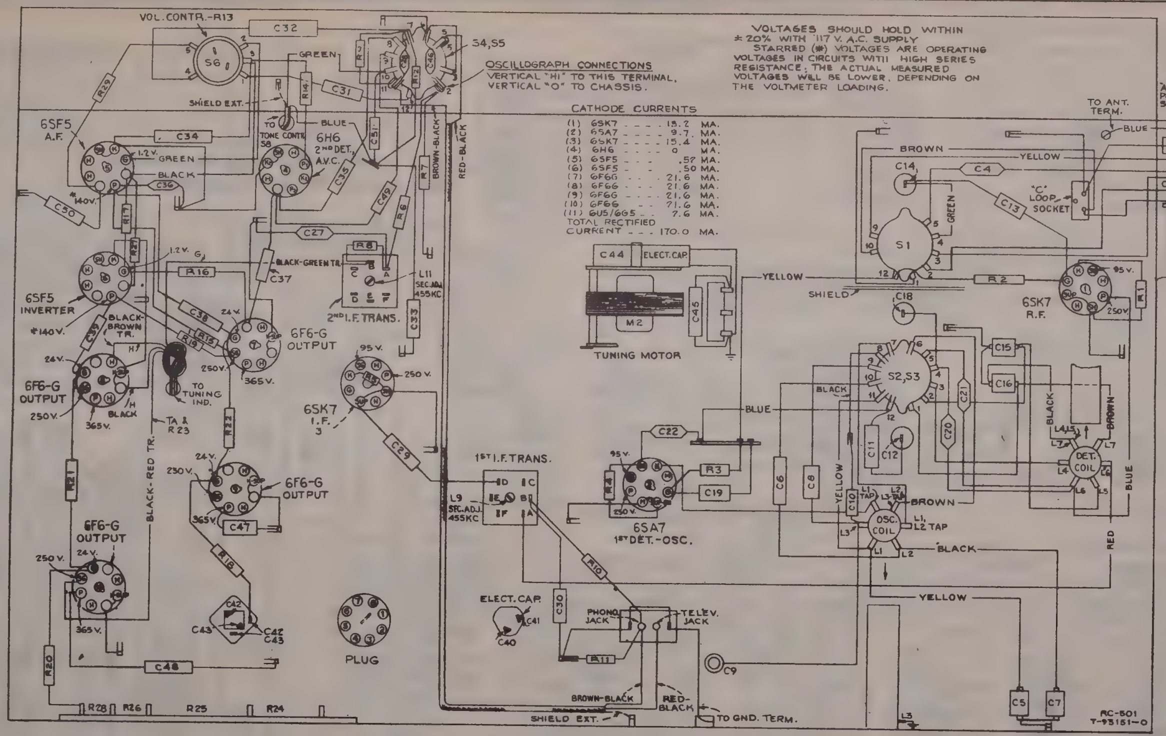
Power Supply Schematic Circuit Diagram

For Electric Tuning mechanism data, see RCA page 10-29

FREQUENCY RANGES	
Standard Broadcast	540-1,560 kc
Medium Wave	1.55-4.0 mc
Short Wave	5.8-18.0 mc
INTERMEDIATE FREQUENCY	455 kc

MODELS U46,K130
Chassis Wiring,Voltage

RCA MFG. CO., INC.



VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY
STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL,
VERTICAL "O" TO CHASSIS.

CATHODE CURRENTS

(1)	6SK7	15.2 MA.
(2)	6SA7	9.7 MA.
(3)	6SK7	15.4 MA.
(4)	6H6	0 MA.
(5)	6SF5	.57 MA.
(6)	6SF5	.50 MA.
(7)	6F6G	21.6 MA.
(8)	6F6G	21.6 MA.
(9)	6F6G	21.6 MA.
(10)	6F6G	71.6 MA.
(11)	6U5/6G5	7.6 MA.
TOTAL RECTIFIED CURRENT		170.0 MA.

R-F Wiring Diagram and Socket Voltages

Loudspeaker (RL-76B-5)
Type .... 12-inch electrodynamic
V.C. Impedance .... 11.5 ohms at 400 cycles

Power Supply Ratings K-130 (U-46, 50 watts additional)

Pilot Lamps .... { Mazda No. 44, 6.3 volts, 0.25 amp.
Mazda No. 47, 6.3 volts, 0.15 amp.

Power Output Rating
Undistorted .... 20 watts
Maximum .... 22 watts

Phonograph (Model U-46 only)

MODELS U-46, K-130

Test-Oscillator.—For all alignment operations, keep the out-

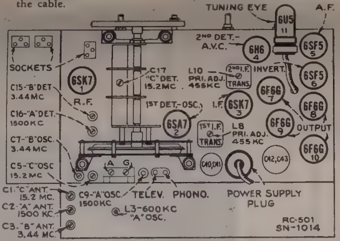
steps in alignment the low side of the test-oscillator should be connected to the receiver chassis. Following step 8, the signal must be radiated.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during the first eight steps of alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 510 kc mark, and gang condenser fully the cable.



Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band quiet point	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
2A	With input to 6SA7 grid, do not re-adjust 2nd I-F trans. after 1st I-F trans. has been adjusted.			
3	Front section of gang in series with .01 mfd.	15.2 mc	"C" band 15.2 mc (144°)	C5 (osc.)* C17 (det.)** Rock gang
4		3.44 mc	"B" band 3.44 mc (136°)	C7 (osc.)* C15 (det.)**
5		600 kc	"A" band 600 kc (29.5°)	L3 (osc.)
6		1,500 kc	"A" band 1,500 kc (165°)	C9 (osc.) C16 (det.)
7		600 kc	"A" band 600 kc (295°)	L3 (osc.) Rock gang
8		Repeat step 6		
9	Following step 8, a radiated signal must be used for the remainder of the alignment. One or two turns of wire forming a loop approximately 18 inches in diameter connected across the output of a test-oscillator such as RCA Model 153, or Stock No. 9595 (TMV-97C), etc., will be suitable. For the adjustments using the radiated signal, the chassis must be placed in the cabinet and the receiver loops connected.	15.2 mc	"C" band; 15.2 mc	C1 (ant.)
10		6.1 mc	"C" band; 6.1 mc	Inductance of "C" band loop†
11		Repeat step 9		
12		3.44 mc	"B" band; 3.44 mc	C3 (ant.)
13		1,500 kc	"A" band; 1,500 kc	C2 (ant.)
14		600 kc	"A" band; 600 kc	L3 (osc.) Rock gang
15		1,500 kc	"A" band; 1,500 kc	C9 (osc.) C16 (det.)

* Use minimum capacity peak if two can be obtained. Check for selection of correct peak by tuning receiver approximately 910 kc lower where a weaker signal should be received.

** Use maximum capacity peak if two can be obtained.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer together decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the inductance and tunes the loop to a lower frequency.

Important.—The oscillator tracks **above** the signal on all bands.

MODEL K-50, 2nd Production

Precautionary Lead Dress:

away from 6SQ7 socket and close as possible to end of chassis; dress ground wire to volume control between power leads and audio grid; and dress lead from phono switch to volume control as far away from power leads as possible.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematics.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the

Calibration Marks. — The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment. — With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	Quiet point between 600-700 kc	L4 and L5 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground			L2 and L3 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	1,500 kc	C2 antenna C5 oscillator*
4		600 kc	Rock at 600 kc	L1 oscillator while rocking
5		1,500 kc	1,500 kc	C2 antenna C5 oscillator*

When making adjustments 3 to 5 inclusive the chassis must be in the cabinet, the loop connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal.

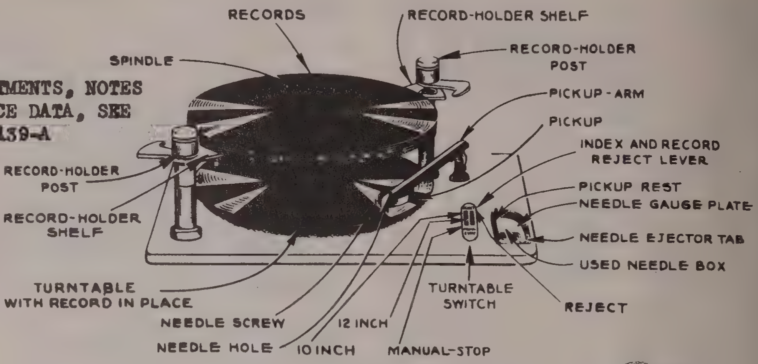
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-497)	
33719	Belt—Adjusting belt for push button arms	.05
34724	Board—Antenna-Ground board	.25
33817	Capacitor—Mica trimmer comprising 1 section of 2-20 mmfd. (C2, C5)	.30
12948	Capacitor—33 mmfd. (C26)	.35
30949	Capacitor—56 mmfd. (C6, C7, C10, C11)	.25
12723	Capacitor—56 mmfd. (C23)	.35
12720	Capacitor—100 mmfd. (C12, C24)	.35
12694	Capacitor—220 mmfd. (C14)	.35
12537	Capacitor—560 mmfd. (C3)	.35
30303	Capacitor—.0035 mfd. (C22)	.40
33584	Capacitor—.005 mfd. (C13, C16, C27)	.25
4937	Capacitor—.01 mfd. (C8, C15, C21)	.25
4839	Capacitor—0.1 mfd. (C9)	.30
32240	Capacitor—Electrolytic comprising 2 sections of 10 mfd. and 1 section of 20 mfd.	1.45
33724	Coil—Oscillator coil	.75
33635	Condenser—6 button tuning condenser	5.15
33630	Control—Tone control	1.00
34796	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
33633	Indicator—Station selector indicator	.20
11765	Lamp—Dial lamp	.15
34795	Plate—Dial plate complete less tuner and dial	1.00
5119	Plug—3 contact female plug for speaker cable	.25
31388	Resistor—390 ohms, 1 watt (R8)	.22
33489	Resistor—15,000 ohms, 2½ watt (R2)	.55
13998	Resistor—22,000 ohms, ¼ watt (R12)	.20
12738	Resistor—27,000 ohms, ¼ watt (R10)	.20
12454	Resistor—33,000 ohms, ¼ watt (R1)	.20
12285	Resistor—470,000 ohms, ¼ watt (R6, R7)	.20
12486	Resistor—560,000 ohms, ¼ watt (R13)	.20
12679	Resistor—2.2 megohms, ¼ watt (R11)	.20
11668	Resistor—5.6 megohms, ¼ watt (R3)	.20
13601	Resistor—10 megohms, ¼ watt (R5)	.20
33735	Screw—Push button adjusting and locking screw	.05
33725	Shaft—Drive shaft	.30
34411	Shaft—Drive shaft	.20
34723	Socket—Antenna loop socket	.15
31364	Socket—Dial lamp socket	.20
14278	Socket—Phonograph input socket and jack	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
33720	Spring—Push button arm return spring	.02
33634	Switch—"Radio-Phono" switch	.30
31575	Transformer—Power transformer (100-120 and 200-240) volt 50-60 cycle	8.35
33112	Transformer—Power transformer 105-125 volt, 50-60 cycle	4.30
33618	Transformer—Power transformer 110 volt, 25-60 cycle	6.40
32263	Transformer—1st I.F. transformer	2.30
34719	Transformer—2nd I.F. transformer	1.75
33726	Washer—"C" washer for drive shaft	.02
	SPEAKER ASSEMBLIES (RL-70J2)	
31825	Cap—Dust cap	.02
11469	Coil—Neutralizing coil (L6)	.30
33116	Coil—Speaker field coil (L8)	2.10
31275	Cone—Speaker cone and voice coil (L7)	1.75
5118	Plug—3 contact male connector plug	.25
33779	Transformer—Output transformer (T2)	1.50
	MISCELLANEOUS ASSEMBLIES	
33731	Button—Push button	.15
31456	Cover—Protective cover for push button markers	.08
34801	Dial—Glass dial scale	1.50
33637	Escutcheon—Dial and push button escutcheon	.80
30863	Knob—Tuning, tone control, or volume control knob	.15
34800	Loop—Antenna loop	6.00
33973	Marker—Station markers	.45
32641	Plug—3 prong male plug for antenna loop	.10
30900	Spring—Retaining spring for knob Stock 30863 and Button Stock 33731	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

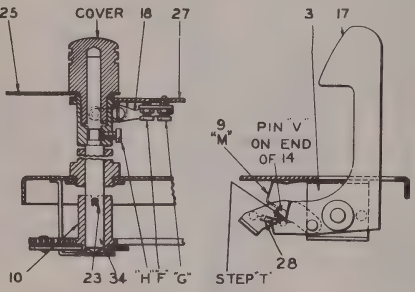
MODELS U46,K130
Record Changer
Assembly

RCA MFG. CO., INC.

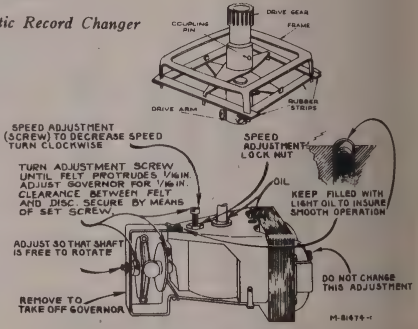
FOR ADJUSTMENTS, NOTES
AND SERVICE DATA, SEE
MODEL RP-139-A



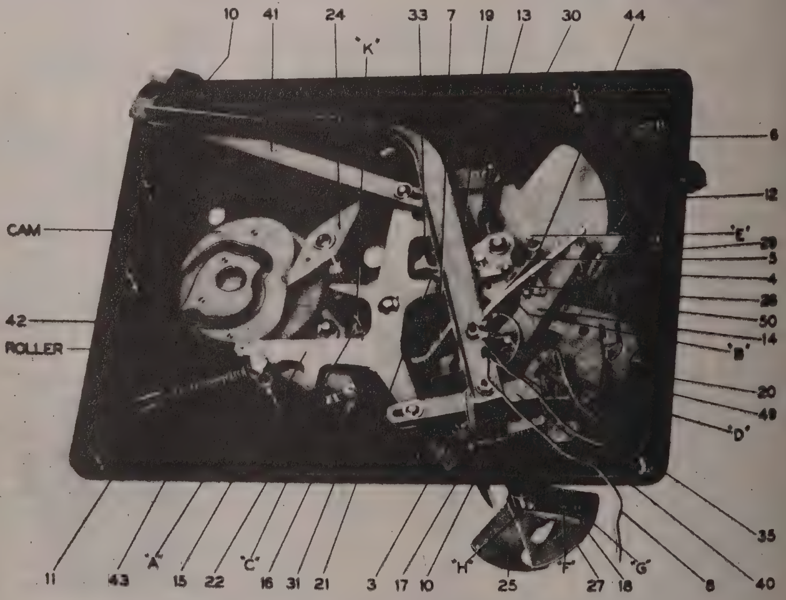
Top View of Automatic Record Changer



Details of Record Shelf Posts and Lever Assemblies


DRIVE GEAR
COUPLING PIN
FRAME
DRIVE ARM
RUBBER STRIPS
SPEED ADJUSTMENT (SCREW) TO DECREASE SPEED TURN CLOCKWISE
SPEED ADJUSTMENT LOCK NUT
TURN ADJUSTMENT SCREW UNTIL FELT PROTRUDES 1/16 IN. ADJUST GOVERNOR FOR 1/16 IN. CLEARANCE BETWEEN FELT AND DISC. SECURE BY MEANS OF SET SCREW.
OIL
KEEP FILLED WITH LIGHT OIL TO INSURE SMOOTH OPERATION
ADJUST SO THAT SHAFT IS FREE TO ROTATE
DO NOT CHANGE THIS ADJUSTMENT
REMOVE TO TAKE OFF GOVERNOR
M-81474-c

Motor Data and Coupling



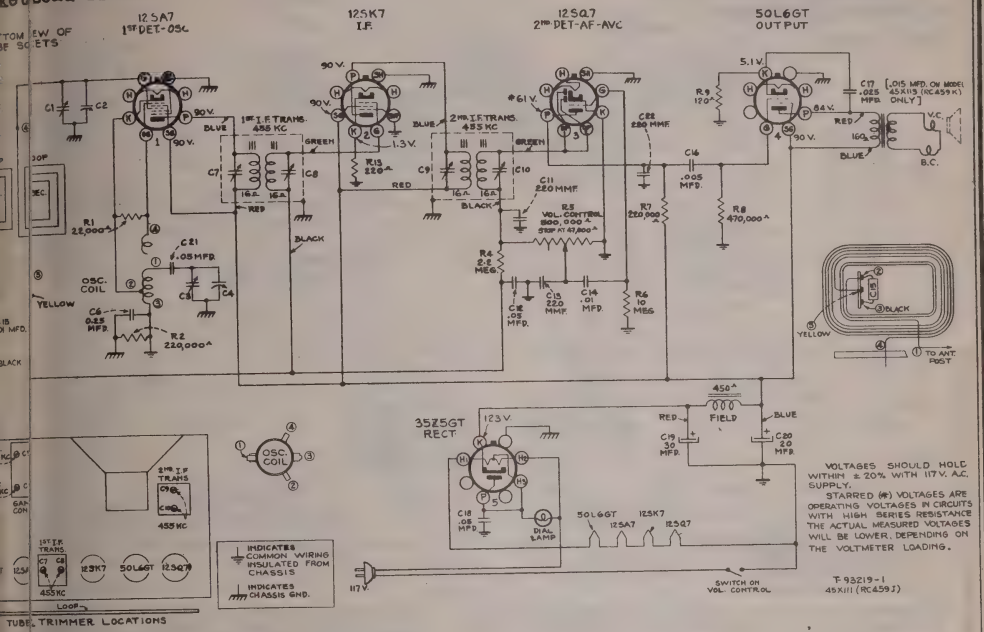
Bottom View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

ema ic,Voltage
gnm nt,Trimmers
ket Lead Dress

RCA MFG. CO., INC.

MODELS 45X111,45X112
Ch.RC459J,45X113
Chassis RC459K



—1 0 No. 2—

First Edition

Features of design include: New type single-ended tubes (12SA7, 12SK7, and 12SQ7); clock-type dial; dust-proofed electrodynamic loudspeaker; "Magic Loop"; and Beam Power Output.

Electrical and Mechanical Specifications

QUEN RANGE .... 550-1,600 kc
medi Frequency .... 455 kc

E CO PLEMENT
RCA 2SA7 .... 1st-Detector—Oscillator
RCA 2SK7 .... I-F Amplifier
RCA 2SQ7 .... 2nd-Detector, 1st A-F, and A.V.C.
RCA 0L6GT .... Power Output
RCA 5Z5GT .... Rectifier
Lam (1) .... Mazda 51, 7.5 volts, .20 amp.

POWER SUPPLY RATINGS
A-C Rating .... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating .... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted .... .8 watts
Maximum .... 1.3 watts

LOUDSPEAKER
Type .... 5-inch electrodynamic

el	Weight (shipping)	Description	Cabinet Dimensions (inches)
.111	8½ lbs.	Mahogany plastic finish	6 19/32 x 9 25/32 x 5⅞
.112	8½ lbs.	Antique-ivory plastic finish	6 19/32 x 9 25/32 x 5⅞
.113	10 lbs.	Walnut finish	8⅛ x 13⅛ x 6 5/16

Alignment Procedure

Outpu Meter Alignment.—Connect the meter across the voice and rn the receiver volume control to maximum.

Test-C illator.—For I-F alignment, connect the low side of the oscil or to the receiver chassis through a .01 mfd. capacitor, and p the utput as low as possible.

Pre-S ing Dial.—With gang condenser in full mesh, the pointer uld b adjusted so that it is vertical.

Anten .—The set is equipped with a built-in loop antenna. If outd r antenna is used, it may be connected to the "ANT" minal n rear of cabinet. It should not be longer than 100 feet, uding lead-in. If it is longer, connect a 100 to 200 mmf. caitor series with the lead-in.

Powe Supply Polarity.—For operation on d-c, the power plug st be nserted in the outlet for correct polarity. If the set does fun on, reverse the plug. On a-c, reversal of the plug may re- e hu

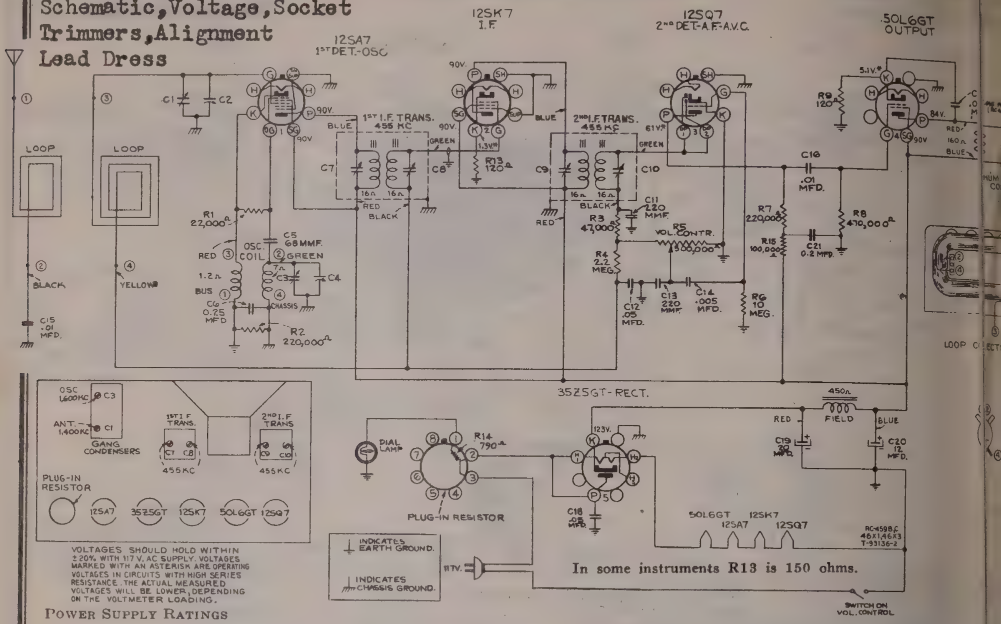
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

Precautionary Lead Dress

1. Dress grid lead of 12SK7 close to chassis under condenser (C12).
2. Dress green and blue leads from i-f transformers close to chassis and away from each other.
3. Dress leads from terminal board on loop support away from loop.

MODELS 46X1,46X2,Ch.RC459B, 46X3,Chassis RC459C
Schematic,Voltage,Socket Trimmers,Alignment Lead Dress

RCA MFG. CO., INC.



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC SUPPLY. VOLTAGES MARKED WITH AN ASTERISK ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

In some instruments R13 is 150 ohms.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 50 watts
D-C Rating	105-125 volts, direct current, 50 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	.6 watts
Maximum	2.0 watts

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust lowing peak o
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 ar (2nd I-
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 a (1st I-
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (osc
4		1,400 kc	Resonance on 1,400 kc signal	C1 (an

Precautionary Lead Dress

1. Dress grid lead of 12SK7 close to chassis under c (C12).

2. Dress green and blue leads from i-f transformers close t and away from each other.

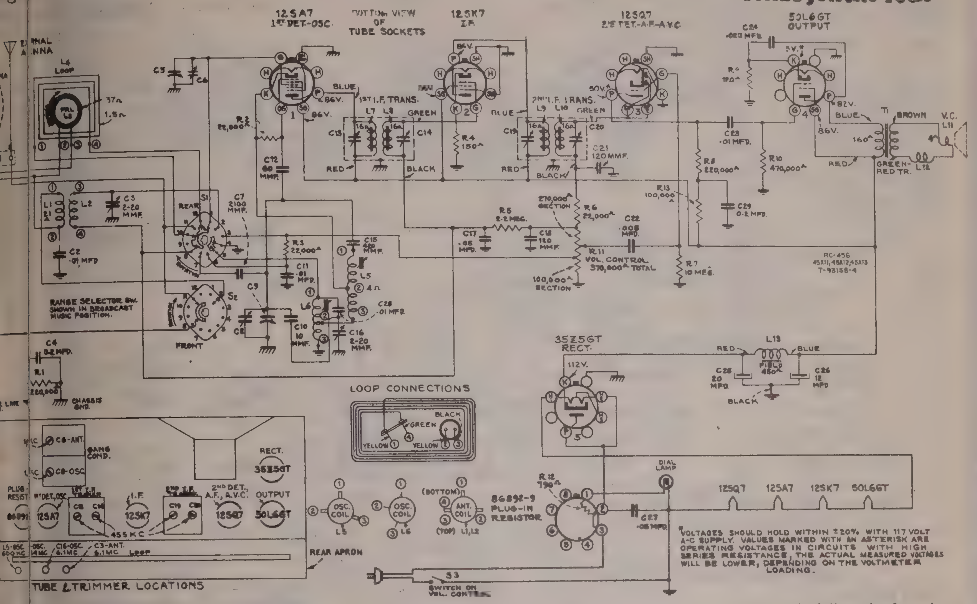
3. Dress leads from terminal board on loop support aw loop.

STOCK No.	DESCRIPTION	Unit List Price
	SPEAKER ASSEMBLIES (39223-2)	
35065	Cone—Cone complete with voice coil	1.20
34174	Transformer—Output transformer	1.25
	SPEAKER ASSEMBLIES (RL 86-5)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	1.30
34450	Speaker 5" dynamic speaker complete with cone and voice coil less output transformer	3.25
	CHASSIS ASSEMBLIES (RC-459B and RC-459C)	
35000	Ballast—Ballast tube resistor	.80
13057	Capacitor—68 mmfd. (C5)	.35
12694	Capacitor—220 mmfd. (C11, C13)	.35
33584	Capacitor—.005 mfd. (C14)	.25
4937	Capacitor—.01 mfd. (C15, C16)	.25
11315	Capacitor—.015 mfd. (C17)	.20
30938	Capacitor—.025 mfd. (C17)	.20
32787	Capacitor—.05 mfd. (C12, C18)	.20
34505	Capacitor—.2 mfd. (C21)	.30
12484	Capacitor—0.25 mfd. (C6)	.30
35064	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd.	.75
34443	Coil—Oscillator coil	.60
35053	Condenser—Variable tuning condenser *less drive drum*	2.00
35057	Control—Volume control and power switch	1.50
32634	Cord—Tuning condenser drive cord	.10
35063	Drum—Tuning condenser drive drum	.30
35062	Indicator—Station selector indicator	.20

STOCK No.	DESCRIPTION
31480	Lamp—Dial lamp
35061	Loop—Antenna loop complete
12071	Resistor—120 ohms, ¼ watt (R13)
32535	Resistor—120 ohms, ½ watt (R9)
13998	Resistor—22,000 ohms, ¼ watt (R1)
12412	Resistor—47,000 ohms, ¼ watt (R3)
11281	Resistor—100,000 ohms, 1/10 watt (R15)
12264	Resistor—220,000 ohms, ¼ watt (R2)
12285	Resistor—470,000 ohms, ¼ watt (R8)
12679	Resistor—2.2 megohms, ¼ watt (R4)
13601	Resistor—10 megohms, ¼ watt (R6)
35000	Resistor—Ballast tube resistor
35060	Scale—Dial scale
35058	Shaft—Tuning condenser drive shaft
34449	Socket—Dial lamp socket
31319	Socket—Tube socket
30585	Spring—Drive cord tension spring
35056	Transformer—Output transformer
35054	Transformer—1st I.F. transformer
35055	Transformer—2nd I.F. transformer
35000	Tube—Ballast tube resistor

RCA MFG. CO., INC.

MODELS 46X11,46X12
Chassis RC-456
46X13,Ch.RC456A



	nnect the high side of test-scillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
	12SK7 grid n series with .01 mfd.	455 kc	"Standard Broadcast" band quiet point with gang nearly open	L9 and L10 (2nd I-F Trans.)
	12SA7 grid n series with .01 mfd.			L7 and L8 (1st I-F Trans.)
	nt. terminal 1 n series with 200 mmfd. Link closed	600 kc	600 kc "Standard Broadcast" band	L5 (osc.)
		1,560 kc	Pointer at second from bottom mark at extreme right edge of dial plate* "Standard Broadcast" band	C8 (osc.)
		1,400 kc	Resonance on 1,400 kc signal "Standard Broadcast" band	C6 (ant.)
		600 kc	Resonance on 600 kc signal "Standard Broadcast" band	L5 (osc.) Rock gang
7	Repeat steps 4, 5, and 6			
8	nt. terminal 1 n series with 200 mmfd. Link closed	6.1 mc	Pointer on dot at extreme right edge of dial* "Short Wave" band	C16 (osc.)** C3 (ant.) Rock gang
9		2.44 mc	Resonance on 2.44 mc signal "Short Wave" band	L6 (osc.) Rock gang
10	Repeat steps 8 and 9			

*Th calibration marks are concealed when chassis is in cabinet.
**Us minimum capacity peak if two can be obtained. Check for
ection f correct peak by tuning receiver to approximately 5.19
whe a weaker signal should be received.

Pre-Setting Pointer.—With gang condenser in full mesh, the pointer should be adjusted to a horizontal position.

Antenna.—The set is equipped with a built-in loop antenna. If the loop antenna is used, the antenna terminal board link should be closed. This link should be open when an external antenna is used. Connect the external antenna to terminal 1. If an antenna longer than 100 feet (including lead-in) is used, connect a 100 to 200 mmf. capacitor in series with the lead-in.

LOUDSPEAKER

Type	5-inch electrodynamic
V.C. Impedance	4 ohms at 400 cycles

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 50 watts
D-C Rating	105-125 volts, direct current, 50 watts

POWER OUTPUT RATING

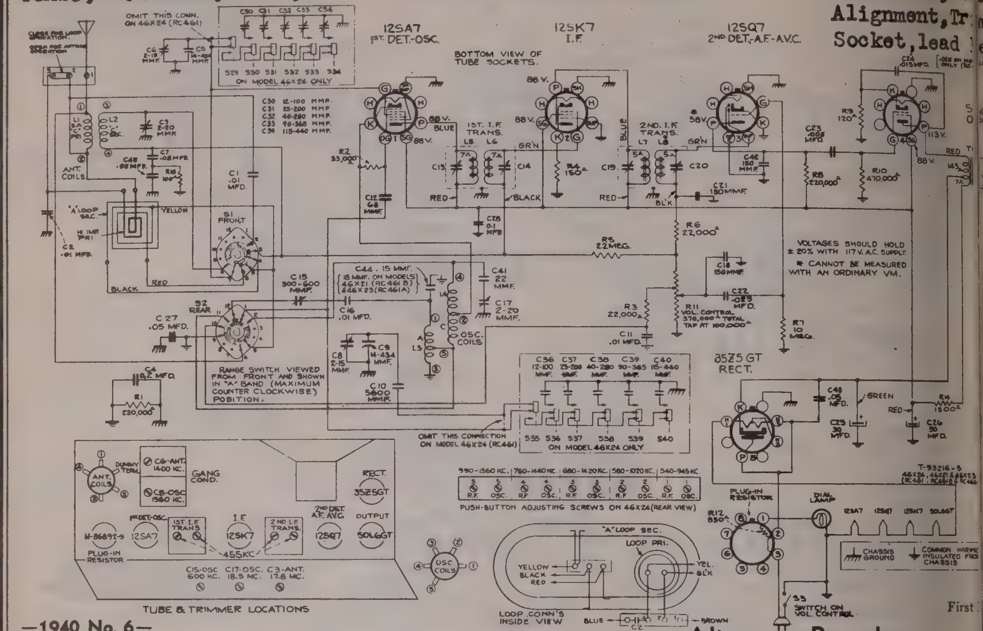
Undistorted	1 watt
Maximum	2 watts

32830	Capacitor—Mica trimmer comprising 2 sections of 2-20 mmfd. (C3, C16)	.40
13200	Capacitor—10 mmfd. (C10)	.35
12724	Capacitor—120 mmfd. (C18, C21)	.35
31870	Capacitor—415 mmfd. (C15)	.30
35099	Capacitor—2,100 mmfd. (C7)	.45
33584	Capacitor—.005 mfd. (C22)	.25
4937	Capacitor—.01 mfd. (C2, C11, C23, C28)	.25
4870	Capacitor—.025 mfd. (C24)	.20
32787	Capacitor—.05 mfd. (C17, C27)	.20
34505	Capacitor—0.2 mfd. (C4, C29)	.30
32576	Capacitor—Electrolytic, comprising 1 section of 20 mfd., and 1 section of 12 mfd. (C25, C26)	.90
31296	Coil—"A" band oscillator coil (L5)	1.05
35090	Coil—Antenna coil—"B" band (L1, L2)	.80
35096	Coil—Loop loading coil (L3)	.50
35251	Coil—Oscillator coil—"B" band (L6)	.70
35082	Condenser—Variable tuning condenser—less drum	2.10
35086	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
35093	Dial—Dial scale	.50
35083	Drum—Tuning condenser drive drum	.35
35091	Indicator—Station selector indicator	.25
31480	Lamp—Dial lamp	.20
35095	Loop—Antenna loop complete	2.50
35092	Plate—Dial plate—less dial scale	.30
35000	Resistor—Ballast tube resistor	.80
30936	Resistor—120 ohms, 1 watt (R9)	.22
13428	Resistor—150 ohms, ½ watt (R4)	.20
13998	Resistor—22,000 ohms, ½ watt (R2, R3, R6)	.20
14560	Resistor—100,000 ohms, ½ watt (R13)	.20
12264	Resistor—220,000 ohms, ½ watt (R1, R8)	.20
12285	Resistor—470,000 ohms, ½ watt (R10)	.20
12679	Resistor—2.2 meg., ½ watt (R5)	.20
13601	Resistor—10 meg., ½ watt (R7)	.20

MODELS 46X21,Ch.RC461A
46X23,Ch.RC461B,46X24,

RCA MFG. CO.. INC.

Chassis RC46
Schematic,Vo
Alignment,Tr
Socket,lead



—1940 No. 6—

Specifications

Frequency Ranges	550-1,550 kc and 6-18 mc

PUSH BUTTON RANGES (Model 46X24 only)

(1) Approximately 540- 945 kc
(2) Approximately 580-1,020 kc
(3) Approximately 650-1,320 kc
(4) Approximately 760-1,440 kc
(5) Approximately 990-1,560 kc

Intermediate Frequency	455 kc

POWER OUTPUT RATING

Undistorted	1.1 watts
Maximum	1.4 watts

LOUDSPEAKER (RL81A1)

Type	5-inch permanent magnet dynamic
Voice Coil Impedance at 400 Cycles	4.5 ohms

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 50 watts
D-C Rating	105-125 volts, direct current, 50 watts

Adjustments for Electric Tuning:

The push buttons and corresponding frequency ranges are given in the schematic diagram. Allow the set to warm up for about 15 minutes and proceed as follows:

(1) List five desired stations in order of the push button ranges.

(2) Push in the dial tuning (right hand) button and manually tune in the first station on the list.

(3) Press button No. 1. Turn R-F screw half way in; next turn the oscillator screw entirely in and then gradually back out until the station is heard.

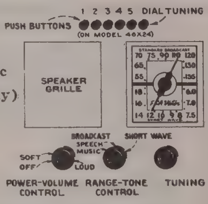
(4) Adjust the R-F trimmer for maximum output. (Clockwise adjustment of oscillator and R-F trimmers tunes the circuits to lower frequencies.)

(5) By turning the set to a position in which reception is weak a final more accurate adjustment may be made.

(6) Adjust for each of the remaining stations in a similar manner and place corresponding station tabs in recesses above buttons. A "Dial Tuning" tab should be above button No. 6.

Precautionary Lead Dress:

(1) Dress all leads away from oscillator and antenna coils.
(2) Dress cathode resistor (R4) and B+ lead across 12SK7 socket between plate and grid terminals.
(3) (46X24 only) Dress leads to push button switch straight up and parallel so that they do not touch each other.
(4) Dress black lead from 1st I-F transformer over green lead.
(5) Keep plate-cathode bypass (C43) of rectifier tube away from volume control.



Dial and Controls

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voi and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator receiver chassis through a .01 mfd. capacitor, and keep the ou low as possible.

Pre-Setting Pointer.—With gang condenser in full mesh, the should be adjusted to a horizontal position.

Antenna.—The set is equipped with a built-in loop antenna. loop antenna is used, the antenna terminal board link should be This link should be open when an external antenna is used. C the external antenna to terminal 1. If an antenna longer th feet (including lead-in) is used, connect a 100 to 200 mmf. ca in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plu be inserted in the outlet for correct polarity. If the set d operate, reverse the plug. On a-c, reversal of the plug may hum.

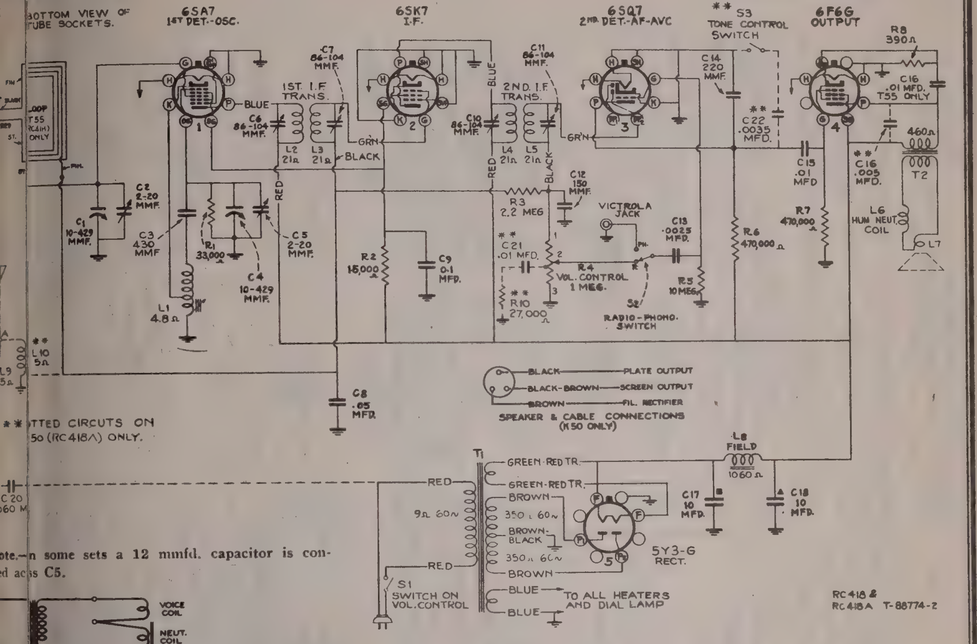
Step	Connect high side of test oscillator to—	Tune test oscillator to—	Turn radio dial to—	Adjust foll for max. ou
1	Grid 12SK7 in series with 0.01 mfd.	455 kc	"A" Band Quiet Point at 1,550 kc end of dial	C19 and (2nd I-F T
2	Grid 12SA7 In series with 0.01 mfd.			C13 and (1st I-F T
3	Antenna in series with 200 mmfd.	600 kc	"A" Band 600 kc	C15 (os
4		1,560 kc	"A" Band Full Clockwise	C8 (osc
5		1,400 kc	Resonance on 1,400 kc "A" Band	C6 (ant
6	Repeat steps 3 (rock in), 4 and 5			
7	Antenna in series with 300 ohms	18.5 kc	"C" Band Full Clockwise	C17 (osc
8		17.8 kc	"C" Band Resonance on 17.8 kc Signal	C3 (ant
9	Repeat steps 7 and 8			

* Use minimum capacity peak if two can be obtained.
Note: Oscillator tracks above signal on all bands.

RCA MFG. CO., INC.

MODELS K50,Ch.RC418A
T55,T56,Ch.RC418
Schematic,Voltage
Chassis Wiring

OR TUNER DATA
EE PAGE 11-41

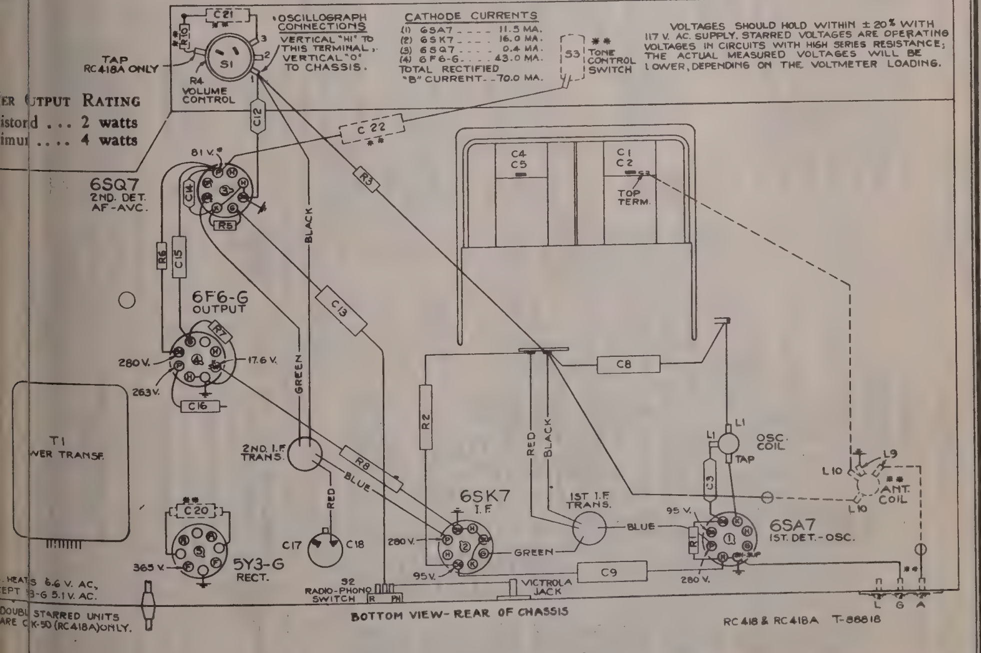


** OTTED CIRCUITS ON 50 (RC418A) ONLY.

ote.—n some sets a 12 mmfd. capacitor is con- d acss C5.

LOUDSPEAKER	T55	K50
Type	5 inch electrodynamic	12 inch electrodynamic
V. C. impedance at 400 cycles	3.4 ohms	2.2 ohms

ER UTPUT RATING
istord . . . 2 watts
imur . . . . 4 watts



HEATS 6.6 V. AC,
EPT 3-G 5.1 V. AC.
DOUBL STARRED UNITS
ARE K-50 (RC418A) ONLY.

R-F Wiring Diagram and Socket Voltages

MODELS K50,T55,T56
Alignment,Trimmers
Socket,Dial Data
Lead Dress,Parts

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
	Model T-55 (RC-418) Model K-50 (RC-418A)	
33719	Belt—Tuning unit push arm belt	.05
33718	Board—Antenna-Ground terminal board	.20
12725	Capacitor—150 mmfd. (C12)	.35
12694	Capacitor—220 mmfd. (C14)	.35
32599	Capacitor—430 mmfd. (C3)	.35
12537	Capacitor—560 mmfd. (C20) Model K50	.35
5107	Capacitor—.0025 mfd. (C13)	.20
30303	Capacitor—.0035 mfd. (C22) Model K50	.40
33584	Capacitor—.005 mfd. (C16) Model K50	.25
4937	Capacitor—.01 mfd. (C15, C16, C21) (C16 in Model T55 only) (C21 in Model K50 only)	.25
32787	Capacitor—.05 mfd. (C8)	.20
4839	Capacitor—0.1 mfd. (C9)	.30
33775	Coil—Antenna coil (L9, L10) Model K50	.90
33724	Coil—Oscillator coil (L1)	.75
32342	Condenser—Electrolytic, 2 sections 10 mfd. each (C17, C18)	1.20
33630	Control—Tone control (S3) Model K50	1.00
32634	Cord—Drive cord	.10
33633	Indicator—Dial scale pointer	.20
11765	Lamp—Dial lamp	.15
33431	Link—Antenna terminal board link	.02
33721	Loop—Antenna loop Model T55	1.00
33727	Plate—Dial plate assembly	.90
31388	Resistor—390 ohms, 1 watt (R8)	.22
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
12738	Resistor—27,000 ohms, ¼ watt (R10) Model K50	.20
12454	Resistor—33,000 ohms, ¼ watt (R1)	.20
12285	Resistor—470,000 ohms, ¼ watt (R6, R7)	.20
12679	Resistor—2.2 meg., ¼ watt (R3)	.20
13601	Resistor—10 meg., ¼ watt (R5)	.20
33725	Shaft—Tuning knob shaft	.30
31364	Socket—Dial lamp socket	.20
14278	Socket—Phono-input socket	.25
5119	Socket—3 contact female for speaker cable—Model K50	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
33720	Spring—Push arm return spring	.02
33634	Switch—Radio-Phono switch (S2)	.30
33722	Transformer—First i-f transformer (L2, L3, C6, C7)	1.60

STOCK No.	DESCRIPTION	Unit List Price
33723	Transformer—Second i-f transformer (L4, L5, C10, C11)	1.60
31575	Transformer—Power transformer 110-220 volts, 60 cycle (T1)	8.35
33619	Transformer—Power transformer 105-120 volts, 25-60 cycle (T1)	7.75
33112	Transformer—Power transformer 105-120 volts, 50-60 cycle (T1)	4.30
33631	Volume control and power switch (R4, S1) Model T55	1.50
33776	Volume control and power switch (R4, S1) Model K50	2.00
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES	
	(Model T55) (RL-78-6)	
32907	Cap—Cone center dust cap	.02
32906	Coil—Hum neutralizing coil (L6)	.25
33601	Coil—Speaker field coil (L8)	1.25
32904	Cone—Speaker cone and voice coil (L7)	1.20
32905	Transformer—Output transformer (T2)	1.35
	SPEAKER ASSEMBLIES	
	(Model K50) (RL-70J-2)	
31825	Cap—Cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L6)	.30
33116	Coil—Speaker field coil (L8)	2.10
31275	Cone—Speaker cone and voice coil (L7)	1.75
5118	Plug—3 contact male for speaker	.25
33779	Transformer—Output transformer (T2)	

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	Quiet Point between 1,720-1,500 kc	C10 and C11 (2nd I-F trans.)
2	Antenna terminal			C6 and C7 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C2 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.) (Rock in)
5	Repeat step 3			

Note.—Oscillator tracks above signal.

Precautionary Lead Dress.—

1. Power cord leads must be dressed up away from 6SQ7 socket, and toward end of chassis.

2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.

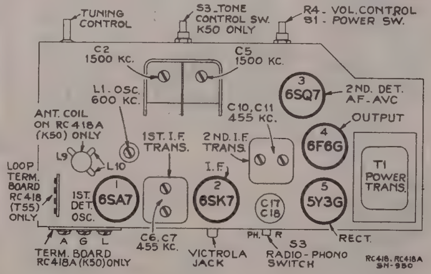
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.

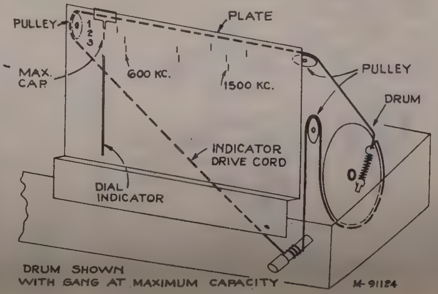
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.

5. Capacitor from volume control center tap to 6SQ7 socket must be dressed so that its body is between AC terminal on control and opening in chassis for gang condenser.

6. Red lead from "L" terminal on antenna board to 5Y3G socket must be dressed against base.

7. Green lead from gang to 6SA7 socket must be dressed toward side apron away from other parts.





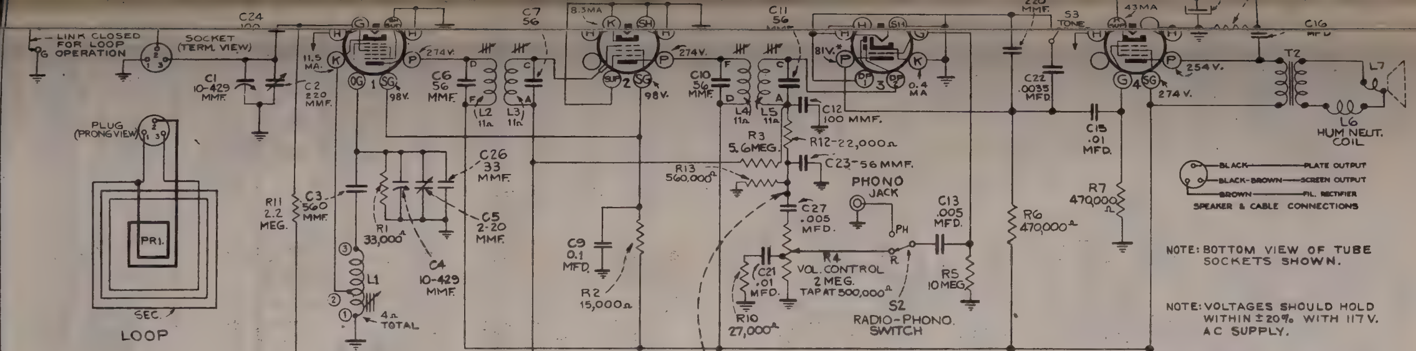
Dial-Indicator and Drive Mech

"calibration marks" shown in this drawing

To center the loudspeaker voice coil, first remove the front

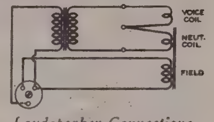
the feelers and fasten a dust cover in place with loudspeaker

MODEL K50,Chassis RC497
2nd Production
Schematic,Voltage
Socket,Trimmers,Dial



NOTE: BOTTOM VIEW OF TUBE SOCKETS SHOWN.

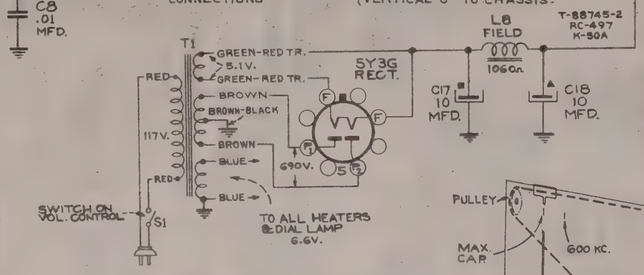
NOTE: VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC SUPPLY.



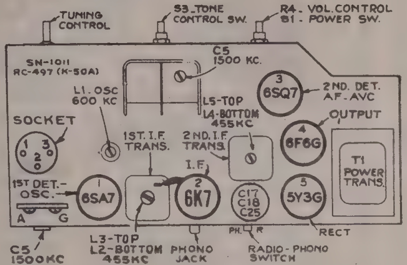
Loudspeaker Connections

IF PEAK 455 KC

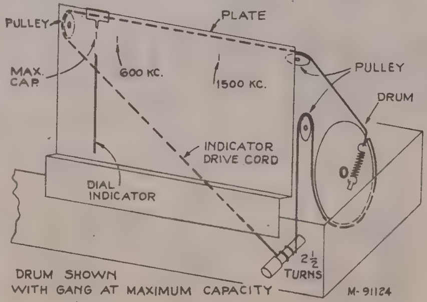
CATHODE RAY OSCILLOGRAPH CONNECTIONS {VERTICAL "HI" TO THIS TERM. VERTICAL "O" TO CHASSIS.



FOR ALIGNMENT SEE INDEX



FOR TUNER DATA SEE PAGE 11-41



Dial Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

Centering Loudspeaker Cone

To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers in the gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement

Power Output Rating

Undistorted .... 2 watts
Maximum .... 4 watts

Power Supply Ratings

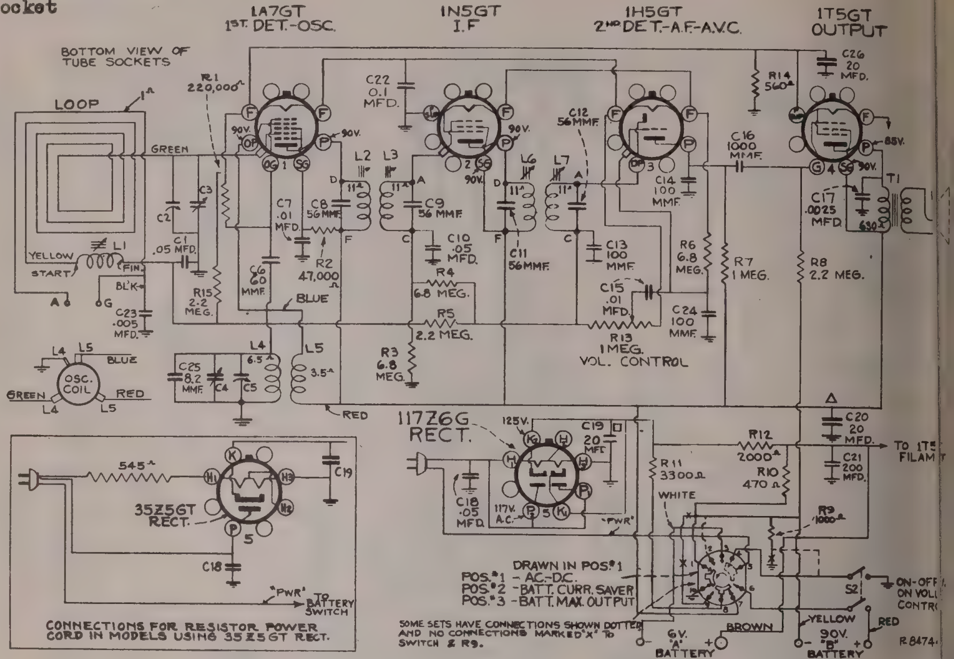
Rating A............ 105-125 volts, 50-60 cycles, 75 watts
Rating B............ 105-125 volts, 25-60 cycles, 75 watts
Rating C..... 105-125, 200-250 volts, 50-60 cycles, 75 watts

Loudspeaker

Type .... 12-inch electrodynamic
V C. impedance at 400 cycles.................................. 2.2 ohms

MODELS BP55,BP56,BP85
Chassis RC-455
Schematic,Voltage
Alignment,Trimmers
Socket

RCA MFG. CO., INC.



Schematic Circuit Diagram

Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately 20% with rated battery voltage.

Line Current Supply
110 to 125 volts, AC 50 or 60 cycles, or DC

Batteries Required
"A" one 6 volt dry plug-in type (Eveready No. 747 or equivalent)
"B" two 45 volt dry plug-in type. (Eveready No. 482 or equivalent)

Frequency Range	540-1,600 kc
Intermediate Frequency	455 kc

Current Consumption
"A," 0.05 ampere—"B," 10.5 milliamperes full power; 6.0 milliamperes save power.

Power Output

Undistorted	0.125 watt
Maximum	0.17 watt

Loudspeaker

Type	5-inch permanent-magnet dynamic
Voice-coil Impedance	4.5 ohms at 400 cycles

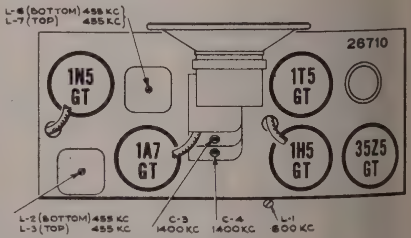
Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

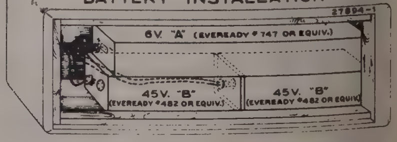
Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7GT 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L2, L3, L6, L7 (1st and 2nd I-F transformers)
2		1,600 kc	1,600 kc	C4 osc.
3	radiated signal near 600 kc		signal frequency	L1
4	radiated signal near 1,400 kc		signal frequency	C3
5	radiated signal near 600 kc		signal frequency	L1

For steps 3, 4, and 5 the chassis must be in the cabinet and the batteries in place and connected. L-1 is then reached through the small hole in the cabinet which is normally covered with a small plug located farthest away from C-3 and C-3 is reached through an eyelet in the speaker-grille. If a broadcast signal is used it should be weak to avoid a-v-c action. Turning loop to minimum pickup position will sometimes be helpful. If no broadcast signal is available connect test oscillator output to a suitable radiation loop located several feet away from receiver.

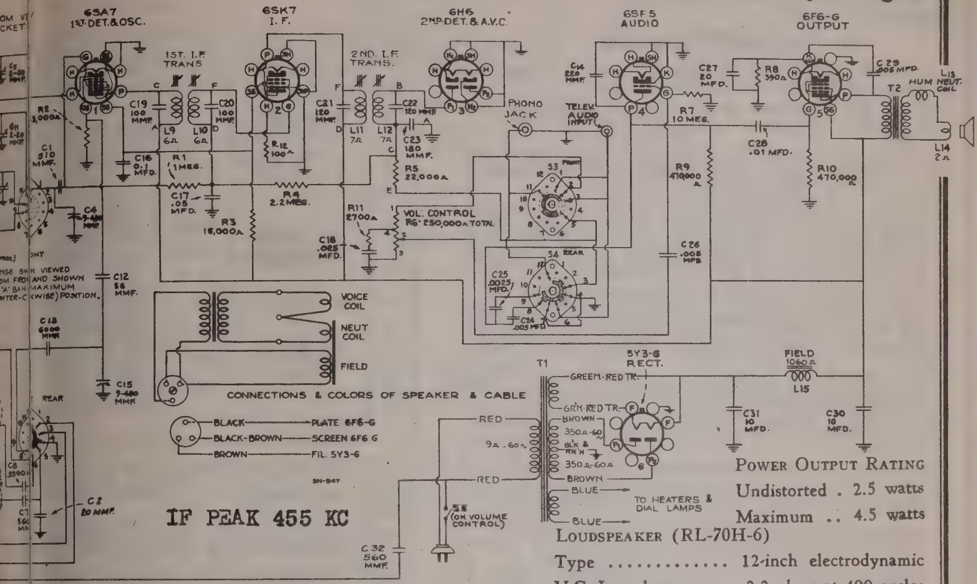


BATTERY INSTALLATION


27894-1
6V. "A" (EVEREADY #747 OR EQUIV.)
45V. "B" (EVEREADY #482 OR EQUIV.)
45V. "B" (EVEREADY #482 OR EQUIV.)

RCA MFG. CO., INC.

MODEL K60, Chassis RC415 Schematic, Voltage Chassis Wiring, Changes



Power Output Rating

Undistorted . 2.5 watts

Maximum .. 4.5 watts

Loudspeaker (RL-70H-6)

Type .... 12-inch electrodynamic

V.C. Impedance ......2.2 ohms at 400 cycles

On sc e receivers the following circuit modifications are

is 4, 0 ohms, and C18 is .05 mfd.

470 mfd.

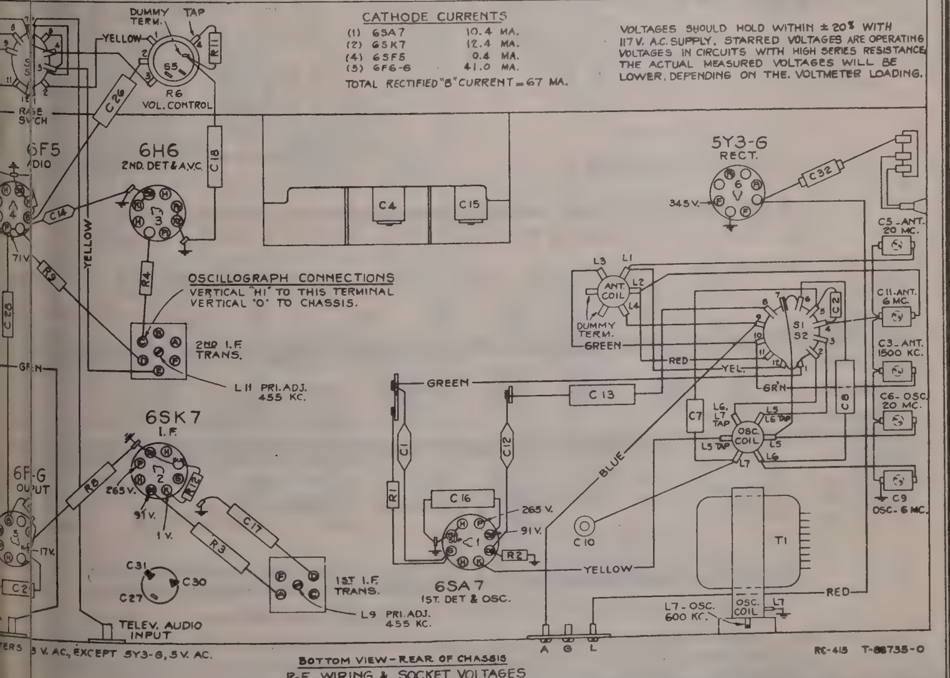
are ree types of 2nd I-F transformers in use.

first e (Stock No. 14308) has C23 and R5 mounted case, nd is connected exactly as shown above.

e sec d type R5 is omitted and the lead from S4 con- inst of E. E is not used.

c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the above diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the diagram.



CATHODE CURRENTS

(1)	6SA7	10.4 MA.
(2)	6SK7	12.4 MA.
(4)	6SF5	0.4 MA.
(5)	6F6-G	41.0 MA.

TOTAL RECTIFIED "B" CURRENT = 67 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY. STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

ERS 3 V. AC., EXCEPT 5Y3-G, 5 V. AC.

BOTTOM VIEW - REAR OF CHASSIS
R-F WIRING & SOCKET VOLTAGES

MODEL K60,Chassis RC415
MODEL K80,Chassis RC415A
Alignment,Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

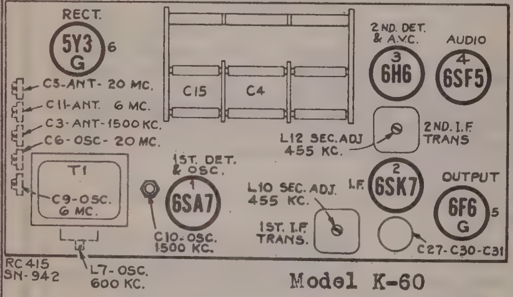
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjusting for peak	
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L11 (2nd I-	L1 ran
2	6SA7 grid in series with .01 mfd.			L9 (1st I-	L10 rans
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (200°) "C" Band	C6 C5	.)* t.)
4		6 mc	6 mc (187.5°) "B" Band	C9 C11	)** t.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (198.25°) "A" Band	C10 C3	c.) .)
6		600 kc	600 kc (39.75°) "A" Band	L7 Rock	.) ng
7	Repeat step 5.				

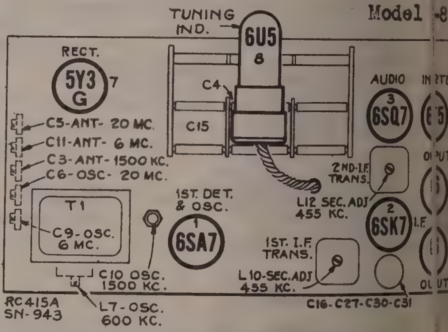
* Use minimum capacity peak if two can be obtained. determine that C6 has been adjusted to correct peak by ceiver to approximately 19.09 mc where a weaker signal received.

** Use minimum capacity peak if two can be obtained. determine that C9 has been adjusted to correct peak by ceiver to approximately 5.09 mc where a weaker signal received.

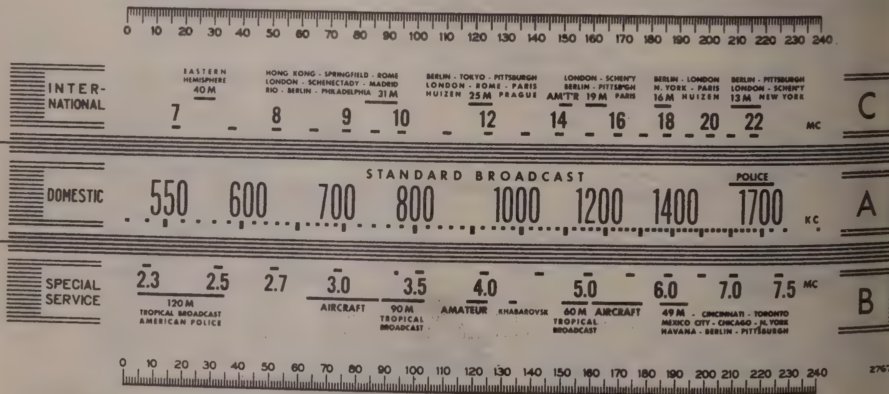
Note: Oscillator tracks above signal on all bands.



Model K-60



Calibration Scale



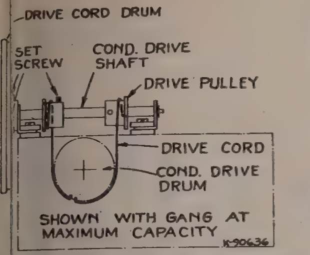
Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by draw line from this point on the bottom calibration scale to the same point on the top calibration scale. For example 39.7 the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

EL 105
ve rd Data

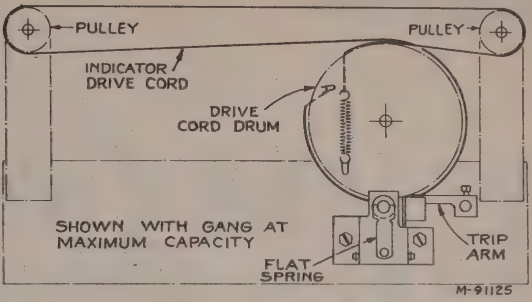
RCA MFG. CO., INC.

MODEL K60,Chassis RC415
MODEL K80,Chassis RC415A
Dial Data, Parts List

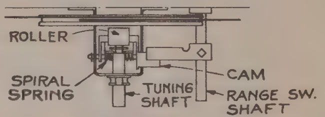


C NDENSER DRIVE CORD ARRANGEMENT

ote: In the Dial Indicator Drive Cord As sbly drawing at the right the mechanism is swn with the range switch in the "A" band ption. In this position the trip arm on the rge switch shaft must be adjusted so that when p-buttons are operated, the drive cord drum w turn freely without rubbing or binding anst the drive roller.



DIAL INDICATOR DRIVE CORD ASSEMBLY.



TOP VIEW

SOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-415A)	
3620	Arm—Push arm and cam assembly on tuning unit—less lock screw	.35
3432	Arm—Trip arm and set screw located on range switch shaft	.15
3430	Board—Antenna and ground terminal board	.20
0766	Cap—Rubber cap for Magic Eye—Model K80 only	.15
2714	Capacitor—Air-trimmer, 2-12 mmfd. (C10)	.50
3429	Capacitor—Trimmer capacitor bank, 2 sections 4-50 mmfd., and 3 sections 2-20 mmfd. (C3, C5, C6, C9, C11)	.80
1871	Capacitor—20 mmfd. (C2)	.40
2723	Capacitor—56 mmfd. (C12)	.35
0904	Capacitor—100 mmfd. (C19, C20)	.25
2404	Capacitor—120 mmfd. (C21, C22)	.30
4712	Capacitor—180 mmfd. (C23)	.30
0232	Capacitor—220 mmfd. (C14)	.35
0608	Capacitor—510 mmfd. (C1)	.35
1433	Capacitor—560 mmfd. (C7)	.35
2537	Capacitor—560 mmfd. (C32)	.35
1403	Capacitor—3,300 mmfd. (C8)	.60
1405	Capacitor—6,000 mmfd. (C13)	.75
5107	Capacitor—.0025 mfd. (C25)	.20
4838	Capacitor—.005 mfd. (C24, C26, C29, C33,* C35)*	.25
4937	Capacitor—.01 mfd. (C28)	.25
2787	Capacitor—.05 mfd., 400 V. (C17, C34)*	.20
2786	Capacitor—0.1 mfd. (C18)	.25
3014	Capacitor—Electrolytic, 3 sections 10 mfd., one section 20 mfd. (C16, C27, C30, C31)	1.90
2821	Coil—Antenna coil (L1, L2, L3, L4)	1.35
2824	Coil—Oscillator coil (L5, L6, L7)	1.00
3424	Control—Tone control (S3, S4)	1.15
3425	Control—Volume control and power switch (R6, S5)	2.00
2635	Cord—Condenser drive cord	.24
2634	Cord—Drive cord	.10
2713	Core—Adjustable core and stud for oscillator coil	.35
3627	Drum—Condenser drive drum	.25
3174	Drum—Drive cord drum with set screws and calibrator dial	.65
1891	Lamp—Dial lamp	.17
3625	Plate—Front guide plate for push arms	.25
5040	Plug—4-contact female for speaker cable	.30
3427	Pulley—Drive cord pulley and mounting bracket	.30
3626	Pulley—Drive pulley—less bronze drive cord	.25
4439	Resistor—100 ohms, ¼ watt (R12)	.20
0735	Resistor—560 ohms, 1 watt (R8)	.22
3714	Resistor—5,600 ohms, ¼ watt (R11)	.20
2265	Resistor—6,800 ohms, ¼ watt (R17)	.20
3489	Resistor—15,000 ohms, 2.5 watt (R3)	.55
4284	Resistor—22,000 ohms, 1/10 watt (R5)	.15
2454	Resistor—33,000 ohms, ¼ watt (R2)	.20
2285	Resistor—470,000 ohms, ¼ watt (R9, R10, R14,* R16)*	.20
2013	Resistor—1 meg., 1/10 watt (R13)*	.15

STOCK No.	DESCRIPTION	Unit List Price
13730	Resistor—1 meg., ¼ watt (R1)	.20
12679	Resistor—2.2 meg., ¼ watt (R4)*	.20
13601	Resistor—10 meg., ¼ watt (R7, R15)	.20
30340	Retainer—Retainer for shaft of tuning shaft cam and arm	.02
33419	Roller—Friction roller for tuning knob shaft	.10
4669	Screw—No. 8-32 square head set screw for drum	.03
33621	Screw—Push arm lock screw	.05
33624	Shaft—Tuning condenser drive shaft and washer	.15
33422	Shaft—Tuning shaft—less friction roller	.20
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye tube socket*	.45
14278	Socket—Phonograph or Television input socket	.25
31319	Socket—Tube socket	.25
33175	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
33421	Spring—Tuning shaft flat spring	.10
33420	Spring—Tuning shaft cam spiral spring	.06
33426	Switch—Range switch (S1, S2)	1.10
33428	Transformer—First i-f transformer (L9, L10, C19, C20)	1.95
14308	Transformer—Second i-f transformer (L11, L12, C21, C22, C23, R5)	2.90
33618	Transformer—Power transformer—105-120 volts, 25 cycle (T1)	6.40
33112	Transformer—Power transformer—105-120 volts, 50-60 cycle (T1)	4.30
	SPEAKER ASSEMBLIES (RL-70J1)	
31825	Cap—Cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L13)	.30
33116	Coil—Speaker field coil (L15)	2.10
31275	Cone—Speaker cone, voice coil, and dust cap (L14)	1.75
5039	Plug—4-prong male, for speaker*	.30
33444	Transformer—Output transformer (T2)*	2.00
	MISCELLANEOUS ASSEMBLIES	
33473	Button—Push button	.10
30716	Clip—Magic Eye clip	.25
33437	Dial—Dial scale (glass)	1.10
33439	Escutcheon—Dial escutcheon—less push buttons	2.20
33435	Frame—Dial scale holder, mounting brackets, pointer, and Magic Eye bracket and clip assembled—less dial*	2.50
34383	Indicator—Dial pointer, carriage, and clip	.40
33434	Knob—Volume control, tone control, range switch, or station selector knob	.30
33431	Link—Link for "Antenna-Ground" terminal board	.02
33842	Marker—Station selectors call letter markers	.25
33438	Screw—Thumb screw for Magic Eye clip*	.05
34143	Shaft—Pointer carriage slide rod	.15
14270	Spring—Retaining spring for knob	.05

8 in Model K80

*IN MODEL K80 ONLY

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

4839	Capacitor—0.1 mfd. (C16)	.30
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C27, C30, C31)	1.45
5119	Plug—3-contact female for speaker cable	.25
31388	Resistor—390 ohms, 1 watt (R8)	.22
30146	Resistor—4,700 ohms, ¼ watt (R11)	.20
	SPEAKER ASSEMBLIES (RL-70H6)	
5118	Plug—3-contact male, for speaker	.25
31301	Transformer—Output transformer (T2)	1.70
33436	Frame—Dial scale holder, mounting brackets, and pointer assembled—less dial	2.35

DTE: Above Parts List applies to oth Model K-60 and K-80 except for ems noted. Items on the right pply only to Model K-60.

MODELS K60,K62,Ch.RC415B
MODELS K80,K81,K82,
Chassis RC415C,RC415D
Alignment,Parts

RCA MFG. CO., INC.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
33620	Arm—Push arm and cam assembly on tuning unit —less lock screw	.35
33432	Arm—Trip arm and set screw located on range switch shaft	.15
34574	Board—"Ant.-Grd." terminal board	.20
12581	Cap—i-f transformer shield cap	.25
30766	Cap—Rubber cap for Magic Eye — Models K-80, K-81	.15
34573	Capacitor—Trimmer, 2 sections 2-10 mmfd. each	.35
34572	Capacitor—Trimmer, 2 sections 4-50 mmfd. each	.35
12714	Capacitor—Air-trimmer, 2-12 mmfd. (C10)	.50
14079	Capacitor—6.8 mmfd. (C3)	.35
34580	Capacitor—39 mmfd. (C2)	XX
12723	Capacitor—56 mmfd. (C12)	.35
30949	Capacitor—56 mmfd. (C21, C22)	.25
30904	Capacitor—100 mmfd. (C19, C20)	.25
30232	Capacitor—220 mmfd. (C14)	.35
30433	Capacitor—470 mmfd. (C1)	.35
34581	Capacitor—650 mmfd. (C7)	.40
30057	Capacitor—2,700 mmfd. (C8)	.55
31399	Capacitor—4,700 mmfd. (C13)	.65
5107	Capacitor—.0025 mfd. (C25)	.20
33584	Capacitor—.005 mfd. (C18—Model K-60 only), (C35 — Models K-80, K-81), (C37 — All Models)	.25
4838	Capacitor—.005 mfd. (C24, C26, C29)	.25
4937	Capacitor—.01 mfd. (C18—Models K-80, K-81), (C28—All Models)	.25
32787	Capacitor—.05 mfd. (C34—Models K-80, K-81), (C17—All Models)	.20
4839	Capacitor—0.1 mfd. (C16) (Model K-60 only)	.30
32786	Capacitor—0.1 mfd.	.25
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C27, C30, C31) (Model K-60 only)	1.45
33014	Capacitor—Electrolytic, 3 sections 10 mfd., one section 20 mfd. (C16, C27, C30, C31) (K-80, K-81)	1.90
34579	Coil—Oscillator coil	.80
34578	Control—Tone control	1.35
3‘695	Control—Volume control and power switch	XX
32635	Cord—Condenser drive cord	.24
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil	.35
33627	Drum—Condenser drive drum	.25
33174	Drum—Drive cord drum with set screws and calibrator dial	.65
11891	Lamp—Dial lamp	.17
33625	Plate—Front guide plate for push arms	.25
5119	Plug—3-contact female for speaker cable (Model K-60-A only)	.25
5040	Plug—4-contact female for speaker cable (Models K-80, K-81)	.30
33427	Pulley—Drive cord pulley and mounting bracket	.30
33626	Pulley—Drive pulley—less bronze drive cord	.25
31388	Resistor—390 ohms, 1 watt (R8) (Model K-60 only)	.22
30735	Resistor—560 ohms, 1 watt (R8) (Models K-80, K-81)	.22
14024	Resistor—2,700 ohms, ½ watt (R11, R15) (Models K-80, K-81)	.20
12695	Resistor—15,000 ohms, ½ watt (R17) (Models K-80, K-81)	.20
33489	Resistor—15,000 ohms, 2.5 watt (R3)	.55
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
5132	Resistor—47,000 ohms, 1/10 watt	.15
12412	Resistor—47,000 ohms, ½ watt (R11) (Model K-60 only)	.20
12286	Resistor—56,000 ohms, ½ watt (R11) (Models K-80, K-81)	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12013	Resistor—1 meg., 1/10 watt (R13) (Models K-80, K-81)	.15
12679	Resistor—2.2 meg., ½ watt (R4)	.20
30271	Resistor—4.7 meg., ½ watt (R1)	.20
13601	Resistor—10 meg., ½ watt (R7)	.20
30340	Retainer—Retainer for shaft of tuning shaft cam and arm	.02
33419	Roller—Friction roller for tuning knob shaft	.10
4669	Screw—No. 8-32 square head set screw for drum	.03
33621	Screw—Push arm lock screw	.05
33624	Shaft—Tuning condenser drive shaft and washer	.15
33422	Shaft—Tuning shaft—less friction roller	.20
34575	Socket—3-contact female, for loop input	.20

STOCK No.	DESCRIPTION	Unit List Price
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye tube socket (Models K-80, K-81)	.45
14278	Socket—Phonograph or Television input socket	.25
31319	Socket—Tube socket	.25
33175	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
33421	Spring—Tuning shaft flat spring	.10
33420	Spring—Tuning shaft cam spiral spring	.06
34577	Switch—Range switch	1.55
14376	Transformer—First i-f transformer	2.45
32825	Transformer—Second i-f transformer	2.50
33618	Transformer—Power transformer—105-120 volts, 25-60 cycle (T1)	6.40
33112	Transformer—Power transformer—105-120 volts, 50-60 cycle (T1)	4.30
	SPEAKER ASSEMBLIES (K-60) (RL-70H6)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil and dust cap	1.75
5118	Plug—3-contact male, for speaker	.25
31301	Transformer—Output transformer (T2)	1.70
	SPEAKER ASSEMBLIES (K-80, K-81, K-80-X) (RL-70J1)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil and dust cap	1.75
5039	Plug—4 prong male, for speaker	.30
33444	Transformer—Output transformer (T2)	2.00
	MISCELLANEOUS ASSEMBLIES	
33474	Button—Push button (K-60, K-80)	.10
34994	Button—Push button (K-81)	XX
34992	Cap—Spindle cap for antenna loop (K-81)	XX
30716	Clip—Magic Eye clip (K-60, K-80)	.25
34582	Dial—Dial scale (glass) (K-60, K-80)	1.25
34997	Dial—Dial scale (glass) (K-81)	
33439	Escutcheon—Dial escutcheon—less push buttons (K-60, K-80)	2.20
34993	Escutcheon—Dial scale and push button escutcheon (K-81)	XX
33436	Frame—Dial scale holder, mounting brackets, and pointer assembled—less dial	2.35
34996	Frame—Dial frame complete with brackets—*less* pointer guide rods, pointer and carriage, dial scale and Magic Eye clip (K-81)	XX
33435	Frame—Dial scale holder, mounting brackets, pointer, and Magic Eye bracket and clip assembled—less dial (K-60, K-80)	2.50
34583	Frame—Frame only for "C" band loop—less wire and plug	.30
34383	Indicator—Dial pointer, carriage, and clip	.40
34998	Knob—Tuning, tone control, range switch, volume control and power switch or antenna loop shaft knob (K-81)	XX
33434	Knob—Volume control, tone control, range switch or station selector knob (K-60, K-80)	.30
34988	Loop—"A" and "B" band loop complete for K-60	XX
34991	Loop—"A" and "B" band antenna loop complete (K-81)	XX
33842	Marker—Station selector markers	.25
34872	Pin—Complete set of dowel pins for antenna loop (K-60, K-80)	.25
34990	Plug—2-prong male plug for antenna loop—"C" band (K-81)	XX
32641	Plug—3-prong male plug for "A" and "B" band antenna loop	.10
31482	Screw—No. 8-32 square head set screw (K-81)	.03
33438	Screw—Thumb screw for Magic Eye clip (K-60, K-80)	.05
34995	Shaft—Flexible shaft for antenna loop (K-81)	XX
34491	Shaft—Pointer and carriage guide rods (K-81)	.15
14270	Spring—Retaining spring for knob	.05

ALL PRICES ARE SUBJECT TO CHANGE OR

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference when the chassis is removed; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	1st-det. grid, in series with .01 mfd.	455 kc	"C" band quiet point	L6 and L7 (2nd I-F trans.) L4 and L5 (1st I-F trans.)
2		15 mc	191° "C" band	C6 (osc.)*
3		2.44 mc	115° "B" band	C9 (osc.)
4	Fasten chassis in cabinet, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 530 kc mark and gang at maximum capacity.			
5	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15 mc	15 mc signal "C" band	C11 Rock gang
6		6.0 mc	6.0 mc signal "C" band	"C" loop leads**
7		Repeat step 5		
8		600 kc	600 kc "A" band	L3 (osc.) Rock gang
9		1,500 kc	1,500 kc "A" band	C10 (osc.) C36 (loop)
10	Repeat steps 8 and 9			
11		2.44 mc	2.44 kc "B" band	C9 (osc.) Rock gang

* Use minimum capacity peak if two peaks can be obtained.
** Adjust spacing between two leads from "C" band loop.
NOTE: Oscillator tracks above signal on all bands.

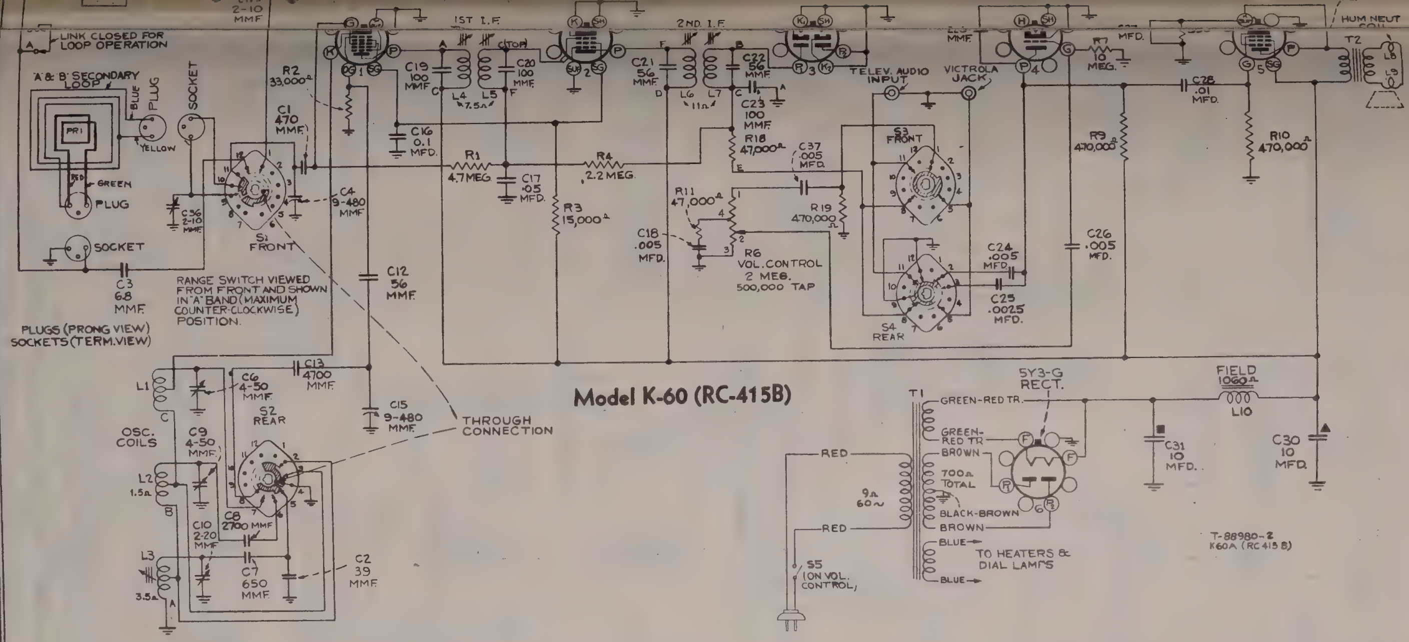
The push-buttons should be adjusted for eight favorite stations after the receiver is operating, and has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

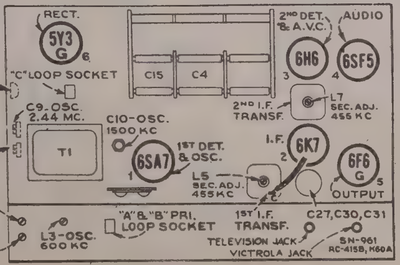
1. Loosen the push-button screws in back of the station-marker recesses.
2. Set Accessory-Tone Knob to "Radio" and turn the range selector to "A."
3. Press in the tuning knob and accurately tune in the first station.
4. With station accurately tuned in, press in the first push-button and tighten the screw.
5. Place the station marker tab in the recess.
6. Proceed in a similar manner to adjust the remainder of

RCA MFG. CO., INC.

MODELS K60,K62,Ch.RC415B
(With Loop)
Schematic,Socket,Trimmers



Model K-60 (RC-415B)

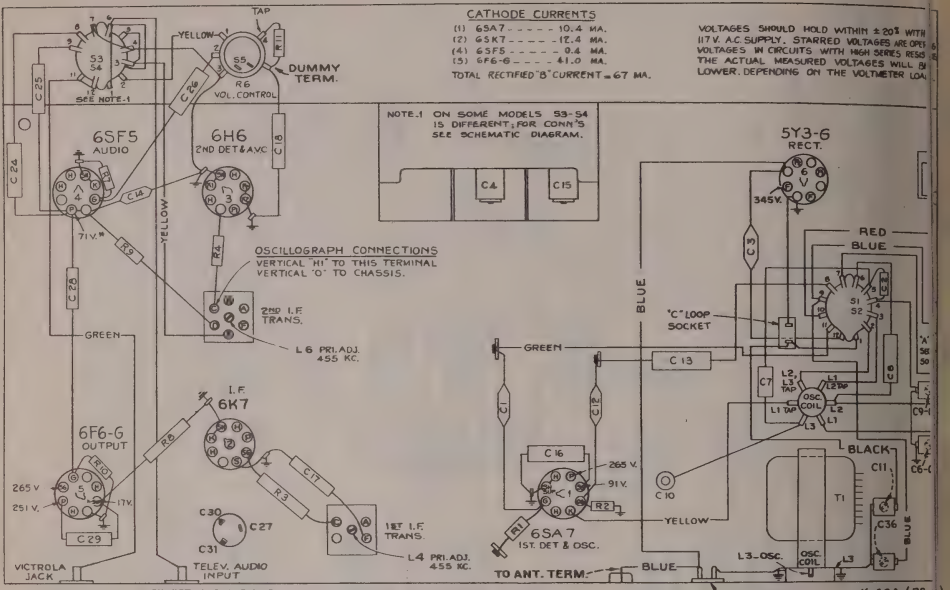


Model K-60 (RC-415B)

PILOT LAMPS (2)	Mazda No. 44, 6.3 volts, 0.25 amp.
POWER OUTPUT RATING	
Undistorted	2.5 watts
Maximum	4.5 watts
LOUDSPEAKER (RL-70H-6)	
Type	12-inch electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles
POWER CONSUMPTION	
Watts	75

MODELS K60,K62,Ch.RC415B
MODELS K80,Ch.RC415C,RC415D
K81,K82,Chassis RC415C
Chassis Wiring,Voltage

RCA MFG. CO., INC.



CATHODE CURRENTS
(1) 6SA7 - - - - - 10.4 MA.
(2) 6SK7 - - - - - 12.4 MA.
(4) 6SF5 - - - - - 0.4 MA.
(5) 6F6-G - - - - 41.0 MA.
TOTAL RECTIFIED "B" CURRENT = 67 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY. STARRED VOLTAGES ARE OPE VOLTAGES IN CIRCUITS WITH HIGH SERIES RESIS THE ACTUAL MEASURED VOLTAGES WILL B LOWER. DEPENDING ON THE VOLTMETER LOA

NOTE-1 ON SOME MODELS S3-S4 IS DIFFERENT; FOR CONN'S SEE SCHEMATIC DIAGRAM.

ALL HEATERS 6.3 V. AC, EXCEPT 5Y3-G, 5 V. AC.

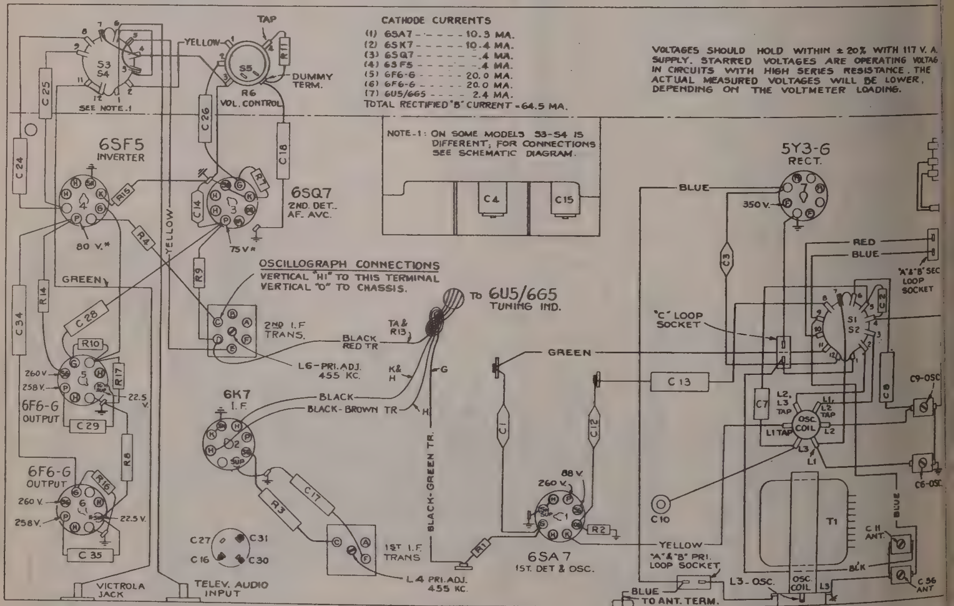
"A" & "B" PRI. LOOP SOCKET

K-60A (RC-4

SN-1004

BOTTOM VIEW - REAR OF CHASSIS
R-F WIRING & SOCKET VOLTAGES

Model K-60 (RC-415B)



CATHODE CURRENTS
(1) 6SA7 - - - - - 10.3 MA.
(2) 6SK7 - - - - - 10.4 MA.
(3) 6SQ7 - - - - - .4 MA.
(4) 6SF5 - - - - - .4 MA.
(5) 6F6-G - - - - - 20.0 MA.
(6) 6F6-G - - - - - 20.0 MA.
(7) 6U5/6G5 - - - - 2.4 MA.
TOTAL RECTIFIED "B" CURRENT - 64.5 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A. SUPPLY. STARRED VOLTAGES ARE OPERATING VOLTAG IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

NOTE-1: ON SOME MODELS S3-S4 IS DIFFERENT; FOR CONNECTIONS SEE SCHEMATIC DIAGRAM.

ALL HEATERS 6.2 V. AC, EXCEPT 5Y3-G, 5 V. AC.

SM-1002
RC-415C-K80

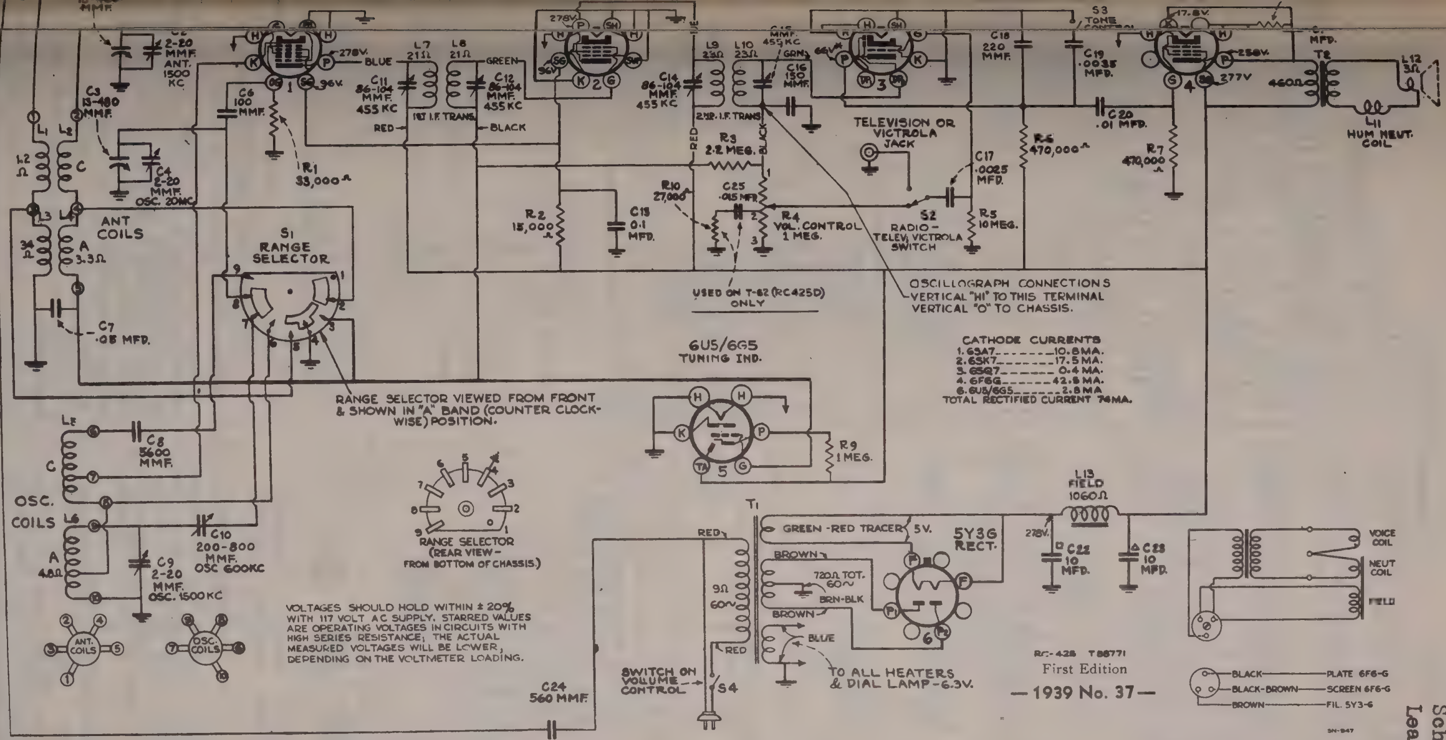
BOTTOM VIEW - REAR OF CHASSIS
R-F WIRING & SOCKET VOLTAGES

Models K-80 (RC-415C, RC-415D), and K-81 (RC-415C)

* *The Tuning Indicator is not used in RC-415D*

MODELS T60,Ch.RC425
T62,Chassis RC425D
Schematic,Voltage
Lead Dress

RCA MFG. CO., INC.



RC-428 T86771

First Edition

— 1939 No. 37 —

Power Line Antenna

Each of these models is equipped with a built-in power line antenna. To use this antenna, the link on the antenna terminal board should be connected between "A" and "L", thus connecting the antenna input of the receiver through a capacitor to the powerline. If an outside antenna is used, it should be connected to "A", a ground connection made to "G", and the link removed.

LOUDSPEAKER (T-60, RL-78-6; T-62, RL-79A-4)

Type .... T-60, 5-inch electrodynamic; T-62, 6-inch electrodynamic

V. C. Impedance.................. 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A .... 105-125 volts, 50-60 cycles, 80 watts

Rating B .... 105-125 volts, 25-60 cycles, 80 watts

Rating C.............. 100-130, 140-160, 195-250 volts, 40-60 cycles, 80 watts

PILOT LAMP (1) .....Mazda No. 51, 6.3 volts, 0.20 amp.

CONNECTIONS & COLORS OF SPEAKER & CABLE (MODEL T-62 ONLY)

FREQUENCY RANGES

Standard Broadcast .... 540-1,720 kc

Short Wave .... 5.6-20 mc

INTERMEDIATE FREQUENCY .... 455 kc

POWER OUTPUT RATING

Undistorted .... 2.2 watts

Maximum .... 4.2 watts

Precautionary Lead Dress.—

1. Dress the Power Line Antenna lead close to the chassis base and near the back flange.
2. Power switch leads should be dressed around the 6SQ7 socket.

MODELS T60,T62
Alignment,Trimmers
Socket,Tuner,Dial Data

RCA MFG. CO., INC.

Alignment Procedure

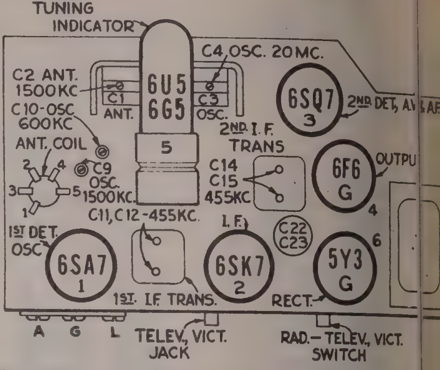
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid A.V.C. action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 mc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

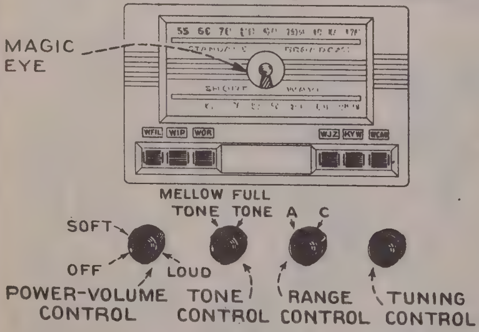
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the mark at the extreme left (low frequency) end of the dial scale.

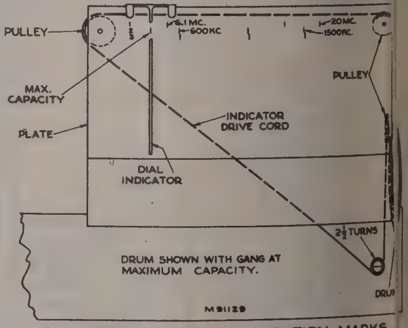


Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the followin or maximum peak ou t
1	Antenna terminal	455 kc	"A" Band Quiet point between 550-750 kc	C14 and C15 (2nd I-F trans.)
2				C11 and C12 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C4 (osc.)*
4	Antenna terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C9 (osc.) C2 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C10 (osc.) Rock gang
6	Repeat step 4			

* Use **minimum** peak if two can be obtained. Check to determine that C4 has been adjusted properly by tuning to approximately 19.09 mc where a weaker signal should be received.

Note: Oscillator tracks **above** signal on both bands.





DIAL MECHANISM AND CALIBRATION MARKS.

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Turn the accessory switch on the back apron of the chassis to "Radio" position and accurately tune in the station for which the first button is to be set.

3. Press in the first push-button rod (left) wit screwdriver, as far as it will go without undue pressure in, retune station with manual control if necessary fo reception, and then carefully tighten up the rod. D tighten more than 1/4 turn after the rod begins to g damage to the mechanism may result.

4. Replace the push-button on its shaft.

5. Proceed in a similar manner for the remainder push-buttons.

6. Insert the station marker tabs in the recesses the push-buttons.

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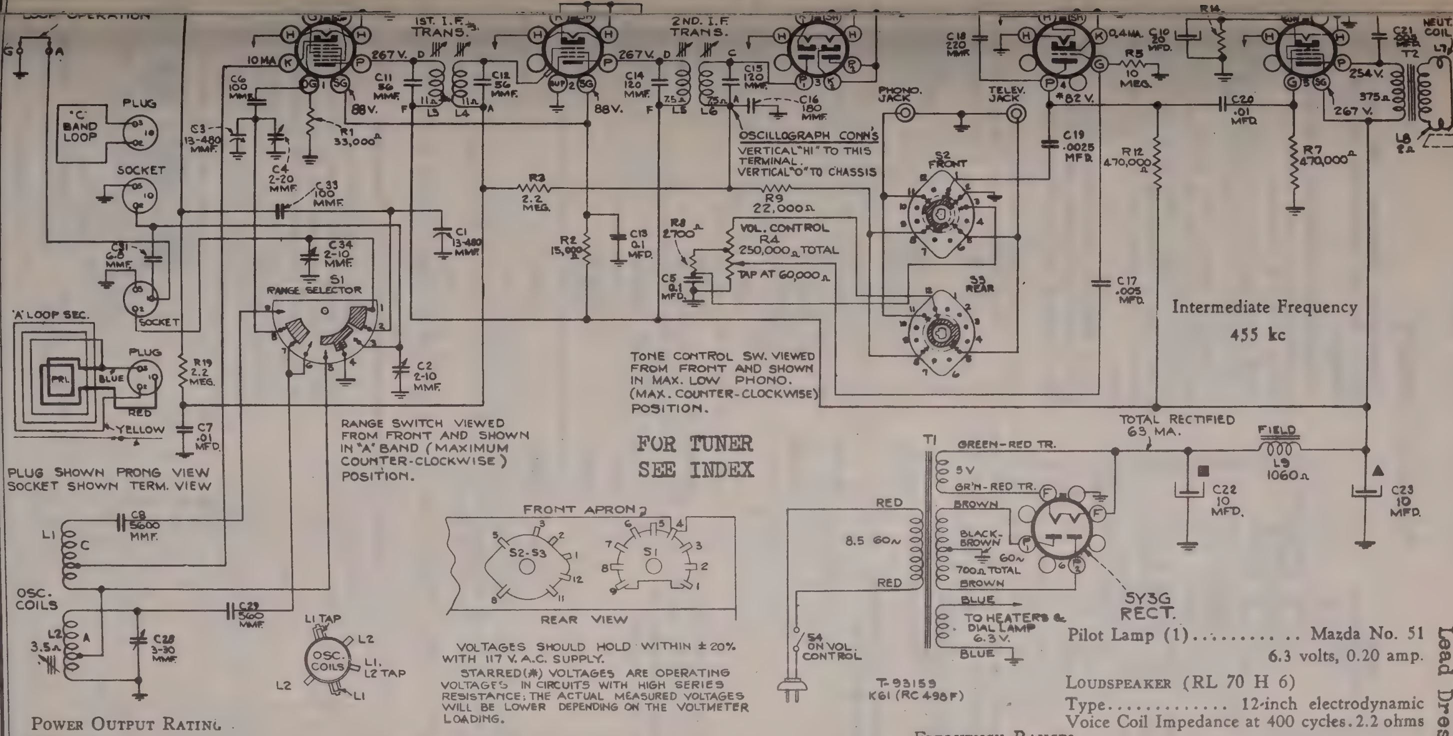
MODEL K61, Chassis RC498F Schematic, Voltage Lead Dress



Pilot Lamp (1)........... Mazda No. 51
6.3 volts, 0.20 amp.

Loudspeaker (RL 70 H 6)
Type............ 12-inch electrodynamic
Voice Coil Impedance at 400 cycles. 2.2 ohms

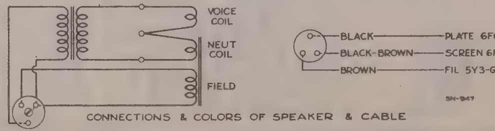
Frequency Ranges
Standard Broadcast......... 540 to 1,560 kc
Short-Wave .... 5.8 to 18 mc

Power Output Rating
Undistorted .... 2.5 watts
Maximum.................... 4.5 watts

Power Supply Ratings
Rating A..... 105-125 volts, 50-60 cycles, 75 watts
Rating B..... 105-125 volts, 25-60 cycles, 75 watts
Rating C..... 105-125, 200-250 volts, 50-60 cycles, 75 watts

Precautionary Lead Dress.—

1. Dress AC switch leads away from 6SF5 tube socket.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "5".
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress C-6 and C-33 away from each other.
5. Dress C-17 away from power switch leads.

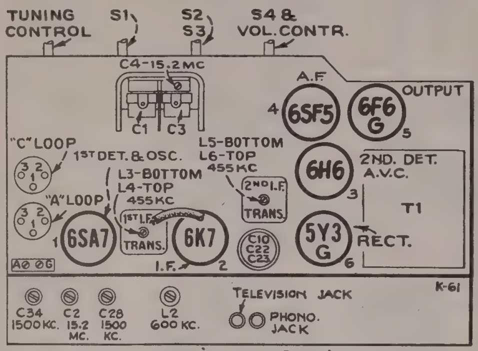


CONNECTIONS & COLORS OF SPEAKER & CABLE

MODEL K61,Chassis RC498F
Alignment,Trimmers
Socket,Dial Data

RCA MFG. CO., INC.

Alignment Procedure



Tube and Trimmer Locations

Cathode-Ray Alignment is the preferable method nections for the oscillograph are shown on the schematic.

Output Meter Alignment.—If this method is used, the output meter across the voice coil, and turn the volume control to maximum.

Test Oscillator.—For all alignment operations, ke oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened cabinet and can not be used for reference during alig Therefore calibration marks have been stamped in th on the front of the chassis as shown in the accomp drawing. These marks are used for reference during ment.

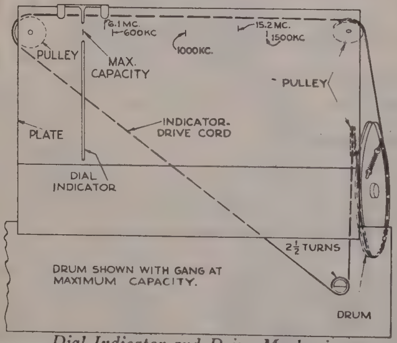
Dial Indicator Adjustment.—With the gang cor in full mesh, the indicator should point to the extre (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following maximum peak outp
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads "C" band loop to chas
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads i normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale m on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (mi capacity) peak.

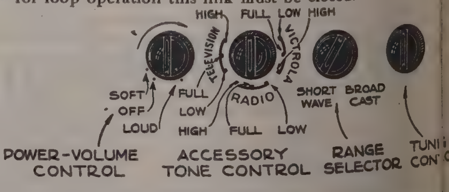
† If two peaks can be obtained use low frequency (maximum capacity) peak.



Dial Indicator and Drive Mechanism

Antennas

This receiver is equipped with two loop antennas band horizontal and fixed, and "A" band vertical and able). During operation the "A" band loop should be to the position giving maximum signal strength and fr from noise. If desired, an outside antenna and groun be connected to the terminals provided and when this is the link between these terminals must be opened. Ho for loop operation this link must be closed.



Controls

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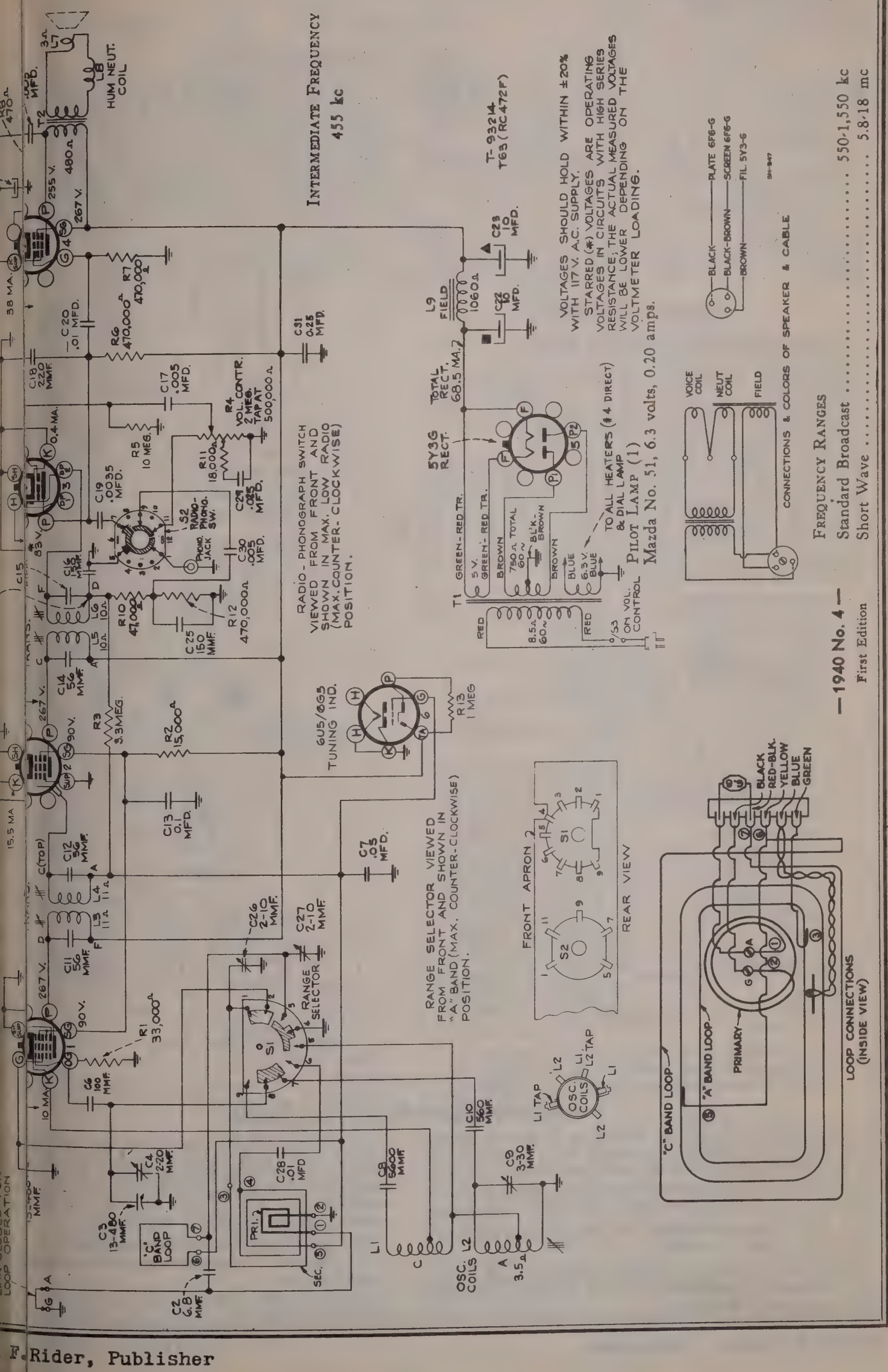
MODEL T63, Ch. RC472F
Schematic, Voltage



INTERMEDIATE FREQUENCY 455 kc

T-93214
T63 (RC472F)

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY. STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER DEPENDING ON THE VOLTMETER LOADING.

RADIO - PHONOGRAPH SWITCH VIEWED FROM FRONT AND SHOWN IN MAX. LOW RADIO (MAX. COUNTER-CLOCKWISE) POSITION.

RANGE SELECTOR VIEWED FROM FRONT AND SHOWN IN "A" BAND (MAX. COUNTER-CLOCKWISE) POSITION.

PILOT LAMP (1)
Mazda No. 51, 6.3 volts, 0.20 amps.

CONNECTIONS & COLORS OF SPEAKER & CABLE

LOOP CONNECTIONS (INSIDE VIEW)

FREQUENCY RANGES

Standard Broadcast .... 550-1,550 kc
Short Wave .... 5.8-18 mc

— 1940 No. 4 —
First Edition

MODEL T63,Ch.RC472F
Alignment,Trimmers
Socket,Dial Data
Tuner

RCA MFG. CO., INC.

POWER OUTPUT RATING

Undistorted	2.5 watts
Maximum	4.5 watts

LOUDSPEAKER (RL 79 A 4)

Type	6 inch Electrodynamic
Voice Coil Impedance at 400 Cycles	3.4 ohms

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 75 watts
Rating B	105-125 volts, 25-60 cycles, 75 watts
Rating C	105-125, 200-250 volts, 50-60 cycles, 75 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. The low side of the test-oscillator should be connected to the receiver chassis.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, adjust the dial indicator along the drive cable to the 540 kc mark, gang condenser fully meshed. The indicator has a clip for attachment to the cable.

Precautionary Lead Dress:

(1) Dress C8 (Oscillator coil to range switch) and its leads away from surrounding wires and chassis.

(2) Dress R2 (Screen to B+) away from surrounding wires and parts.

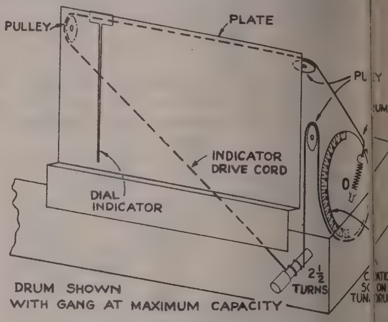
(3) Dress power switch leads away from 6SQ7 and 6F6G tube sockets.

Steps	Connect high side of test-osc. to—	Tune test osc. to—	Turn radio Dial to	Adjust the following for max. peak output
1	Grid of 6K7 through 0.01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L5 and L6 (2nd I-F trans.)
2	Grid of 6SA7 through 0.01 mfd.			L3 and L4 (1st I-F trans.)
3	Antenna terminal through 300 ohms	15 mc	"C" band 15 mc (132°)	C4 osc.* C27 ant.**
4	Antenna terminal through 200 mmfd.	600 kc	"A" band 600 kc (23.5°)	L2 osc. (Rock in)
5		1,500 kc	"A" band 1,500 kc (156.5°)	C9 osc. C26 ant.
6	Repeat Steps 4 and 5			

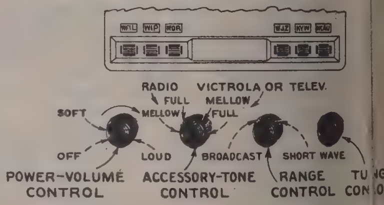
* Use minimum capacity peak if two can be obtained.
** Use maximum capacity peak if two can be obtained.
NOTE: Oscillator tracks above signal on all bands.

ANTENNAS

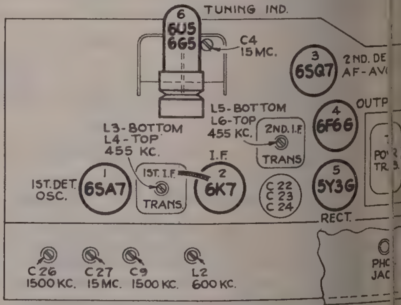
This receiver is equipped with a loop antenna for "C" bands. Both loops are fixed in position being vertically from the rear of the chassis. For best pe the receiver should be turned to a position giving signal strength and freedom from noise. The loop cc are shown in a separate diagram. If desired, an ex tenna and ground can be connected to the terminals In this case the link between these terminals must b however, for loop operation this link must be closed.



Dial Indicator and Drive Mechanism



Dial and Controls



Tube and Trimmer Locations

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up for any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Set the receiver for "Radio" operation, range selector on "Broadcast", and accurately tune in the station for which the first button is to be set.

3. Press in the first push-button rod (left) with th driver as far as it will go without undue pressure, retune station with manual control if necessary reception, and then carefully tighten up the rod. tighten more than ¼ turn after the rod begins to damage to the mechanism may result.

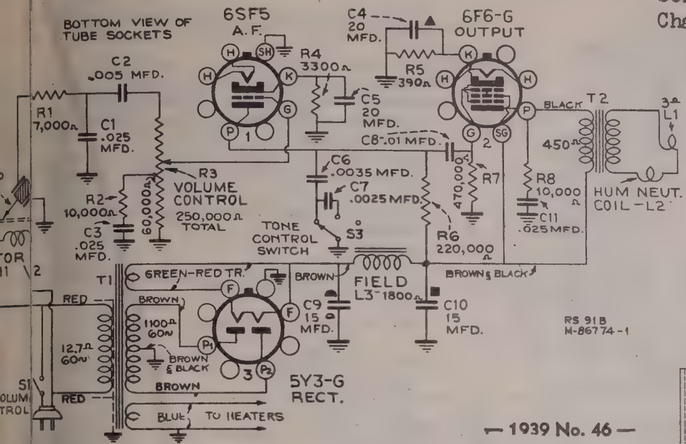
4. Replace the push-button on its shaft.

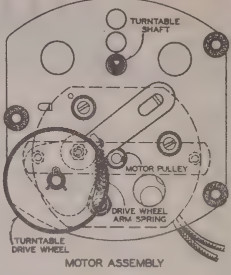
5. Proceed in a similar manner for the remainde push-buttons.

6. Insert the station marker tabs in the recesse the push-buttons.

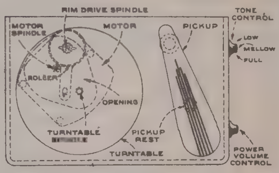
RCA MFG. CO., INC.

MODEL R60,Chassis RS91B
Victrola
Schematic,Voltage
Chassis Wiring,Assembly





MOTOR ASSEMBLY



— 1939 No. 46 —
First Edition

VICTROLA MODEL R-60

(phonograph only) RS-91B

e Virola Model R-60 consists of a crystal pickup, a tage idio amplifier, a six-inch electrodynamic speaker, rimdrive motor turntable mechanism with automatic ury sitch for starting and stopping—all housed in a cabit of modern design and appearance.

e phnograph motor is a self-starting, constant-speed tion pe. It should be lubricated every six months by ing few drops of light machine oil to the top and m mor spindle bearings, to the turntable spindle, and e turable drive wheel bearing.

UTIN: Keep oil away from drive bushing on top of spille and from rubber driving tire on turntable whe

e m**or switch** is automatic for both starting and stop- andwhen properly adjusted, will turn the motor on e picup is moved from the pickup rest toward the ble. he switch should be adjusted so that it will snap he "f" position when the pickup needle is 1¾ inches the nter line of the spindle. The motor may be shut any me by placing the pickup on the pickup rest.

Specifications

R SUPLY RATINGS
.... 105-125 volts, 60 cycles, 90 watts
.... 105-125 volts, 50 cycles, 90 watts

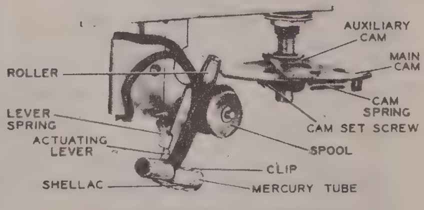
SPEAER (RL-79-2)
.... 6-inch electrodynamic
Impdance at 400 cycles...................... 3.4 ohms

COPLEMENT
RCA-6SF5.............................. A-F Amplifier
RCA-6F6-G.................................... Output
RCA-5Y3-G................................ Rectifier

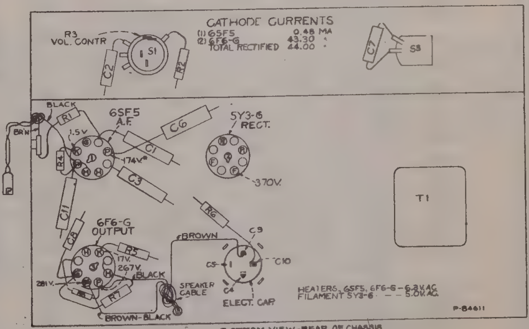
UP
.... Crystal
dand.................. 100,000 ohms at 400 cycles
age utput.... 1½ volts at 1,000 cycles with 250,000 ohms load

	Height	Width	Depth
net Imensions (inches)......	8$\frac{1}{16}$....	14	....9¾
sis Be Dimensions (inches)..	2¼	7⅜....	4¼

all Cassis Height.............................. 6½ inches
ght. .... 20 lbs. (shipping)



MERCURY SWITCH MECHANISM
(VIEWED FROM FRONT SHOWN WITH PICKUP IN REST POSITION)



BOTTOM VIEW-REAR OF CHASSIS
PARTS LAYOUT AND SOCKET VOLTAGES

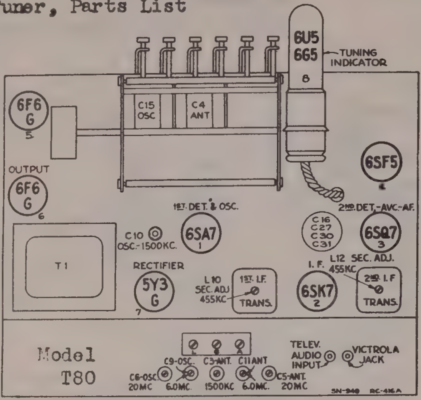
***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated. Values should hold within approximately ±20% with 117-volt a-c supply.

MODELS T64,T65,Ch.RC416
MODEL T80,Chassis RC416A
Tuner, Parts List

RCA MFG. CO., INC.

MODEL T8
Socket,T



The push-buttons should be adjusted for six favorite stations after the receiver is operating, and has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-button screws in back of the station-marker recesses.
2. Set Accessory-Tone Knob to "Radio" and turn the range selector to "A," so that the "A" band indicator lights up.
3. Press in the tuning knob and accurately tune in the first station.
4. With station accurately tuned in, press in the first push-button and tighten the screw.
5. Place the station marker tab in the recess.
6. Proceed in a similar manner to adjust the remainder of the push-buttons.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-416A)	
33620	Arm—Push arm and cam assembly on tuning unit—less lock screw	.35
33430	Board—Antenna and ground terminal board	.20
34268	Cap—Rubber cap for tuning tube	.10
12714	Capacitor—Air trimmer, 2-12 mmfd. (C10)	.50
33429	Capacitor—Trimmer capacitor bank, two 4-50 mmfd., three 2-20 mmfd., sections (C3, C5, C6, C9, C11)	.80
32792	Capacitor—25 mmfd. (C2)	.40
12723	Capacitor—56 mmfd. (C12)	.35
30904	Capacitor—100 mmfd. (C19, C20)	.25
12404	Capacitor—120 mmfd. (C21, C22)	.30
14712	Capacitor—180 mmfd. (C23)	.30
12694	Capacitor—220 mmfd. (C14)	.35
30433	Capacitor—470 mmfd. (C1)	.35
12537	Capacitor—560 mmfd. (C32)	.35
31433	Capacitor—560 mmfd. (C7)	.35
31403	Capacitor—3,300 mmfd. (C8)	.60
31405	Capacitor—6,000 mmfd, (C13)	.75
5107	Capacitor—.0025 mfd. (C25)	.20
4838	Capacitor—.005 mfd. (C24, C26, C29, C33*, C35)*	.25
4937	Capacitor—.01 mfd. (C28)	.25
4870	Capacitor—.025 mfd. (C18)	.20
32787	Capacitor—.05 mfd. (C17, C34)*	.20
33014	Capacitor—Electrolytic, three 10 mfd., and one 20 mfd. sections (C16, C27, C30, C31)	1.90
33508	Clip—Magic Eye mounting clip and bracket	.25
32821	Coil—Antenna coil (L1, L2, L3, L4)	1.35
32824	Coil—Oscillator coil (L5, L6, L7)	1.00
32635	Cord—Condenser drive cord	.24
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil	.35
33627	Drum—Condenser drive drum	.25
34267	Drum—Drive cord drum	.65
33186	Gear—Volume control knob shaft and gear	.40
33185	Gear—Volume control gear and hub, with set screws	.50
11891	Lamp—Dial lamp	.17
33431	Link—Antenna and ground terminal board link	.02
34041	Link—Link complete with arm and cam for operating range switch	.50
33628	Plate—Front guide plate for push arms	.25
13871	Plug—Eye cable plug	.45
5040	Plug—Speaker cable plug	.30
33509	Pulley—Drive cord pulley and bracket (1 pulley)	.20
33510	Pulley—Drive cord pulleys and bracket (2 pulleys)	.45
33626	Pulley—Drive pulley	.25
14439	Resistor—100 ohms, ¼ watt (R12)	.20
30735	Resistor—560 ohms, 1 watt (R8)	.22
12265	Resistor—6,800 ohms, ¼ watt (R17)*	.20
14559	Resistor—10,000 ohms, ¼ watt (R11)	.20
33489	Resistor—15,000 ohms, 2.5 watts (R3)	.55
14284	Resistor—22,000 ohms, 1/10 watt (R5)	.15
12454	Resistor—33,000 ohms, ¼ watt (R2)	.20
12285	Resistor—470,000 ohms, ¼ watt (R9, R10, R14*, R16)*	.20
12013	Resistor—1 meg., 1/10 watt (R13)	.15
13730	Resistor—1 meg., ¼ watt (R1)	.20
12679	Resistor—2.2 meg., ¼ watt (R4)	.20
13601	Resistor—10 meg., ¼ watt (R7, R15)	.20
14343	Retainer—Retaining ring for volume control knob shaft	.03
34040	Ring—Retaining ring for tuning shaft	.02
4669	Screw—No. 8-32 sq. hd. set screw for volume control gear and drum	.03
33621	Screw—Push arm lock screw	.05
34039	Shaft—Range switch knob shaft	.15
33624	Shaft—Tuning condenser drive shaft and washer	.15
34038	Shaft—Tuning knob shaft with rubber drive roller and pulley assembled	.60
33545	Shield—Dial lamp shield	.05
31364	Socket—Dial lamp socket	.20
33514	Socket—Phonograph and Television socket	.25
31319	Socket—Tube socket	.25
33544	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
34042	Spring—Spring and pin for range switch shaft	.20
33515	Spring—Tension spring for spring and pin	.02
33513	Switch—Range switch (S1, S2)	1.05
33511	Tone Control, Television and Phono switch (S3, S4)	1.10
33428	Transformer—First i-f transformer (L9, L10, C19, C20)	1.95
14308	Transformer—Second i-f transformer (L11, L12, C21, C22, C23, R5)	2.90
33619	Transformer—Power transformer 105-120 volts, 25-60 cycles (T1)	6.40
33112	Transformer—Power transformer 105-120 volts, 50-60 cycles (T1)	4.30
31446	Transformer—Power transformer—Universal—60 cycle (T1)	6.40
33512	Volume control and power switch (R6, S5)	2.00
33726	Washer—"C" washer for spring and pin	.02
34037	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL79-5)	
32907	Cap—Cone center dust cap	.02
32906	Coil—Hum neutralizing coil	.25
33547	Coil—Speaker field coil	1.00
32934	Cone—Speaker cone and voice coil	1.65
5039	Plug—4-prong male speaker connection plug*	.30
33599	Transformer—Speaker output transformer*	1.35
	MISCELLANEOUS ASSEMBLIES	
33474	Button—Push button	.10
33552	Dial—Glass dial scale	1.80
33549	Escutcheon—Dial and push button escutcheon—less buttons and screen	1.95
33551	Frame—Dial frame, holder, and pointer assembled—less dial	1.70
33471	Knob—Volume control knob	.25
33553	Knob—Range selector knob	.30
33470	Knob—Tone control knob	.20
33505	Knob—Tuning control knob	.30
33842	Marker—Station selector call letter markers	.25
33550	Screen—"Push Button "A" Band" marker screen	.20
30330	Spring—Retaining spring for knob, Stock No. 33470	.03
14270	Spring—Retaining spring for knob, Stock No. 33553 and Stock No. 33471	.05
4982	Spring—Retaining spring for knob, Stock No. 33505	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

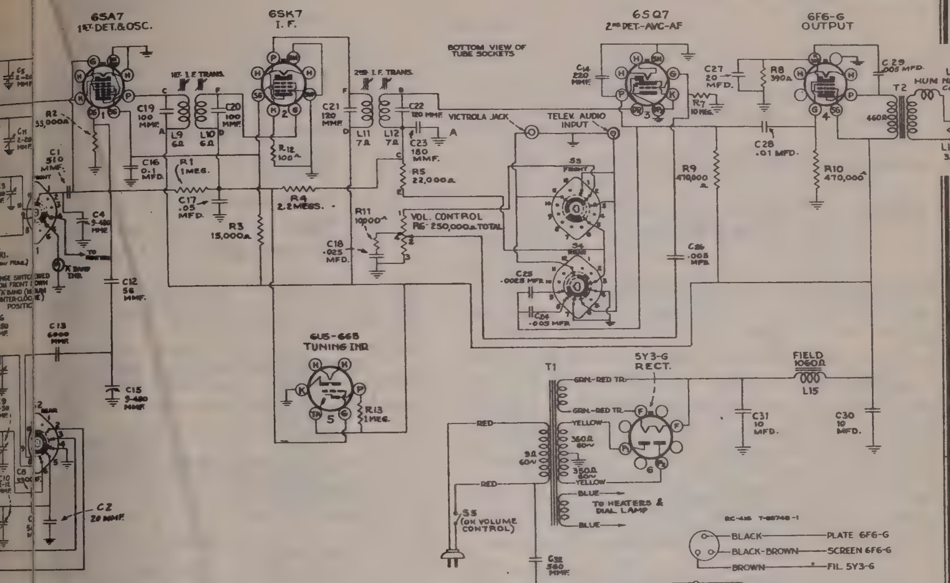
* Model T-80 only

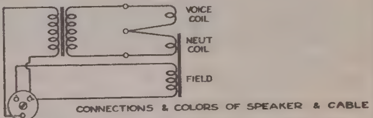
NOTE: Above Parts List applies to both Models T-64 and T-80, except for the items noted. Items on the right apply only to Model T-64.

4839	Capacitor—0.1 mfd. (C16)	
32240	Capacitor—Electrolytic, two 10 mfd., and one 20 mfd. sections (C27, C30, C31)	
31388	Resistor—390 ohms, 1 watt (R8)	
5119	Plug—Speaker cable plug	
	SPEAKER ASSEMBLIES (RL-79-4)	
5118	Plug—3-contact male plug for speaker	
32905	Transformer—Output transformer (T2)	

RCA MFG. CO., INC.

MODELS T64,T65,Ch.RC416
Schematic,Voltage
Chassis Wiring,Changes

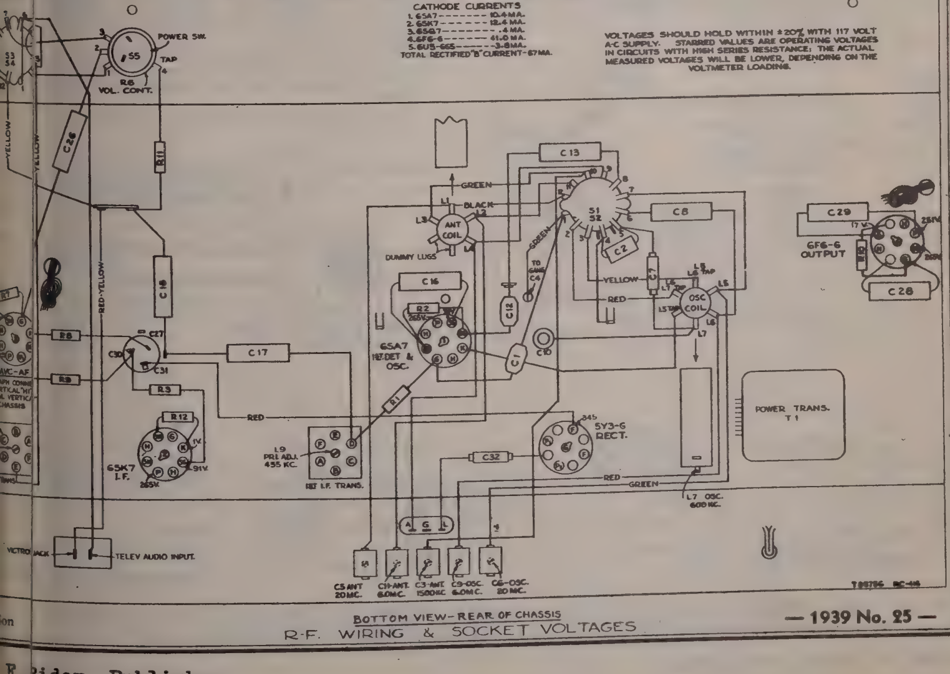




CONNECTIONS & COLORS OF SPEAKER & CABLE

On me receivers the following circuit changes are in
is 4 mmfd.
ere ar three types of 2nd. I-F transformers in use.
first pe (Stock No. 14308) has C23 and R5 mounted
case and is connected exactly as shown below.
the se nd type R5 is omitted and the lead from S4 con-
C inst d of E. E is not used.
he thi type R5 is omitted and C23 is connected externally
o gro d. E is not used. The lead from the diode plate
to A stead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the schematic diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the schematic diagram.



CATHODE CURRENTS
1. 6SA7 ——— 10.4 MA.
2. 6SK7 ——— 12.4 MA.
3. 6SQ7 ——— .4 MA.
4. 6F6-G ——— 41.0 MA.
5. 6U5-6G5 ——— 3.8 MA.
TOTAL RECTIFIED "B" CURRENT-67 MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 VOLT A-C SUPPLY. STARRED VALUES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

BOTTOM VIEW- REAR OF CHASSIS
R-F. WIRING & SOCKET VOLTAGES

MODEL T64,T65,Ch.RC416
Alignment,Trimmers
Socket,Drive Cable

RCA MFG. CO., INC.

Power Supply Ratings

Rating A......	105-125 volts, 50-60 cycles, 75 watts
Rating B......	105-125 volts, 25-60 cycles, 75 watts
Rating C......	100-130, 140-160, 195-250 volts, 40-60 cycles, 75 watts

Pilot Lamps (2).. Mazda No. 44, 6.3
0.2

Power Output Rating

Undistorted...................	2.5
Maximum.....................	4.5

Loudspeaker (RL-79-4)

Type..............	6-inch Electrody
V.C. Impedance.....	3.4 ohms at 400

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

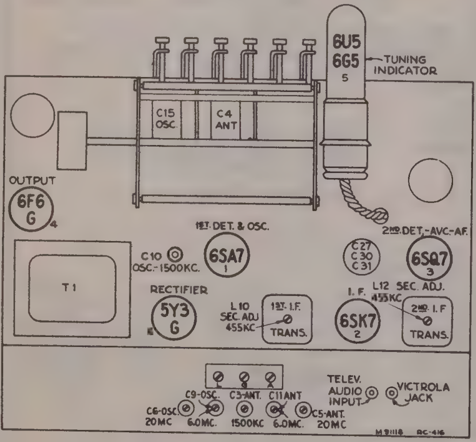
Pointer for Calibration Scale.—Improvise a pointer for tion scale by fastening a piece of wire to the chassis, ar wire so that it points to the 240° mark on the calib when the plates are fully meshed.

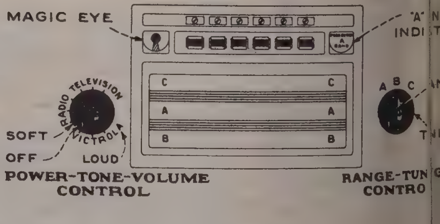
Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjus ing fo pea
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L11 (2nd
2	6SA7 grid in series with .01 mfd.			L9 (1st I
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (40°) "C" Band	C6 C5
4		6 mc	6 mc (52.5°) "B" Band	C9 C1
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (41.75°) "A" Band	C1 C3
6		600 kc	600 kc (200.25°) "A" Band	L7 Roc
7	Repeat step 5.			

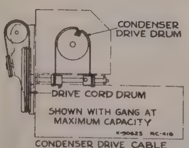
* Use minimum capacity peak if two can be obtained. determine that C6 has been adjusted to correct peak by ceiver to approximately 19.09 mc where a weaker signal received.

** Use minimum capacity peak if two can be obtained. determine that C9 has been adjusted to correct peak by ceiver to approximately 5.09 mc where a weaker signal received.

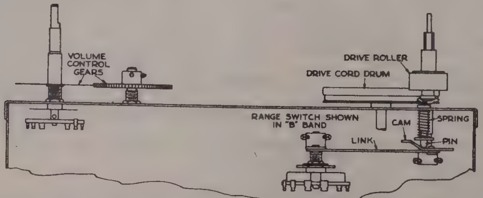
Note: Oscillator tracks above signal on all bands.

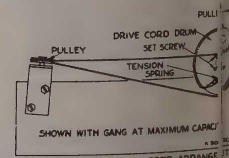






CONDENSER DRIVE CABLE ARRANGEMENT



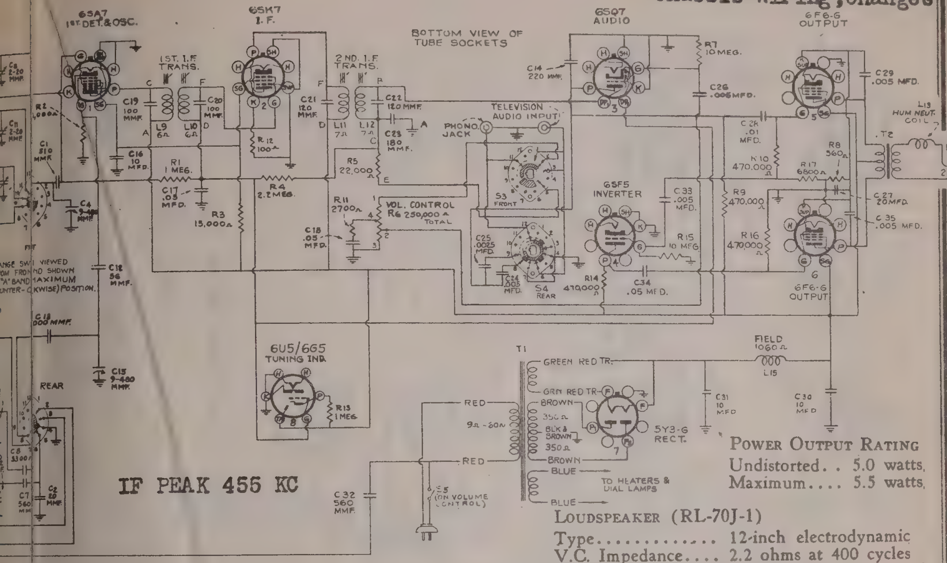


DIAL INDICATOR DRIVE CORD ARRANGE

Note! Adjustment of the link and cam should be such that in "A" band positicn when push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.

RCA MFG. CO., INC.

MODEL K80,Ch.RC415A Schematic,Voltage Chassis Wiring,Changes



IF PEAK 455 KC

Power Output Rating

Undistorted. . 5.0 watts,

Maximum. . . . 5.5 watts,

Loudspeaker (RL-70J-1)

Type. . . . . 12-inch electrodynamic

V.C. Impedance. . . . 2.2 ohms at 400 cycles

Note: On some receivers the following circuit modifications are in effect:

1. R11 is 5,600 ohms, and C18 is 0.1 mfd.

2. C1 is 470 mmfd.; R15 is 2,700 ohms and is connected from cathode of 6SF5 Inverter to ground; R17 is 15,000 ohms; and C33 is omitted.

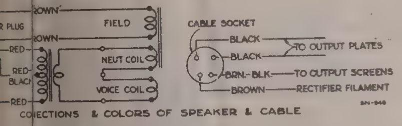
3. There are three types of 2nd I-F transformers in use.

a. The first type (Stock No. 14308) has C23 and R5 mounted inside the case, and is connected exactly as shown above.

b. In the second type R5 is omitted and the lead from S4 connects to C instead of E. E is not used.

c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the above diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the diagram.

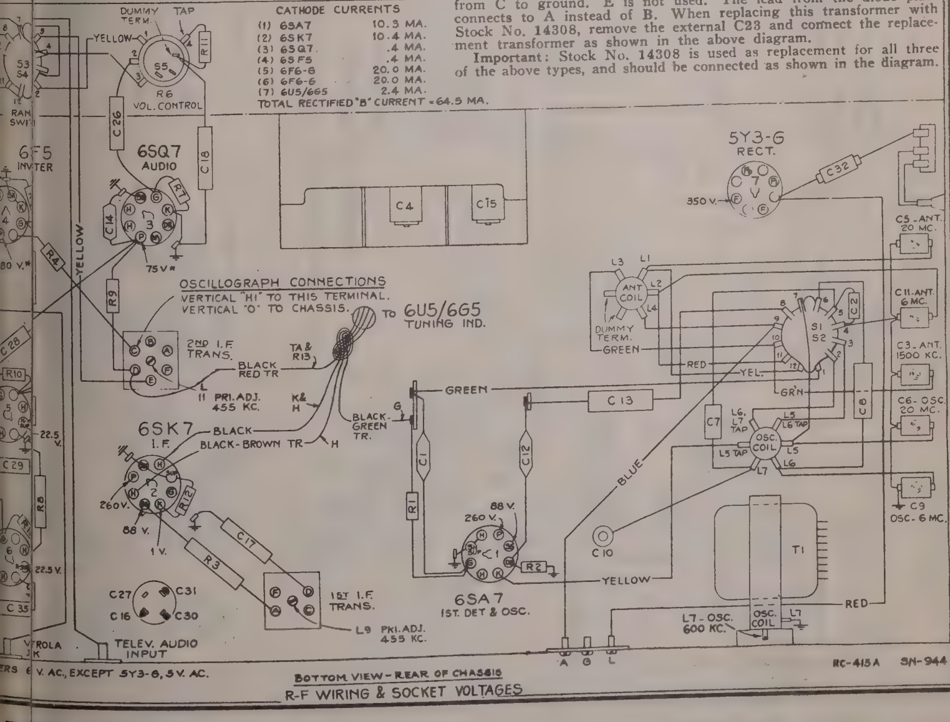


CO[N]NECTIONS & COLORS OF SPEAKER & CABLE

CATHODE CURRENTS

(1)	6SA7	10.3 MA.
(2)	6SK7	10.4 MA.
(3)	6SQ7	.4 MA.
(4)	6SF5	.4 MA.
(5)	6F6-G	20.0 MA.
(6)	6F6-G	20.0 MA.
(7)	6U5/6G5	2.4 MA.

TOTAL RECTIFIED "B" CURRENT = 64.5 MA.



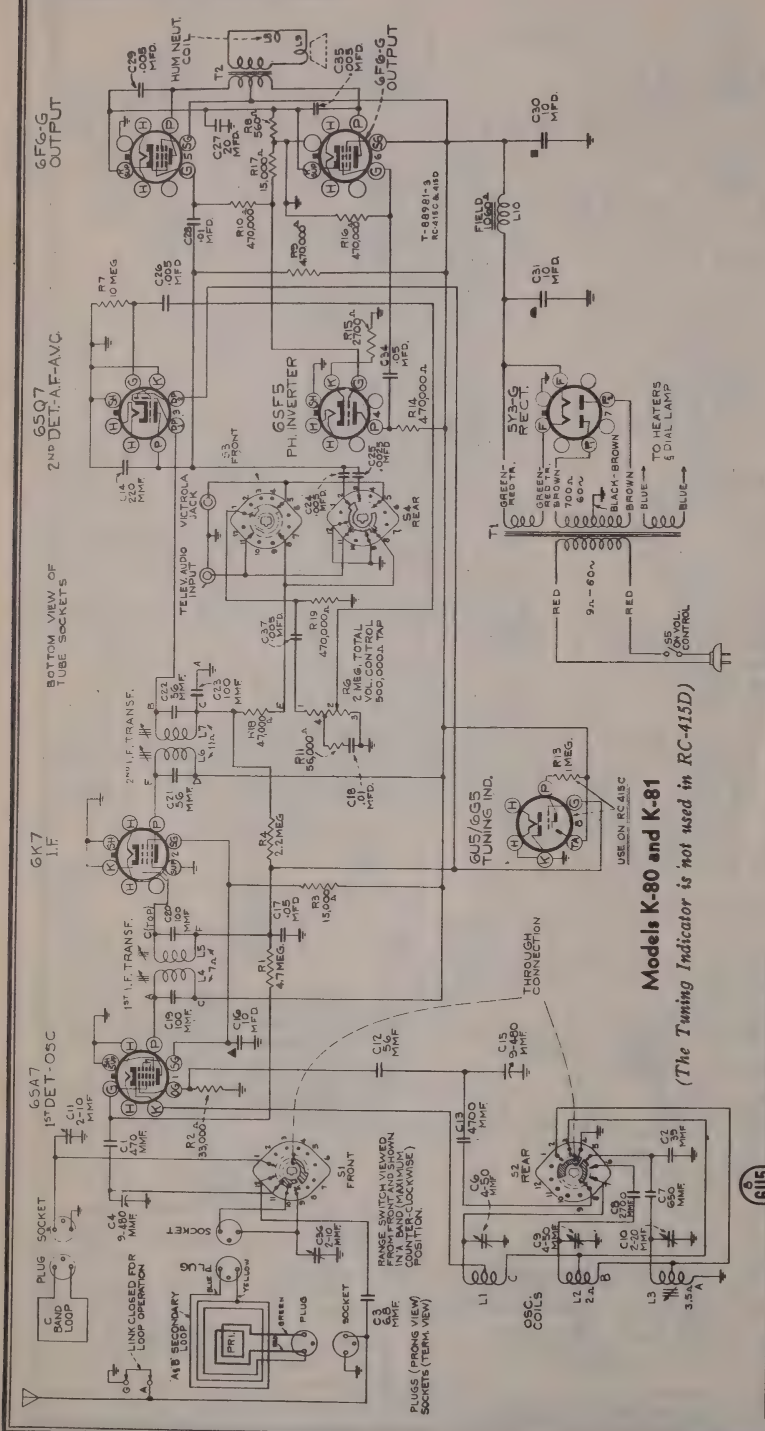
V. AC, EXCEPT 5Y3-G, 5 V. AC.

BOTTOM VIEW - REAR OF CHASSIS

R-F WIRING & SOCKET VOLTAGES

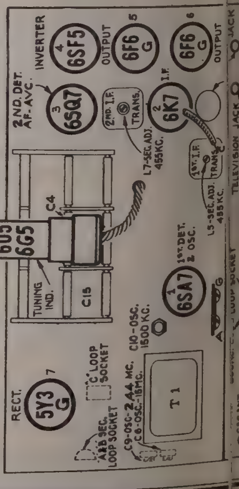
MODELS K80,Ch.RC415C,RC415D
K81,K82,Ch.RC415C
Schematic,Socket,Trimmers

RCA MFG. CO., INC.



Models K-80 and K-81

(The Tuning Indicator is not used in RC-415D)



PILOT LAMPS (2)........ Mazda No. 44, 6.3 volts, 0.25 amp.

POWER OUTPUT RATING
Undistorted.............................. 5.0 watts
Maximum................................ 5.5 watts

LOUDSPEAKER (RL-70J-1)
Type.............................. 12-inch electrodynamic
V.C. Impedance.................. 2.2 ohms at 400 cycles

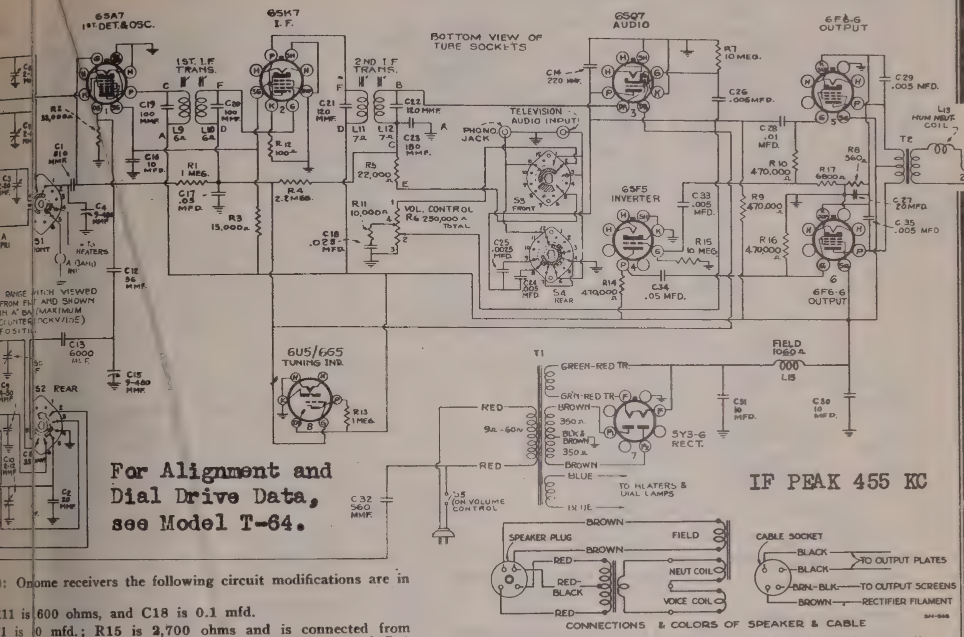
POWER CONSUMPTION
Watts.. 85

FOR OTHER DATA
SEE INDEX

The Dial Drive used in this
used in Chassis RC415

RCA MFG. CO., INC.

MODEL T80, Ch. RC416A
Schematic, Voltage
Chassis Wiring



For Alignment and Dial Drive Data, see Model T-64.

IF PEAK 455 KC

CONNECTIONS & COLORS OF SPEAKER & CABLE

: On ome receivers the following circuit modifications are in

11 is 600 ohms, and C18 is 0.1 mfd.

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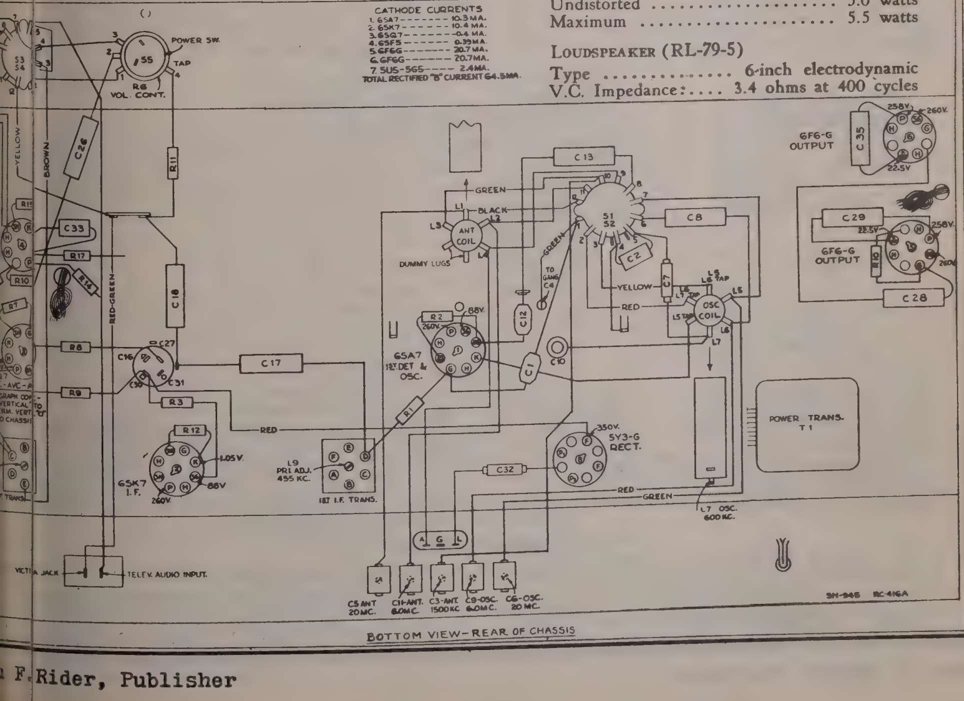
Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the schematic diagram.

POWER OUTPUT RATING

Undistorted	5.0 watts
Maximum	5.5 watts

LOUDSPEAKER (RL-79-5)

Type	6-inch electrodynamic
V.C. Impedance:....	3.4 ohms at 400 cycles



CATHODE CURRENTS

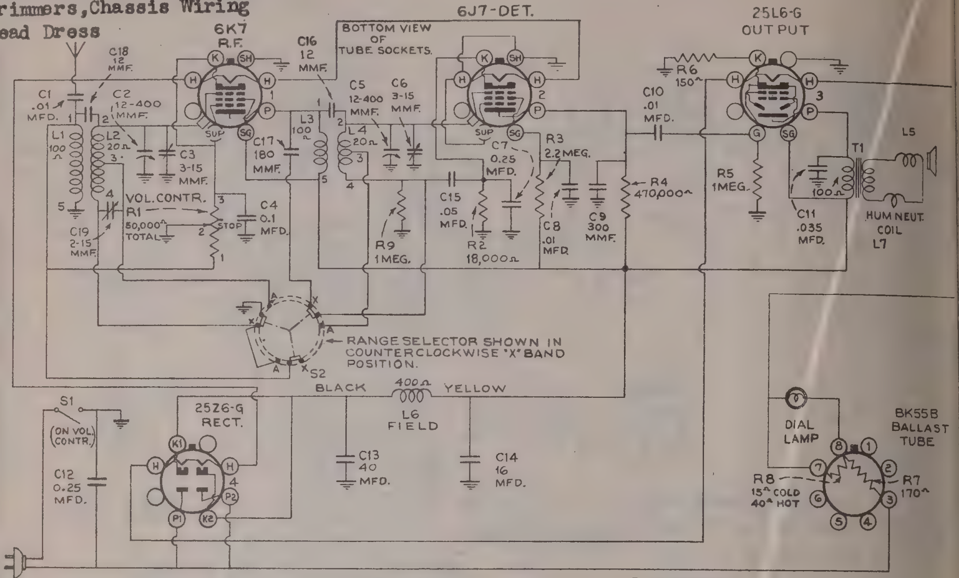
1. 6SA7	10.3 MA.
2. 6SK7	10.4 MA.
3. 6SQ7	0.4 MA.
4. 6SF5	0.39 MA.
5. 6F6G	20.7 MA.
6. 6F6G	20.7 MA.
7. 5U5-5G5	2.4 MA.

TOTAL RECTIFIED "B" CURRENT 64.5 MA.

BOTTOM VIEW-REAR OF CHASSIS

MODEL 95XLW
Chassis RC-345F
Schematic, Voltage, Socket
Trimmers, Chassis Wiring
Lead Dress

RCA MFG. CO., INC.



Dial Lamp. Mazda No. 40, 6.3 volts, .15 amps.

POWER SUPPLY RATINGS

A-C Rating.................. 105-125 volts, 25-60 cycles, 50 watts
D-C Rating.................................. 105-125 volts, 50 watts

FREQUENCY RANGES

Long Wave (X)	150-360 kc
Standard Broadcast (A)	530-1,500 kc

LOUDSPEAKER

Type	5-inch electrodynamic
Voice-Coil Impedance	3 ohms at 400 cycles

POWER OUTPUT
(125 volt, 60 cycle supply)

Undistorted	1.0 watt
Maximum	1.5 watts

Alignment Procedure

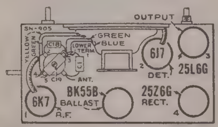
CAUTION: The chassis is connected to one side of the power line. Avoid contact of chassis or parts to external ground when servicing.

Turn pointer, while holding tuning knob, so that the pointer is horizontal and pointing to low frequency end when the gang condenser is at maximum.

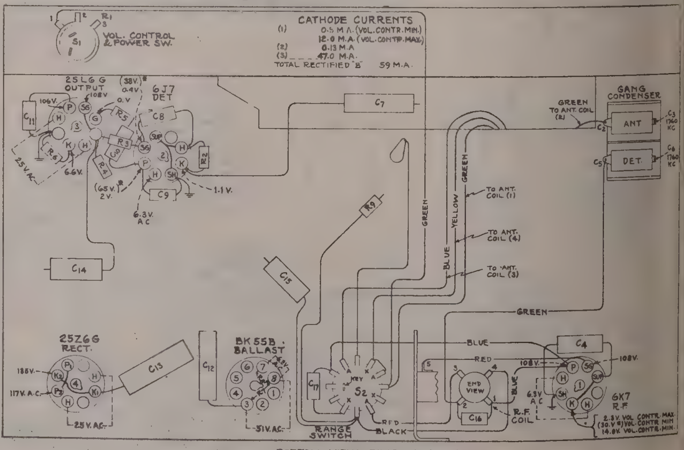
Reel up the antenna wire, and connect the high side of test-oscillator through an 80 mmfd. capacitor to the antenna terminal on the antenna transformer. Connect low side of oscillator to receiver chassis through a 0.1 capacitor. Keep antenna roll and lead clear of chassis during alignment.

To align "A" band, turn range switch to "A" band (clockwise) position, turn receiver dial to 1,500 kc, tune test-oscillator to 1,500 kc, connect an output meter across the voice coil, and turn volume control to maximum. Adjust the two trimmers (C3 and C6) on side of gang condenser for maximum output, using lowest possible output from test-oscillator.

To align "X" band, turn range switch to "X" band (counter-clockwise) position, tune test-oscillator to 360 kc, and adjust C19 for maximum output. The gang should be rocked during "X" band alignment.



Tube and Trimmer Locations



* Note: Values with (*) are operating voltages.

Values not starred are actual measured voltages.

Measurements made to chassis unless otherwise indicated.

Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, and 250 volts. (Use nearest range above the specified measured voltage.)

Values should hold within approximately ± 20% for 117-volt 60-cycle a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.

BOTTOM VIEW - REAR OF CHASSIS

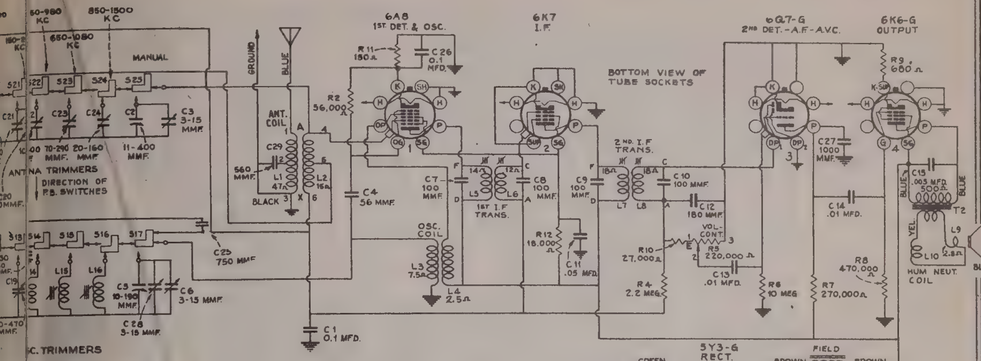
Precautionary Lead Dress

1. Dress power cord away from yellow lead to volume control.
2. Dress all leads away from antenna coil.
3. Green lead from gang to detector coil must be dressed under switch shaft and over detector coil (looking from bottom of chassis).
4. Yellow lead from volume control to 6K7 cathode must be dressed down against rear apron of chassis.
5. Green lead from switch to volume control must be dressed away from all other wires.
6. All leads to detector coil, except green lead in No. 3 (above) must be dressed down against the chassis base.

First Edition, 39

RCA MFG. CO., INC.

MODEL 95T5LW
Chassis RC-348F
Schematic,Voltage
Chassis Wiring,Lead Dress

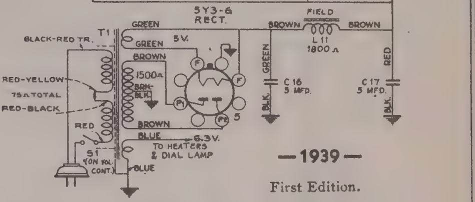


auti ary Lead Dress.—

Bl , green, and black leads to the volume control sh ld be dressed away from the 6K6-G socket and fr leads to this socket.

Le s to the power transformer should be dressed to rd the end of the chassis and away from wires to th push button assembly.

Po er cord lead should be dressed toward the end of th chassis.



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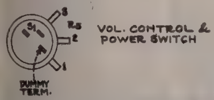
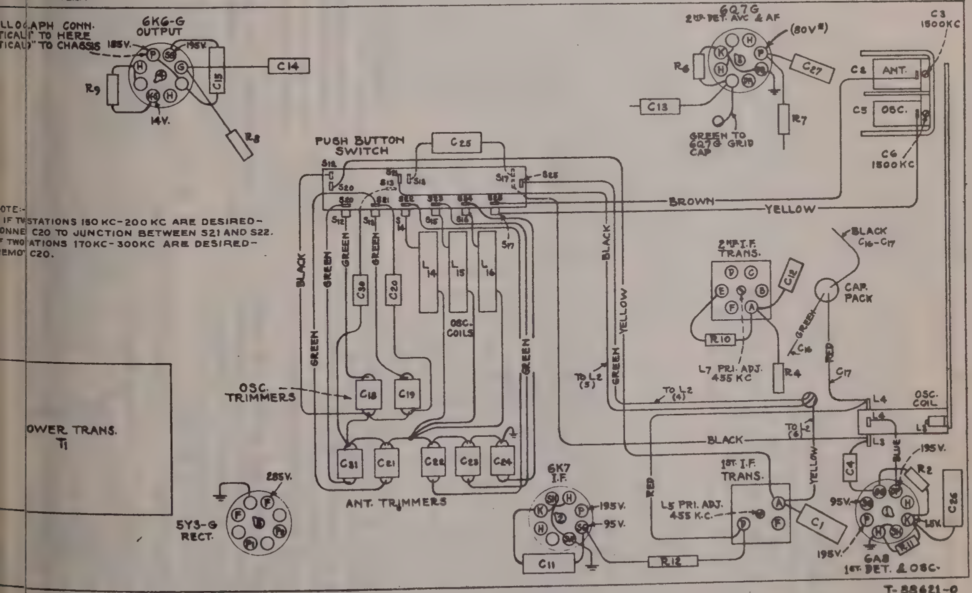
First Edition.



CATHODE CURRENTS

(1)	6A8-G	9. M.A.
(2)	6K7	12.1 M.A.
(3)	6Q7-G	0.48 M.A.
(4)	6K6-G	22. M.A.

TOTAL RECTIFIED "B" CURRENT 44 M.A.



BOTTOM VIEW- REAR OF CHASSIS

R-F Wiring Diagram and Socket Voltages

easu ements made to chassis unless otherwise indicated, set uned to quiet point and volume control at mini . lues should hold within approximately ±20% with volt c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 95T5LW,Ch.RC-348F
Alignment,Trimmers
Socket,Tuner,Dial Data

Adjustments for Electric Tuning

Push Button Ranges:

Two stations between approximately	150- 300 kc
One station between approximately	550- 980 kc
One station between approximately	650-1,080 kc
One station between approximately	850-1,500 kc

This model has six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations. The station buttons connect to separate magnetite-core coils and trimmers and to separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screw-driver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments. Use a regular antenna for preliminary adjustments.

The procedure is as follows:

1. Make a list of the desired stations, arranged in the order of the push button ranges shown on the schematic diagram.
2. To adjust buttons Nos. 1 and 2, best results are obtained by using a test-oscillator. Using a separate receiver, tune in the desired station for button No. 1 and zero-beat the test-oscillator against the carrier of this station. Then, keeping the same setting on the test-oscillator, connect its output to the antenna of the 95T5LW. Adjust the antenna and oscillator trimmers of button No. 1 for maximum output. Proceed in a similar fashion for button No. 2.
3. To adjust buttons Nos. 3, 4 and 5, proceed as follows:
   - a. Push in the dial-tuning (right-hand) button, and manually tune in the third station on the list.
   - b. Push in station-button No. 3 and adjust No. 3 oscillator core (L14) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.
   - c. Adjust No. 3 antenna trimmer (C22) for maximum output on this station.
   - d. Adjust for each of the remaining stations in a similar manner.

     (Clockwise adjustment of oscillator and antenna trimmers tunes the circuits to lower frequencies.)
   - e. Make a final careful adjustment of the oscillator and antenna trimmers, using one or two feet of wire as an antenna to insure sharp peaking.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 50 watts
Rating C	100-120, 200-240 volts, 50-60 cycles, 50 watts

POWER OUTPUT

Undistorted	1.0 watt
Maximum	1.5 watts

LOUDSPEAKER

Type	5-inch Electrodynamic
V.C. Impedance	3.1 ohms at 400 cycles

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Marks. — The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

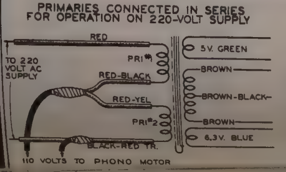
Drum and Dial Indicator Adjustment. — As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing directly down as shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

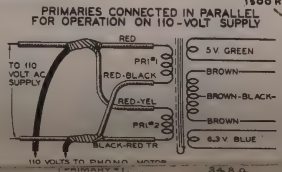
After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

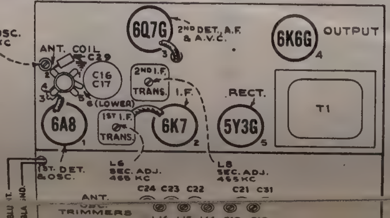
After completion of alignment, seal the i-f core-adjustment screws with household cement.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark	C6 (osc.)* C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

*** The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.**







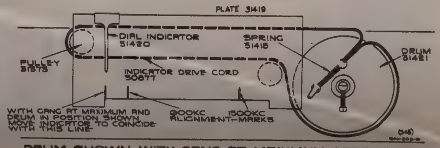


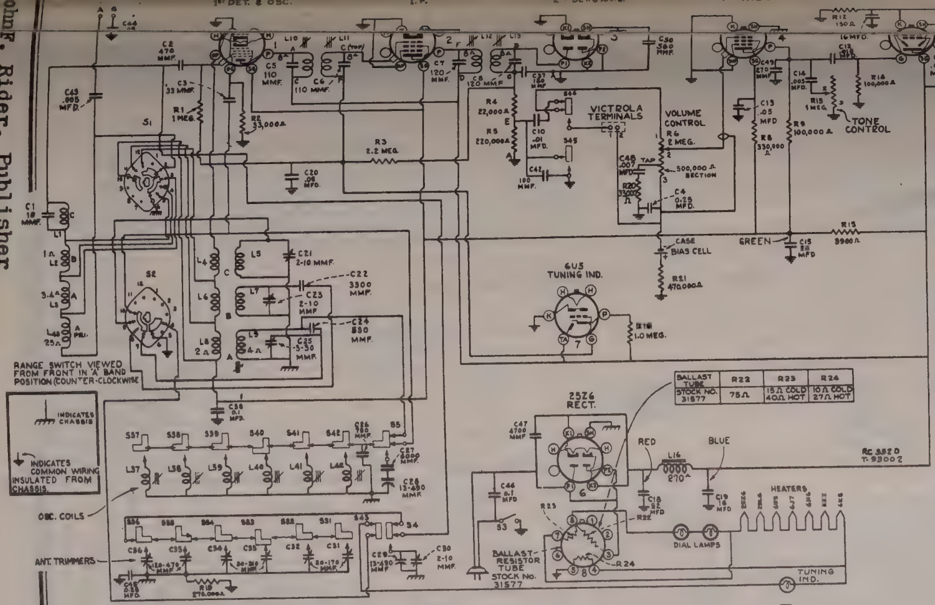
PLATE 31419
DIAL INDICATOR 31420
SPRING 31418
DRUM 31421
PULLEY 31575
INDICATOR DRIVE CORD 30677
WITH GANG AT MAXIMUM AND DRUM IN POSITION SHOWN MOVE INDICATOR TO COINCIDE WITH THIS LINE
600KC 1500KC ALIGNMENT-MARKS
(348)

DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

RCA MFG. CO., INC.

MODEL 98T2, Chassis RC352D
Schematic, Alignment, Tuner



Alignment Procedure

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The distance from the front of the chassis to the drum must not exceed ⅜-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio-dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Transformer)
2	6K8 det. grid cap, in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Transformer)
3	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (150.5°) "A" band	L9
4		1,500 kc	1,500 kc (28°) "A" band	C25 (osc.) C30 (ant.)
5	Repeat steps 3 and 4.			
6	Antenna Terminal, in series with 400 ohms.	6 mc	6 mc (26.5°) "B" band	C23 (osc.)*
7		20 mc	20 mc (22°) "C" band	C21 (osc.)*
8	Follow "Adjustments for Electric Tuning."			

*Use minimum capacity peak if two peaks can be obtained, and rock gang condenser slightly while adjusting C23 and C21.

Note.—Oscillator tracks 455 kc above signal on all bands.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, move the dial indicator on the drive cable to the left-hand end mark on dial, with gang condenser fully meshed.

Adjustments for Electric Tuning

These models have eight push buttons. The left-hand button is a Victrola switch. The right-hand button connects the gang condenser for manual tuning. The other six buttons are for electric tuning of six different stations in the standard-broadcast range. The station buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button, and manually tune in the first station on the list.
3. Push in station button No. 1 (second from left) and adjust No. 1 oscillator core (L37) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer (C36) for maximum output on this station.

Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

5. Adjust for each of the remaining five stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Pilot Lamps........Mazda 47, 6.3 volts, .15 amp.

POWER OUTPUT

Undistorted ....1.5 watts

Maximum ....2.5 watts

POWER SUPPLY RATING

A-C Rating 105-125 volts, 25-60 cycles, 55 watts

D-C Rating .... 105-125 volts, 55 watts

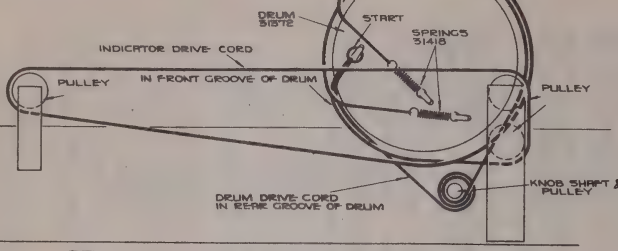
LOUDSPEAKER (PERMANENT-MAGNET DYNAMIC)

Diameter .... 6 inches

V. C. Impedance at 400 cycles .... 3 ohms

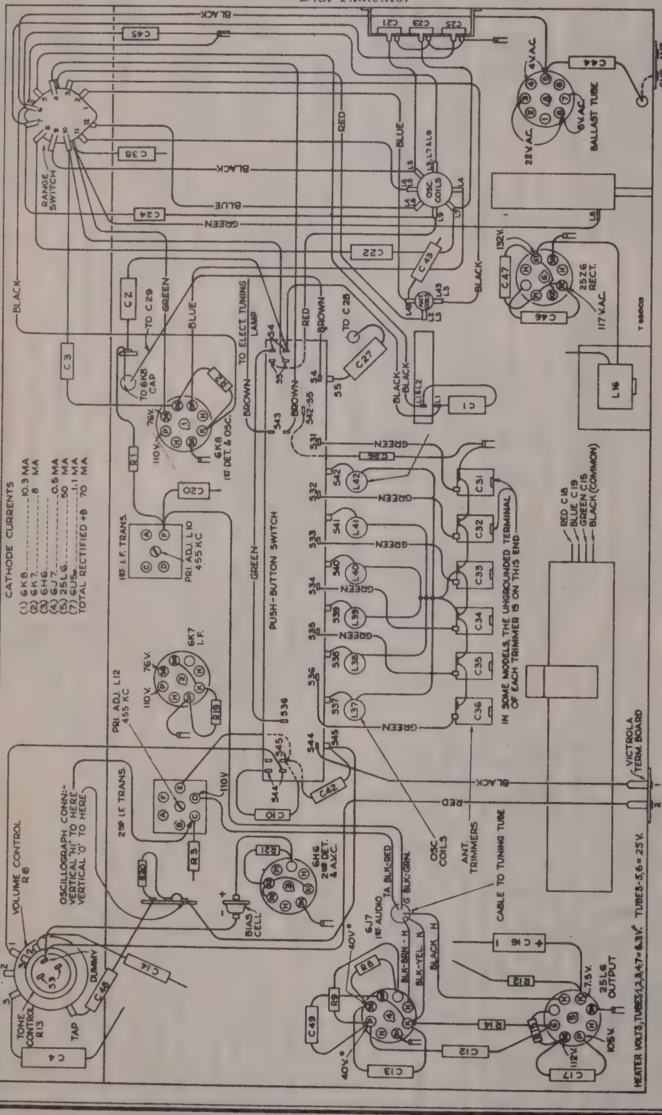
MODEL 98T2,Ch.RC352D
Chassis Wiring,Voltage
Trimmers,Socket,Lead Dress

RCA MFG. CO., INC.

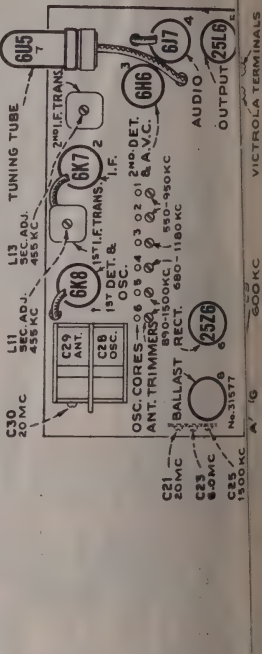


DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator



R-F Wiring Diagram and Socket Voltages



Measurements made to low-side of tone control unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ± 20% with 117-volt a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Precautionary Lead Dress.—

1. Dress the bias cell clear of all bus leads.
2. Leads from S43 must be dressed in front of range switch.
3. Blue lead from range switch to L5 must be short and clear of other leads.
4. Dress leads away from antenna and oscillator coils.
5. Leads across back of chassis must be dressed under electrolytic to prevent approaching Victrola jack.
6. Green lead from

Miscellaneous Service Notes

Bias Cell.—The bias cell provides approximately 1-volt bias for 1s udio grid. The cell should never be shorted, not measured th a ordinary voltmeter or other device that draws current. The l m be checked by measuring the 1st-audio cathode current with new tested 6J7 tube in this socket. The current should be prox ately ½ milliampere. If it is appreciably greater than ½ mil., tall new bias cell.

Vic la Attachment.—Two screw-type terminals, numbered 1 and are rovided on the rear apron of the chassis for connection to a ctro Attachment, such as the R-93, R-93B, etc. *(When A-C ppl is available.)*

Car must be taken that these terminals are never connected in any y the chassis, otherwise injury will result to the bias cell. To egu l against this possibility, the following precautions should be observed in connecting the Victrola Attachment to the receiver.

Victrola Attachment with shielded cable.—If the shielded cable has a plug connector, remove the plug, connect the shielding to terminal 1, and connect the lead (inside the shielding) to terminal 2. Tape the shielding for a sufficient distance to prevent the possibility of it shorting against the chassis.

Victrola Attachment with twisted-pair cable.—Connect the low-side of the Attachment to terminal No. 1, and the high-side of the Attachment to terminal No. 2. (In some Attachments, the lead from the low-side is black, and the lead from the high-side is black-brown.)

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the position of the plug. For operation on a-c, a similar reversal of the plug may reduce hum.

REPLACEMENT PARTS

sis on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES	
3 77	Ballast—Ballast resistor tube (R22, R23, R24)	.80
3 37	Board—Antenna-ground terminal board	.20
3 79	Board—Phonograph terminal board	.20
3 52	Bracket—Bracket for holding Magic Eye tube	.25
1 38	Bushing—Variable condenser mounting bushing and screws	.08
3 36	Cap—Cap for Magic Eye	.15
3 00	Capacitor—Adjustable trimmer capacitor, two sections 2-10 mmfd. and one section 3-30 mmfd. (C21, C23, C25)	.50
3 36	Capacitor—Antenna coil trimmer capacitor bank—20-470 mmfd. (C31, C32, C33, C34, C35, C36)	1.40
1 48	Capacitor—33 mmfd. (C3)	.35
1 22	Capacitor—18 mmfd. (C1)	.35
1 20	Capacitor—100 mmfd. (C42)	.35
1 62	Capacitor—109 mmfd. (C5, C6)	.30
1 04	Capacitor—120 mmfd. (C7, C8)	.30
1 12	Capacitor—180 mmfd. (C37)	.30
1 88	Capacitor—270 mmfd. (C49)	.35
3 33	Capacitor—470 mmfd. (C2)	.35
3 92	Capacitor—530 mmfd. (C24)	.40
1 37	Capacitor—560 mmfd. (C50)	.35
3 35	Capacitor—750 mmfd. (C26)	.40
81	Capacitor—3,300 mmfd. (C22)	.60
1 97	Capacitor—4,700 mmfd. (C47)	.65
3 05	Capacitor—6,000 mmfd. (C27)	.75
48	Capacitor—.007 mfd. (C48)	.20
38	Capacitor—.005 mfd. (C14, C43)	.25
1 93	Capacitor—.01 mfd. (C10)	.30
1 15	Capacitor—.015 mfd. (C12, C17)	.20
86	Capacitor—.05 mfd. (C13, C20, C44)	.20
39	Capacitor—0.1 mfd. (C38, C46)	.30
1 84	Capacitor—0.25 mfd. (C4, C45)	.30
3 23	Capacitor—16 mfd. (C16)	.65
3 76	Capacitor—Comprising one 32 mfd., one 20 mfd., and one 16 mfd. section (C15, C18, C19)	2.15
3 81	Cell—Bias cell	.25
3 82	Clip—Mounting clip for coils and cores on oscillator bank	.04
3 93	Coil—Antenna coil (L1, L2, L3, L43)	1.35
3 51	Coil—Oscillator coil (L4, L5, L6, L7, L8, L9, C24)	1.40
3 85	Coil—Push button oscillator coil (L37, L38)	.30
3 87	Coil—Push button oscillator coil (L39, L40)	.35
3 83	Coil—Push button oscillator coil (L41, L42)	.30
3 69	Condenser—2-gang variable tuning condenser (C28, C29, C30)	2.65
19	Connector—3-contact female connector plug for reproducer cable	.25
3 68	Control—Volume control, tone control, and on-off switch (R6, R13, S3)	3.00
3 34	Cord—Drum drive cord	.10
3 35	Cord—Indicator pointer drive cord	.24
3 86	Core—Adjustable core and stud assembly for oscillator bank	.15
1 00	Core—Adjustable core and stud for oscillator coil, Stock No. 31951	.35
3 72	Drum—Variable condenser drive cord drum and calibrator	.65
3 80	Holder—Bias cell holder	.15
3 52	Indicator—Dial pointer	.20
3 80	Lamp—Dial lamp (Mazda No. 47)	.20
3 70	Plate—Dial color plate, pointer slide, and lamp brackets assembled	.75
31373	Pulley—Drive cord pulley	.08
5066	Reactor (L16)	1.65
31577	Resistor—Ballast resistor (R22, R23, R24)	.80
30880	Resistor—150 ohms, ½ watt (R12)	.20
30694	Resistor— 3,900 ohms, ½ watt (R15)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R4)	.15
12454	Resistor—33,000 ohms, ¼ watt (R2, R20)	.20
14560	Resistor—100,000 ohms, ¼ watt (R9, R14)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ¼ watt (R19)	.20
14983	Resistor—330,000 ohms, ¼ watt (R8)	.20
12285	Resistor—470,000 ohms, ¼ watt (R21)	.20
13730	Resistor—1 meg., ¼ watt (R1)	.20
12013	Resistor—1 meg., 1/10 watt (R16)	.15
12679	Resistor—2.2 meg., ¼ watt (R3)	.20
14343	Retainer—Drive cord pulley retainer	.03
14887	Retainer—Retainer for drive cord pulley	.01
4669	Screw—No. 8-32 square head set screw for drum, Stock No. 31372	.03
32671	Shaft—Station selector knob shaft and pulley	.35
12110	Shield—Radiotron shield cap	.14
31365	Socket—Dial lamp socket	.30
13871	Socket—Magic Eye socket	.45
31251	Socket—Tube socket	.25
31970	Spring—Tension spring for station selector push button switch latch bar	.05
31418	Spring—Indicator or drum drive cord tension spring	.05
31370	Switch—Push button selector switch (S4, S5, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45)	3.85
33009	Switch—Range switch (S1, S2)	1.15
14376	Transformer—First i-f transformer (L10, L11, C5, C6)	2.45
14283	Transformer—Second i-f transformer (L12, L13, C7, C8, C37, R4, R5)	3.80
31577	Tube—Ballast resistor tube (R22, R23, R24)	.80
	SPEAKER ASSEMBLIES (84307-1)	
31665	Cone—Speaker cone and voice coil (L14)	3.20
5118	Plug—3-contact male plug for speaker	.25
31664	Speaker complete	6.30
31666	Transformer—Output transformer (T1)	1.20
	MISCELLANEOUS ASSEMBLIES	
31397	Button—Station selector push button	.15
31456	Cover — 8-protective covers for push button markers	.08
32673	Dial—Station selector dial scale (glass)	.60
32674	Escutcheon—Station selector escutcheon less dial scale and push buttons	3.85
31355	Knob—Range switch knob	.12
14359	Knob—Station selector knob	.20
31391	Knob—Tone control knob	.15
30773	Knob—Volume control knob	.15
31458	Marker—"Dial Tuning" push button marker	.01
31457	Marker—"Record Player" push button marker	.01
31589	Marker—Station call letters push button markers	.35
4982	Spring—Retaining spring for knob, Stock No. 14359	.05
30330	Spring—Retaining spring for knob, Stock No. 31391	.03
14270	Spring—Retaining spring for knob, Stock Nos. 30773 and 31355	.05

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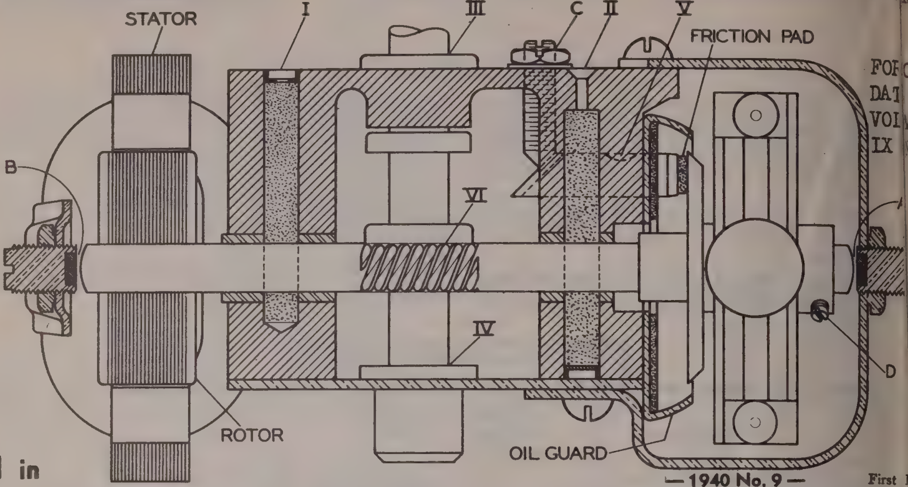
MODEL Governor Motors for
Models R98,U103,U105,U124

RCA MFG. CO., INC.

U125,U126,U130,U132,134
Assembly,Maintenanc Note



FOF OTHI
DAT SEI
VOL MES
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— 1940 No. 9 —

First I tion

Used in Models U-125, U-126, U-130, U-132, U-134, U-103, U-105, U-124, R-98 Etc

Lubrication and Adjustment

To assure normal and satisfactory operation, every motor requiring service should be lubricated and adjusted as follows:—

(1) Remove motor end brackets, bottom cover containing lower spindle bearing, and governor. Slide vertical spindle downward, remove C-washer; then push upward to disengage worm gear. Slide rotor and shaft from motor.

(2) Clean rotor bearings and rotor shaft thoroughly with "Carbona" or "benzine." Flush oil reservoirs I and II with the same solvent, preferably after removing oil wicks.

(3) Remove governor felt friction pad V. Replace this pad with revised type Stock No. 34058, being certain to saturate thoroughly with oil.

(4) Put slight amount of oil in each rotor bearing, and reinsert rotor shaft. See that shaft revolves freely when in position.

(5) Oil bearing IV, grease gear VI, and re-install bottom cover; checking to assure that vertical spindle revolves freely and worm is properly meshed after cover is in place and screws tightened. Do not misplace small disc of bottom thrust bearing.

(6) Inspect governor to see that springs move freely under retaining washers, and that governor is otherwise in good condition. Install on rotor shaft, checking for possible bind of sleeve on the shaft.

(7) Replace end brackets containing thrust screws "A" and "B"

(8) Adjust thrust screw "A" so that one steel lamination of rotor shows beyond the stator laminations as illustrated. This positions rotor at the electrical center of the stator, for maximum torque.

(9) Adjust thrust screw "B" to provide 1/16 inch clearance from end of rotor shaft.

(10) Fill both wells I and II with oil. At least 30-50 drops are required. Also oil bearing III.

(11) Position governor so that when it is fully contracted (closed), the friction disc is aligned with outer edge of oil guard. Tighten set screw "D".

(12) Connect motor to source of power, and adjust screw "C" to give 78 R.P.M. After allowing motor to run a short time, to compress felt pad. It may be necessary to recheck position of governor to give sufficient range of speed adjustment.

(13) Test motor, after allowing it to reach operating temperature, by grasping spindle and noting relative amount of force required to cause governor to contrac Als stall motor, and release, to see that governor has "s ppy response.

Special Notes

(1) Do not interchange parts of different motors, es iall bearings, shafts, or gears.

(2) Where a new rotor or turntable spindle is installed llov motor to run-in for eight hours; preferably under l d.

(3) The motor should not be tested or used at tempe ure below 65 degrees Fahrenheit.

(4) Where thrust bearing screw "A" is badly worn o loe not have a fibre insert, replace with RCA Stoc No 31616.

(5) Governor motors should be thoroughly lubricated fte approximately 300-500 hours of operation. T i equivalent to 1-2 years usage in the average home.

Lubricant Specifications

Only **mineral** base oils and greases should be used.

(1) For points requiring oil, use a type having a igl viscosity index (with a viscosity rating of SAE 20 0) such as "Esso Motor Oil, Uniflo No. 3."

(2) For points requiring grease, a light gear grease h in good clinging properties, such as "Cities Service No 7035-A1" or "Koolmotor Universal Trojan No 1" should be used.

Governor Waver—Causes

Drifting of motor speed at a slow rate, or erratic shi t other than normal speed, is generally caused by (1) bin n of rotor or spindle bearings due to lack of lubrication, 2 scored shafts or bearings, (3) binding due to tight adjust n of thrust bearing "B", (4) binding of turntable spi ll bearing on motor board (where used), (5) improper cente of motor with respect to turntable spindle.

Governor Chatter—Causes

When the governor rattles or flutters rapidly, accompa by excessive mechanical noise, the likely source of troub (1) glazed felt friction pad due to lack of lubrication, rotor not centrally positioned in stator, (3) thrust bearing worn, (4) mis-aligned or rough governor disc.

Heavy Duty Motor

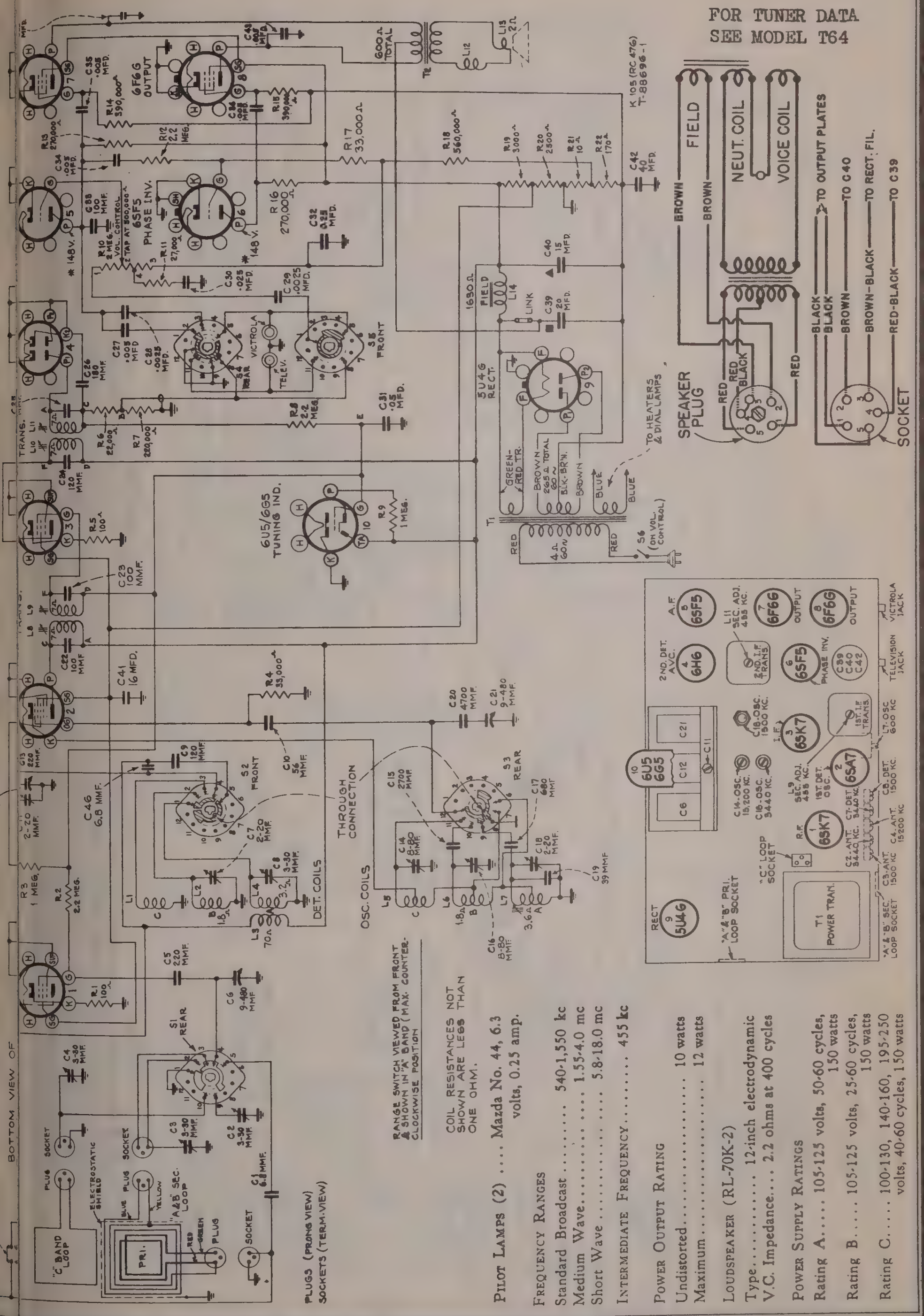
A heavy duty motor Stock No. 31163 is available replacement of the Stock No. 31157 type used in Mo U125, U126, U128, U132, U134, etc., at a nominal excha price. The larger motor has a higher torque specificat will operate normally over greater ranges of voltage and quency, and gives increased life before relubricaton is requi

OR DRIVE DATA
EE MODEL K60

RCA MFG. CO., INC.

MODEL K105, Chassis RC476
Schematic, Socket, Trimmers

FOR TUNER DATA
SEE MODEL T64



RANGE SWITCH VIEWED FROM FRONT & SHOWN IN "A" BAND (MAX. COUNTER-CLOCKWISE POSITION

COIL RESISTANCES NOT SHOWN ARE LESS THAN ONE OHM.

Pilot Lamps (2) .... Mazda No. 44, 6.3 volts, 0.25 amp.

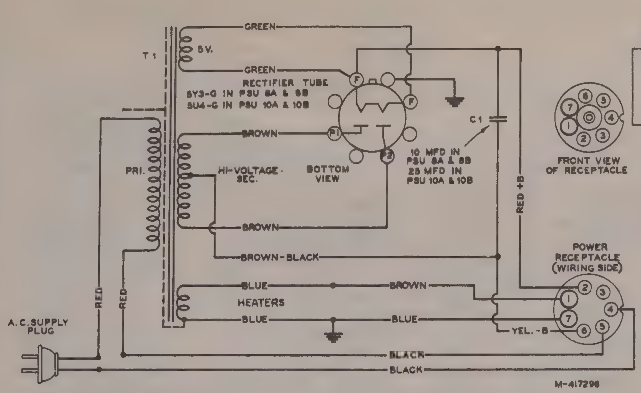
Frequency Ranges
Standard Broadcast .... 540-1,550 kc
Medium Wave .... 1.55-4.0 mc
Short Wave .... 5.8-18.0 mc
Intermediate Frequency .... 455 kc

Power Output Rating
Undistorted .... 10 watts
Maximum .... 12 watts

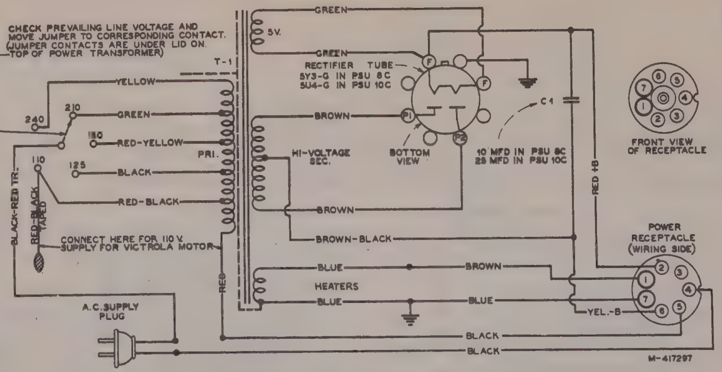
Loudspeaker (RL-70K-2)
Type .... 12-inch electrodynamic
V.C. Impedance .... 2.2 ohms at 400 cycles

Power Supply Ratings
Rating A ..... 105-125 volts, 50-60 cycles, 150 watts
Rating B ..... 105-125 volts, 25-60 cycles, 150 watts
Rating C ..... 100-130, 140-160, 195-250 volts, 40-60 cycles, 150 watts

RCA MFG. CO., INC.



Schematic Circuit Diagram of Power Supply Units PSU 8A, 8B, 10A, and 10B



Schematic Diagram of Power Supply Units PSU 8C and 10C

PSU 8A, 8B, 8C, 10A, 10B and 10C A-C Power Supply Units

General Description

Certain models of the "Q" Line of RCA Victor "Magic Brain" 1938 radio receivers are designed for use with a separate plug-in power supply unit. Different units are available to permit operation on a-c power supplies of various voltages and cycles, and also on 110 or 220 volts d-c.

Service data and diagrams for the a-c units are contained in this sheet: The d-c units are described in a separate sheet.

Each a-c unit is equipped with an 18-inch 6-wire cable with a 7-contact female receptacle which plugs into a 7-prong male connector on the receiver chassis. The a-c power cord is 6 feet long. The units are approximately 7½ inches long, 4¼ inches wide, and 6 inches high.

Testing.—To check an a-c power unit when a receiver is not available, connect a 50-watt resistor (4,800 ohms for PSU 8A, 8B, 8C, and 3,450 ohms for PSU 10A, 10B and 10C) across contacts 2 and 6 on the power receptacle. Connect a jumper across contacts 4 and 5. Measure the d-c voltage across the resistor, which should be approximately 375 volts, with 117 volts supply on the 117-volt tap.

Specifications

Type	Rating		Radiotron Rectifier	D-C Output	Heater (A-C)	Used with Models	D-C Resis., T1		Net Weight (pounds)
	Voltage	Cycles					Pri. ohms Total	Sec. ohms Total	
PSU 8A	105-125	50/60	5Y3-G	375 volts at 78 milliamps	6.45 V 3 amps	8Q1 and 8Q4	6.4	535	7
PSU 8B	105-125	25/60					8.3	705	9½
PSU 8C	Universal*	50/60					17.4	455	11½
PSU 10A	105-125	50/60	5U4-G	380 volts at 110 milliamps	6.36 V 5 amps	10Q1, 12Q4, 12QK, 12QU**	3.0	250	9
PSU 10B	105-125	25/60					3.9	250	13
PSU 10C	Universal*	50/60					8.9	190	15

* The universal can be set for 105-117, 117-130, 140-160, 200-225, or 225-250 volt supply.
** Model 12QU has a phonograph motor designed for 50/60 cycle operation only, and uses either PSU 10A, or 10C.

First Edition

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
31739	Cable—6-conductor power output cable with plug	1.20	31734	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1) (PSU 8B only)	10.35
11203	Capacitor—10 mfd. (C1) (PSU 8A, 8B or 8C only)	1.15	31737	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1) (PSU 10B only)	14.30
14531	Capacitor—25 mfd. (C1) (PSU 10A, 10B or 10C only)	1.55	31735	Transformer—Power transformer 105-130, 140-160, 200-250 volts, 50-60 cycle (T1) (PSU 8C only)	10.80
14409	Plug—7-contact plug for power output cable	.45	31738	Transformer—Power transformer, 105-130, 140-160, 200-250 volts, 50-60 cycle (T1) (PSU	
31251	Socket—Rectifier tube socket	.25			
31733	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1) (PSU 8A only)	7.70			
31736	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1) (PSU 10A only)	10.75			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE

RCA MFG. CO., INC.

MODEL RP139A
MODEL RP145
Adjustments,Notes
Parts

T RP-139-A and RP-145 automatic record changers are very ilar in design and construction. Most of the parts and ustments are identical on both. The RP-139-A turntabl driven through a worm gear in the motor housing whil e RP-145 turntable is driven through a friction drive disc unted on the turntable spindle.

O Model RP-145 it is important that the drive motor spin and rubber tires on main driving disc and idler pulley kept clean and free from oil, grease, dirt, or any fore matter at all times. Any quick-drying naphtha is satisfact for cleaning these parts. The RP-145 drive motor bear is lubricated from an oil well filled and sealed at the fact It should not require lubrication in the field.

T RP-145 turntable is not removable from the spindle. How r, the rubber tired driving disc is fastened to the spin by means of a tapered pin "24." If necessary to remov ese parts the tapered pin should first be removed. The ving disc can then be removed from the spindle and the table and spindle assembly lifted upward from the mot ard. If this is done, great care should be taken not to b the spindle. At the same time the spindle bearing shou e oiled and the cup and ball thrust bearing oiled and chec for proper position.

Be servicing the automatic record changer, inspect the assen to see that all levers, parts, gears, springs, etc., are in g order and are correctly assembled.

A d or jam in the mechanism can usually be relieved by rotat the turntable in the reverse direction.

Th changer can be conveniently rotated through its chan cycle by pushing the index lever to "Reject" and revolvi the turntable by hand. Six turntable revolutions are requi for one change cycle.

If record changer or cabinet is not perfectly level, normal ation is likely to be affected.

Th 0 and 12 inch records must be absolutely flat for smoo peration.

A kup shorting switch, located under the motorboard, oper when the pickup is moved outward to the pickup rest.

MISCELLANEOUS SERVICE HINTS

Inc ect adjustment of a particular mechanism of the chan is generally exhibited in a specific mode of improper opera . The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature; on Model RP-145 oil, grease, dirt, or other foreign matter on motor spindle, main driving disc or idler pulley rubber tire. Clean with any quick drying naphtha. Also, on RP-145 the motor support bracket "N" should be moved in its mounting holes until the motor spindle is parallel to the turntable spindle and exactly at right angles to the main driving disc "29." The bracket mounting nuts should then be securely tightened.
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. When playing both types of records mixed and needle either lands in 10 inch position on 12 inch record or misses record entirely—Increase tension of mixed record discriminating lever spring "M."

ADJUSTMENTS

A. in Lever.—This lever is basically important in that it int ks the various individual mechanisms which control needl nding, tripping, record separation, etc. Rotate the turnt until the changer is out-of-cycle; and check rubber bump bracket (A). The roller should clear the nose of the cam e by approximately 1/16 inch.

B. tion Clutch.—The motion of the tone arm toward the c r of the record is transmitted to the trip pawl "22" by th rip lever "7" through a friction clutch "5." If the motio f the pickup is abruptly accelerated or becomes irregular d to swinging in the eccentric groove, the trip finger "7" es the trip pawl "22" into engagement with the pawl the main gear, and the change cycle is started. Prope djustment of the friction clutch "5" occurs when move t of the tone arm causes positive movement of the trip p "22" without tendency of the clutch to slip. The frictio hould be just enough to prevent slippage, and is adjustab y means of screw "B." If adjustment is too tight, the n e will repeat grooves; if too loose, tripping will not occur the end of the record.

C. kup Lift Cable Screw.—During the record change cycle, er "16" is actuated by the main lever "15" so as to raise tone arm clear of the record by means of the pickup lift ca . To adjust pickup for proper elevation, stop the chang "in-cycle" at the point where pickup is raised to the maxim height above turntable plate, and has not moved outwa at this point adjust locknuts "C" to obtain 1 inch spacin etween needle point and turntable top surface.

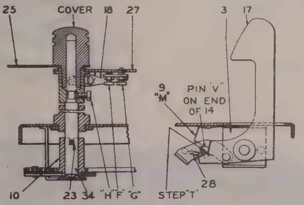
D. E. Needle Landing on Record.—The relation of coupl between the tone arm vertical shaft and lever "20" deter s the landing position of the needle on a 10 inch recor Position of eccentric stud "E" governs the landing of the edle on a 12 inch record; this, however, is dependent on th oper 10 inch adjustment.

To ust for needle landing, place 10 inch record on turntable; sh index lever to reject position and return to the 10 in position; see that pickup locating lever "17" is tilted fully ard turntable; rotate mechanism through cycle until needl just ready to land on the record; then see that pin "V" ever "14" is in contact with "Step T" on lever "17." The ect point of landing is 4⅝ inches from the nearest side o e turntable spindle; loosen the two screws "D" and adjust rizontal position of tone arm to proper dimension, being eful not to disturb levers "14" and "17." Leave appro ately 1/32 inch end play between hub of lever "20" and p up base bearing, and tighten the blunt nose screw "D"; mechanism through several cycles as a check, then tighte one pointed screw "D."

Aft adjusting for needle landing on a 10 inch record, place inch record on turntable; push index lever to reject and r n to 12 inch position: rotate mechanism through cycle l needle is just ready to land on the record; the correct p t of landing is 5⅝ inches from nearest side of spindl If the landing is incorrect, turn stud "E" until the eccen end adjusts lever "14" to give correct needle landing. eccentric end of the stud must always be toward the re of the motorboard, otherwise incorrect landing may occur h 10 inch records.

F. G. Record Separating Knife.—The upper plate (knife "25" on each of the record posts serves to separate the lo record from the stack and to support the remaining record uring the change cycle. It is essential that the spacing b een the knife and the rotating record shelf "27" be accura maintained. The spacing for the 10 inch record is nomir .055 inch, and for the 12 inch record is .075 inch.

To ust, rotate the knife to the point of minimum vertical s ation from the record shelf and turn screw and locknut " o give .052—.058 inch separation. Screw "G" must not b pressed during this adjustment. After setting screw "F," st screw "G" so that when its tip is depressed flush with of record shelf, the vertical spacing between the knife, its lowest rotational position, and the shelf, is .072—.078 i



H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where both separating knives have turned clockwise as far as the mechanism will turn them; lift record upward until it is in contact with both separating knives. Then loosen screws "H" and shift record shelves "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16 inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motorboard. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers and pulleys on underside of motorboard. The turntable spindle bearing of RP-145 must be lubricated from the top of the motorboard. Using an oil can with a long spout, reach in between the turntable and motorboard and apply oil directly to the spindle.

On Model RP-139-A apply a few drops of light machine oil (S.A.E.-10) to the motor oil hole adjacent to the spindle bearing after each 1,000 hours of operation. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, rubber spindle cap, or rubber parts of friction drive mechanism of Model RP-145.

STOCK No.	DESCRIPTION	Unit List Price
	PICKUP ARM ASSEMBLIES	
33906	Arm—Pickup arm shell	.45
33977	Cable—Pickup shielded cable (8)	.50
33905	Crystal—Pickup cartridge and needle screw (RP-139-A only)	4.25
35171	Crystal—Pickup cartridge and needle screw (RP-145 only)	xx
33976	Pin—Used to fasten pivot arm in pickup arm shell	.03
33974	Screw—Needle screw	.15
33975	Shaft—Pickup pivot shaft and pivot arm	1.40
	MOTOR ASSEMBLIES (Model RP-139A)	
32956	Coil—Field coil and laminations for 25 cycle motor	7.15
32955	Coil—Field coil and laminations for 50 cycle motor	5.90
32954	Coil—Field coil and laminations for 60 cycle motor	5.35
32960	Gear—Motor spindle gear and pin	.75
32873	Motor—Motor complete, 25 cycle, 110 volt AC	15.95
32872	Motor—Motor complete, 50 cycle, 110 volt AC	13.75
32871	Motor—Motor complete, 60 cycle, 110 volt AC	13.25
30870	Plug—2-prong male plug—used on motor leads	.35
32959	Spindle—Turntable spindle complete with metal pinion and fibre gear for 25 cycle motor	2.90
32958	Spindle—Turntable spindle complete with metal pinion and fibre gear for 50 cycle motor	2.90
32957	Spindle—Turntable spindle complete with metal pinion and fibre gear for 60 cycle motor	2.90
32875	Switch—Motor control switch (4)	.30
	MOTOR ASSEMBLIES (Model RP-145)	
34513	Armature—Complete armature and shaft for 60 cycle motor	xx
34512	Cap—Bakelite cap for motor	xx
34365	Capacitor—1.25 mfd., for 60 cycle motor (38)	1.75
34364	Motor—105/125 volts, 60 cycle, complete with capacitor (37)	6.75
30870	Plug—2-prong male plug for motor leads	.35
	MOTORBOARD ASSEMBLIES (Model RP-139A)	
33981	Base—Pickup arm mounting base	.60
33978	Board—Motorboard complete with bearings and posts less operating mechanism	6.50
33909	Cup—Used needle cup, lid, and pickup arm rest (6)	1.00
33979	Escutcheon—Index escutcheon	.50
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Used needle cup lid spring (49)	.04
	MOTORBOARD ASSEMBLIES (Model RP-145)	
33981	Base—Pickup arm mounting base	.60
34363	Board—Motorboard complete with bearings and posts—less operating mechanisms	6.70
33909	Cup—Used cup, lid, and pickup arm rest (6)	1.00
33979	Escutcheon—Index escutcheon	.50
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Used needle cup lid spring (49)	.04
32875	Switch—Motor switch (4)	.30
	OPERATING MECHANISM	
10129	Ball—Steel ball for turntable bearing (Model RP-145)	.02
33984	Bracket—Record discriminating lever mounting bracket (3)	.20
33987	Cam—Cam and drive gear (42)	2.00
6808	Clutch—Trip lever clutch (5)	.35
34369	Cup—Turntable bearing cup (Model RP-145) (36)	.20
32883	Damper—Rubber drive sleeve and damper plate for motor spindle (Model RP-139A) (45, 46)	.30
34367	Disc—Turntable drive disc and tire (Model RP-145) (29)	2.25
31116	Finger—Trip lever friction finger (7)	.45
32879	Gear—Long arm and rack gear (41)	.80
31121	Gear—Record separator shaft gear (10)	.90
32880	Gear—Short arm and rack gear (40)	.55
34368	Grommet—Rubber grommet for motor mounting (Model RP-145) (48)	.08
31151	Guide—Lift cable guide spring (2)	.10
33982	Guide—Main spring guide (11)	.10
34370	Idler—Turntable idler wheel and arm (Model RP-145) (39)	.60
33986	Lever—Index lever (12)	.80
31138	Lever—Locating lever and pawl (14)	.70
33985	Lever—Main lever (15)	1.05
33993	Lever—10-inch and 12-inch record discriminating lever (17)	.35
31140	Lever—Pickup lift cable lever and spring (16)	.55
31130	Lever—Record separator elevating lever with adjustment screws (18)	.80
31132	Lever—Trip detaining lever (19)	.30
34874	Lever—Trip lever assembly (20)	1.85
31131	Lever—Trip regulator lever (21)	.25
33992	Link—Index lever setting link and button	.20
31137	Pawl—Index lever pawl (13)	.30
31133	Pawl—Trip pawl assembly (22)	.80
31535	Pin—Drive pin for turntable drive disc (Model RP-145) (24)	.03
31124	Pin—Pin to fasten gear on record separator shaft (23)	.04
31118	Screw—Cone pointed set screw for record separator shelf ("H")	.06
14195	Screw—No. 10-32 cone pointed set screw for trip lever hub ("D")	.05
33983	Screw—Record separator elevating lever pivot screw	.15
31117	Screw—Special to adjust friction clutch	.03
33990	Separator—Record separator knife (25)	1.85
33988	Shaft—Record separator shaft (34)	.70
33989	Shelf—Record separator shelf (27)	1.25
3676	Spring—Cam gear pawl spring	.04
31136	Spring—Index lever pawl spring (30)	.05
3666	Spring—Lift cable spring (31)	.04
32436	Spring—Locating lever spring (35)	.05
32882	Spring—Main lever tension spring (43)	.05
34876	Spring—Pickup arm starting spring (26)	.10
14190	Spring—Record discriminating lever pawl spring or locating lever pawl spring (28)	.08
33994	Spring—Record discriminating lever spring (flat) (9)	.05
14191	Spring—Trip detaining lever spring (33)	.04
34372	Spring—Turntable idler wheel spring (Model RP-145) (47)	.10
34371	Support—Turntable drive and motor support (Model RP-145)	.70
34875	Switch—Pickup shorting switch (44)	.45
33991	Turntable—(Model RP-139A)	3.00
34366	Turntable and Spindle Shaft—(Model RP-145) (32)	3.35
34373	Washer—"C" washer for mounting idler wheel and arm (Model RP-145)	.03

xx Price upon application to your RCA Victor Parts Distributor.

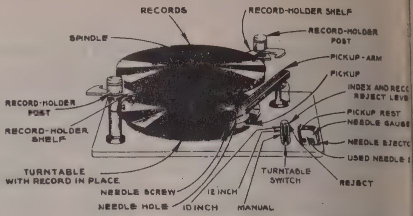
ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

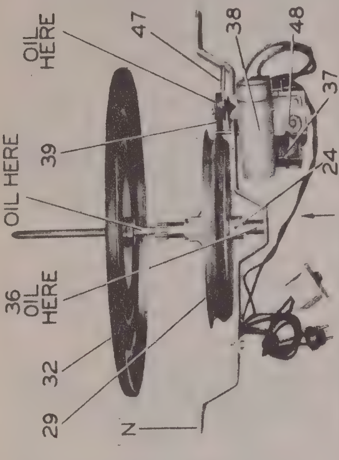
MODEL RP139A
MODEL RP145
Assembly,Ratings

RCA MFG. CO., INC.

These record changers are available for operation on voltages and frequencies as follows:

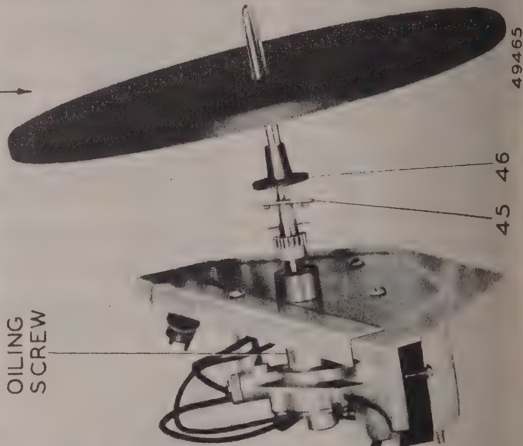
RP-139-A	105-125 volts,	60 cycles,	21 watts
RP-139-A	105-125 volts,	50 cycles,	21 watts
RP-139-A	105-125 volts,	25 cycles,	22 watts
RP-145	105-125 volts,	60 cycles,	15 watts
RP-145	105-125 volts,	50 cycles,	15 watts

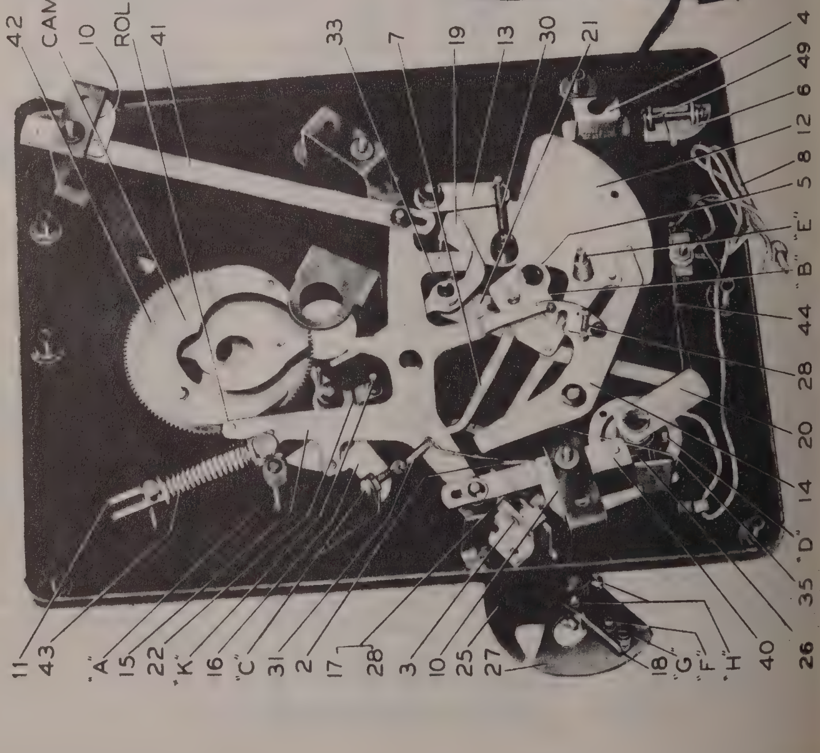




MOTOR AND TURNTABLE ASSEMBLY RP-145

MOTOR AND TURNTABLE ASSEMBLY RP-139-A

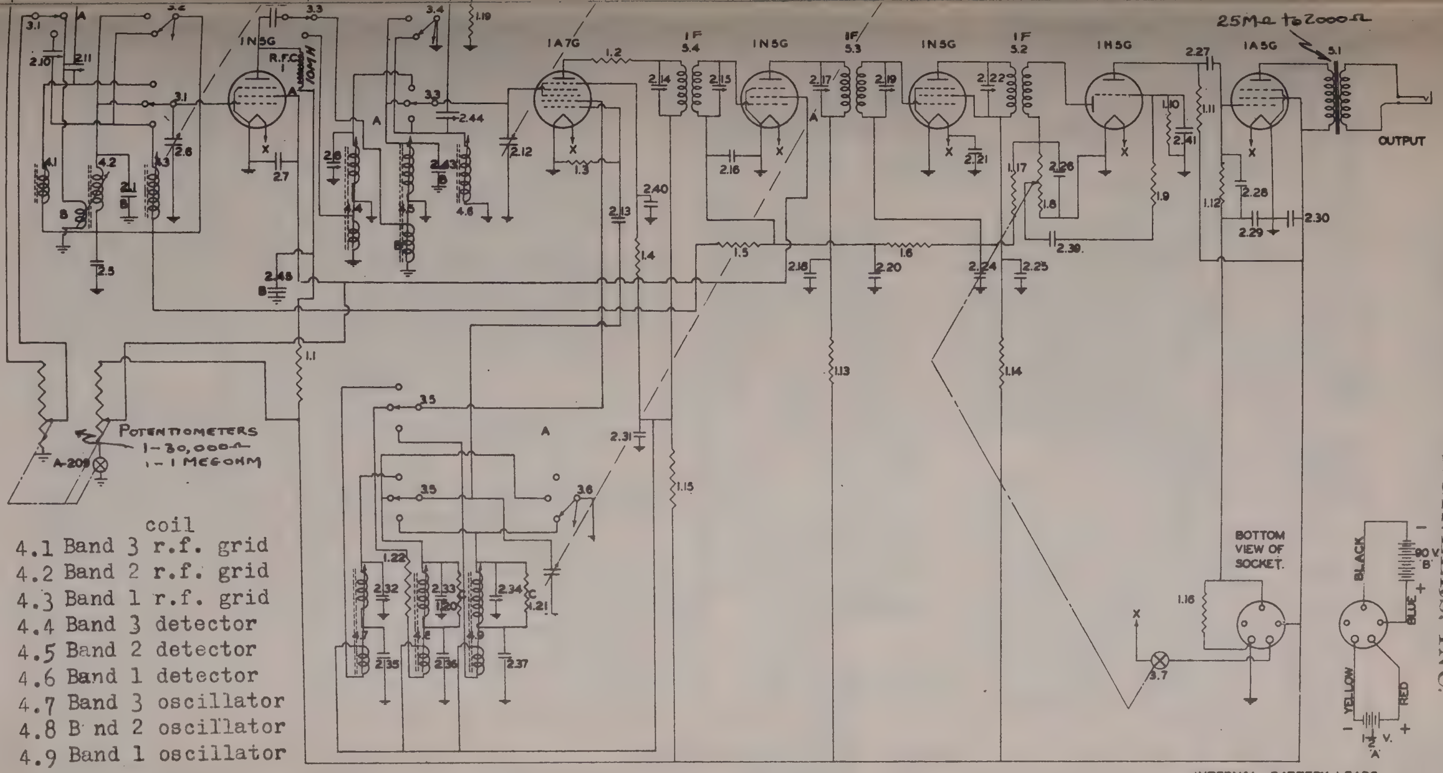




RADIO MFG. ENGINEERS, INC.

MODEL ME-14
Schematic

IF PEAK 525 KC



coil
4.1 Band 3 r.f. grid
4.2 Band 2 r.f. grid
4.3 Band 1 r.f. grid
4.4 Band 3 detector
4.5 Band 2 detector
4.6 Band 1 detector
4.7 Band 3 oscillator
4.8 B nd 2 oscillator
4.9 Band 1 oscillator

SCHEMATIC ME-14	C-149		DATE 3 6 39. DRAWN BY R.B.M. APPROVED BY:

The power drawn from the batteries is very small--being .675 watts from the 90 volt "B" battery, represented by a current of 7.5 milliamperes; and a current from a 1.4 volt filament battery of 300 milliamperes.

RADIO MFG. ENGINEERS, Inc.
111 Harrison Street PEORIA, ILL., U. S. A.

MODEL ME-14
Alignment, Socket
Trimmers, Parts

RADIO MFG. ENGINEERS, INC.

The unit includes 6 tubes and is a superheterodyne type receiver, providing both manual and automatic volume control; coverage of the entire frequency range in three selective positions of the band switch, and an audio output of 100 milliwatts. 100 milliwatts of audio power is also sufficient to operate a small loudspeaker. However, the unit is primarily designed for headphone operation and a jack is provided on the rear apron of the chassis for the insertion of a standard headphone plug. The output impedance of this phone circuit carries no direct current through it, since it is the secondary of a transformer and it is designed to supply a 2000 ohm load. If a loudspeaker is used, a suitable transformer should be used with it to match it to the output of the receiver.

SERVICE NOTES

The intermediate frequacy used in the ME-14 receiver is 525 kilocycles. Alignment can be achieved by inserting a signal of 525 kilocycles. By connecting a test oscillator generating 525 kilocycles (modulated) to the grid of the first detector tube, the intermediate frequency transformers labeled No. 1, No. 2, and No. 3 I.F. (See Figure 3) can be adjusted to maximum reading on an audio output meter connected directly across the headphones, or across a special plug inserted in the headphone jack. Alignment is made on a given signal of 525 kilocycles for maximum reading on the output meter. It is essential that the input signal put into the first detector tube be not more than 200 microvolts, since the automatic volume control will hold all variations constant if the signals are of this order or higher. If it is impossible to cut down the energy delivered by the test oscillator, by means of adjustments on the test oscillator itself, the "Manual Gain" control may be of some assistance, although its range insofar as controlling circuits behind the first detectoris rather limited. About 10 volts of audio should be obtained for optimum adjustment purposes, and the output of the signal generator, or test oscillator, should be lowered to a point where about 10 volts are obtained for alignment at the optimum peak adjustments. This, of course, means that the "Audio Gain" control should be set for maximum audio output.

Distorted signals having a very broken and rough characteristic are usually due to the fact that the fialment battery is below its required voltage and needs replacement. The sensitivity of the instrument will, of course, fall off at the same time and the combination of the two conditions can be used as an indication that the filament battery has served its purpose.

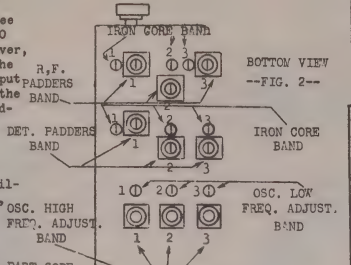
RADIO FREQUENCY ALIGNMENT

All of the controls for radio frequency alignment, except the series padder for low frequency calibration of Band 3, are available from the bottom of the chassis. In Figure 3 it will be seen that the oscillator padder, used for adjustment of the low frequency calibration of Band 3, is located near the center of the chassis between the "B" batteris and the last section of the variable condenser. The capacity of this condenser is increased with counterclockwise rotation of the screw-driver with which it is adjusted. Counterclockwise rotation decreases the frequency, and clockwise rotation increases the frequency.

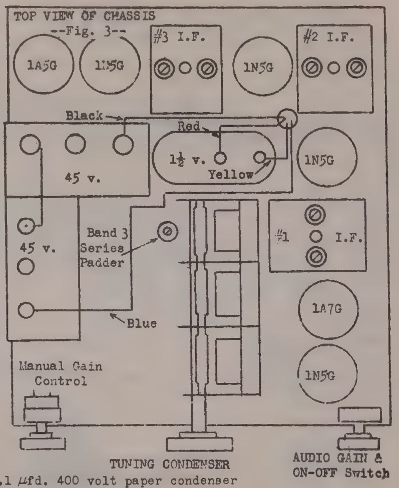
For recalibrating the instrument is is only necessary to make sure that the pointer is set properly with respect to the rotors of the variable condenser, and this is done by setting the rotors at full mesh and having the pointer, at the same time, set to the horizontal line on the left end of the calibrated scale. Under these conditions and with frequencies of accurately known value the following alignment frequencies and their respective adjusters are listed as follows:

Band 1 .2 megacycles, Band 1 Oscillator Series Padder (See Figure 2)
Band 1 .4 megacycles, Band 1 Oscillator Parallel Padder (See Figure 2)
Band 2 700 kilocycles, use Band 2 Oscillator Series Padder (See Fig. 2)
Band 2 1200 kilocycles, use Band 2 Oscillator Parallel Padder (See Fig.2)
Band 3 2 megacycles, use Band 3 Series Padder, (See Figure 3)
Band 3 4 megacycles, use Band 3 Oscillator Parallel Padder (See Fig. 2)

After the calibration has been established by means of these adjustments, the respective bands are lined up, insofar as their radio frequency circuits are concerned, by adjustment of the respective Band padders for the radio frequency grid and the detector grid. Figure 2 shows the detector and r.f. padder for each band. Adjustments are to be made on a given modulated signal with an output meter across the headphones and adjustments left at the position giving maximum output meter reading.

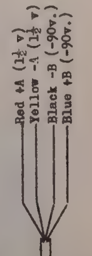


BOTTOM VIEW
--FIG. 2--

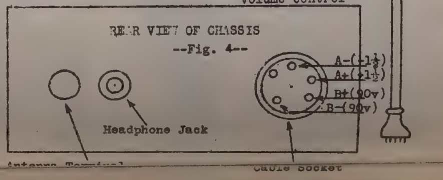


TOP VIEW OF CHASSIS
--Fig. 3--

PART CODE NUMBER	SPECIFICATION
1.1	2000 ohms, 1/3 watt resistor
1.2	2000 ohms, 1/3 watt resistor
1.3	250,000 ohms, 1/3 watt resistor
1.4	100,000 ohms, 1/3 watt resistor
1.5	250,000 ohms, 1/3 watt resistor
1.6	100,000 ohms, 1/3 watt resistor
1.8	250,000 ohms, 1/3 watt resistor
1.9	5000 ohms, 1/3 watt resistor
1.10	250,000 ohms, 1/3 watt resistor
1.11	250,000 ohms, 1/3 watt resistor
1.12	250,000 ohms, 1/3 watt resistor
1.13	2000 ohms, 1/3 watt resistor
1.14	2000 ohms, 1/3 watt resistor
1.15	2000 ohms, 1/3 watt resistor
1.16	500 ohms, 1/2 watt resistor
1.17	1 megohm, 1/3 watt resistor
1.18	50,000 ohms, 1/3 watt resistor
1.19	100,000 ohms, 1/3 watt resistor
1.20	50,000 ohms, 1/3 watt resistor
1.21	100,000 ohms, 1/3 watt resistor
1.22	1,000 ohms, 1/3 watt resistor
2.1	30μμfd adjustable padder
2.5	.1 μfd. 400 volt paper condenser
2.7	.1 μfd. 400 volt paper condenser
2.8	30 μμfd. adjustable padder
2.10	30 μμfd. adjustable padder
2.11	30 μμfd. adjustable padder
2.13	100 μμfd. mica condenser
2.14	I.F.Amplifier Trans. Adj. Trimmer
2.15	I.F. Amplifier Trans. Adj. Trimmer
2.16	deleted
2.17	I.F. Amplifier Trans. Adj. Trimmer
2.18	.1 μfd. 400 volt paper condenser
2.19	I.F. Amplifier Trans. Adj. Trimmer
2.20	.01 μfd. 400 volt paper condenser
2.21	.1 μfd. 400 volt paper condenser
2.22	I.F. Amplifier Trans. Adj. Trimmer
2.24	.01 μfd. 400 volt paper condenser
2.25	.1 μfd. 400 volt paper condenser
2.26	250 μμfd. mica condenser
2.27	.01 μfd. 400 volt paper condenser
2.28	250 μμfd. mica condenser
2.30	.1 μfd. 200 volt paper condenser
2.31	.1 μfd. 400 volt paper condenser
2.32	30 μμfd. adjustable padder
2.33	30 μμfd. adjustable padder
2.34	30 μμfd. adjustable padder
2.35	Band 3 Series Oscillator pad. 1000 μμfd.
2.36	Band 2 Series pad. 380 μμfd.
2.37	Band 1 Series Oscillator pad. 129 μμfd.
2.39	.01 μfd. 400 volt paper condenser
2.40	.01 μfd. 400 volt paper condenser
2.41	250 μμfd mica condenser
2.42	400 μμfd. mica condenser
2.43	30 mmfd. adjustable padder
2.44	30 mmfd. adjustable padder
2.45	.1 mfd. 400 volt paper condenser
2.46	.01 mfd. 400 volt paper condenser
3.1, 3.2, 3.3,	Band Switch Section
3.4, 3.5, 3.6.	On-Off Switch connected
3.7	in tandem with audio volume control

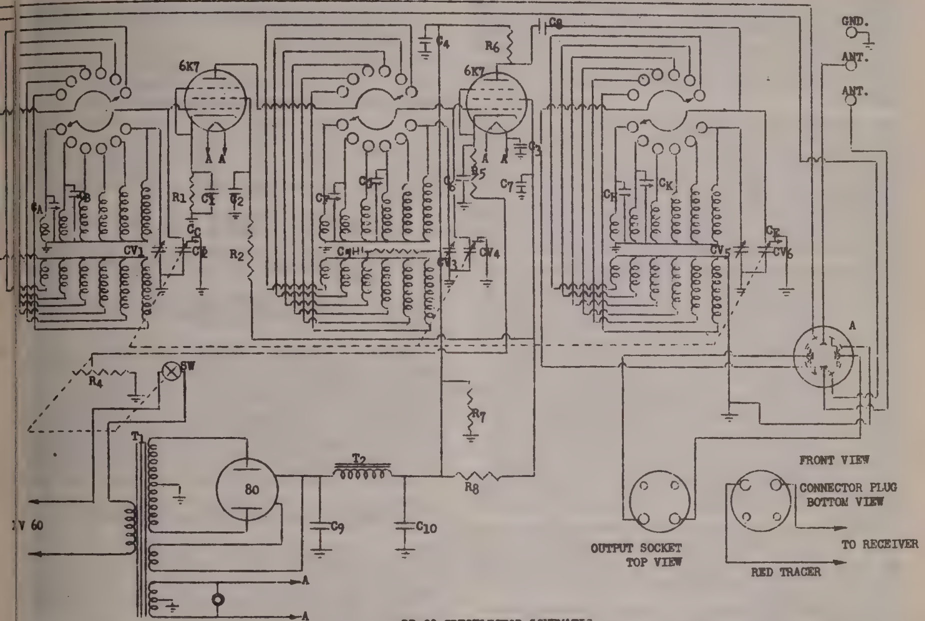


REAR VIEW OF CHASSIS
--Fig. 4--

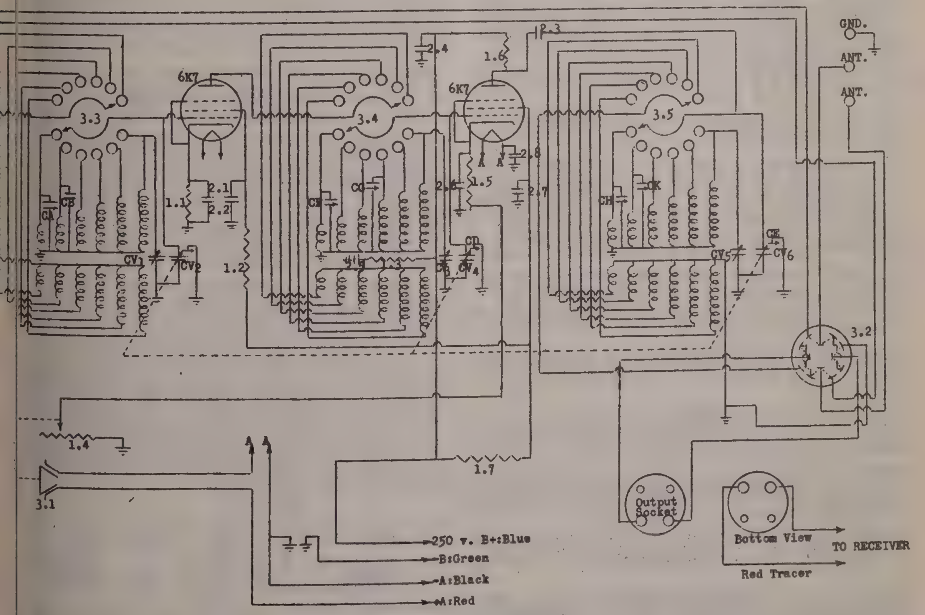


RADIO MFG. ENGINEERS, INC.

MODEL DB-20,Late
MODEL DB-20 Batt.
Schematics



DB-20 PRESELECTOR SCHEMATIC



DB-20 BATTERY OPERATED SCHEMATIC

MODEL DB-20,Late
MODEL DB-20 Batt.
Alignment,Trimmers
Voltage

RADIO MFG. ENGINEERS, INC.

The RME DB-20 Preselector is a compact efficient design of a straightforward radio frequency amplifier cascade with a specified input and output impedance. The input impedance is of a low value varying between 200 and 350 ohms over the frequency range covered by the tuning elements of the instrument. The output impedance varies over the same range in the same manner so that the insertion of this amplifier between the antenna and the RME-69 receiver incurs no mismatch in the coupling system and provides an increase in selectivity and gain due to its insertion.

The adjustment of the amplifier is calibrated on a scale in as close a manner as it is possible to calibrate such an instrument and tuning of the instrument should be done so that the setting of the indicator on the DB-20 scale is very close to the frequency being used. One check on this method is to set the tuning control of the amplifier to a position which gives a maximum meter reading on a given signal when used in conjunction with the RME-69 or any other receiver having a tuning indicator. In the absence of the tuning indicator background noise or signal strength may be used as an indication of optimum setting of the preamplifier and this will compensate for small variations which are bound to occur in the calibration of the instrument.

One side of the output circuit of the DB-20 is grounded and it is essential that the proper wire of the output cable be connected to the antenna post of the receiver with which it is used in order to provide proper operation for the combination. The high side or the ungrounded lead of the output cable is marked with a red tracer and this should be normally connected to the antenna terminal which would be used in the connection of a Marconi Antenna against ground in normal receiver operation without the DB-20. On the RME-69 receiver this is the outside terminal of the three-terminal input strip marked A - A - G. The other lead, which is a plain black wire, is to be connected to the middle antenna terminal and a ground jumper can be used to connect, A (center) to G on the terminal strip. In the case of a receiver being used with the DB-20 which has only a two-terminal input, that is antenna and ground, the black wire connects, of course, to the ground and the red tracer wire to the antenna terminal. A reversal of these leads will cause inefficient operation and probably no operation at all even when the antenna switch is thrown so that the antenna is connected directly to the receiver. This can be a source of trouble when poor operation is experienced.

A change-over switch is provided and consists merely of a four pole double throw switch indicated in Fig. 1 so that when it is thrown to the left the antenna is connected to the DB-20 and the DB-20 connected to the receiver input terminal. When the switch is thrown to the right the antenna is connected directly to the receiver and the DB-20 circuits are entirely removed from the picture.

PROCEDURE FOR ALIGNMENT OF THE RADIO FREQUENCY CIRCUIT

As an indicating device for alignment changes the meter on the RME-69 receiver can be used to indicate maximum signal being supplied the receiver from the DB-20. In the case of other communication receivers the same method may be used with their respective carrier level or R meter indication. In case the alignment is made with a receiver without carrier indicating devices an output meter can be used in the regular manner in which it is used for the alignment of receivers, but in this case, of course, it will be necessary to use a modulated signal input to the DB-20 to supply an audio component which can be used to operate the output meter.

All adjustments described should be adjusted to and left set at maximum meter readings be it carrier amplitude indicator or output as indicated on the output meter.

First set the receiver to 1000 Kc. and tune the DB-20 to 1000 Kc. which will be indicated on the main tuning dial and the band in which will be found 1000 Kc. is provided by setting the switch to position one (1). Set the pointer of the DB-20 on 1 Mc. reading of the scale and supply 1 Mc. signal input to the antenna terminal to the DB-20 setting the selector switch on the DB-20 (Fig.1) to the left position. When in this position adjust C_c, C_d and C_e for maximum meter reading.

Then switch to band two and three successively and check the setting at 2, 3, 4 and 5 megacycles. These frequencies, of course, will be checked by placing the band switch in the proper position required for tuning to these frequencies. The receiver, of course, must also be adjusted to these frequencies simultaneously with the DB-20.

The calibration for these frequencies will be found to be dependent on the settings of C_c, C_d and C_e which are made for 1000 Kc. on band one and will be in adjustment if band one is properly aligned.

Next turn the switch to position four and feed a signal of 7 Mc. into the receiver and adjust the tuning control of the DB-20 so that it sets on 7 Mc. Under these conditions check the setting of C_g for peak output. (Fig. 2).

Next set the band switch on position five and insert a signal of 14 Mc. into the receiver adjusting the tuning control of the DB-20 to 14 Mc. under these conditions adjust C_b, C_f and C_k for maximum output.

Next set the band switch to position six and set the tuning indicator to 30 Mc. on the scale and insert a signal of 30 Mc. into the DB-20. This condition obtained adjust C_a, C_d and C_h for maximum output.

During all of these settings and adjustments, of course, the receiver should be set to the same frequency as the DB-20 so that it will be able to receive the output of the DB-20 at the proper frequency.

The adjustments just described will assure maximum output due to alignment of the RF circuit in the DB-20.

The voltages to be expected at points indicated on the schema diagram of Figure 13 are as follows:

1 to ground (volume control set to minimum) 26.6 volts.
1 to ground (volume control set to maximum) 3.4 volts.
2 to ground 265 volts
3 to ground 100 volts
4 to ground 3.4 volts
5 to ground 333 volts
6 to ground 265 volts
7 to ground 123 volts
8 to ground 333 volts
9 to ground 380 volts
A to A 6.6 volts at 115 volts line voltage AC

The following continuity checks should be made:

	Band (1)	Band (2)	Band (3)	Band (4)	Band (5)	Band (6)
11 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (oh
12 to 13	0.2	0.2	0.2	0.2	0.2	0.2 (oh
14 to 15	0.2	0.2	0.2	0.2	0.2	0.2 (oh
16 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (oh
17 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (oh

All measurements made with output cable and antenna disconnect and changeover switch in DB-20 position.

Voltages greater or smaller than these values listed by an amount exceeding 15% indicates difficulty in the power circuit of the receiver.

Resistances greater or less by 15% than the resistances listed indicates conditions other than normal in continuity in these circuits.

If the amplifier is dead as evidenced by a loss in signal stren on a given signal when the DB-20 is cut into the circuit the loss being compared with the signal received when the antenna is connected directly to the receiver may be due to a dead tube which is usually due to the fact that the filament is burned and can be ascertained by placing the hand on the tube to see whether or not it is warm or cold. If it is warm, of course, the filament is lit and probably the tube is satisfactory. If the tube is cold the filament is probably open and therefore the tube needs replacing. Of course, tubes can be defective from other reasons which can not be detected in this manner but must be ascertained by checking on a regular tube checker.

Another reason for a dead amplifier may be due to lack of voltage on elements of the tube and can be checked by the voltage check.

Cause of no voltage on the plate or screen of the tube can be due to short circuit in the by-passes of C_7, C_2, C_4, C_8, C_{10} or C_1 or an open resistor R_6, R_2, R_3 or an open choke T_2 or a burned out 80 rectifier tube or an open circuit in the antenna coil or the output coils of the DB-20 which can be checked by the continuity measurements listed above.

If the amplifier has very little gain (the average gain should be 3R's over that of the receiver itself) it is probably due to misalignment and can be corrected by the procedure described on pages 2 and 3, or there is a defective tube which is not providing all the gain that is standard and the tubes can be checked and replaced by tubes having suitable characteristics.

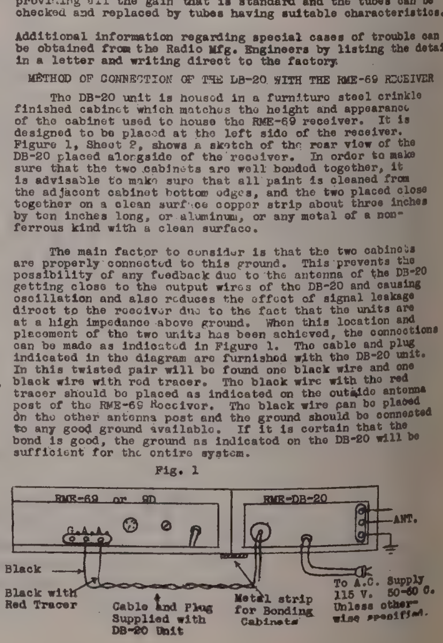
Additional information regarding special cases of trouble can be obtained from the Radio Mfg. Engineers by listing the details in a letter and writing direct to the factory.

METHOD OF CONNECTION OF THE DB-20 WITH THE RME-69 RECEIVER

The DB-20 unit is housed in a furniture steel crinkle finished cabinet which matches the height and appearance of the cabinet used to house the RME-69 receiver. It is designed to be placed at the left side of the receiver. Figure 1, Sheet 2, shows a sketch of the rear view of the DB-20 placed alongside of the receiver. In order to make sure that the two cabinets are well bonded together, it is advisable to make sure that all paint is cleaned from the adjacent cabinet bottom edges, and the two placed close together on a clean surface copper strip about three inches by ten inches long, or aluminum, or any metal of a non-ferrous kind with a clean surface.

The main factor to consider is that the two cabinets are properly connected to this ground. This prevents the possibility of any feedback due to the antenna of the DB-20 getting close to the output wires of the DB-20 and causing oscillation and also reduces the effect of signal leakage direct to the receiver due to the fact that the units are at a high impedance above ground. When this location and placement of the two units has been achieved, the connections can be made as indicated in Figure 1. The cable and plug indicated in the diagram are furnished with the DB-20 unit. In this twisted pair will be found one black wire and one black wire with red tracer. The black wire with the red tracer should be placed as indicated on the outside antenna post of the RME-69 Receiver. The black wire can be placed on the other antenna post and the ground should be connected to any good ground available. If it is certain that the bond is good, the ground as indicated on the DB-20 will be sufficient for the entire system.

Fig. 1


RME-69 or 9D
G A A
RME-DB-20
ANT.
Black
Black with Red Tracer
Cable and Plug Supplied with DB-20 Unit
Metal strip for Bonding Cabinets
To A.C. Supply 115 V. 50-60 C. Unless otherwise specified.

RADIO MFG. ENGINEERS, INC.

MODEL DB-20,Late
MODEL DB-20 Batt.
Trimmers,Chassis
Parts List

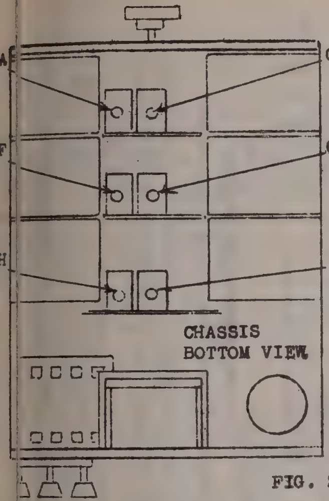
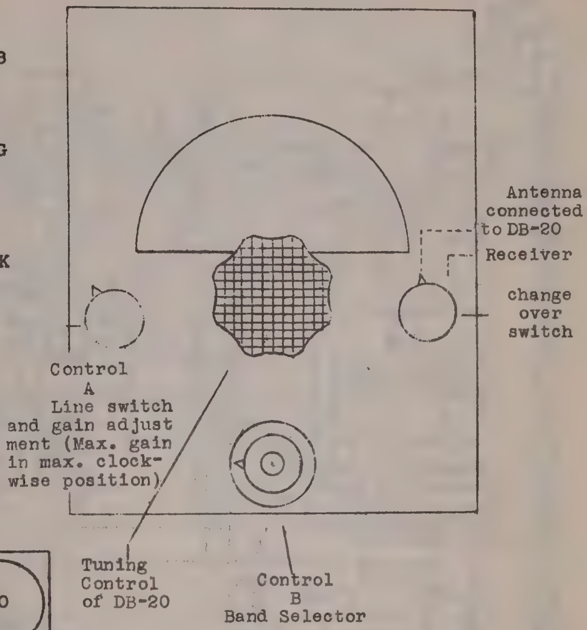


FIG. 2



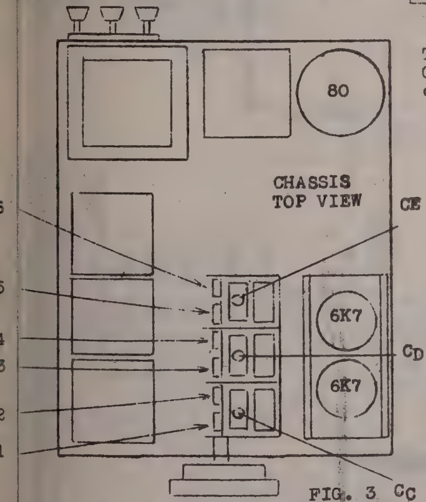


FIG. 3

PARTS LIST FOR DB-20

30 ohm
10 00 ohm
10 00 ohm
30 00 ohm variable
30 ohm
10 00 ohm
15 00 ohm 10 watt
50 00 ohm 1 watt

C_5	.01
C_6	.01
C_7	.01
C_8	.0001
C_9	8 µfd.
C_{10}	12 µfd.

.0
.0
.0
.0

T_1	Power transformer
T_2	Filter choke
C_a	5 - 30 µµfd adj. padder
C_b	5 - 50 µµfd adj. padder
C_f	5 - 30 µµfd adj. padder
C_g	5 - 30 µµfd adj. padder
C_h	5 - 30 µµfd adj. padder
C_k	5 - 50 µµfd adj. padder
$C_{v_{1-6}}$	Variable tuning condenser
C_c, C_d, C_e	Variable condenser, trimmers

BATTERY OPERATED DB-20 PARTS LIST

RESISTORS

1.1.....300 ohm
1.2..10,000 ohm
1.3..10,000 ohm
1.4..30,000 ohm variable
1.5.....300 ohm
1.6..10,000 ohm
1.7..50,000 ohm 1 watt

CONDENSERS

2.1....... .01
2.2....... .01
2.3....... .0001
2.4....... .01
2.5....... .01
2.6....... .01
2.7....... .01

CA	5 - 30 µµfd Adj. padder
CB	5 - 30 µµfd Adj. padder
CC	Variable condenser trimmers
CD	Variable condenser trimmers
CE	Variable condenser trimmers
CF	5 - 30 µµfd Adj. padder
CG	5 - 30 µµfd Adj. padder
CH	5 - 30 µµfd Adj. padder
CK	5 - 30 µµfd Adj. padder
CV_1	Variable tuning condenser
CV_2	Variable tuning condenser
CV_3	Variable tuning condenser
CV_4	Variable tuning condenser
CV_5	Variable tuning condenser
CV_6	Variable tuning condenser

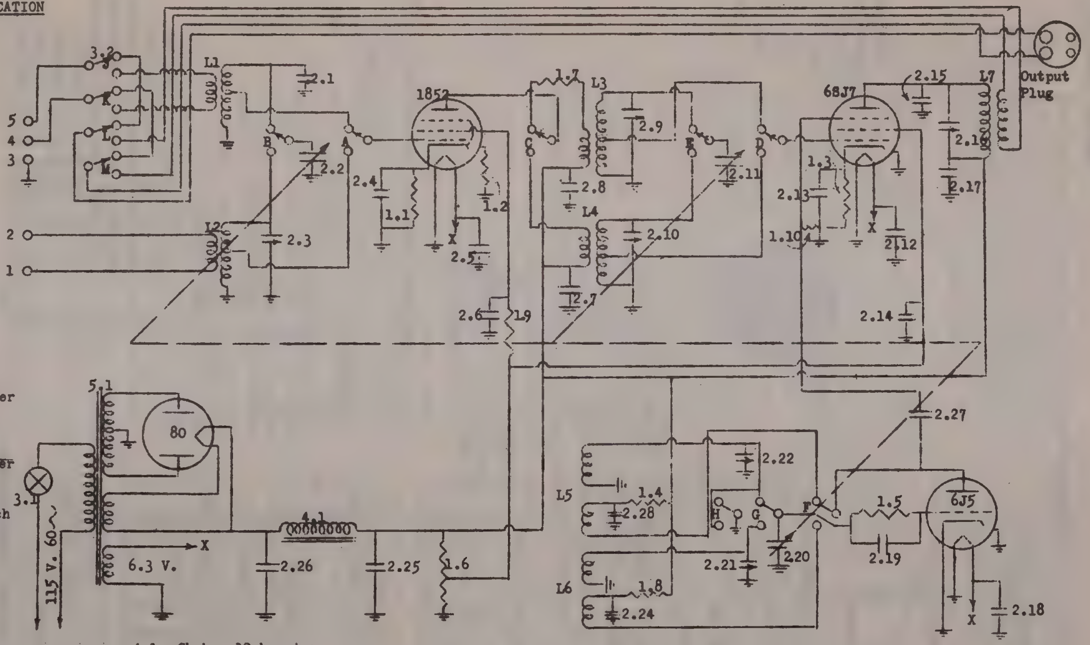
SWITCHES

3.1 Line switch
3.2 Antenna changeover switch
3.3 Band switch section
3.4 Band switch section
3.5 Band switch section

MODEL DM-30X
Schematic, Voltage

RADIO MFG. ENGINEERS, INC.

PART CODE NUMBER	SPECIFICATION
2.1	20 μμfd. condenser
2.2	Tuning condenser
2.3	20 μμfd. condenser
2.4	400 μμfd. condenser
2.5	400 μμfd. condenser
2.6	400 μμfd. condenser
2.7	400 μμfd. condenser
2.8	250 μμfd. condenser
2.9	20 μμfd. condenser
2.10	20 μμfd. condenser
2.11	Tuning Condenser
2.12	400 μμfd. condenser
2.13	400 μμfd. condenser
2.14	400 μμfd. condenser
2.15	50 μμfd. condenser
2.16	30 μμfd. condenser
2.17	.01 μfd. condenser
2.18	400 μμfd. condenser
2.19	100 μμfd. condenser
2.20	Tuning condenser
2.21	15 μμfd. condenser
2.22	15 μμfd. condenser
2.24	400 μμfd. mica condenser
2.25	15 μfd. condenser
2.26	10 μfd. condenser
2.27	50 μμfd. condenser
2.28	.002 μfd. mica condenser
3.1	S.P.S.T. Switch
3.2	(J K,L,M) 4.P.D.T. Switch
A,B,C,D, E,F,G,H.	Band Switch
1.1	200 ohm, 1/3 watt resistor
1.2	35 ohm, 1/3 watt resistor
1.3	5000 ohms, 1/3 watt resistor
1.4	10,000 ohm, 1 watt resistor
1.5	5000 ohm, 1/3 watt resistor
1.6	15,000 ohm, 10 watts C.T.
1.7	35 ohm, 1/3 watt resistor
1.8	10,000 ohm, 1 watt resistor
1.9	5000 ohm, 1/3 watt resistor
1.10	1000 ohm, 1/3 watt resistor
4.1	Choke, 30 henries
5.1	Power transformer
L_1	Band 2 R.F. coil
L_2	Band 1 R.F. Coil
L_3	Band 2 Det. coil
L_4	Band 1 Det. coil
L_5	Band 2 Osc. coil
L_6	Band 1 Osc. coil
L_7	Output Coupling Transformer 1550KC



DM-30X SCHEMATIC

TEST VOLTAGES OF RME DM-30X

Measurements obtained with 115 v. A.C. line voltage:

R.F. Amplifier, cathode to ground........ 1 v. - 1.5 v.
R.F. Amplifier, plate to ground.......... 210 v. - 240 v.
R.F. Amplifier, screen to ground......... 110 v. - 125 v.

Detector, cathode to ground............... 5 v. - 6 v.
Detector, plate to ground................. 210 v. - 240 v.
Detector, screen to ground................ 110 v. - 125 v.

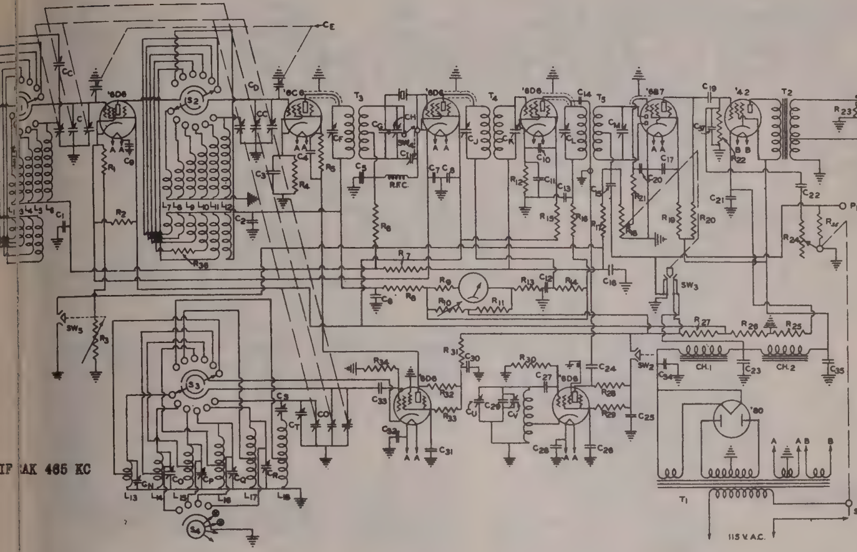
*Oscillator, plate to ground (oscillating) 125 v. - 140 v.
Osc., plate to ground (not oscillating).. 110 v. - 120 v.

Note* This voltage must be measured at "B" plus end of plate coil to prevent

This unit is in effect a frequency converter and therefore acts as a radio frequency amplifier and mixer tube with its oscillator in an over-all superheterodyne type of circuit. It must be used in connection with a regular receiver capable of tuning to a frequency of 1550 KC. The associated receiver therefore acts as an intermediate frequency amplifier unit and a demodulator and audio amplifier in order to re-

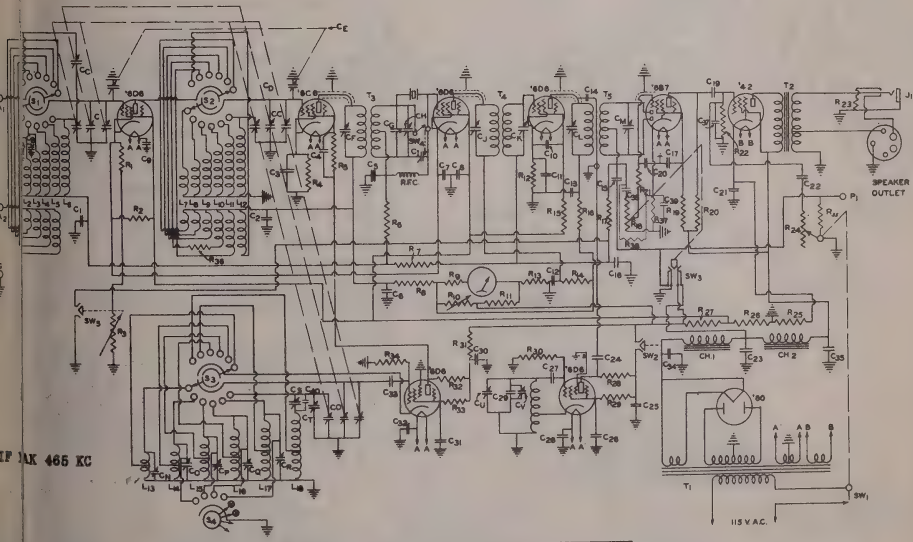
MODEL 69 AC Late
MODEL 69AC Late Revised
Schematics

RADIO MFG. ENGINEERS, INC.



R.M.E. 69 SCHEMATIC CIRCUIT
AC - LATE

C-23



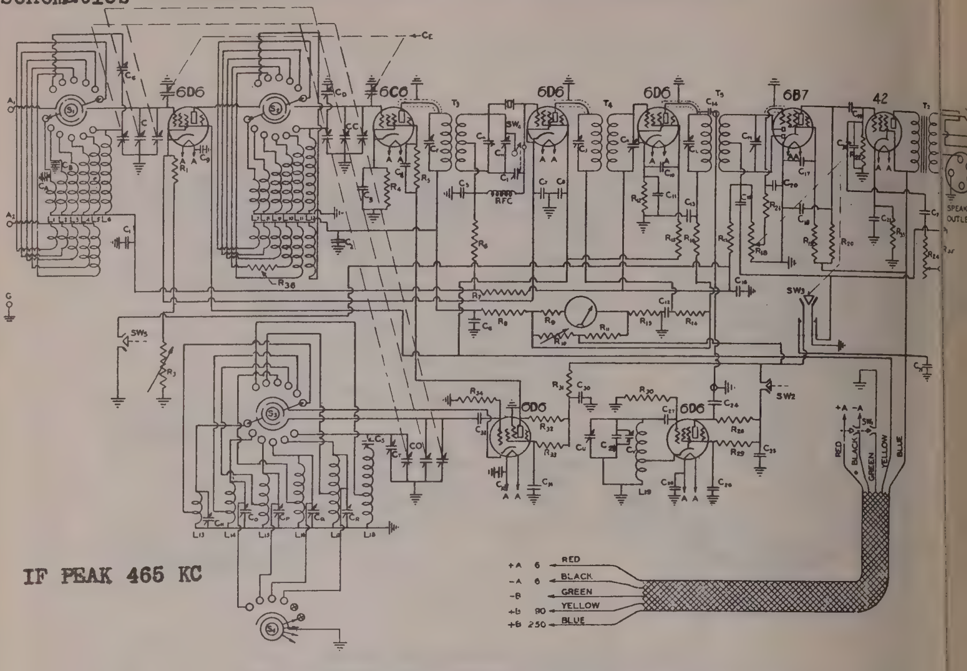
R.M.E. 69 SCHEMATIC CIRCUIT
AC-LATE REVISED

C-23

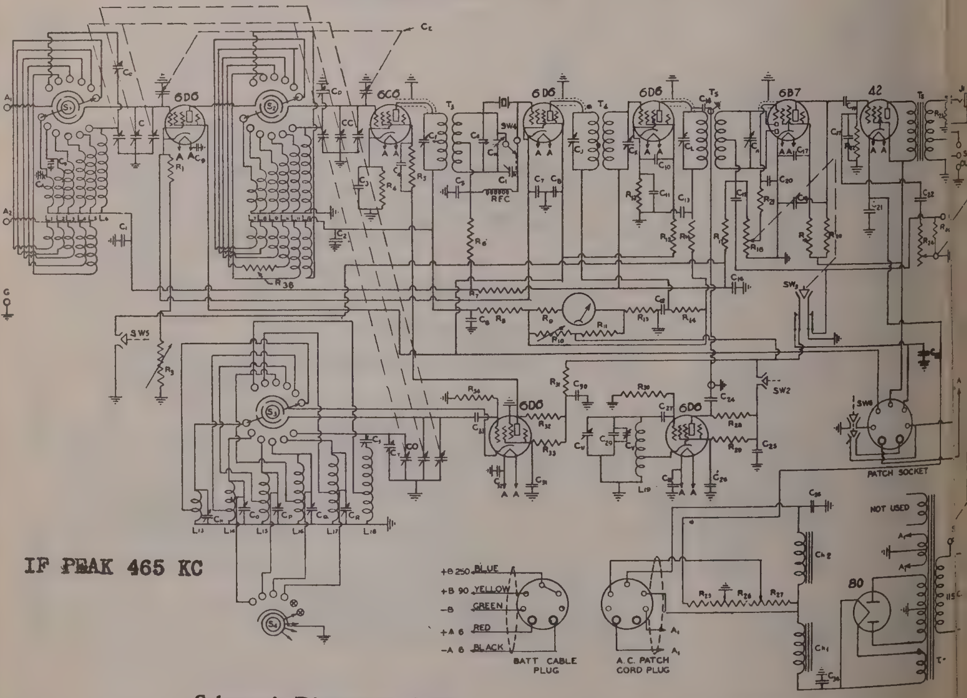
RAD MFG. ENGINEERS, Inc.
11 HA ON STREET PEORIA, ILLINOIS

MODEL 69A
MODEL 69B
Schematics

RADIO MFG. ENGINEERS, INC.



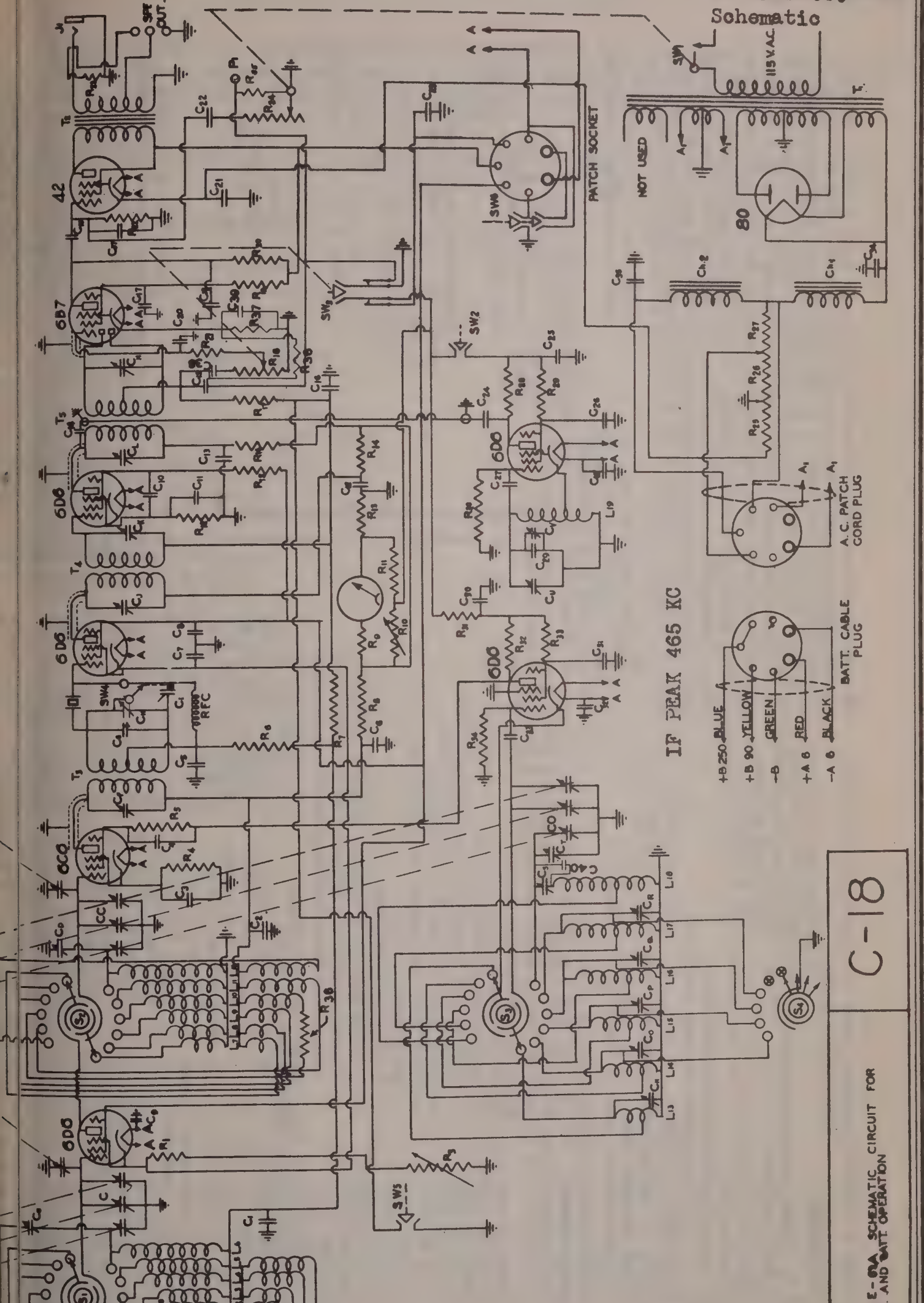
Schematic Diagram of RME 69-B for Battery Operation



Schematic Diagram of RME 69-A for AC or Battery Operation

RADIO MFG. ENGINEERS, INC.

MODEL 69 Revised
AC or Batt.
Schematic



RADIO MFG. ENGINEERS, INC.

LEGEND OF RESISTORS, CONDENSERS, CHOKES, AND TRANSFORMERS OF RME-69 RECEIVER SCHEMATIC DIAGRAM.

SPECIFICATION

C_a and C_b 30 μμfd. adjustable mica padders.
C_c 30 μμfd. mica padder.
C_d deleted.
C_e Dual section resonator control, 4 μμfd minimum, 30 μμfd maximum.
C_f, C_g, C_j, C_k, C_l, C_m. Adjustable trimming condensers in the intermediate frequency transformers.
C_h 25 μμfd midget air padder.
C_i 30 μμfd mica adjustable phasing condenser.
C_n, C_o, C_p, C_r 30 μμfd adjustable padders.
C_q 70 μμfd adjustable padder.
C_s .0004 mica condenser shunted by 70 μμfd. mica adjustable trimmer.
C_t Mica trimmer on the oscillator section of the main tuning condenser.
C_u 70 μμfd adjustable mica padder.
C_v 25 μμfd variable air condenser

C_{34} 8 μfd 450 volt electrolytic.
C_{35} 8 μfd 450 volt electrolytic.
C_{37} .00025 μfd moulded condenser
C_{38} .1 μfd, 400 volts
C_{39} 20 μfd, 25 volt
C_{40} 400 μμfd, moulded mica

RFC 16 millhenries
CH_1 30 henries, 100 ma.
CH_2 30 henries, .50 ma.

L_1 Band 6 RF grid coil
L_2 Band 5 RF grid coil
L_3 Band 4 RF grid coil
L_4 Band 3 RF grid coil
L_5 Band 2 RF grid coil
L_6 Band 1 RF grid coil

S_1, S_2, S_3, S_4, Band Change Switch
SW_1 115 volt line switch
SW_2 Beat oscillator on and off switch
SW_3 Switch operated by control "H" for connecting monitor circuit and opening B supply to amplifier stage.
SW_4 Crystal switch for series of for paralllel
SW_5 Cut-off switch for removing AVC action (operated in tandem with R)
T_1 Main power trahsformer
T_2 Audio output transformer to 4,000 ohms and 600 ohms.
T_3 First intermediate frequency amplifier transformer.
T_4 Second intermediate frequency amplifier transformer.
T_5 Third intermediate frequency amplifier transformer.

C_1 .01 μfd 400 volts.
C_2 .01 μfd 400 volts.
C_3 .01 μfd 400 volts.
C_4 .01 μfd 400 volts.
C_5 .01 μfd 400 volts.
C_6 .1 μfd 400 volts.
C_7 .1 μfd 400 volts.
C_8 .1 μfd 400 volts.
C_9 .002 moulded mica condenser.
C_{10} .01 μfd 400 volts.
C_{11} .1 μfd 400 volts.
C_{12} .1 μfd 400 volts.
C_{13} .1 μfd 400 volts.
C_{14} 1" of shielded braid wrapped around plate lead of second intermediate frequency amplifier tube. Approximate capacity 10 μμfds.
C_{15} .00025 μμfd.
C_{16} .01 μfd. 400 volts.
C_{17} .1 μfd. 400 volts.
C_{19} .01 μfd 400 volts.
C_{20} .00025 μfd moulded mica condenser.
C_{21} 20 μfd 25 volt electrolytic.
C_{22} .01 μfd 400 volts.
C_{23} 12 μfd 450 volt electrolytic.
C_{24} .0001 moulded mica condenser.
C_{25} .01 μfd 400 volt electrolytic.
C_{26} .01 μfd 400 volts.
C_{27} .0001 μfd moulded mica.
C_{28} .01 μfd 400 volt.
C_{29} .00025 moulded ± 5%.
C_{30} .1 μfd 400 volts.
C_{31} .01 μfd. 400 volts.
C_{32} .01 μfd. 400 volts.
C_{33} .0001 μfd moulded ± 5%.

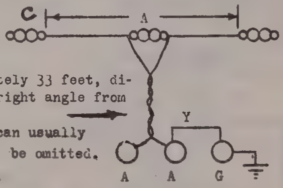
R_1 200 ohms, 1/2 watt
R_2 20,000 ohms, 1 watt
R_3 30,000 ohms, variable
R_4 5,000 ohms, 1/2 watt
R_5 1 megohm, 1/2 watt
R_6 250,000 ohms, 1/2 watt
R_7 100,000 ohms, 1/2 watt
R_8 2,000 ohms, 1/2 watt
R_9 500 ohms, 1/2 watt ±5%
R_{10} 200 ohms wire wound var. R meter balance
R_{11} 1,000 ohms. 1/2 watt
R_{12} 800 ohms, 1/2 watt
R_{13} 100,000 ohms, 2 watts
R_{14} 2,000 ohms, 1/2 watt
R_{15} 10,000 ohms, 1/2 watt
R_{16} 2,000 ohms, 1/2 watt
R_{17} 1 megohm, 1/2 watt

R_{19} 1 megohm, 1/2 watt
R_{20} 100,000 ohms, 1/2 watt
R_{21} 50,000 ohms, 1/2 watt
R_{22} 250,000 ohms, 1/2 watt
R_{23} 5,000 ohms, 1/2 watt
R_{24} 1,000,000 ohms potentiometer
R_{25} 410 ohms bleeder section
R_{26} 7200 ohms, bleeder section
R_{27} 6800 ohms, bleeder section
R_{28} 10,000 ohms, 1/2 watt
R_{29} 100,000 ohms, 1/2 watt
R_{30} 100,000 ohms, 1/2 watt
R_{31} 2,000 ohms, 1/2 watt
R_{32} 2,000 ohms, 1/2 watt
R_{33} 50,000 ohms, 1/2 watt
R_{35} 10,000 ohms, 1/2 watt
R_{36} 5,000 ohms, 1/2 watt
R_{37} 1,000 ohms, 1/2 watt
R_{38} 100,000 ohms, 1/2 watt
R_{34} 50,000 ohms, 1/2 watt

L_7 Band 6 first detector grid coil
L_8 Band 5 first detector grid coil
L_9 Band 4 first detector grid coil
L_{10} Band 3 first detector grid coil
L_{11} Band 2 first detector grid coil
L_{12} Band 1 first detector grid coil
L_{13} Band 6 oscillator coil
L_{14} Band 5 oscillator coil
L_{15} Band 4 oscillator coil
L_{16} Band 3 oscillator coil
L_{18} Band 1 oscillator coil

The antenna input impedance to an RME-69 Receiver varies in the vicinity of 250 to 350 ohms. The antenna supply should therefore be of the Marconi type which is fed at current maximum to the receiver or of the twisted pair type where impedances of lines involved are in the vicinity of the 250 ohms previously mentioned. For maximum selectivity insofar as the input circuit is concerned, the value of this impedance should be taken into account. Antennae which are supplying signal to the receiver at a high potential point should not be used in conjunction with the RME-69 Receiver because of the great loss in voltage transfer encountered in such a combination. The half-wave doublet type of antenna providing a tuned antenna system for a certain range of frequencies has certain marked directional characteristics. These directional characteristics are evident in the fact that the greatest pick-up occurs in a direction at right angles to the axis of the antenna, forming in effect a Figure 8 pattern in which the lobes are located off the sides of the antenna instead of off the ends.

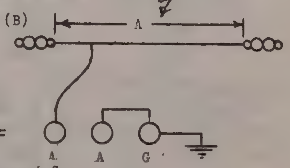
C-Optimum condition when $A = \frac{\lambda}{2}$ Not satisfactory for wide range freq. Excellent for any amateur band if $A = \frac{\lambda}{2}$ is in the middle of the band. For example For 20 meter band antenna should be designed for 14,200 KC.

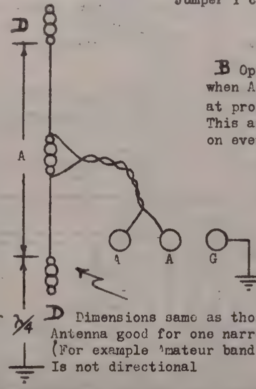


A = approximately 33 feet, directional at right angle from line of wire.

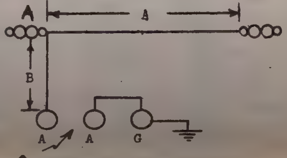
Jumper Y can usually be omitted.

B Optimum signal input to receiver when $A = \frac{\lambda}{2}$; and feeder is tapped at proper distance from center. This antenna works quite well usually on even harmonics also.





D Dimensions same as those of C. Antenna good for one narrow band. (For example Amateur band). Is not directional



A General Marconi connection.

A plus B $= \frac{\lambda}{4}$ $\frac{\lambda}{4}$ $\frac{\lambda}{4}$ etc.

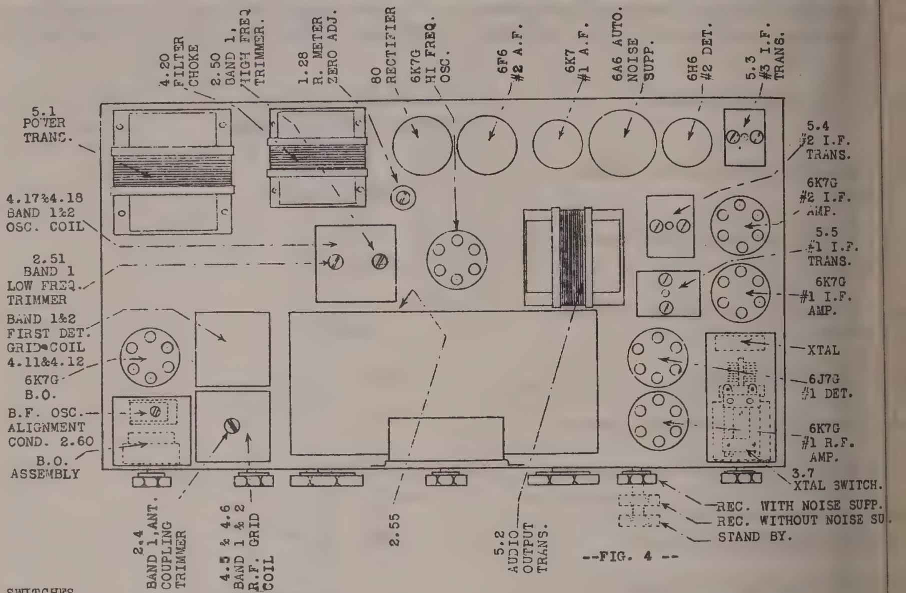
E VOLTAGES OBTAINED AT VARIOUS POINTS IN THE RECEIVER CIRCUIT (Measurements made i voltmeter having internal resistance of 1,000 ohms per volt. Instruments with t r internal resistances give entirely different readings) Note: Line voltage h ld be 115 v.

LE TEST PRODS BETWEEN	CORRECT VOLTAGE (Switch "H" in toward panel)	CORRECT VOLTAGE (Switch "H" pulled outward fm.panel)
ado frequency amplifier plate nd ground	240 volts	0 volts
ado frequency amplifier screen nd ground	100 "	0 "
ado frequency amplifier cathode nd ground	3.2 "	0 "
irt detector plates	240 "	0 "
irt detector screen and ground	75 "	0 "
irt detector cathode and ground	3.5 "	0 "
irt intermediate frequency mpifier plate and ground	250 "	0 "
irt intermediate frequency mpifier screen and ground	100 "	0 "
ntrmediate frequency amplifier atode and ground	3.2 "	0 "
Th same voltages apply to the ecnd intermediate frequency mpifier tube elements)		
37plate and ground	115 "	145 "
37screen and ground	25 "	35 "
late and ground	244 "	280 "
reen and ground	248 "	290 "
athode and ground	16 "	18 "
ectifier filament and ground	258 "	335 "
cllator plate and ground	248 "	0 "
cllator screen and ground	115 "	0 "
a oscillator plate and ground	180 "	210 "
a oscillator screen and ground	100 "	130 "
eroltage across R-31	14 "	0 "

e voltages are subject to a fluctuation of plus or minus 15% without indication aterial difficulties.

MODEL 70
Chassis, Socket,
Trimmers,
Switch Data

RADIO MFG. ENGINEERS, INC.



--FIG. 4 --

SWITCHES

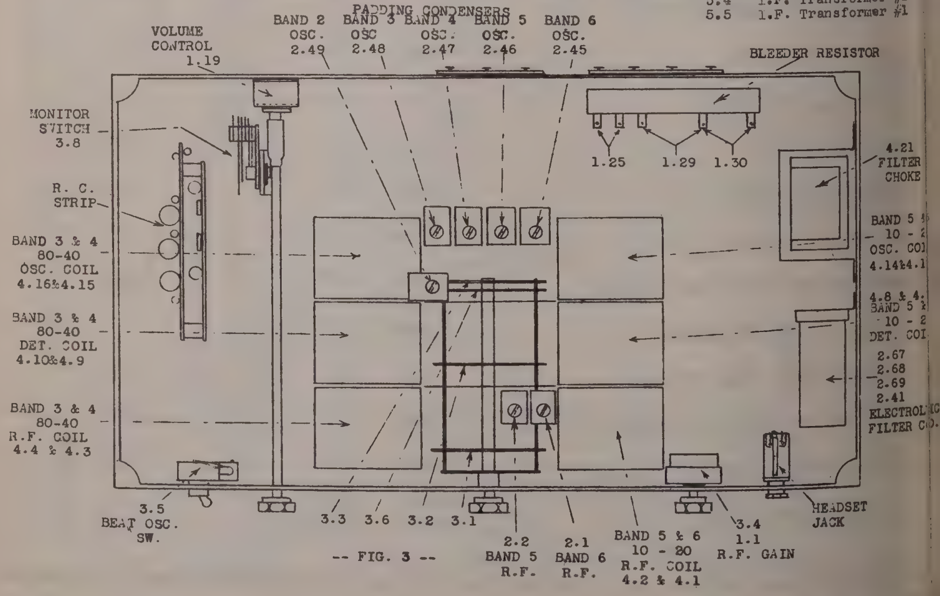
3.1	Band change switch
3.2	Band change switch
3.3	Band change switch
3.4	AVC On-Off
3.5	Beat Oscillator
3.6	Band change switch
3.7	Crystal switch
3.8	Noise suppressor and stand-by.
3.9	Line switch

INDUCTANCES

4.1	Band 6 R.F. Grid coil
4.2	Band 5 R.F. Grid coil
4.3	Band 4 R.F. Grid coil
4.4	Band 3 R.F. Grid coil
4.5	Band 2 R.F. Grid coil
4.6	Band 1 R.F. Grid coil
4.7	Band 6 1st Det. coil
4.8	Band 5 1st Det. coil
4.9	Band 4 1st Det. coil
4.10	Band 3 1st Det. coil
4.11	Band 2 1st Det. coil
4.12	Band 1 1st Det. coil
4.13	Band 6 Osc. coil
4.14	Band 5 Osc. coil
4.15	Band 4 Osc. coil
4.16	Band 3 Osc. coil
4.17	Band 2 Osc. coil
4.18	Band 1 Osc. coil
4.19	Beat Oscillator coil
4.20	30H 100MA Filter chok
4.21	30H 50 MA Filter chok
RFC	10MH R.F. Choke

TRANSFORMERS

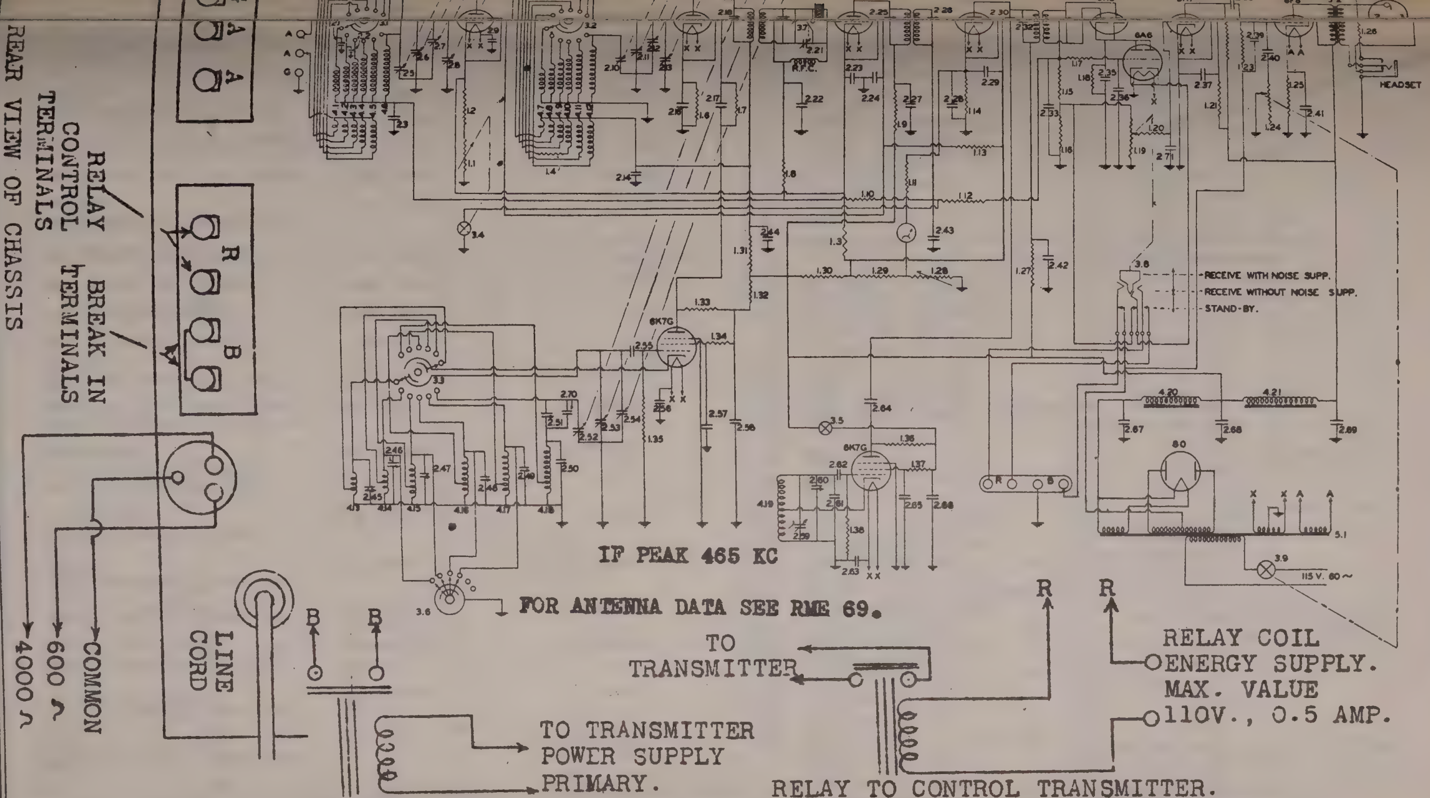
5.1	Power transformer
5.2	Audio transformer
5.3	I.F. Transformer #3
5.4	I.F. Transformer #2
5.5	I.F. Transformer #1



-- FIG. 3 --

RADIO MFG. ENGINEERS, INC.

MODEL 70
Schematic



IF PEAK 465 KC

FOR ANTENNA DATA SEE RME 69.

RELAY TO CONTROL TRANSMITTER.

TYPICAL CIRCUIT FOR REMOTE BREAK-IN CONTROL OF RECEIVER. TERMINAL PAIR MARKED B ON RECEIVER CONNECT TO B - B. CIRCUIT BETWEEN B PAIR IS CLOSED WHEN RELAY OR REMOTE SWITCH IS CLOSED DURING TRANSMITTER STAND-BY PERIODS.

TYPICAL CIRCUIT DIAGRAM OF CONNECTING OF RELAY CONTROL CIRCUIT OF RECEIVER. LEADS R - R CONNECT TO TERMINAL PAIR MARKED R., ON RECEIVER.

RELAY CLOSES WHEN RECEIVER STAND-BY CONTROL IS PULLED OUTWARD FROM PANEL. (MAXIMUM POSITION)

TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN THE RECEIVER CIRCUIT
(Measurements made with voltmeter having internal resistance of 1,000 ohms per volt. Instruments with other internal resistances give entirely different readings) Note: Line voltage should be 115v.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE (Switch marked Audio level and Standby in toward panel)	CORRECT VOLTAGE (Switch marked Audio level and Standby outward from panel.)
Radio frequency amplifier plate and ground.	240 volts	0 volts
Radio frequency amplifier screen and ground	100 volts	0 volts
Radio frequency amplifier cathode and ground	3.2 volts	0 volts
First detector plates	240 volts	0 volts
First detector screen and ground	75 volts	0 volts
First detector cathode and ground	3.5 volts	0 volts
First intermediate frequency amplifier screen and ground	100 volts	0 volts
First intermediate frequency amplifier plate and ground	250 volts	0 volts
6K7 Audio Amp. plate and ground	115 volts	0 volts
6K7 screen and ground	25 volts	0 volts
6F6 plate and ground	244 volts	0 volts
6F6 screen and ground	248 volts	0 volts
6F6 cathode and ground	16 volts	0 volts
80 rectifier filament and ground	258 volts	0 volts
Oscillator plate and ground	248 volts	0 volts
Oscillator screen and ground	115 volts	0 volts
Beat oscillator plate and ground	180 volts	0 volts
Beat oscillator screen and ground	100 volts	0 volts
The voltage across 1.32	14 volts	0 volts

These voltages are subject to a fluctuation of plus or minus 15% without indication of material difficulties.

RME-70 PARTS LIST

Resistors

1.1	30,000 ohm variable
1.2	150 ohm 1/2 watt
1.3	20,000 ohm 1 watt
1.4	5,000 ohm 1/2 watt
1.6	5,000 ohm 1/2 watt
1.7	1 megohm 1/2 watt
1.8	250,000 ohm 1/2 watt
1.9	2,000 ohm 1/2 watt
1.10	100,000 ohm 1/2 watt
1.11	35 ohm 1/2 watt
1.12	1 megohm 1/2 watt
1.13	5,000 ohm 1/2 watt
1.14	150 ohm 1/2 watt
1.15	50,000 ohm 1/2 watt
1.16	50,000 ohm 1/2 watt
1.17	1 megohm 1/2 watt
1.18	100,000 ohm 1/2 watt
1.19	250,000 ohm volume control
1.20	50,000 ohm 1/2 watt
1.21	1 megohm 1/2 watt
1.22	100,000 ohm 1/2 watt
1.23	250,000 ohm 1/2 watt
1.24	1 megohm potentiometer
1.25	410 ohm section of bleeder
1.26	5,000 ohm 1/2 watt
1.27	2,000 ohm 1/2 watt
1.28	200 ohm R meter pot.
1.29	7,200 ohm bleeder
1.30	6,800 ohm bleeder
1.31	2,000 ohm 1/2 watt
1.32	2,000 ohm 1/2 watt
1.33	2,000 ohm 1/2 watt
1.34	50,000 ohm 1/2 watt
1.35	50,000 ohm 1/2 watt
1.36	10,000 ohm 1/2 watt
1.37	100,000 ohm 1/2 watt
1.38	100,000 ohm 1/2 watt

Condensers

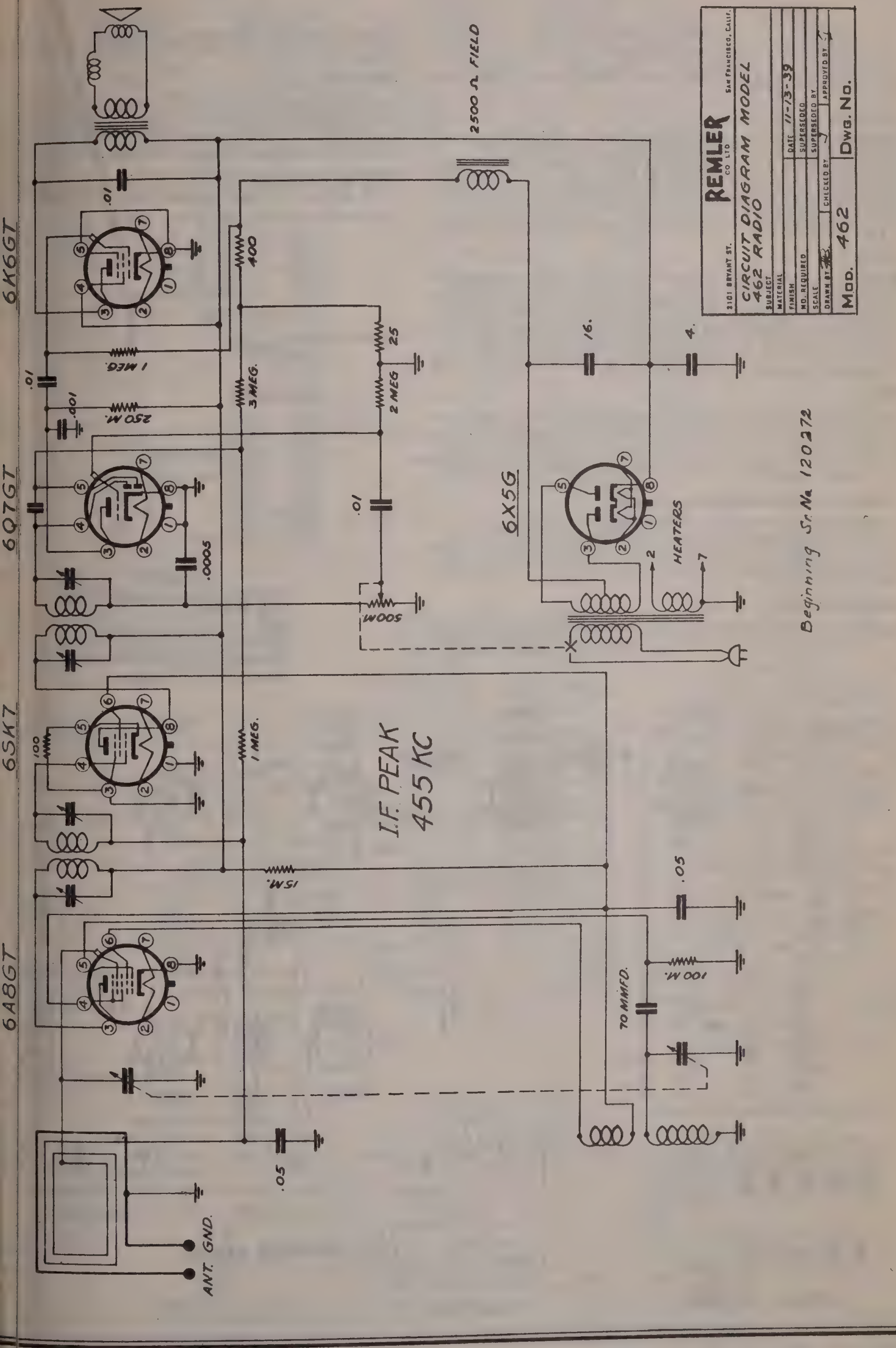
2.1	30 μμfd Adj.
2.2	30 μμfd Adj.
2.3	.01 μfd 400 volt
2.4	30 μμfd Adj.
2.5	Tuning condenser
2.6	Tuning condenser
2.7	Bandspread condenser
2.8	Resonator
2.9	.002 Mica
2.10	Tuning condenser
2.11	Tuning condenser
2.12	Bandspread condenser
2.13	Resonator
2.14	.01 400 volt
2.16	[illegible]

Condensers cont.

2.17	.01 400 volt
2.18	I.F. Trimmer
2.19	I.F. Trimmer
2.20	25 μμfd variable
2.21	30 μμfd Adj.
2.22	.01 400 volt
2.23	.1 400 volt
2.24	.1 400 volt
2.25	I.F. Trimmer
2.26	I.F. Trimmer
2.27	.1 400 volt
2.28	.1 400 volt
2.29	.01 400 volt
2.30	1" of shielded braid--Capacity approximately 10 μμfd.
2.32	I.F. Trimmer
2.33	.00005 Mica
2.34	I.F. Trimmer
2.35	.00005 Mica
2.36	.1 400 volt
2.37	.1 400 volt
2.38	.01 600 volt
2.39	.00025 Mica
2.40	.01 400 volt
2.41	40 μfd 25 v. electrolytic
2.42	.1 400 volt
2.43	.01 400 volt
2.44	.1 400 volt
2.45	30 μμfd Adj.
2.46	70 μμfd Adj.
2.47	30 μμfd Adj.
2.48	30 μμfd Adj.
2.49	30 μμfd Adj.
2.50	30 μμfd Adj.
2.51	.0004 Mica
2.52	Tuning condenser
2.53	Tuning condenser
2.54	Bandspread condenser
2.55	.0001 Mica 5% Tol.
2.56	.0004 Mica
2.57	.01 400 volt
2.58	.1 400 volt
2.59	25 μμfd variable
2.60	50 μμfd Adj.
2.61	.00025 Mica
2.62	.0001 Mica
2.63	.01 400 volt
2.64	.00025 Mica
2.65	.01 400 volt
2.66	.01 400 volt
2.67	10 μfd 450 V. Elec.
2.68	15 μfd 450 V. Elec.
2.70	70 μμfd Adj.
2.71	.00025 Mica

REMLER COMPANY, LTD.

MODEL 462
Schematic



MODELS 463,464,465,470
Schematic,Tuner,Notes

REMLER COMPANY, LTD.

MODELS 463, 464, 465 and 470

This is a six tube superheterodyne receiver, operating on 110 - 120 volts, 50 or 60 cycles current.

INSTALLATION

This receiver may be used with the Built-In antenna where receiving conditions are favorable. When greater distance is required, or where receiving conditions are not satisfactory with the Built-In antenna, an outside antenna may be used. This outside aerial should be from 50 to 100 feet in length and should be connected to the terminal on the back of the cabinet marked A. The outside aerial should be run in as straight a line as possible and be kept clear of wires or other metal objects. A good ground connection to a water pipe is essential for clearest reception. The ground lead should be connected to the terminal marked G and should be as short as possible.

CONTROLS

The control on the left of the cabinet is the volume control and ON and OFF switch when the extreme left position. On the right side of the receiver is located the station selector or tuning control. On Models 463, 465 and 470 the center knob controls the high frequency response. When turned to the left the full tone range of the program is reproduced. Turning the control to the right diminishes the higher frequency tones. A position approximately one quarter turn from the left position is satisfactory for most programs. On Model 464, this control is on the back of the receiver. The antenna switch on the back of the cabinet changes the connections to either the Built-In or Outside Aerial when one is used.

OPERATION

With the line cord connected turn the volume control about one half turn to the right and allow about one half minute for the tubes to properly heat. Select the desired station with the tuning control, varying the control until the tuning indicator produces the narrowest shadow. Adjust the volume control to the desired level and the tone control for the most pleasing response. For best quality be certain the station is properly tuned in as indicated by the tuning indicator.

AUTOMATIC PUSH BUTTON TUNING-MODELS 464 and 470

The push buttons are adjusted for selecting five stations as indicated by the call letters over the buttons. To receive any one of these stations, turn on the receiver as described above and depress the button corresponding to the desired station. Adjust the volume to the intensity required. To use the tuning control for selecting the stations, depress the DIAL button. Directions for changing the push button station set up are attached to the bottom of the cabinet.

PHONOGRAPH-MODEL 465

This model is provided with a record player which reproduces up to 12 inch recordings with the cabinet top closed. To change over to phonograph, turn the volume control to the right about half a turn and throw the record switch, located in the top of the cabinet, to the right. Volume and be ma adjusted as with the radio operation. Use a heavy needle fo est r duction.

SERVICE DATA

The antenna switch on the back of the receiver changes the i circ to either the enclosed loop antenna or to an outside aerial. e tr for this circuit is on the rear section of the variable conde r, w the oscillator trimmer is on the front section of the variabl onde Trimmers for the I.F. circuits are adjustable through holes o he to of the I.F. transformer shields. The intermediate frequency 455

Trimmers for the push button circuits are accessible through open in the bottom of the cabinet. The oscillator gang is nearest e fro of the cabinet. The lowest frequency range sections are on t left.

The following tubes are used in this receiver:

6A8GT	-	Mixer Oscillator
6SK7	-	I.F. Amplifier
6SQ7	-	Detector - A.F. Amplifier
6V6GT	-	Power Amplifier
6X5G	-	Rectifier
6V5	-	Tuning Indicator

Type 46 dial lamps

Voltage Readings

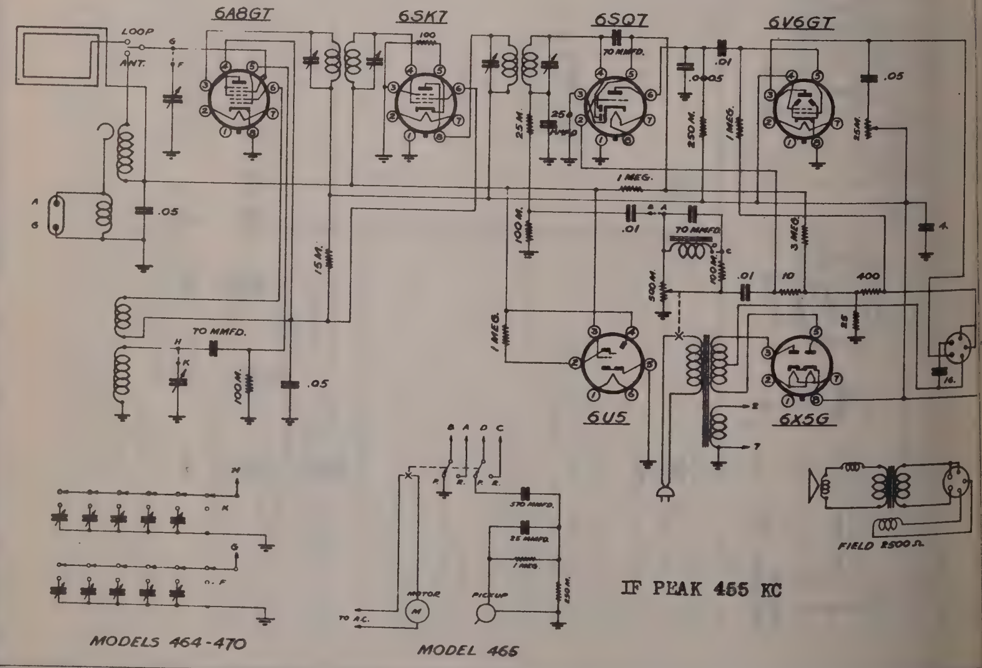
A.C. Voltages

Line	120 volts
Heater	6 "

D.C. Voltages
From Ground to-

6X5G	Cathode	235 volts
6V6GT	Plate	225 "
6V6GT	Screen	235 "
6V6GT	Grid Bias Supply	18 "
6SQ7	Plate	110 "
6SQ7	Grid Bias Supply	1.1 "
6SK7	Plate	235 "
6SK7	Screen	105 "
6SK7	Cathode	1.3 "
6A8GT	Plate	235 "
6A8GT	Screen	105 "
6A8GT	Oscillator Plate	105 "

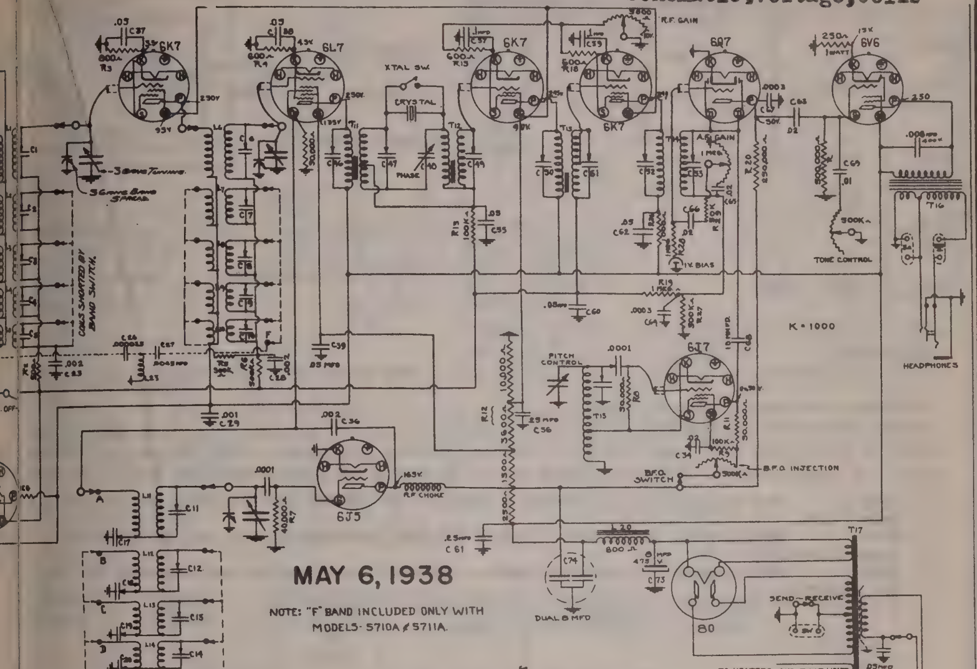
REMLER
CO. LTD
2101 BRYANT ST. SAN FRANCISCO, CALIF.
CIRCUIT DIAGRAM MODEL 463-470 RADIO
MATERIAL
FINISH
DATE 11/1/39
NO. REQUIRED
SUPERSEDED
SCALE
SUPERSEDED BY
DRAWN BY [illegible]. CHECKED BY J APPROVED BY G
MOD. 463-470 DWG. NO.



IF PEAK 455 KC

MODELS 5710,5711,Ch.107.450
5710A,5711A,Ch.107.450-2
Schematic,Voltage,Coils

SEARS, ROEBUCK & CO.



MAY 6, 1938

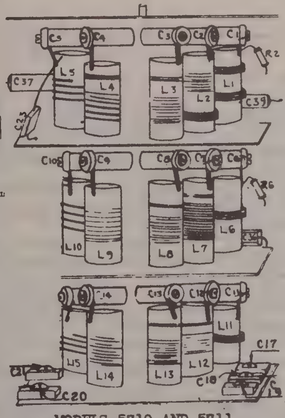
NOTE: "F" BAND INCLUDED ONLY WITH MODELS- 5710A & 5711A.

I.F. = 465 KC.

5710	5710A-11A	See Note 1
9-37	Lic.# 1731	Dwg. No. B29-715
	-JWH	App-

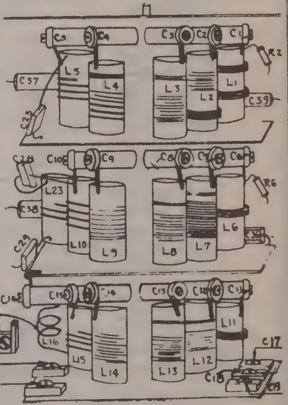
TUBE SOCKETS ARE VIEWED FROM UNDER-SIDE OF CHASSIS.

VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS WITH A.C. LINE OF 117 VOLTS, AND WITH R.F. GAIN CONTROL FULL ON, NO SIGNAL IN ANTENNA.



MODELS 5710 AND 5711

FIG 2.



MODELS 5710A AND 5711A

FIG. 3.

ER UPPLY:

5 - 120 Volts, 60 Cycle A.C. - 95 Watts
5 - 35 Volts, 25 Cycle A.C. - 95 Watts

D AKER:

pe . . . . . . Permanent Magnet Dynamic
e . . . Within Separate Case - 8 Inch

ER OUTPUT:

ype . . . . Single Output
distorted . . . . 4 Watts
ximum . . . . 5 Watts

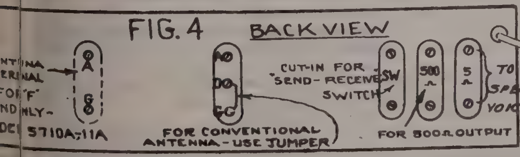
S D FUNCTIONS:

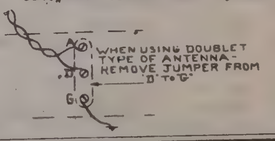
6K	1st RF	6Q7G	Second Detector, 1st AF
6L	Translator	6V6G	Single Output
6J	Oscillator	80	Rectifier
6K	IF Amplifier	6J7G	Beat Frequency Oscillator
6K	IF Amplifier	6U5	Tuning Eye

Recommended Antenna Equipment:

Cat.#5567 The Doublet System.
Cat.#5510 Conventional System.
Cat.#5575 Conventional System.
Cat.#5512 Conventional System.

FIG. 4 BACK VIEW


NTENNA
ERINAL
FOR "F"
ND ONLY-
DE 5710A, 11A
A
G
D
CUT-IN FOR "SEND-RECEIVE" SWITCH
SW
500 Ω
5 Ω
TO 5 Ω SPEAKER VOICE COIL.
FOR CONVENTIONAL ANTENNA - USE JUMPER
FOR 500 Ω OUTPUT



WHEN USING DOUBLET TYPE OF ANTENNA - REMOVE JUMPER FROM "D" TO "G"

MODEL 5710,5711,5710A
5711A

SEARS, ROEBUCK & CO.

Alignment,Tri
Socket

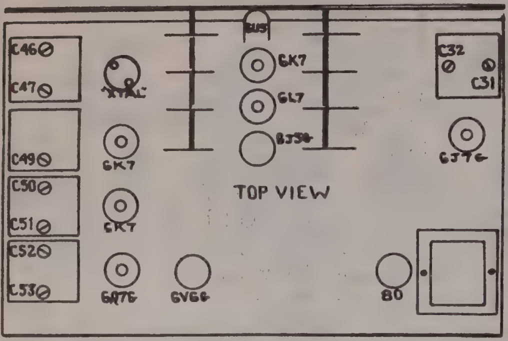
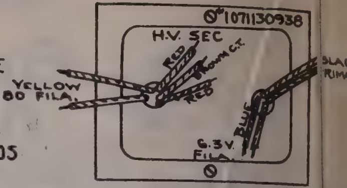
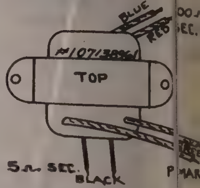


FIG. 1

COLOR CODE OF POWER TRANS. LEADS



Color Code of Output Trans. Leads



PRELIMINARY:

Output meter connection......................4,000 ohm or more copper oxide meter across 5 ohm terminals. Shunt with speaker

Output meter reading to indicate .5 watt...1.575 V.

Average sensitivity in microvolts for .5 watt output..................................See chart below

Generator ground lead connection. ..Direct to chassis Generator modulation....30%, 400 cycles Position of control A.F. gain....Full on R.F. gain....Full on A.V.C. Switch...On Band spread dial set at 100...Min. Ca

NOTE 1; When aligning the I.F. channel a condenser of .05 MFD. may be used in series with the generator lead.

NOTE 2; When aligning the broadcast band, a 250 MMFD. condenser may be used in series with the signal generator.

NOTE 3; When aligning the short wave bands a 400 ohm resistor may be used in series with the signal generator.

POSITION OF VARIABLE AND BAND SW.	GENERATOR FREQ.	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER ADJUSTMENTS IN ORDER	TRIMMER FUNCTION	APPROX. MICROVOLTS
Closed "A" Band	465 KC	6L7 Grid	SEE FIG.1	C53,52,51 50,49,47,46	I.F.	15
60 MC "F"	60 MC	A-G Ant. Term.	MODELS 5710A-11A SEE FIG.3	C16	Osc.	Approx. 10
40 MC "F"	40 MC	A-G Ant. Term.		C22	Padder	Approx. 10
36 MC "E"	36 MC	A-D-G Ant. Term.	SEE FIG.2or3	C15,10,5	Osc. Trans. Ant.	Approx. 3
16 MC "E"	16	A-D-G Ant. Term.		C21	Padder	Approx. 3
15 MC "D"	15 MC	A-D-G Ant. Term.	SEE FIG.2or3	C14, 9,4	Osc. Trans. Ant.	Approx. 1
7 MC "D"	7 MC	A-D-G Ant. Term.		C20	Padder	Approx. 1
6 MC "C"	6 MC	A-D-G Ant. Term.	SEE FIG.2or3	C13, 8,3	Osc. Trans. Ant.	Approx. 1
3 MC "C"	3 MC	A-D-G Ant. Term.		C19	Padder	Approx. 1
2.6MC "B"	2.6	A-D-G Ant. Term.	SEE FIG.2or3	C12, 7,2	Osc. Trans. Ant.	Approx. 1
1.3MC "B"	1.3	A-D-G Ant. Term.		C18	Padder	Approx. 1
1.2MC "A"	1200 KC	A-D-G Ant. Term.	SEE FIG.2or 3	C11, 6,1	Osc. Trans. Ant.	Approx. 1
.6 MC "A"	600 KC	A-D-G Ant. Term.		C17	Padder	Approx. 1

NOTE: 4 When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions below for Crystal.

ALIGNMENT INSTRUCTIONS - FOR RECEIVERS EQUIPPED WITH CRYSTALS

(1) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw "XTAL" switch to "in" position.

(2) With the 465 KC signal, re-adjust the I.F. Trimmer C-46 - the one nearest the front panel of the receiver - by turning the screw counter-clockwise. The signal now may be slightly weaker than before and sound "off-side". This, however, is a normal condition.

(3) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted, due to the filtering action of the crystal, and the frequency control of the signal generator must be "rocked" slowly back and forth, until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-align the entire I.F. system to this frequency.

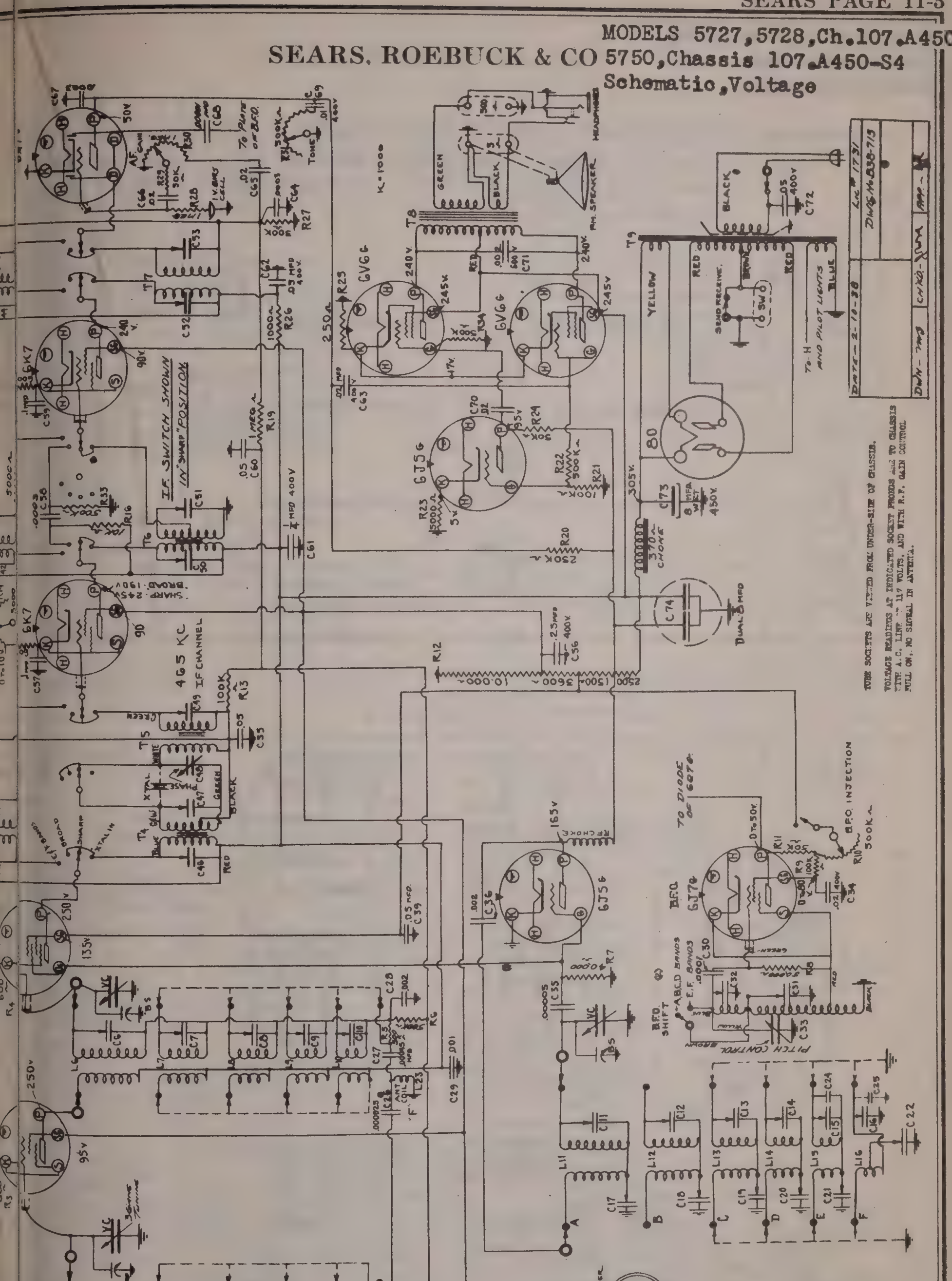
(4) Adjust "XTAL" phasing condenser for the lowest pitched note possible and re-adjust signal generator frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alignment can be accomplished.

NOTE: If the "XTAL" switch should now be thrown to another position, an apparent rise in gain will be noticed, which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.

NOTE: 5 THE BEAT FREQUENCY OSCILLATOR is adjusted for the A, B, C, D, Bands with Trimmer C31 and C32. Set pitch control to half capacity. Recheck C31.

SEARS, ROEBUCK & CO

MODELS 5727,5728,Ch.107.A450
5750,Chassis 107.A450-S4
Schematic,Voltage



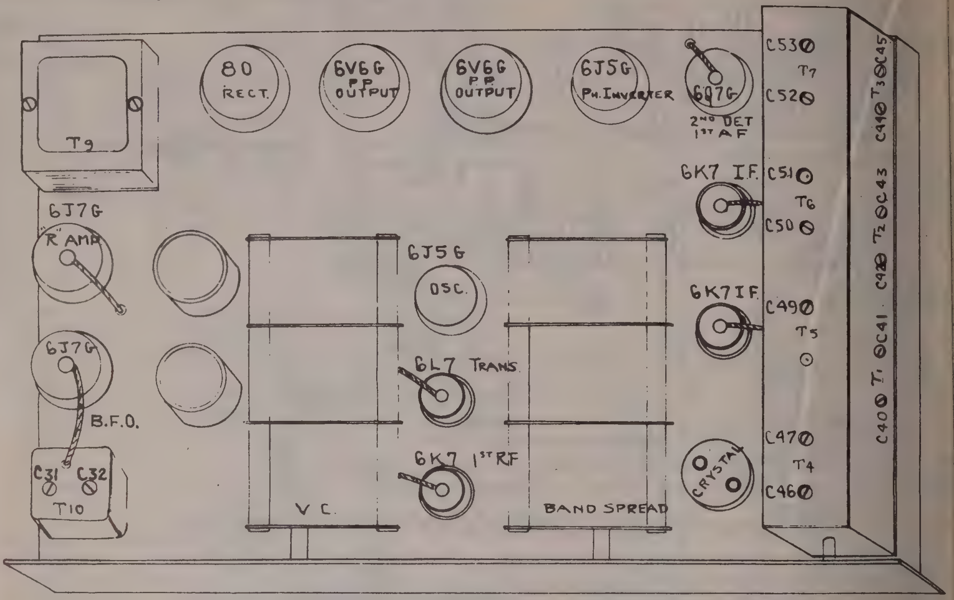
TUBE SOCKETS ARE VIEWED FROM UNDER-SIDE OF CHASSIS.

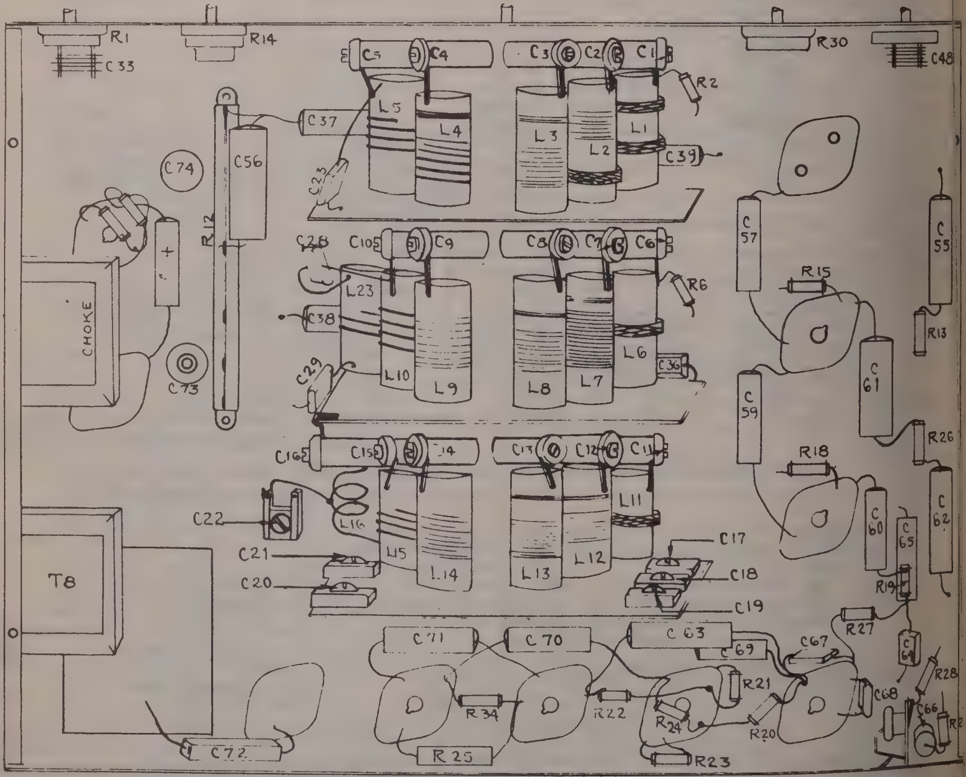
VOLTAGE READINGS AT INDICATED SOCKET PRONGS AND TO CHASSIS WITH A.C. LINE AT 117 VOLTS, AND WITH R.F. GAIN CONTROL FULL ON, NO SIGNAL IN ANTENNA.

NOV. 14, 1938

MODELS 5727,5728,5750
Socket,Trimmers
Chassis Wiring

SEARS, ROEBUCK & CO.





SEARS, ROEBUCK & CO.

MODELS 5727,5728,5750
Changes, Transformers Specifications

BJECT: MECHANICAL CHANGES WITH DIAL MECHANISM ON MODELS 5727, 5728 TO ACCOMPLISH A HORIZONTAL TYPE DIAL UNTED IN A NEW CABINET, FINISHED GREY. THIS IS KNOWN AS MODEL 5750, FACTORY IDENTIFICATION NUMBER 7.A450-64.

FUNCTIONS:
. . . . 1st RF
. . . . Translator
. . . . Oscillator
. . . . IF Amplifier
. . . . Second Detector, 1st AF
. . . . IF Amplifier
. . . . Phase inverter
. . . . P. P. Output
. . . . P. P. Output
. . . . Rectifier
. . . . . "R" Meter Voltage Amplifier
. . . . . . Beat Frequency Oscillator

LY:
- 120 Volts, 60 Cycle A.C. - 125 Watts
- 135 Volts, 25 Cycle A.C. - 125 Watts

RANGE - 6 BANDS:

A	.55 to 1.2 MC
B	1.2 to 2.8 MC
C	2.8 to 6.5 MC
D	6.5 to 16 MC
E	16 to 40 MC
F	32 to 65 MC

TE FREQUENCY = BANDS A,B,C, & D - 465 KC

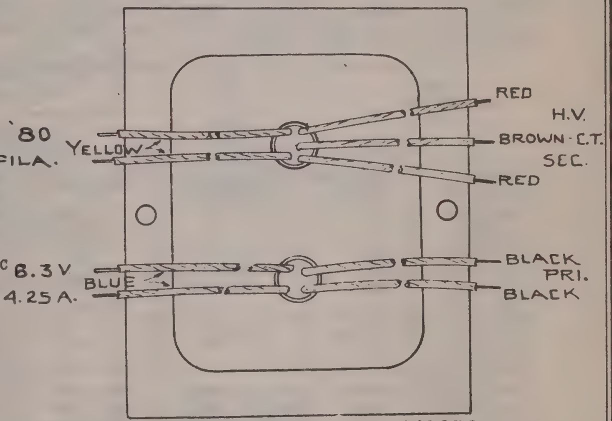
UT:
. . . . Push Pull Output
torted . . . . 9 Watts
um . . . . 15 Watts

KER:
. . . . Permanent Magnet Dynamic
. . . . . Within Separate Case 10 Inch

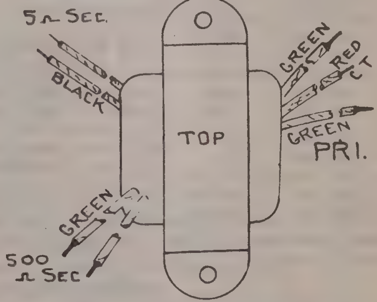
ATURES:
-RECEIVE terminals in rear of chassis break-in connection.
ages . . . . One
BLE CONDENSER . . . . Three Gang
NAE . . . . TWO REQUIRED
HONE JACK . . . . ON FRONT PANEL
al Phaser.
Frequency Oscillator, Pitch Control.
. OFF-ON Switch with Injection Control.

OPERATING FEATURES:
A.V.C. with ON-OFF Switch
Three Gang Electrical Band Spread
A.F. Gain or Audio Level
R.F. Gain or Sensitivity
Tone Control
"R" Meter Showing Signal Strength
"R" Meter Zero Adjustment
Four-position IF Setting: 1560 KC
Iron Core Broad 465 KC
Iron Core Sharp 465 KC
Crystal Filter-In Position

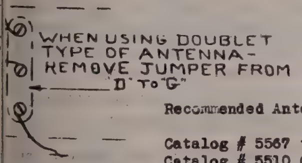
COLOR CODE AND LEAD POSITION



POWER TRANS. 1071046938



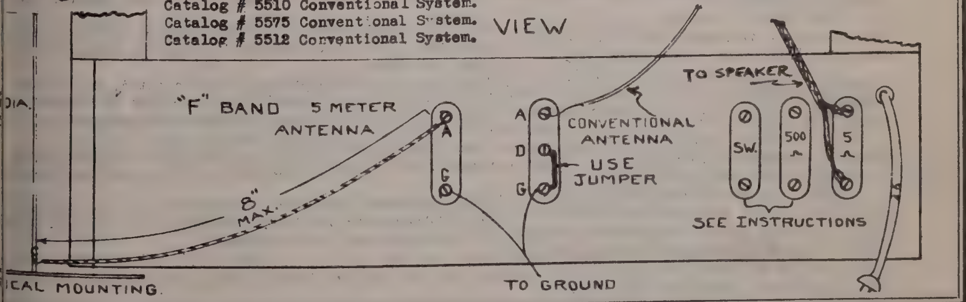
OUTPUT TRANS. 107139961



WHEN USING DOUBLET TYPE OF ANTENNA - REMOVE JUMPER FROM "D" TO "G"

Recommended Antenna Equipment:

Catalog # 5567 the Doublet System.
Catalog # 5510 Conventional System.
Catalog # 5575 Conventional System.
Catalog # 5512 Conventional System.



MODELS 5727,5728,5750
Alignment

SEARS, ROEBUCK & CO.

This receiver is a 12 tube 6 Band set designed especially for use on the short wave bands. The se was not designed for ordinary broadcast reception although it will cover this band.

This Amateur receiver employs many features as outlined above. Attention must be noted to the Dual I.F. system, the use of the 1560 KC I.F. for use on the "E" and "F" Bands to obtain a higher image response and prevent "garbling" of frequency modulated signals on 5 meters. The 1560 KC I.F. assemblies are designed to give a broad band pass flat top response characteristic.

Note that two antenna systems must be used, one for the "E & F" Bands and one for the "A" "B" "C" & "D" Bands.

PRELIMINARY:

Output meter connection.......................4,000 ohm or more copper oxide meter across 5 ohm terminal
Shunt with speake

Output meter reading to indicate .5 watt...1.575 V.

Average sensitivity in microvolts for .5 watt output...............................See chart below

Generator ground lead connection...Direct to chassis

Position of volume control R.F. gain.......Fu on

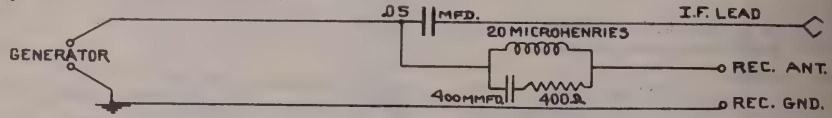
Generator modulation...............30%, 400 cycles

A.V.C. Switch...................................On

Position of volume control A.F. gain.......Full on

Band spread dial set at 100..........Min. Cap ty

NOTE 1 When aligning the two I.F. channels a condenser of .05 Mfd. may be used in series with the generator lead. For the other bands the following circuit is shown with the values that make a universal dummy antenna system for all bands.



POSITION OF VARIABLE AND BAND SW.	GENERATOR FREQ.	GENERATOR CONNECTION	POSITION OF I.F. BAND SWITCH	TRIMMER ADJUSTMENTS IN ORDER	TRIMMER FUNCTION	APPROX. MICROVOLTS
Closed "A" Band	465 KC	6L7 Grid	"XTAL" See Note 2	C53,52,51 50,49,47,46	I.F.	15
Closed "A" Band	1560 KC	6L7 Grid	"E" & "F"	C45,44,43 42,41,40	I.F.	15
60 MC "F" 40 MC "F"	60 MC 40 MC	A-G Ant. Term. A-G Ant. Term.	"E" & "F" "E" & "F"	C16 C22	Osc. Padder	Approx. 10 Approx. 10
36 MC "E" 16 MC "E"	36 MC 16	A-D-G Ant. Term. A-D-G Ant. Term.	"E" & "F" "E" & "F"	C15,10,5 C21	Osc. Trans. Ant. Padder	Approx. 3 Approx. 3
15 MC "D" 7 MC "D"	15 MC 7 MC	A-D-G Ant. Term. A-D-G Ant. Term.	XTAL or "Sharp" XTAL or "Sharp"	C14, 9,4 C20	Osc. Trans. Ant. Padder	Approx. 1 Approx. 1
6 MC "C" 3 MC "C"	6 MC 3 MC	A-D-G Ant. Term. A-D-G Ant. Term.	XTAL or "Sharp" XTAL or "Sharp"	C13, 8,3 C19	Osc. Trans. Ant. Padder	Approx. 1 Approx. 1
2.6MC "B" 1.3MC "B"	2.6 1.3	A-D-G Ant. Term. A-D-G Ant. Term.	XTAL or "Sharp" XTAL or "Sharp"	C12, 7,2 C18	Osc. Trans. Ant. Padder	Approx. 1 Approx. 1
1.2MC "A" .6 MC "A"	1200 KC 600 KC	A-D-G Ant. Term. A-D-G Ant. Term.	XTAL or "Sharp" XTAL or "Sharp"	C11, 6,1 C17	Osc. Trans. Ant. Padder	Approx. 1 Approx. 1

NOTE 2: When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions below for Crystal. Align set in "sharp" position if set is without crystal.

ALIGNMENT INSTRUCTIONS - FOR RECEIVERS EQUIPPED WITH CRYSTALS

(A) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw IF switch to "XTAL" position.

(B) With the 465 KC signal, re-adjust the I.F. Trimmer C-46 - the one nearest the front panel of the receiver - by turning the screw counter-clockwise. The signal now may be slightly weaker than before and sound "off-side". This, however, is a normal condition.

(C) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted, due to the filtering action of the crystal,and the frequency control of the signal generator must be "rocked" slowly back and forth, until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-align the entire I.F. system to this frequency.

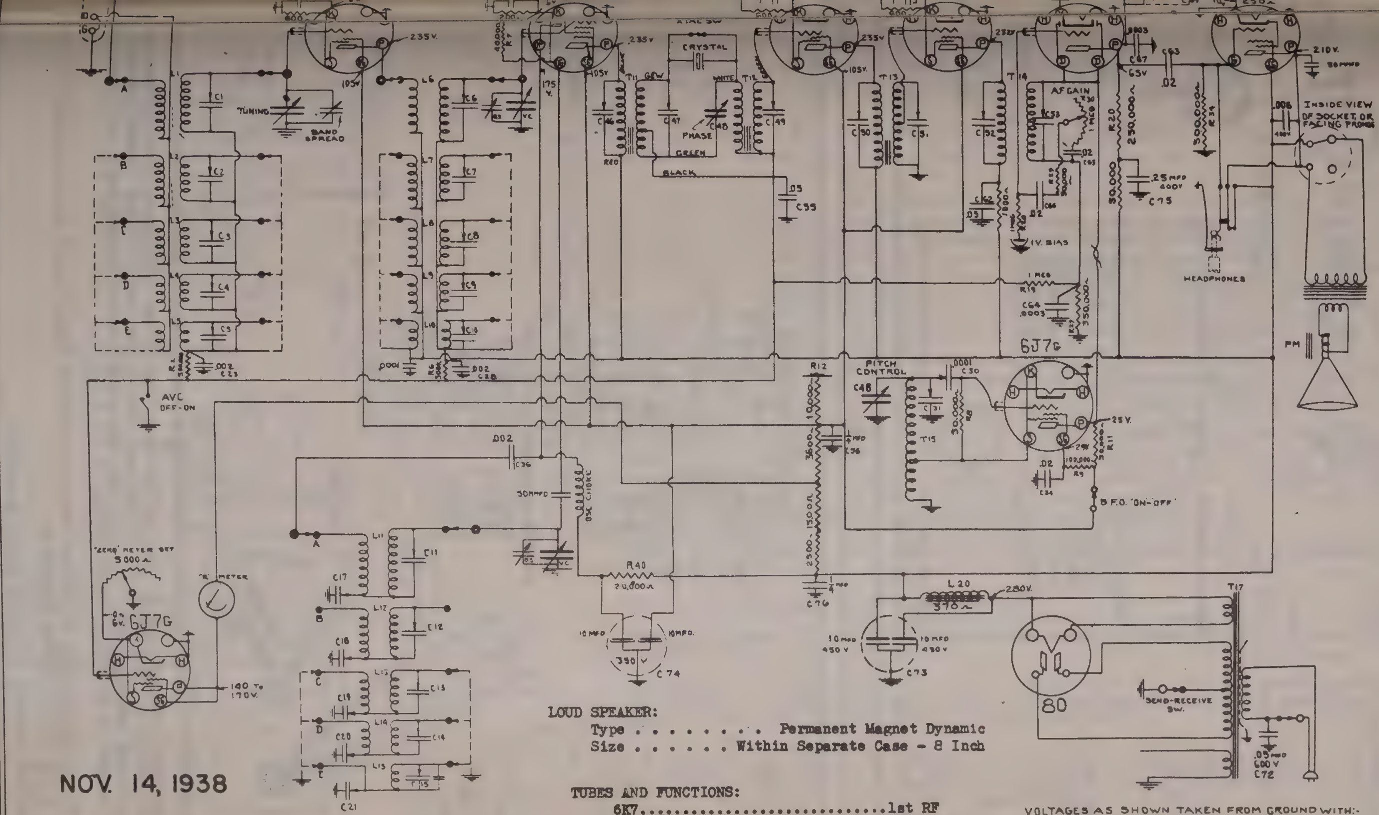
(D) Adjust "XTAL" phasing condenser for the lowest pitched note possible and re-adjust signal generator frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alignment can be accomplished.

NOTE: If the IF switch should now be thrown to another position, an apparent rise in gain will be noticed, which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.

NOTE 3: THE BEAT FREQUENCY OSCILLATOR is adjusted for the A, B, C, D, Bands with Trimmer C31. With models having an "E" & "F" Band B.F.O.——Adjust C32 with dial at 1560 on Band D to 1560 KC. Recheck C31. Set pitch control to half capacity.

SEARS, ROEBUCK & CO.

MODELS 5752,5753
Chassis 107.440-S1
Schematic,Voltage



LOUD SPEAKER:
Type . . . . Permanent Magnet Dynamic
Size . . . . . . Within Separate Case - 8 Inch

NOV. 14, 1938

POWER SUPPLY:
105 - 120 Volts, 60 Cycle A.C. 85 Watts

105-135 Volts, 25 Cycle A.C. - 85 Watts

POWER OUTPUT:
Type . . . . Single Output
Undistorted . . . . 4 Watts
Maximum . . . . 5 Watts

TUBES AND FUNCTIONS:
6K7............................1st RF
6K8G..........................Translator
6K7.......................IF Amplifier
6K7.......................IF Amplifier
6Q7G..........Second Detector, 1st AF

6V6G.........................Single Output
80................................Rectifier
6J7G................Beat Frequency Oscillator
6J7G...................V.T.V.M. for "R" Meter

VOLTAGES AS SHOWN TAKEN FROM GROUND WITH:-
- LINE VOLTAGE - 118 V.A.C.
- R.F. GAIN - FULL ON
- TUNING COND. - FULL CAPACITY

107.440-S1		
9-19-36		Dwg No. B39-715
	L.I.C. #1791	
REVISIONS:		
D'W'N	CH'K'D	APP'V'D.
7-1-3		

MODELS 5752,5753
Socket,Trimmers
Chassis

SEARS. ROEBUCK & CO.

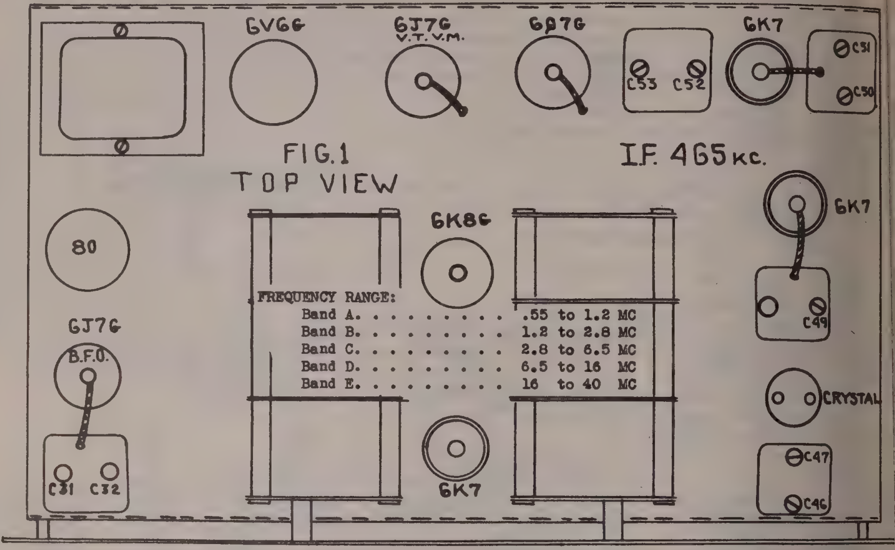
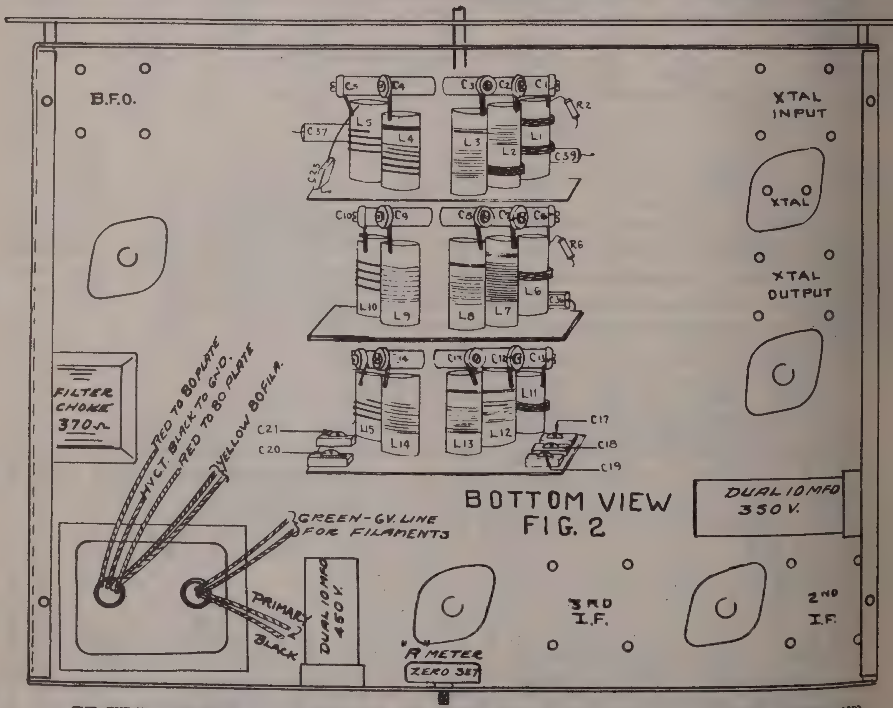


FIG.1
TOP VIEW

FREQUENCY RANGE:

Band A.	.55 to 1.2 MC
Band B.	1.2 to 2.8 MC
Band C.	2.8 to 6.5 MC
Band D.	6.5 to 16 MC
Band E.	16 to 40 MC



BOTTOM VIEW
FIG. 2

THE THREE TERMINALS - A, D, and G in the middle back of the chassis are for the ANTENNA AND GROUND connections. When using the conventional flat-top and lead-in type of antenna, CONNECT THE LEAD-IN TO THE TERMINAL MARKED "A", being sure that a wire jumper connects from D to G terminals. The G terminal is for the ground connection.

For any DOUBLET TYPE of antenna, remove the shorting jumper from D to G and connect the two leads of the doublet system to A and D.

The "G" terminal is for the ground connection.

A.V.C. with ON-OFF Switch
Three-Gang Electrical Band Spread
AF Gain or Audio Level Control
RF Gain or Sensitivity Control
Tone Control
Beat Frequency Osc. Pitch Control
B.F.O. Switch with Injection Control
Crystal Phaser
Send-Receive terminals in rear of Chassis
for break-in connection
IRON CORE IF Stages
Headphone Jack on Front Panel

ALIGNMENT FREQUENCIES

Band A	600 and 1200 KC
Band B	1.5 and 2.6 MC
Band C	3.0 and 6.0 MC
Band D	7.0 and 15 MC
Band E	16 and 36 MC

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection..

...4,000 ohm or more copper oxide meter across 5 ohm terminals. Shunt with speaker

Output meter reading to indicate .5 watt.............1.575 V.

Average sensitivity in microvolts for .5 watt output....See chart

Generator ground lead connection................. Direct to chassis

Dummy antenna value in series with generator output. See Note 1

Connection of generator output lead..................See Chart

Generator modulation..........................30%, 400 cycles

Position of volume control A.F. gain..................Full on

Position of volume control R.F. gain..................Full on

A.V.C. Switch..On

Band spread dial set at 100......................Min. Capacity

NOTE 2; When aligning the broadcast band, a 250 MMFD. condenser may be used in series with the signal generator.

NOTE 3, When aligning the short wave bands a 400 ohm resistor may be used in series with the signal generator.

POSITION OF VARIABLE AND BAND SW.	GENERATOR FREQ.	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER ADJUSTMENTS IN ORDER	TRIMMER FUNCTION	APPROX. MICROVOLTS
Closed "A" Band	465 KC	6L7 Grid	SEE FIG.1	C53,52,51 50,49,47,46	I.F.	15
36 MC "E"	36 MC	A-D-G Ant. Term.	SEE FIG.2	C15,10,5	Osc. Trans. Ant.	Approx. 3
16 MC "E"	16	A-D-G Ant. Term.		C21	Padder	Approx. 3
15 MC "D"	15 MC	A-D-G Ant. Term.	SEE FIG.2	C14, 9,4	Osc. Trans. Ant.	Approx. 1
7 MC "D"	7 MC	A-D-G Ant. Term.		C20	Padder	Approx. 1
6 MC "C"	6 MC	A-D-G Ant. Term.	SEE FIG.2	C13, 8,3	Osc. Trans. Ant.	Approx. 1
3 MC "C"	3 MC	A-D-G Ant. Term.		C19	Padder	Approx. 1
2.6MC "B"	2.6	A-D-G Ant. Term.	SEE FIG.2	C12, 7,2	Osc. Trans. Ant.	Approx. 1
1.3MC "B"	1.3	A-D-G Ant. Term.		C18	Padder	Approx. 1
1.2MC "A"	1200 KC	A-D-G Ant. Term.	SEE FIG.2	C11, 6,1	Osc. Trans. Ant.	Approx. 1
.6 MC "A"	600 KC	A-D-G Ant. Term.		C17	Padder	Approx. 1

NOTE: 4 When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions below for Crystal.

ALIGNMENT INSTRUCTIONS FOR RECEIVERS USING CRYSTALS

THE I.F. STAGES:

FIRST - With the XTAL switch in the "OUT" position, align the I.F. stages to 465 KC, feeding signal into the grid of the 6L7.

SECOND - FOR RECEIVERS EQUIPPED WITH CRYSTALS:

(A) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw XTAL switch to "IN" position.

(B) With the 465 KC signal re-adjust the I.F. Trimmer - the one nearest the front panel of the receiver - by turning the screw counter-clockwise. The signal now may be slightly weaker than before, and sound "off-side". This, however, is a normal condition.

(C) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted, due to the filtering action of the crystal and the frequency control of the signal generator must be "rocked" slowly back and forth, until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-align the entire I.F. system to this frequency.

(D) Adjust XTAL phasing condenser for the lowest pitched note possible and re-adjust signal generator frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alignment can be accomplished.

NOTE: - If the XTAL switch should now be thrown to the "OUT" position, an apparent rise in gain will be noticed which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.

NOTE: 5 THE BEAT FREQUENCY OSCILLATOR is adjusted with trimmers C31 and C32. Set pitch control to half capacity. Recheck C31.

MODELS See Below
Tuner, Alignment

SEARS, ROEBUCK & CO.

Models 6056,6057
CHASSIS 101.548

THE BIAS CELLS:

Do not attempt to test the bias cells with a voltmeter. Ordinarily these cells have an indefinitely long life and should not be the cause of any trouble. The cells must be in their holders in the proper direction so that the polarity of the bias applied to the tubes will be correct. The zinc shell of the cells is the negative terminal and must connect to the tube grids. If the cells are removed from their holders, be sure that they are replaced so that the polarity will be correct. The Location of Parts diagram shows the correct positions of the cells.

Models 6119,6120,6126,6127,6200,6250
CHASSIS 101.546,101.546-1

THE FILAMENT CIRCUIT:

All of the tube heaters are connected in series. Accordingly, if any one tube burns out, the others will not light. The full line voltage will appear across the heater terminals of the burnt out tube.

Under certain conditions the chassis may be above ground potential by an amount equal to the line voltage. Accordingly, appropriate precaution should be taken when working on the chassis, by insulating the chassis completely from ground, etc.

Models 6025,6128,6201,6231,6251;6119,6120,6126,6127,6200,6250
CHASSIS 101.547,-A,-1,-1B CHASSIS 101.546,101.546-1

PUSH BUTTON TUNING

SETTING UP:

Each of the push buttons should be set up in the following manner:

1. Make a list of the local stations desired to be set up on the push buttons.
2. Punch out of the call letter sheets the corresponding call letters.
3. Pull the push button knob off of its lever (the push buttons slip off the shaft).
4. Unscrew (turn counter-clockwise) the slotted shaft then exposed two or three turns (use a token or small screw driver).
5. Push the slotted shaft all the way in.
6. Tune in the desired station or station to be set up, making sure to hold the slotted shaft as far in as possible.
7. While holding both the tuning knob and the slotted push button shaft all the way in, securely tighten (turning counter-clockwise) the slotted screw.
8. Check for accuracy by detuning the station and retuning with that push button. If the setting is not accurate, follow the procedure as outlined in points No. 3 to No. 8.
9. Place the proper call letter in the recess in front of the push button, and cover the call letter with one of the clear celluloid discs supplied.
10. Push the push button back into place on the push button lever.
11. Follow the procedure as outlined in points No. 3 to No. 10, inclusive, for each of the remaining buttons.

OPERATION:

"Push button stations" will be tuned accurately by pushing the push button all the way to its stop.

NOTE: Push buttons on Model 101.547 chassis are locked and unlocked by turning the button.

FOR CHASSIS 101.546,-1; 101.548; 101.574,A,-1; 101.535.

ELIMINATING WHISTLE AT 910 KC:

A whistle, due to a beat between the second harmonic (910 kc) of the 455 kc IF, and a 910 kc signal may be experienced. In localities where the 910 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 880 kc and 940 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 890 kc would not be objectionable, the IF should be realigned at 890/2 or 445 kc. Try to select the new IF frequency as close to 455 kc as possible.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

ALIGNMENT PROCEDURE

For Models 6025,6128,6201,6231,6251 Chassis 101.547,-A,-1,-1B; 6208,6209 Chassis 101.544; 6214,6270 Chassis 101.552,101.552A; 6056,6057 Chassis 101.548 6133,6141,6139,6137,6202,6203,6253,6252,6199 Chassis 101.535.

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . . Ⓑ(0.89 VOLTS) . . . . . 0.37 volts
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI

Models 6025,6128,6201,6231,6251 Chassis 101.547,-A,-1,-1B; 6208,6209 Chassis 101.544; 6214,6270 Chassis 101.552,101.552A.
Position of Dial Pointer with variable fully closed . . . . . . Horizontal (To fall on first heavy block below 550 kc.)

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	Ⓒ TRIMMERS ADJUSTED (IN ORDER SHOWN) Ⓐ	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6J8G Grid Ⓐ 1D7G " Ⓒ 1C7G "	T_2,T_1 T2, T1 T_2,T_1	IF Output IF Input
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1* C4* C1*	Wave Trap
"AM"	Open	1730 kc	.0002 mfd.	Ant. Term.	C6 C6 C8	Oscillator
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C2 C3 C2	Translator
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7 C7 C9	Padder
"FOR"	Ⓐ 16-15 mc(rock)	Ⓐ 16-15 mc	400 ohms	Ant. Term.	C4 C1 C3	Translator

Ⓐ For Models 6208,6209 Chassis 101.544. Ⓒ For Models 6214,6270 Chassis 101.552,101.552A.

MODELS 6056,6057 Chassis 101.548; 6133,6141,6139,6137,6202,6203,6253.6252.6199 Chassis 101.535.
Position of Dial Pointer with variable fully closed . . . . Horizontal (To fall along second ornamental horizontal line)
Ⓑ For Chassis 101.535 {Center of first mark to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN) Ⓑ	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	1C7G Grid Ⓑ 6J8G "	T3, T1 T_2,T_1	IF Output IF Input
"AM"	600 kc	455 kc*	.0003 mfd.	Ant. Term.	C1* C1*	Wave Trap
"AM"	Ⓑ FULLY OPEN 1750 kc	Ⓑ 1730 KC 1750 kc	.0003 mfd.	Ant. Term.	C5 C7	Oscillator
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C3 C2	Translator
"AM"	600 kc (rock)	600 kc	.0003 mfd.	Ant. Term.	C6 C6	Padder
'SW' or "FOR"	Ⓑ 15-16 mc (rock)	Ⓑ 15-16 mc	400 ohms	Ant. Term.	C4 C3	Translator

Ⓑ For Model 6133,6141, 6139,6137,6202,6203,6253,6252,6199 Chassis 101.535.

IMPORTANT ALIGNMENT NOTES

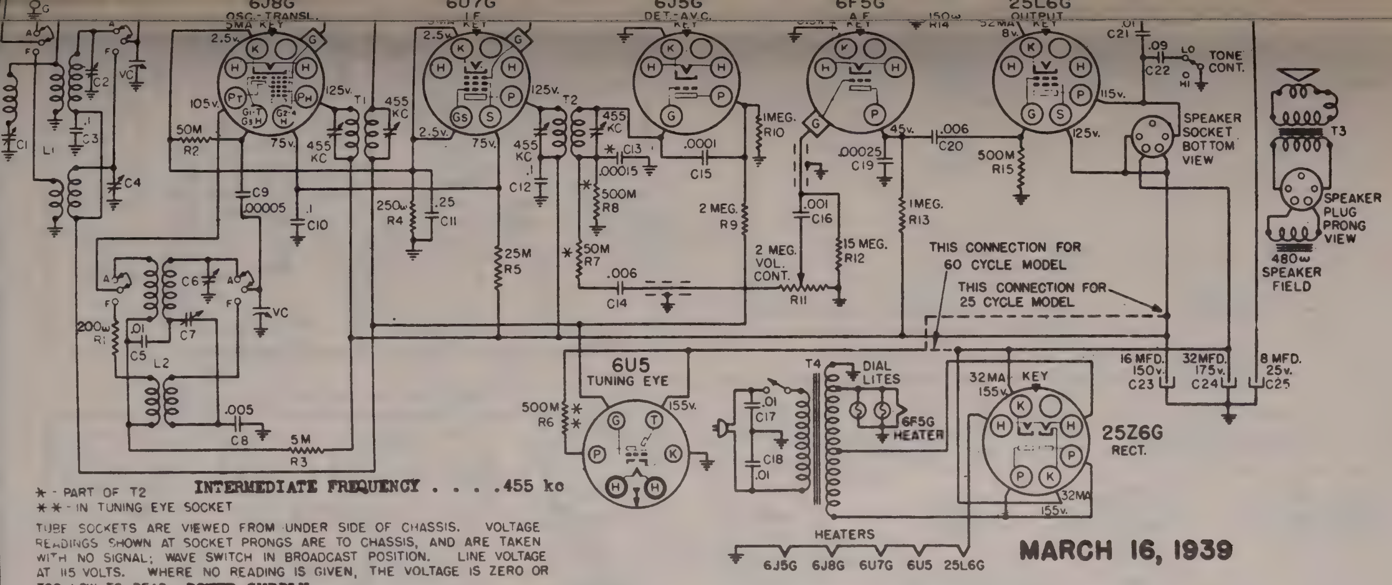
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the

SEARS, ROEBUCK & CO.

MODELS 6025,6201,Ch.101.547
6128,6251,Ch.101.547-1 and
Ch.101.547-A;6231,Chassis
101.547-1B
Schematic,Voltage,Changes



* - PART OF T2

** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

INTERMEDIATE FREQUENCY . . . .455 kc

MARCH 16, 1939

POWER SUPPLY:

All models available . . . . .105-125 volts, 25-60 cycle, 50 watts

FREQUENCY RANGES:

Band "AM" . . . . .540-1730 kc
Band "SW" . . . . .5.9-18.2 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1730 kc	1400 kc	600 kc
Band "SW"	None	15 mc	--

POWER OUTPUT:

Type . . . . Beam tube
Undistorted . . . . 1.75 watts
Maximum . . . . 3 watts

OPERATING FEATURES:

Tone Control . . . . . . .Two Position
Automatic Volume Control
Push Button Tuning (5 button)
Tuning Eye

LOUD SPEAKER:

Type . . . . Dynamic
Size . . . . .6 inch
Field coil resistance . . . . 480 Ohms

CHASSIS FEATURES:

Number IF stages . . . . One
Number condensers in gang . . . . . .Two
Antenna . . . . Conventional
Built-in IF Wave Trap

FOR ALIGNMENT SEE INDEX

CHASSIS IDENTIFIED BY 101.547A:

Chassis identified by the number 101.547A on the metal plate at the rear of the chassis are the same as 101.547-1 chassis except for a change in the design and part number of the dial escutcheon.

ADDITION OF SUFFIX "-1B" TO 101.547 CHASSIS:

Chassis identified by 101.547-1B are the same as 101.547-1A except for a change in the design and part number of the push buttons, push button escutcheon, call letter sheets and covers. Also a new 10" speaker has been used.

CHASSIS 101.547,-1,-A,-1B
CHASSIS 101.546,-1,-1A
Socket,Trimmers,Chassis

SEARS, ROEBUCK & CO.

MODELS 6200, 6120, 6126, 6127, 6119, 6350 CHASSIS— 101.546, -1, -1A

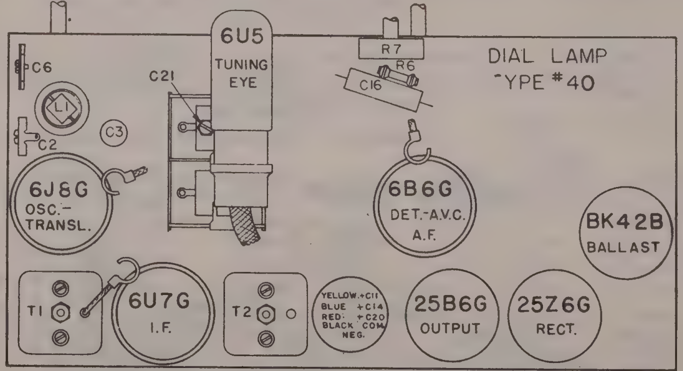
OPERATING FEATURES:
Tone Control . . . . Two Position
Automatic Volume Control
Push Button Tuning (5 button)
Tuning Eye

CHASSIS FEATURES:
Number IF stages . . . . One
Number condensers in gang . . . . . Two
Antenna . . . . Conventional
Built-in IF Wave Trap

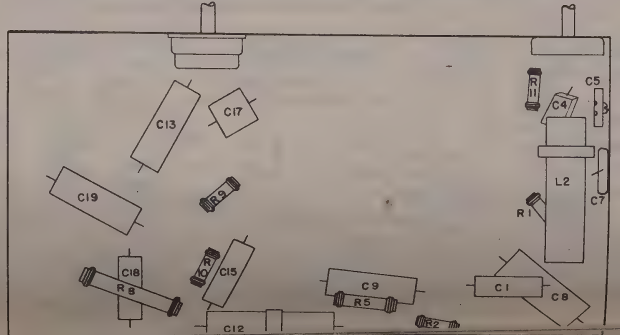
MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Upper left knob . . . . Volume
2. Lower left knob. . . On-off switch & Tone
3. Lower right knob. . Wave band switch
4. Upper right knob. . Station Selector

CONTROL OPERATION:
Turning right: . . . . Volume increase
Turning right: . . . . "ON", "HI", "LO"
Turning right: . . . . "AM", "SW"
Tuning ratio: 4:1



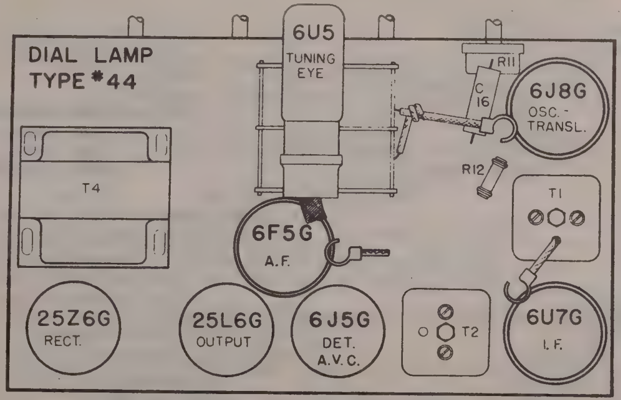
LOCATION OF PARTS ON TOP OF CHASSIS



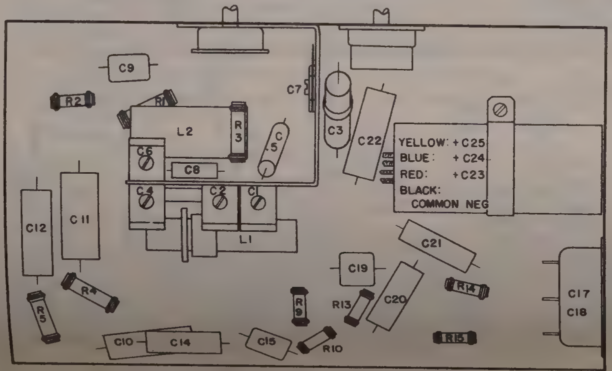
MODELS 6025, 6128, 6201, 6251 MODEL 6231

RECOMMENDED ANTENNA EQUIPMENT

Catalog #5586 Doublet Antenna Kit
" #5587 " " "
" #5588 Conventional Ant. Kit
" #5575 " " "



LOCATIONS OF PARTS ON TOP OF CHASSIS.



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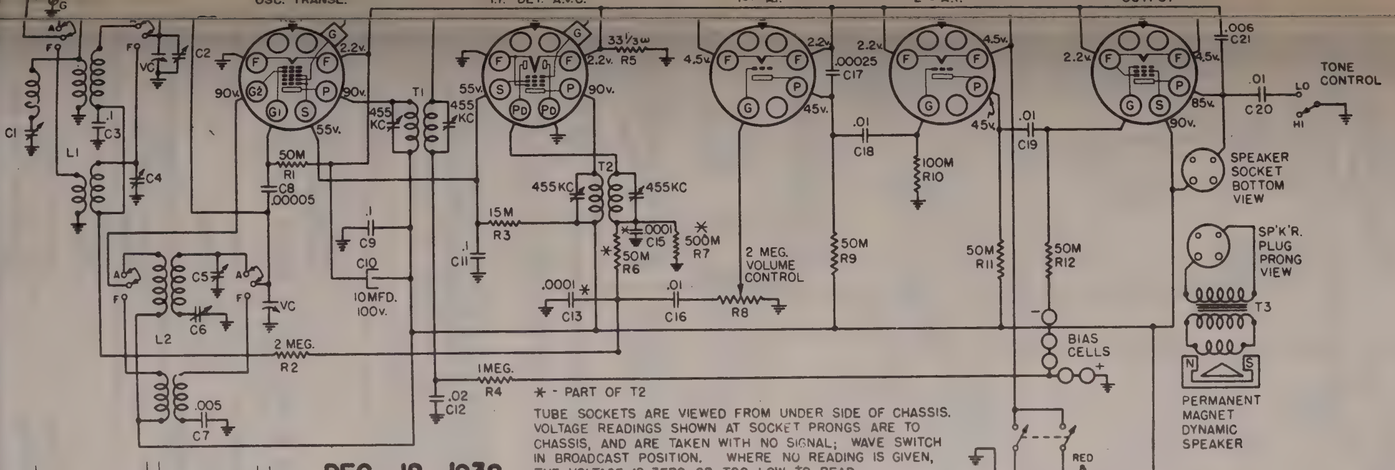
MODELS 6056,6057
Chassis 101.548
Schematic,Voltage
Socket,Trimmers
Chassis



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

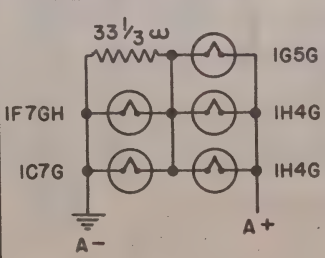
DEC. 18, 1938

FOR ALIGNMENT
SEE INDEX

INTERMEDIATE FREQUENCY

455 kc

FILAMENT CIRCUIT:



POWER SUPPLY:
"A" Battery (4½ volt dry). . . 1-#5031
"A" Battery (4 volt storage). .1-#5049
"B" Batteries . . . . .2-#5131
"A" Drain . . . . 0.24 amperes
"B" Drain . . . . .12 ma

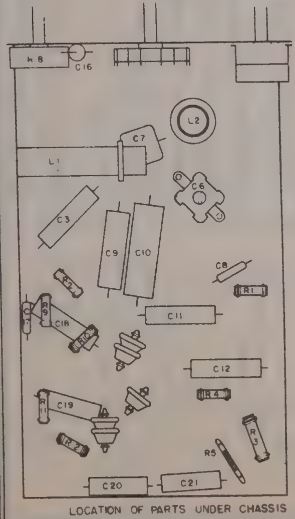
LOUD SPEAKER:
Type . . . . .PM Dynamic
Size . . . . .6 inch

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.20 watts
Maximum . . . . 0.40 watts

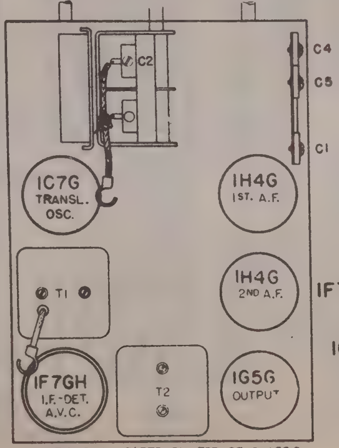
FREQUENCY RANGES:
Broadcast . . . . .540-1750 kc
Short Wave . . . . 5.9-18 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc
None	16 mc	Fixed



LOCATION OF PARTS UNDER CHASSIS

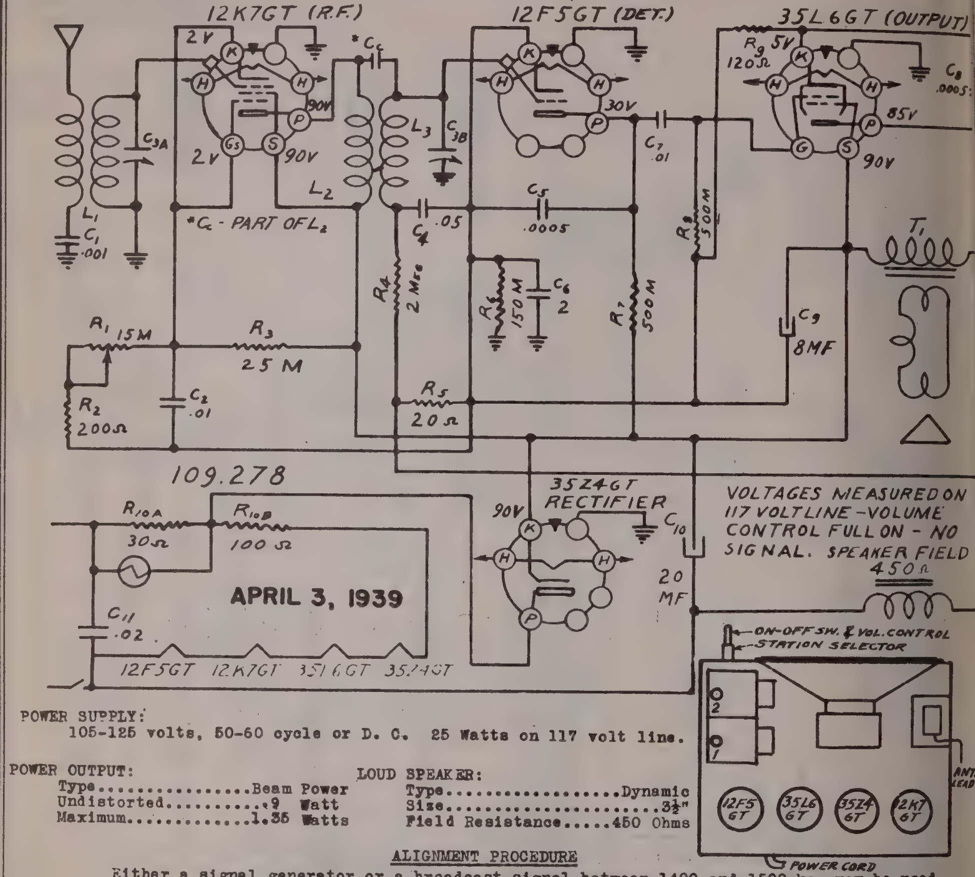


LOCATIONS OF PARTS ON TOP OF CHASSIS.

MODELS 6106,6107,6108,6116
Chassis 109.278

SEARS, ROEBUCK & CO.

Schematic,Voltage,
Alignment,Trimmers



POWER SUPPLY:
105-125 volts, 50-60 cycle or D. C. 25 Watts on 117 volt line.

POWER OUTPUT:

Type	Beam Power
Undistorted	.9 Watt
Maximum	1.35 Watts

LOUD SPEAKER:

Type	Dynamic
Size	3½"
Field Resistance	450 Ohms

ALIGNMENT PROCEDURE

Either a signal generator or a broadcast signal between 1400 and 1500 kc. may be used.

The antenna of the receiver should be extended as for normal use. Tune in a station between 1400 and 1500 kc. and adjust the trimmers on top of the tuning condenser for maximum signal

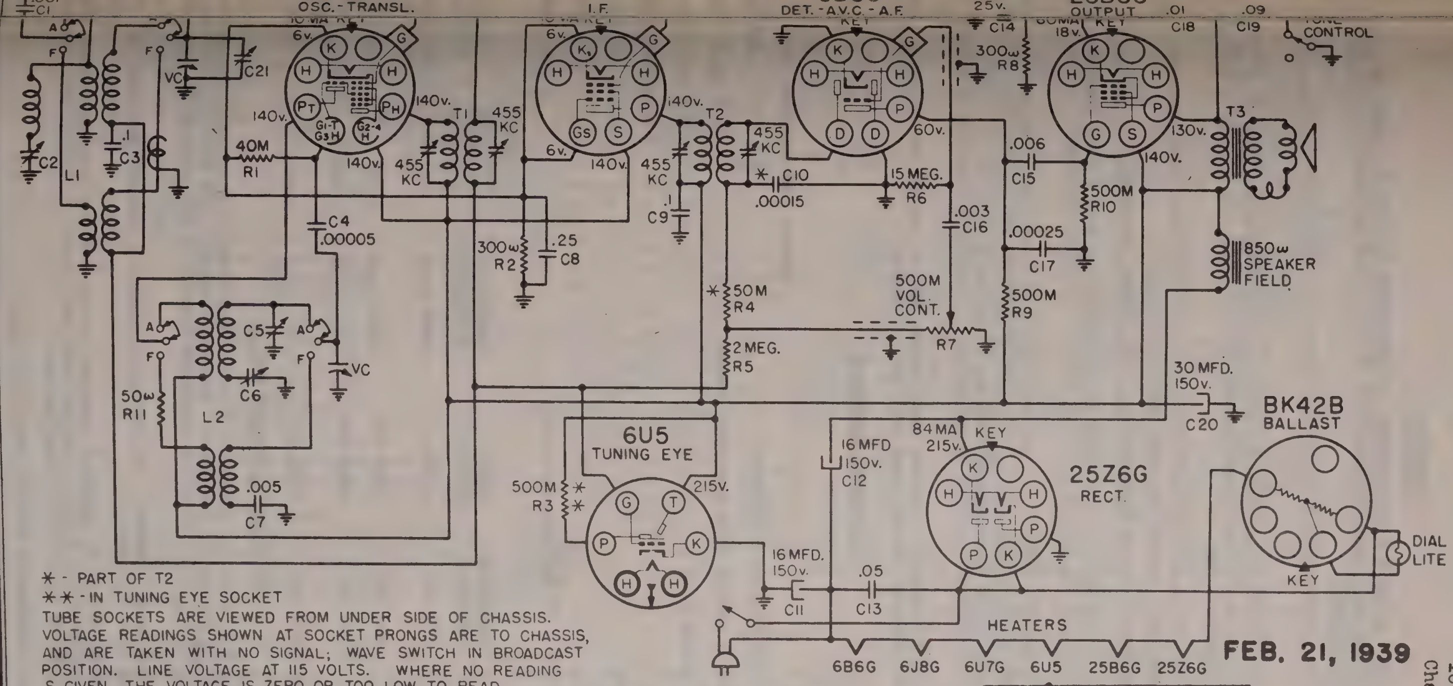
If a signal generator is used, extend the antenna as described above, run a wire from the generator parallel to, but insulated from the antenna. Set the generator to 1720 kc. Turn the tuning condenser all the way to the right (Minimum capacity). Tune in the signal from the generator with the trimmer on the rear section of the tuning condenser. Set the generator at about 1400 kc. Tune in the signal and adjust the trimmer on the front section of the tuning condenser for maximum response.

DEFECT	GENERALLY CAUSED BY	REMEDY
Dead Receiver	No current at outlet	Check outlet for current and be sure power cord plug is making good contact
	Open or short circuit in set	Repair or replace
Poor Sensitivity and Volume	Insufficient antenna pickup	Connect to outdoor antenna
	Defective tube	Replace
	Receiver out of alignment	Follow alignment procedure
Station interference	Receiver located near powerful stations	Do not uncoil all of antenna
Poor tone	Overloading	Reduce volume control setting
	Speaker out of adjustment	Repair or replace
Oscillation	Antenna lead coiled around or near set	Run antenna wire away from set

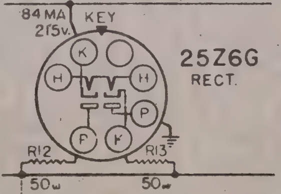
SEARS, ROEBUCK & CO.

MODELS 6119,6120,6126,6127
6200,6250,Chassis 101.546,
101.546-1;6120A,6230,6250A
Chassis 101.546-1A

FEB. 21, 1939



* - PART OF T2
** - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING S GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



Connections
Model 101.546-1
See "CHANGES"

INTERMEDIATE FREQUENCY . . 455 kc

POWER SUPPLY:
All models available . . . . .105-125 volts, 25-60 cycle,60 watts

FREQUENCY RANGES:

Band "AM"	540-1730 kc
Band "SW"	5.95-18.2 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "SW"	None	None	Fixed

RECOMMENDED ANTENNA EQUIPMENT

Catalog	#5586	Doublet Antenna Kit
"	#5587	" " "
"	#5588	Conventional Ant. Kit
"	#5575	" " "

POWER OUTPUT:

Type	Pentode
Undistorted	.2 watts
Maximum	.3 watts

LOUD SPEAKER:

Type	Dynamic
Size	5-3/8 inches
Field coil resistance	850 Ohms

MODELS 6119,6120,6126,6127
6200,6250,6120A,6230,6250A
Alignment,Changes

SEARS, ROEBUCK & CO.

CHANGES

ADDITION OF TWO 50 OHM 2 WATT RESISTORS TO ELIMINATE FAILURE OF 25Z6G RECTIFIE TUBES AND IN SOME CASES SUBSEQUENT SHORTING OF THE FIRST SECTION OF THE ELECTROLYTIC FILTER CONDENSER.

NOTE: The resistors have been added at the factory when the identification number reads 101.546-1.

Remove the wire connecting pins #4 and #5 of the rectifier tube to pin #7 of the ballast tube. One 50 ohm 2 watt resistor is connected from pin #4 of the rectifier to pin #7 of the ballast tube. The other 50 ohm 2 watt resistor is connected from pin #5 of the rectifier to pin #7 of the ballast tube.

The 50 ohm 2 watt resistors, part number 1012214418, can be obtained from source 101.

Connections are shown on schematic diagram, Model 101.546-1.

CHECKING CONDITION OF FILTER ELECTROLYTICS AFTER 25Z6G RECTIFIER TUBE HAS FAILED.

Check the resistance, with the power disconnected from the set, of each filter electrolytic with a DC ohmmeter, reversing the terminals of the ohmmeter on each condenser. A shorted condenser will show very low resistance in both tests.

If, after the resistors are added and a new rectifier tube installed, the set has excessive hum, the voltage across each of the filter electrolytics should be checked. If the voltage across any one of them is more than 20% below the value shown on the schematic, the replacement of this electrolytic should correct the hum. The condenser used to replace the defective section of the electrolytic should be 1012019913. These condensers can be obtained direct from source 101.

Chassis identified by 101.546-1A are the same as 101.546-1 except for a change in design and part number of the push buttons and call letter sheets.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection	Across loud speaker voice co
Output meter reading to indicate 500 milliwatts	.1.2 vol
Dummy antenna value to be in series with generator output	See chart bel
Connection of generator output lead	.See chart bel
Generator modulation	30%, 400 cycl
Position of Volume Control	Fully clockwi
Position of Tone Control	
Position of Dial Pointer with variable fully closed	Horizont

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMM FUNCTI
"AM"	Closed	455 kc	.1 mfd.	6J8G Grid	T2, T1	IF Outp IF Inpu
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Lead	C2*	Wave Tr
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Lead	C5,C21	Oscillat Translat
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Lead	C6	Padde

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted fo minimum output meter reading instead of the usual maximum reading. If the frequency of a interfering station around 455 kc is known, the generator should be adjusted to the frequenc of that station instead of to 455 kc.

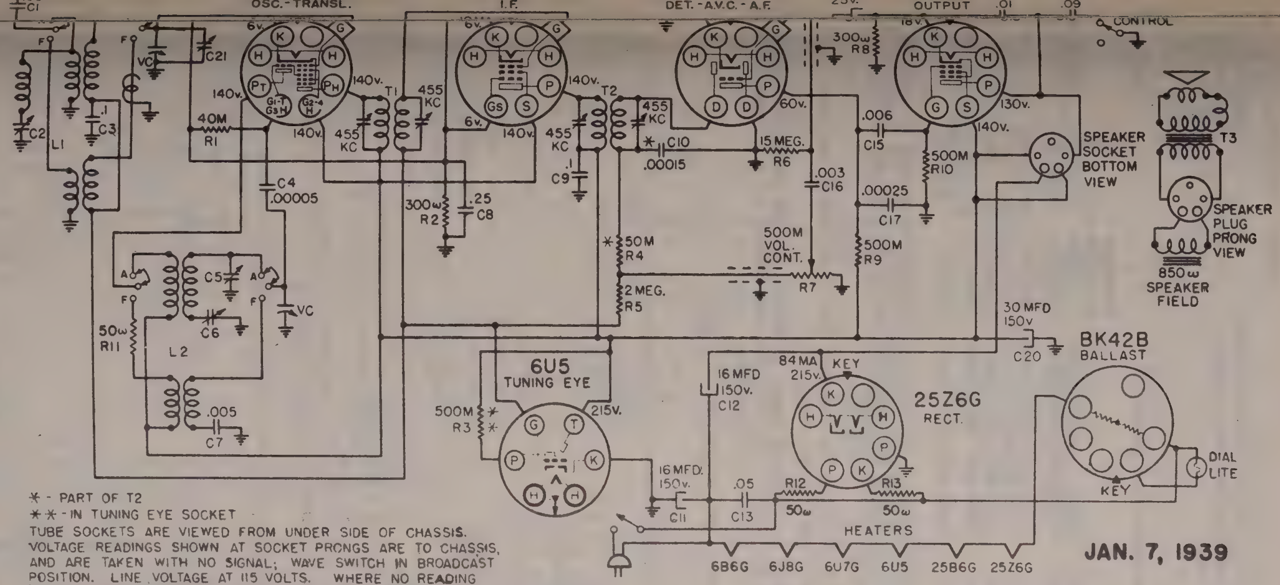
Where indicated by the word, "Rock", the variable should be rocked back and forth degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, fo greatest accuracy. Always keep the output from the test oscillator at its lowest possibl value to make the AVC action of the receiver ineffective.

There are no trimmer adjustments for the short wave band.

SEARS, ROEBUCK & CO.

MODEL 6130
Chassis 101.577
101.577-1
Schematic, Voltage
Changes



* - PART OF T2
** - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS,
AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST
POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING
IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

JAN. 7, 1939

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER SUPPLY:
All models available .
105-125 volts, 50-60 cycle, 60 watts

FREQUENCY RANGES:
Band "AM" . . . . 540-1730 kc
Band "FOR" . . . . 5.95 mc-18.2 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "FOR"	None	None	None

LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . .6"
Field coil resistance . . . . 850 ohms
App. field coil voltage drop. . . 75 V.

POWER OUTPUT:
Type . . . . Beam tube
Undistorted . . . . 2 watts
Maximum . . . . 3 watts

DIFFERENCES BETWEEN 101.557 AND 101.557-1:

R12 and R13, 50 ohms each, have been added to the 25Z6G plate and cathode circuits of 101.557-1 chassis. (See schematic.) These resistors are to prevent failure of the 25Z6G tube and should be added to 101.557 chassis as described in Bulletins XY6784 and XY6795, dated December 28th 1938. Either filter condenser, C11 or C12, may be damaged by a defective 25Z6G tube and should be checked with an ohmmeter before replacing the tube. A normal condenser will show high resistance when the polarity of the ohmmeter terminals agrees with the polarity of the condenser and will show considerably lower resistance when the ohmmeter terminals are reversed. (Be sure power is off when checking.) If C11 is found damaged, it is not necessary to replace the entire 3-section block. Instead, C11 should be replaced by a new single unit 13 mfd. condenser, part #1012019913. Remove the yellow lead of the original electrolytic and in its place connect the yellow lead of the new condenser. Connect the black lead of the new electrolytic to the same place in the circuit as the black lead of the original electrolytic. If the set has excessive hum, the capacity of C11 and C12 should be checked by shunting a #1012019913 condenser across each of them, observing correct polarity.

THE PUSH BUTTON TUNING MECHANISM:

Push buttons are locked and unlocked by tightening or loosening the slotted screw, made accessible when the push button knob is pulled off of its plunger. Stations are set up by holding the plunger all the way in and tuning in the desired station. The setting then is locked by securely tightening the slotted screw.

MODEL 6130
Alignment, Trimmers
Socket, Chassis

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice co
Output meter reading to indicate 500 milliwatts. . . . . 1.2 volt
Average sensitivity in microvolts for 500 milliwatts output . . . . See chart bel
Dummy antenna value to be in series with generator output . . . . .See chart bel
Connection of generator output lead .See chart bel
Generator modulation . . . . 30%, 400 cycle
Position of Volume Control . . . . Fully clockwis
Position of Tone Control . . . . H
Position of Dial Pointer with variable fully closed . . . . Horizonta

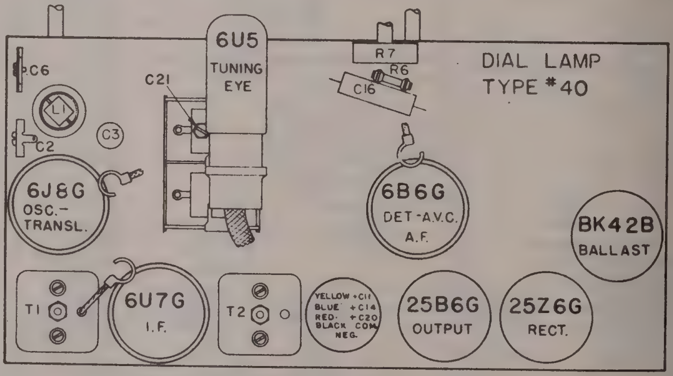
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMAT MICROVOLT
"AM"	Closed	455 kc	.1 mfd.	6J8G Grid	T2,T1	IF Output IF Input	70
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Lead	C2*	Wave Trap	--
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Lead	C5,C21	Oscillator	50
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Lead	C6	Translator Padder	55

* The generator should be adjusted for high output. The trimmer should be adjusted fo minimum output meter reading instead of the usual maximum reading. If the frequency of a interfering station around 455 kc is known, the generator should be adjusted to the frequenc of that station instead of to 455 kc.

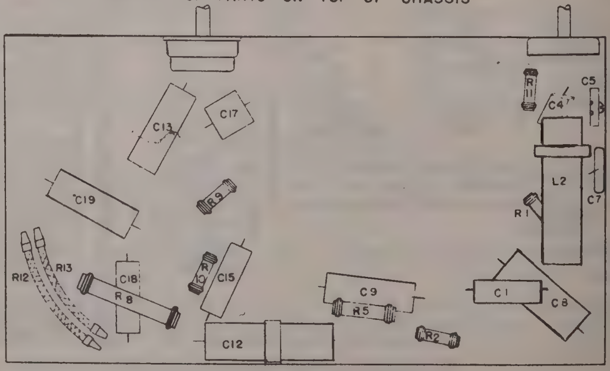
Where indicated by the word, "Rock", the variable should be rocked back and forth degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, fo greatest accuracy. Always keep the output from the test oscillator at its lowest possibl value to make the AVC action of the receiver ineffective

There are no trimmer adjustments for the short wave band.



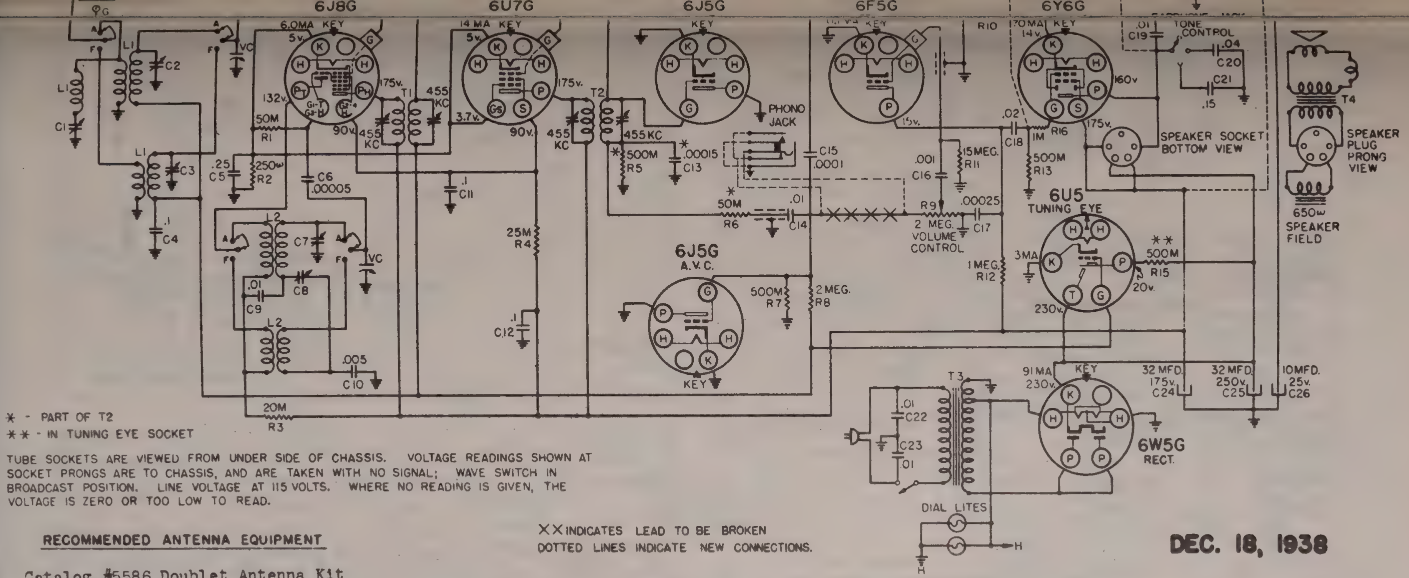
LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS

SEARS. ROEBUCK & CO.

MODELS 6133,6141,6139,6137
6202,6203,6253,6252,6199
Chassis 101.535
Schematic,Voltage



* - PART OF T2
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

XX INDICATES LEAD TO BE BROKEN
DOTTED LINES INDICATE NEW CONNECTIONS.

DEC. 18, 1938

RECOMMENDED ANTENNA EQUIPMENT

Catalog #5586 Doublet Antenna Kit
" #5587 " " "
" #5588 Conventional Ant. Kit
" #5575 " " "

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "SW"	None	15 mc	Fixed

FREQUENCY RANGES:
Band "AM" . . . . 540-1730 kc
Band "SW" . . . . 5.9-18.5 mc

POWER OUTPUT:
Type . . . . .Tetrode
Undistorted . . . . 3-1/2 watts
Maximum . . . . 5 watts

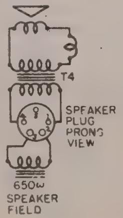
LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . .8 and 10 inch
Field coil resistance . . . . 650 Ohms
App.field coil voltage drop..55 Volts

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER SUPPLY:
All models available . . . . 105-125 volts, 50-60 cycle, 75 watts
All models available . . . . .105-125 volts, 25 cycle, 90 watts

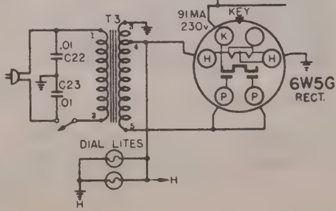
SPEAKER PLUG COLOR CODE

1. Green
2. Yellow
3. Black
4. Brown
5. Blank



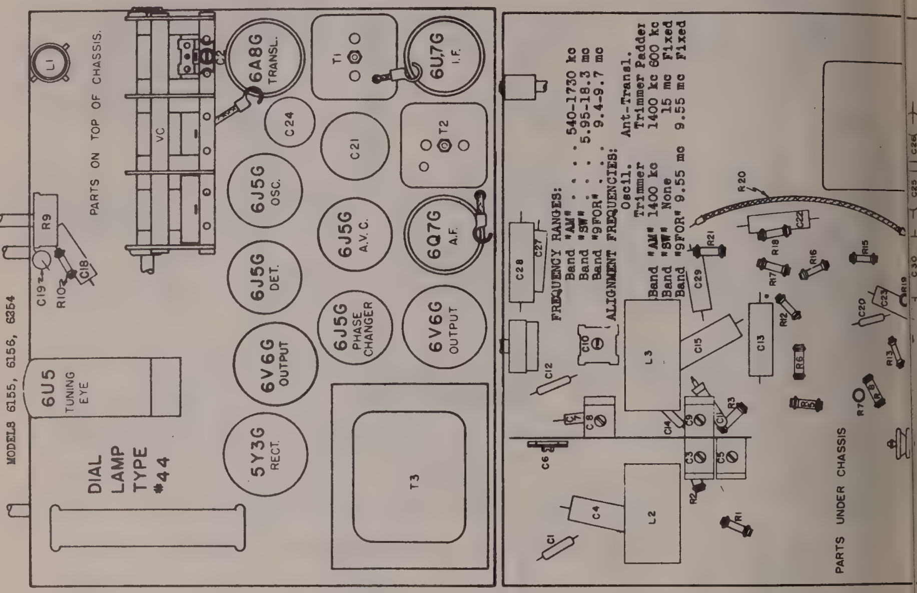
PWR. TRANSF. COLOR CODE

1. Black
3. Green
3. Slate
4. Yellow
5. Red



MODELS 6133,6137,6139,6141
6199,6202,6203,6252,6253
MODELS 6155,6156,6254
Socket,Trimmers,Chassis

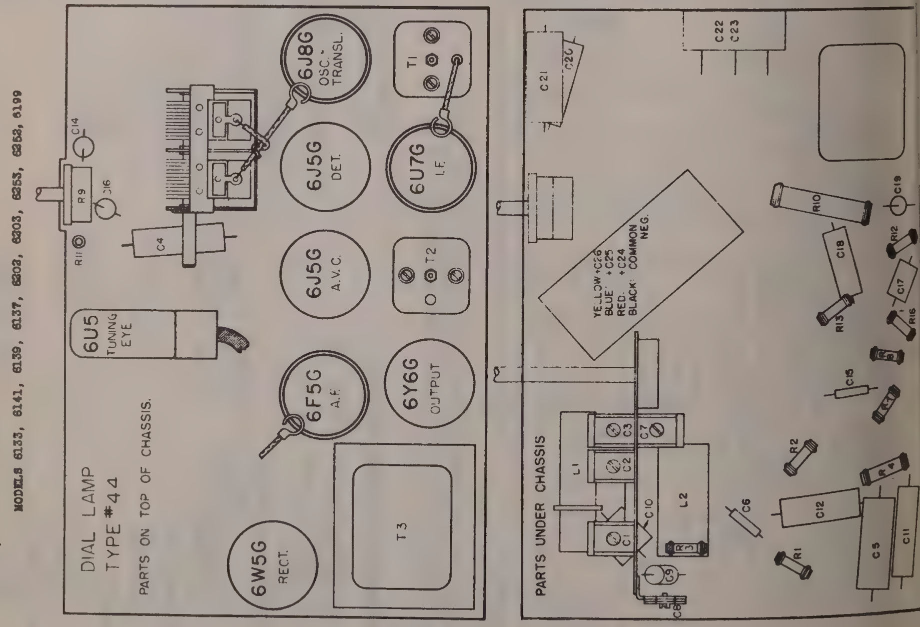
SEARS, ROEBUCK & CO.



FREQUENCY RANGES:
Band "AM" . . . . . 540-1730 kc
Band "SW" . . . . . 5.95-18.3 mc
Band "9FOR" . . . . 9.4-9.7 mc

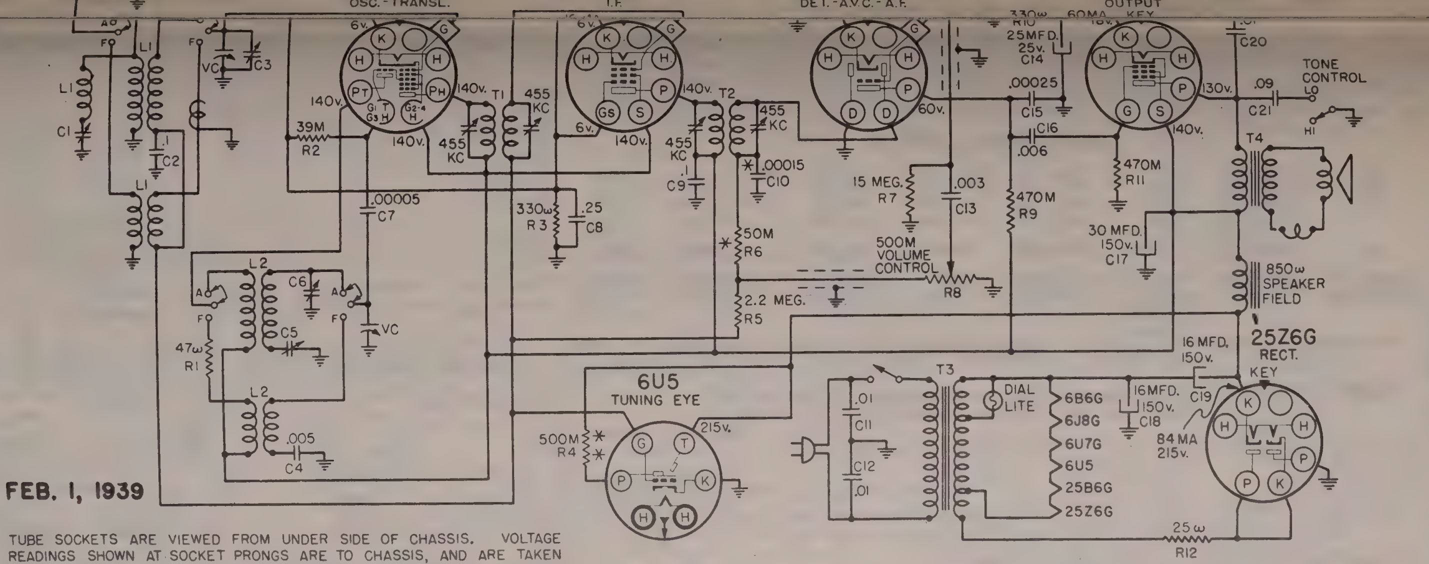
ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "SW"	None	15 mc	Fixed
Band "9FOR"	9.55 mc	9.55 mc	Fixed



SEARS, ROEBUCK & CO.

MODEL 6151
Chassis 101.556,101.556-1
Schematic,Voltage,Changes



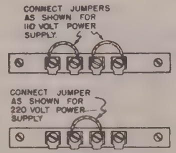
FEB. 1, 1939

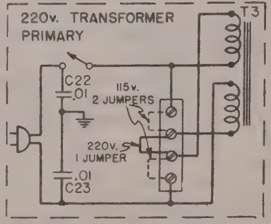
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

* - PART OF T2
** - IN TUNING EYE SOCKET

INTERMEDIATE FREQUENCY

455 kc


CONNECT JUMPERS AS SHOWN FOR 110 VOLT POWER SUPPLY
CONNECT JUMPER AS SHOWN FOR 220 VOLT POWER SUPPLY



DIFFERENCES BETWEEN 101.556 AND 101.556-1:

101.556 is supplied with a 105-125 volt, 50-60 cycle power transformer. This model is intended for domestic use.

101.556-1 is intended for export use and is equipped with a tapped power transformer for 105-125 volt or 210-250 volt, 40-60 cycle power. The illustrations below show the proper jumper connections, found under the chassis, to match the supply voltage (101.556-1 only).

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

RECOMMENDED ANTENNA EQUIPMENT:

Catalog #5586 Doublet; reduces noise on Broadcast and Short Waves.
Catalog #5587 Doublet; reduces noise on Short Waves.
Catalog #5588, #5575; Conventional Antennas.

POWER SUPPLY:
101.556 . . . . 105-125 volts, 50-60 cycle, 45 watts
101.556-1 . . . . 105-125 volts; 210-250 volts,40 cycle, 45 watts

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 3 watts
Maximum . . . . 3 watts

LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . 5-3/8"
App. field coil resistance. .850 ohms

CHASSIS 101.556 AND 101.556-1

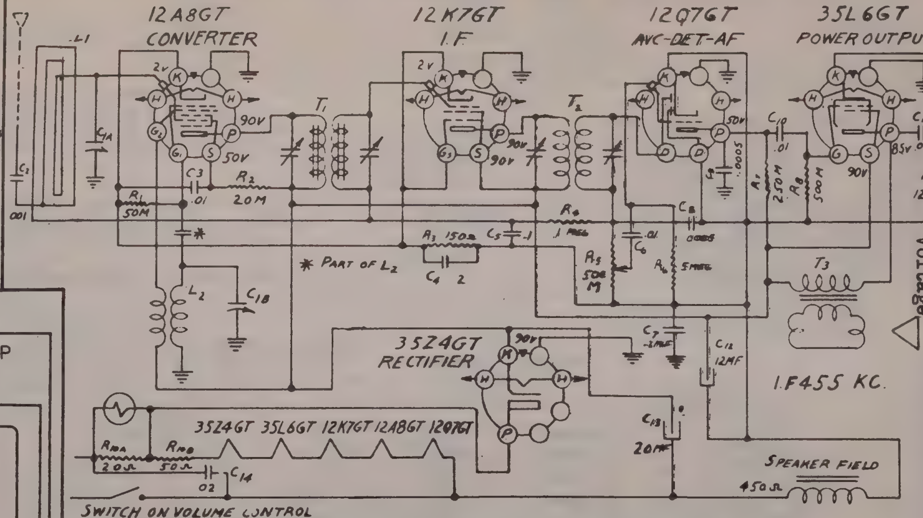
ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts .0.36 volts
Average sensitivity in microvolts for 50 milliwatts output . . . . See chart below

Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of dial pointer with variable fully closed . . . . To fall on block immediately above and between the letters "mc" and "kc".

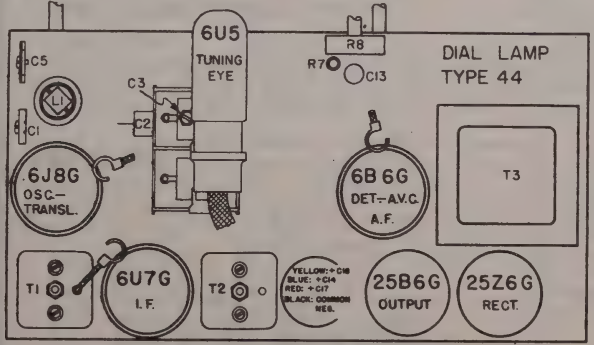
FOR ALIGNMENT SEE INDEX



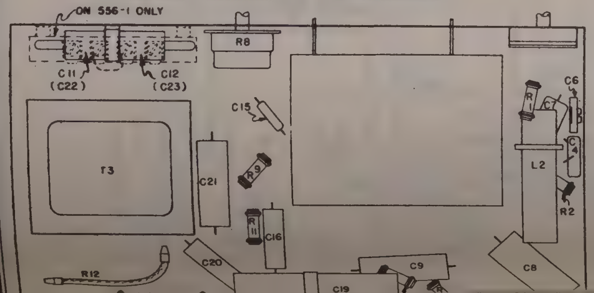
VOLTAGES INDICATED AT SOCKET TERMINALS ARE MEASURED WITH 1000 OHM PER VOLT METER, ON 117V LINE, WITH NO SIGNAL

APRIL 3, 1939

MODELS 6177A, 6178A, 6179A, 6185A (109.279-1) MODEL 6185A (109.279-2)



LOCATION OF PARTS ON TOP OF CHASSIS



WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6J8G Grid	T2,T1	IF output IF Input	60
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"AM"	Fully open	1750 kc	.0002 mfd.	Ant. Term.	C6	Oscillator	100
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3	Translator	50
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C5	Padder	35

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

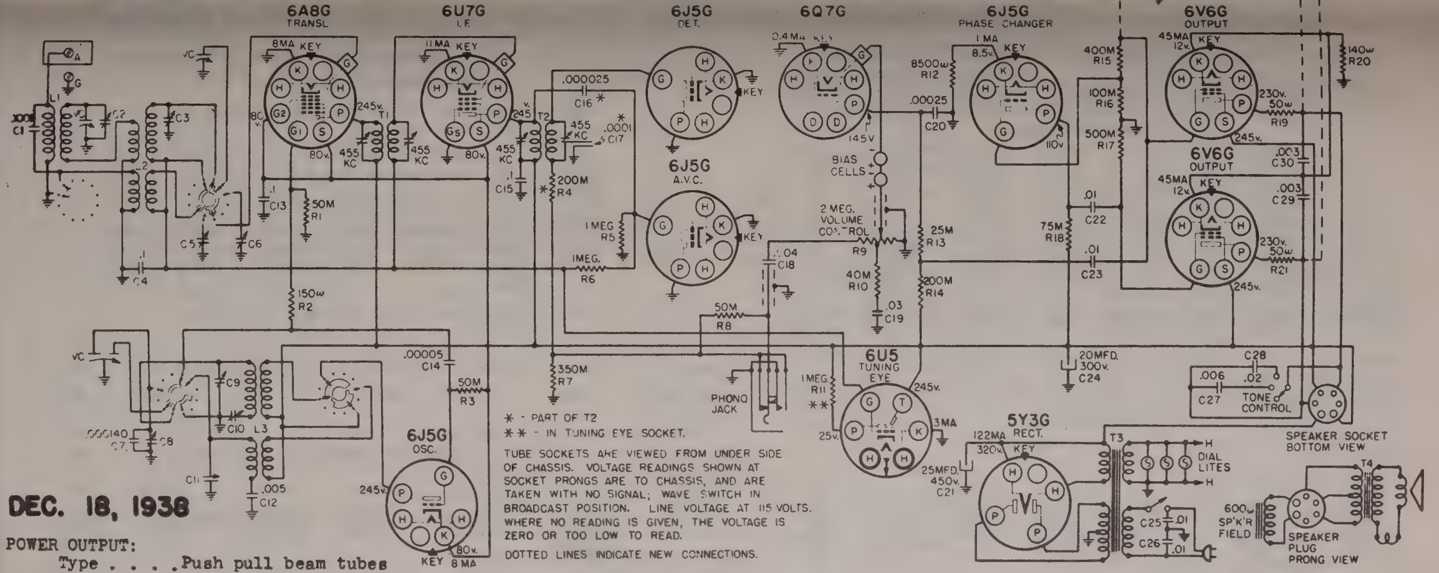
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage in the original order [illegible] receiver ineffective.

All models available . . . . 105-125 volt, 25 cycle, 130 watts

SEARS. ROEBUCK & CO.

MODELS 6155,6156,6254
Chassis 101.549
Schematic,Voltage Changes



* - PART OF T2

** - IN TUNING EYE SOCKET.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

DOTTED LINES INDICATE NEW CONNECTIONS.

DEC. 18, 1938

POWER OUTPUT:
Type . . . . Push pull beam tubes
Undistorted . . . . 6 watts
Maximum . . . . 10 watts

LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . 10 and 12 inch
Field coil resistance . . . . 600 ohms
App. field voltage drop. . . 75 volt

INTERMEDIATE FREQUENCY . . . . 455 kc

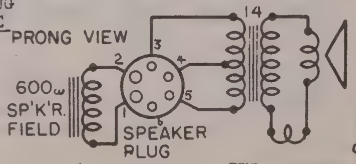
RECOMMENDED ANTENNA EQUIPMENT

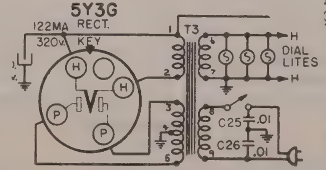
Catalog	#5586	Doublet Antenna Kit
"	#5587	" " "
"	#5588	Conventional Ant. Kit
"	#5575	" " "

SPEAKER PLUG COLOR CODE

1. Black
3. Yellow
2. Brown
4. Red
5. Green
6. Blank

PRONG VIEW





PWR. TRANSF. COLOR CODE

1,2. Red
3. Blue
4. Slate
5. Red
6,7. Black
8. Black
9. Green

CIRCUIT CHANGES TO REDUCE HUM:

If there is complaint about objectionable hum, the following changes will result in reduction of hum.

Replace the 100M ohm resistor, R16, with a 35M ohm resistor.

Replace the 150M ohm resistor, R14, with a 200M ohm resistor.

Remove the ground wire that runs from the volume control to the ground lug on the volume control bracket. Disconnect the braiding of the shielded volume control cable from the ground lug on the volume control bracket. Connect an insulated wire from the ground lug on the volume control to the braiding of the shielded cable, taping this connection carefully to prevent it from shorting to the chassis.

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY: For all Models and Chassis listed in tables below.

Output meter connection . . . . Across loud speaker voice coil

Output meter reading to indicate 500 milliwatts . . . . 0.96 volt

Generator ground lead connection . . . . Receiver chassis

Dummy antenna value to be in series with generator output . . . . See chart below

Connection of generator output lead . . . . See chart below

Generator modulation . . . . 30%, 400 cycles

Position of Volume Control . . . . Fully clockwise

Position of Tone Control . . . . HI

Position of Dial Pointer with variable fully closed . . . . Center of block to left of 550 kc calibration mark.

MODELS 6155,6156,6254 CHASSIS 101.549

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6A8G Grid	T3, T1	IF Output IF Input
"SW"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Translator
"9FOR"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C8* C6	Oscillator Translator
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C9,C3,C2	Osc.,Trans.,Ant.
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder

MODELS 6158,6159,6192 CHASSIS 101.555,101.555-1

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6A8G Grid	T3,T1	IF Output IF Input	- 810
"SW"	15 mc(rock)	15 mc	400 ohms.	Ant. Term.	C13	Translator	40
"9"	9.55 mc	9.55 mc	400 ohms.	Ant. Term.	C9* C16	Oscillator Translator	60
"11"	11.71 mc	11.71 mc	400 ohms.	Ant. Term.	C7* C15	Oscillator Translator	40
"15"	14.9 mc	14.9 mc	400 ohms.	Ant. Term.	C5* C14	Oscillator Translator	40
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C17,C12, C1	Osc.,Transl., RF	30
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C18	Padder	40

IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

*Two peaks can be had, one with the trimmer screwed further out than the other. The correct adjustment is with the trimmer screwed further out. The other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be

ALIGNMENT PROCEDURE

PRELIMINARY: For all Models and Chassis listed in tables below.

Output meter connection . . . . Across loud speaker voice coil

Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead. . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise

MODELS 6264, 6265 CHASSIS 101.551

Output meter reading to indicate 50 milliwatts . . . . 0.34 volts
Average sensitivity in microvolts for 50 milliwatts output . . . . See chart below
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . To fall in center of block to left of 550 kc mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T3,T2,T1	IF Output IF Interstage IF Input	300
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"SW"	16 mc (rock)	16 mc	400 ohms	Ant. Term.	C8	Translator	15
"9FOR"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C2,C11	Osc.,Trans.	18
"AM"	Fully open	1730 kc	.0003 mfd.	Ant. Term.	C9	Oscillator	20
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C7	Translator	10
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	10

MODELS 6336, 6436 CHASSIS 101.574

Approximate microvolts input for 500 milliwatts output . . . . See chart below
Position of Tone Control . . . . Both buttons out
Position of Dial Pointer with variable fully closed . . . . On first mark to left of 550 kc calibration mark.

Output meter reading to indicate 500 milliwatts . . . . 1.6 volts

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"A"	Fully open	1730 kc	.0002 mfd.	Ant. Term.	C14	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C10	Translator	50
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C15	Padder	50
"B"	2.3 mc(rock)	2.3 mc	400 ohms	Ant. Term.	C17	Osc. Pad.	110
"B"	2.5 mc	2.5 mc	400 ohms	Ant. Term.	C12†	Translator	110
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C11†	Transl.Pad.	110
"C"	18 mc	18 mc	400 ohms	Ant. Term.	C5**	Oscillator	--
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C3	Translator	30
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C20**	Oscillator	--
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C9	Translator	85
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C18**	Oscillator	--
"E"	11.71 mc(rock)	11.71 mc	400 ohms	Ant. Term.	C8	Translator	80

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

† Repeat the C11 and C12 adjustments until perfect alignment is obtained. This will require going back and forth in these adjustments several times.

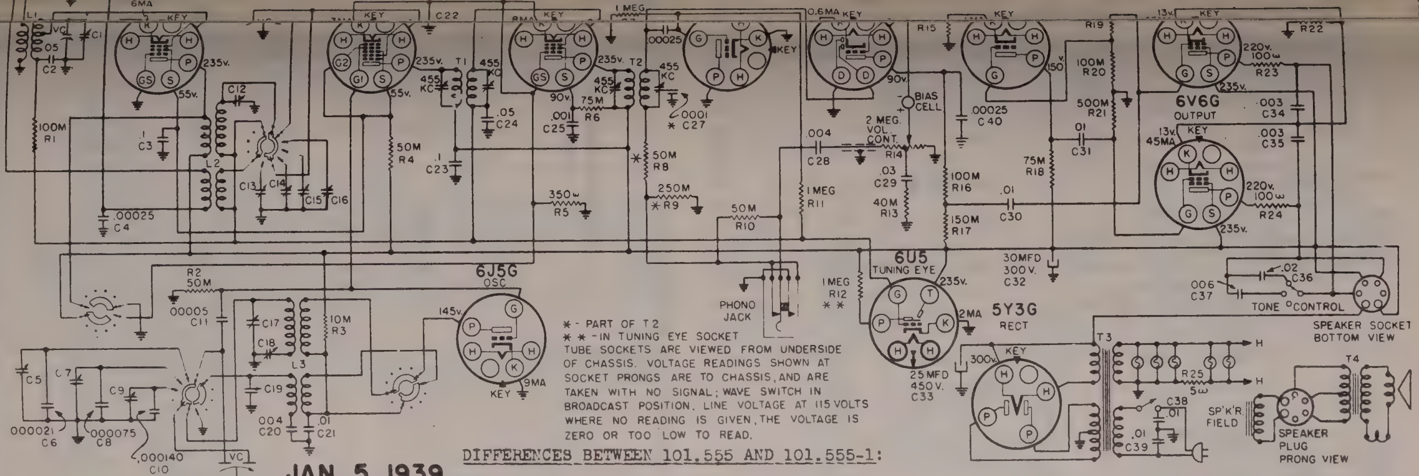
** If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

greatest accuracy. Always keep the output from the test oscillator at its lowest possible

SEARS, ROEBUCK & CO.

MODELS 6158,6159,6192
Chassis 101.555
101.555-1



* - PART OF T2
* * - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

JAN. 5, 1939

INTERMEDIATE FREQUENCY

455 kc

FOR ALIGNMENT SEE INDEX

FREQUENCY RANGES:

Band "AM"	540-1750 kc
Band "SW"	5.95-18.3 mc
Band "9"	9.4-9.7 mc
Band "11"	11.55-12.1 mc
Band "15"	14.4-15.4 mc

POWER OUTPUT:

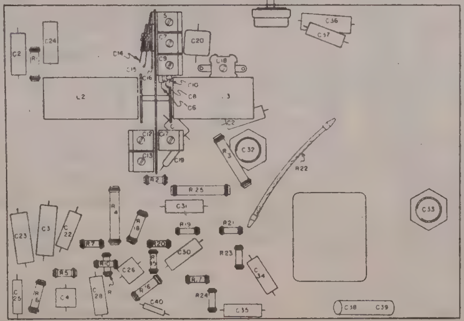
Type	Push pull beam tubes
Undistorted	6 watts
Maximum	10 watts

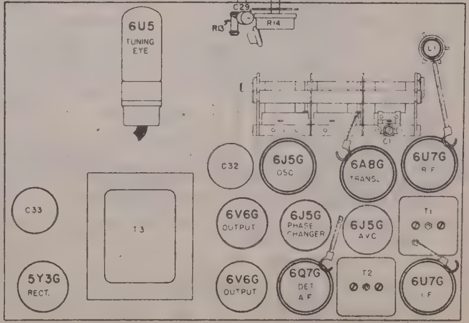
LOUD SPEAKER:

Type	Dynamic
Size	12 and 15 inch
Field coil resistance	600 ohms
App. field coil voltage drop	65 V.

DIFFERENCES BETWEEN 101.555 AND 101.555-1:

101.555 and 101.555-1 are the same electrically. The differences are in the design (and part numbers) of the escutcheons and knobs, as shown in the parts list. The push button escutcheon for Model 101.555 is removed by taking out the snap-in buttons, made accessible when the volume and tuning knobs are pulled off their shafts. The 101.555-1 push button escutcheon is removed by taking out the screws that hold it and the dial escutcheon.





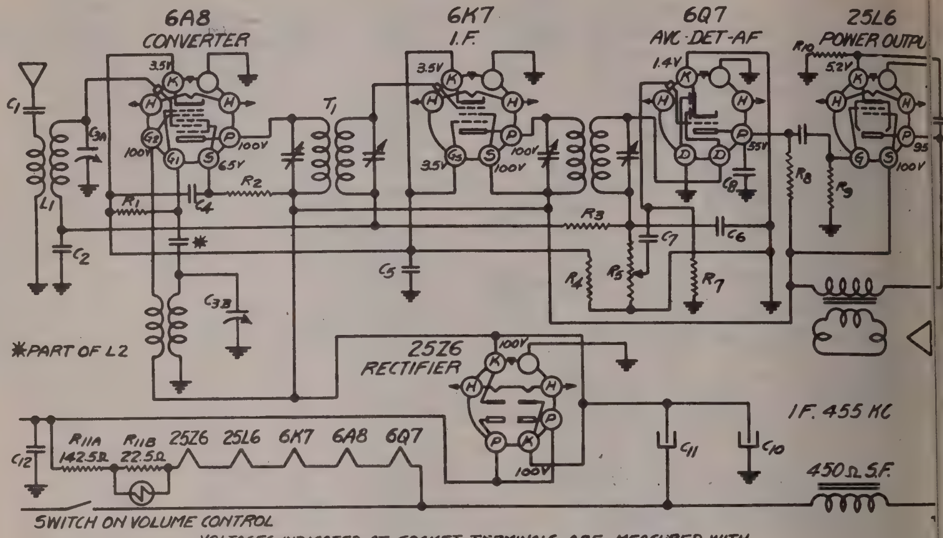
POWER SUPPLY:

All models available	105-125 volts, 50-60 cycle; 105 watts
All models available	105-125 volts, 25 cycle, 115 watts

MODELS 6160,6161,6163
6175.Ch.109.199-1

SEARS, ROEBUCK & CO.

Schematic,V
Socket,Trim
Alignment



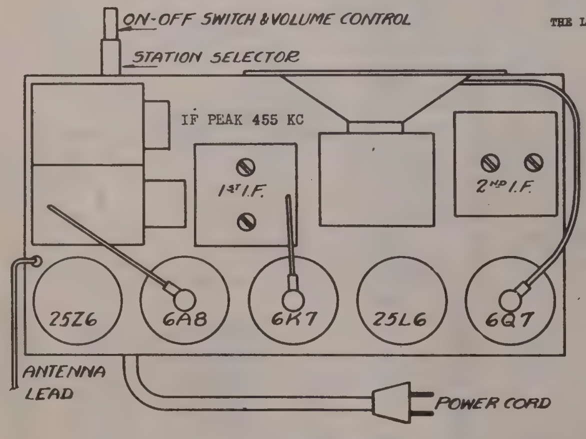
VOLTAGES INDICATED AT SOCKET TERMINALS ARE MEASURED WITH 1000 OHM PER VOLT METER, ON 117V LINE, WITH NO SIGNAL

JAN. 12, 193

POWER SUPPLY

105-125 Volts 50-60 Cycle or D.C. .... 43 watts on 117 volt line.

THE LINE CORD MUST NOT BE SHORTENED OR ALTERED IN ANY W



FREQUENCY RANGE

Broadcast and other services 540 to 1720 K

ALIGNMENT FREQUENCIES

455 KC., 1720 KC., 1400 KC.

LOUD SPEAKER

Type......................Dynamic
Size...................... 5½ inch
Field Resistance........ 450 ohms

POWER OUTPUT

Type................... Beam Power
Undistorted............ 1.2 watt
Maximum .... 2 watts

ALIGNMENT PROCEDURE

See Tube Layout Diagram for location of trimmers.

Connect the Signal Generator ground to the receiver chassis thru a .1 mfd. condenser. Using a .05 mfd. condenser (SEE NOTE BELOW) in series with the high side of the generator, apply a 455 KC. signal to the grid of the 6K7 IF amplifier tube and align the 2nd IF transformer. Repeat for the 1st IF transformer, applying the signal to the grid of the 6A8 tube. Using an 85 to 100 mmf. condenser as a "dummy" antenna, turn the tuning condenser to minimum capacity, apply a 1720 KC signal to the antenna and tune in the signal with the oscillator trimmer. Set the generator to 1400 KC., tune in the signal and adjust the antenna trimmer. (The antenna and oscillator trimmers are located on top of the tuning condenser. see the Tube Layout Diagram).

NOTES

If considerable hum appears when the generator is connected to the 6K7 or 6A8 tubes, use a smaller condenser in series with the high side of the generator.

The "dummy antenna" used for aligning the oscillator and antenna should be connected to the receiver end of the antenna.

Use a weak signal from the generator. Strong signals tend to cause improper adjustments.

MECHANICAL SPECIFICATIONS

CONTROLS

Upper Knob..............Tuni
Lower Knob.. On-Off & Volume

CONTROL OPERATION

Direct Drive
Turn right to turn power on and to increase volume.

SEARS, ROEBUCK & CO.

MODELS See Below
Tuner Data

Part number 1016119531 jack, for connection of earphones or phonograph pick-up, can be ordered directly from source 101. Retail selling price is 79¢.

The schematic diagram on Page 8 shows the connections.

If a crystal pick-up is used, a filter composed of a .01 mfd. condenser and a 100M ohm resistor connected in series, should be connected across the pick-up to prevent excessive bass response. This filter will also act as a partial scratch filter.

PUSH BUTTON TUNING

SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations that can be tuned in on the SPREAD BAND scale can be set up for push button tuning. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".) If your radio is a table model (not a console), remove the snap-in button at the right side of the cabinet. See Fig.1.

3. Push the tuning knob in and turn it so that the dial pointer comes to the right end of the dial. If your radio is a table model, a key, illustrated in Fig. 2, will be found in the Instruction Leaflet envelope. Insert this key in the hole in the side of the cabinet from which the snap-in button was removed and engage the key with the slot at the end of the push button locking mechanism. Unscrew (turn counter-clockwise) the key a few turns, unlocking the mechanism. (A screw driver can be used for unlocking the mechanism instead of the key supplied.)

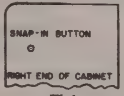
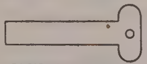


FIG. 1



KEY FOR LOCKING AND UNLOCKING PUSH-BUTTON MECHANISM.

FIG. 2

If yours is a console model, the mechanism can be unlocked by reaching in from the back of the cabinet and unscrewing (turning counter-clockwise) the wing nut, at the end of the mechanism, a few turns. (This can be done by hand.)

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly. Then let go of the push button, making sure not to turn the tuning knob until you have let go of the button. (Turning the knob while the button is pushed in would spoil the accuracy of the adjustment.) Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button and then the tuning knob. Proceed in the same manner for the other stations on your list.

6. When all of the stations have been set up, push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Then lock the mechanism by tightening (turning clockwise) the wing nut for console models or by using the key for table models If yours is a table model, replace the snap-in button in the side of the cabinet.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the celluloid holders at the back of the escutcheon. Be sure to insert the call letters so that they are opposite their respective push buttons. Then replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the call letter holder in their proper position.

OPERATION:

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for approximate push button tuning, be sure the band switch is turned to the proper band.

PUSH BUTTON TUNING

SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is helpful to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations that can be tuned in on a SPREAD BAND scale can be set up for push button tuning. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".)

3. Push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Engage the small screw driver, supplied, with the slotted shaft that is between the tuning knob and the push buttons. Unlock the mechanism by pushing the shaft in and unscrewing it (turn counter-clockwise) about four turns. Then remove the screw driver. Use the small screw driver, supplied. Do not use a large handled one because too much force might damage the mechanism.

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly, as indicated by the tuning eye. Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button. Then let go of the push button before turning the tuning knob again. If properly done, the tuning eye indication will not change when you let go of the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button; then the tuning knob. Proceed in the same manner for the other stations on your list.

6. After the last station has been set up, lock the mechanism by pushing the slotted shaft in and securely tightening it (turn clockwise), using the small screw driver, supplied. (Pushing the slotted shaft in will release the last push button. The dial pointer will move to the right end of the dial as the slotted shaft is turned.) Then remove the screw driver. If the slotted shaft remains pushed in when the screw driver is removed, turning it back and forth very slightly will release it.

After locking the mechanism, test the setting of each button by pushing it in. Then see if the station can be tuned still more accurately by using the tuning knob. Increased accuracy of tuning with the knob will be indicated by a narrower shadow of the tuning eye. If you find any stations that have not been correctly set up, unlock the mechansim, as described in Step 3, and readjust the setting. Be sure to lock the mechanism again before tuning any stations.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the recesses in the front of the push buttons. Cover the call letters with the clear celluloid tabs supplied. Replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechansim as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the proper push button.

OPERATION:

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for push button tuning, be sure the band switch is turned to the proper band. The button will remain part way in, indicating what station is tuned in, until you push another button or until you push the tuning knob

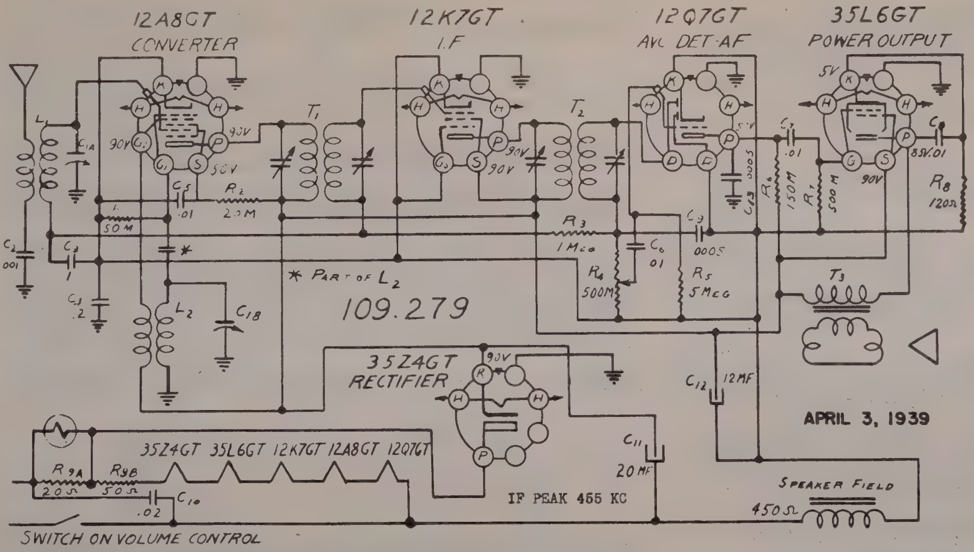
MODELS 6158,6159,6192 CHASSIS 101.555,101.555-1; 6368 CHASSIS 101.582,6382 CHASSIS 101.594; 6497 CHASSIS101.595

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screw driver lightly in the screw head allowing the spring tension to hold the plunger against the screw driver.

MODELS 6177,6178,6179
6185,Ch. 109.279
Schematic,Voltage
Alignment,Trimmers

SEARS, ROEBUCK & CO.



POWER SUPPLY

105-125 Volts 50-60 Cycle or D.C...
...26 watts on 117 volt line.

LOUD SPEAKER

Type	Dynamic
Size	3½ inch
Field Resistance	450 ohms

POWER OUTPUT

Type	Beam Power
Undistorted	1.0 watt
Maximum	1.35 watts

FREQUENCY RANGE

Broadcast and other services 540 to 1720 KC.

ALIGNMENT FREQUENCIES

455 KC., 1720 KC., 1400 KC.

CONTROLS

Upper Knob	Tuning
Lower Knob	On-Off & Volume

CONTROL OPERATION

Direct Drive
Turn right to turn power on and to increase volume.

APRIL 3, 1939

VOLTAGES INDICATED AT SOCKET TERMINALS ARE MEASURED WITH 1000 OHM PER VOLT METER, ON 117V LINE, WITH NO SIGNAL

ALIGNMENT FOR CHASSIS 109.279,109.279-1.

SEE TUBE LAYOUT DIAGRAM FOR LOCATION OF TRIMMERS.

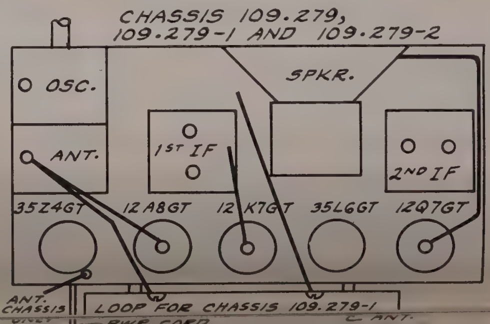
Connect the signal generator ground to the receiver chassis thru a .1 mfd. condenser. Using a .05 mfd. condenser in series with the high side of the generator, apply a 455 kc signal to the grid of the 12K7GT IF amplifier tube and adjust the 2nd IF transformer. Repeat for the 1st IF transformer, applying the signal to the grid of the 12A8GT tube.

CHASSIS 109.279 ONLY
Using an 85 to 100 mmf. condenser as a dummy antenna, turn the tuning condenser to minimum capacity , apply a 1720 kc signal to the antenna and tune in the signal with the oscillator trimmer. Set the generator to 1400 kc., tune in the signal and adjust the antenna trimmer. (the antenna and oscillator trimmers are located on top of the tuning condenser.)

CHASSIS 109.279-1 and 109.279-2 ONLY
Turn the tuning condenser all the way to the right (minimum capacity), apply a 1720 kc signal to the grid of the 12A8GT tube and adjust the Oscillator trimmer. The antenna trimmer may be adjusted by tuning in a station near 1400 kc and adjusting the antenna trimmer for maximum signal.

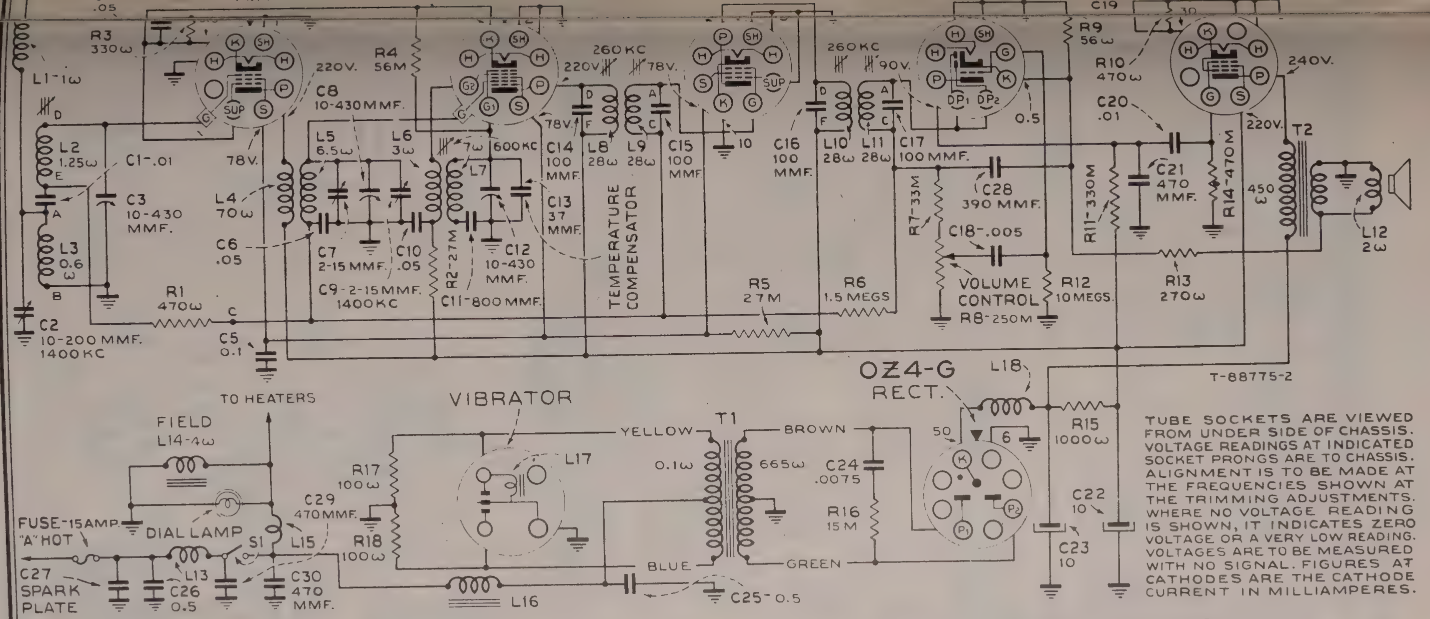
To align the antenna with a signal generator, connect a single turn loop (about a foot square) to the generator in series with a 400 ohm resistor or a 100.mmf. condenser. Place the loop about one foot in back of the receiver, set the generator at 1400 kc. tune in the signal from the generator and adjust the antenna trimmer.

NOTE: ALL MODELS
If considerable hum appears when the signal generator is connected to the receiver, use a smaller condenser in series with the generator. In some cases it will be necessary to connect the generator ground to B- (cathode terminal of the 12Q7GT socket) instead of



MODEL 6190,Ch.126.209
Schematic,Voltage
Drive Cord Data

SEARS, ROEBUCK & CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE THE CATHODE CURRENT IN MILLIAMPERES.

LOUDSPEAKER:

Type	Electrodynamic
Size	5 inches
V.C. Impedance	2.2 ohms at 400 cycles
Field Coil Resistance	4 ohms

FREQUENCY RANGE........ 550-1,550 kc

ALIGNMENT FREQUENCIES:

I-F.	260 kc
Ant.	1,400 kc
Osc.	600 kc
Det.	1,400 kc

POWER OUTPUT:

Type	Pentode
Undistorted	1.8 watts
Maximum	3.7 watts

POWER SUPPLY:

"A"	6.3 volt Auto Storage Battery
"B"	Non-Synchronous Vibrator
Current Drain	6.7 amps.
Fuse Protection	15 amperes

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

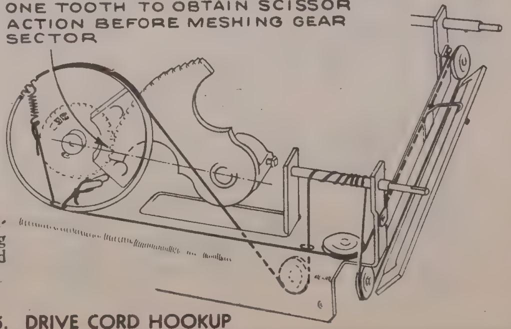
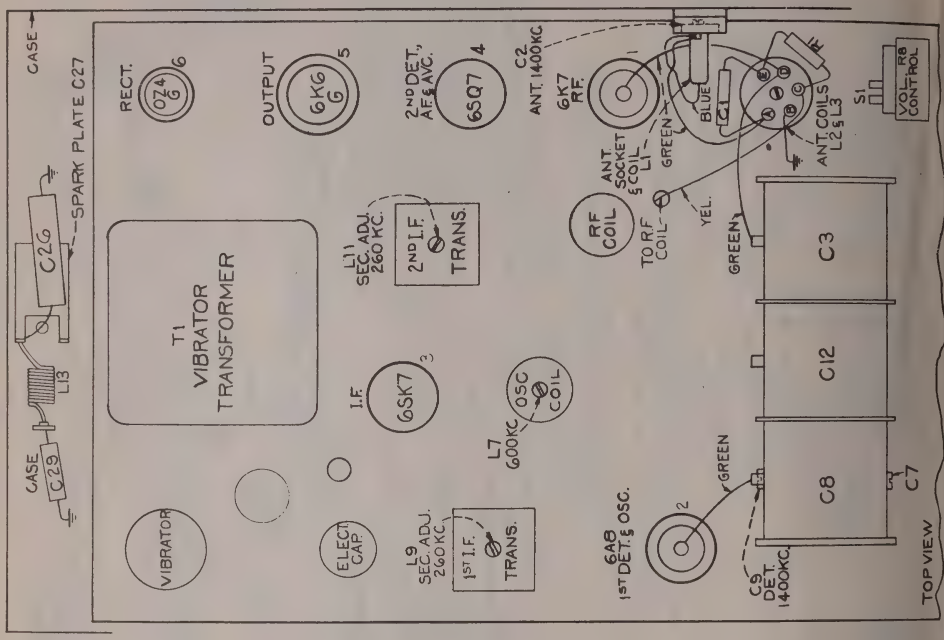

TURN FREE GEAR CLOCKWISE ONE TOOTH TO OBTAIN SCISSOR ACTION BEFORE MESHING GEAR SECTOR

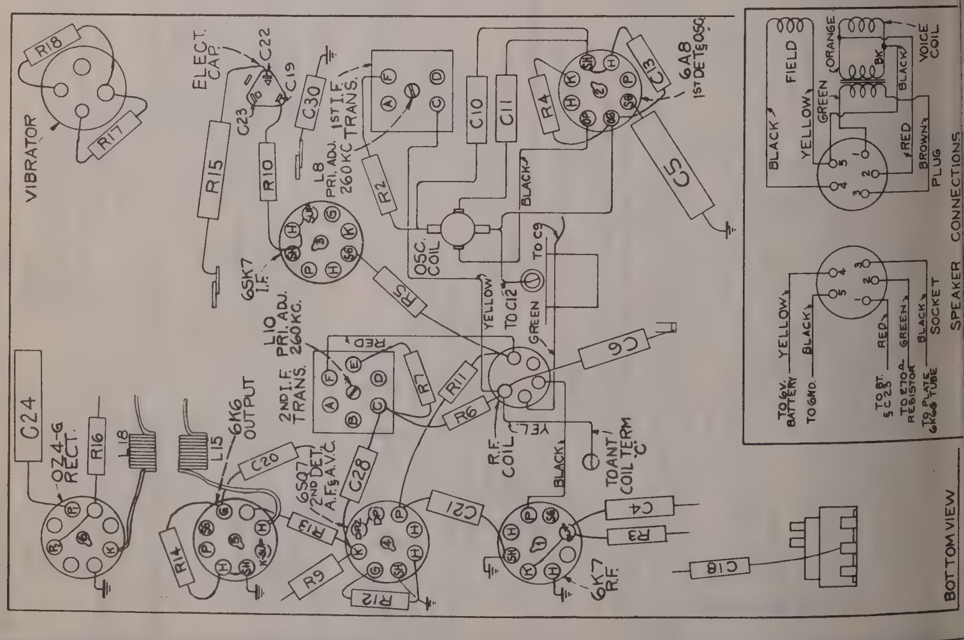
FIG. 5. DRIVE CORD HOOKUP

JUNE 2, 1939

MODEL 6190
Chassis Wiring
Socket, Trimmers

SEARS, ROEBUCK & CO.





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SEARS, ROEBUCK & CO.

MODEL 6190
Alignment,Tuner
Assembly

Filter:

A fi is included in the antenna circuit. Being completely t prevents radiating ignition interference within the It reduces the possibility of picking up vibrator inter- As shown in Figure 4, the filter unit is mounted eel shell which in turn is welded to the chassis. The ntenna lead-in makes contact with the filter unit steel shell and is held in place by a bayonet type

lmination:

The sence of noise is generally due to the high intensity al disturbances from the car ignition system in rela- rength of desired station. The reduction of such ald be carried out methodically by: (1) Increasing ss of the antenna and providing for protection ray pickup; (2) subduing the interference at its d (3) installation of filter devices to prevent trans- interference into the receiver circuits.

Ant a—Should be located well away from engine com- to avoid ignition disturbance, and as far as possible t wheels to eliminate "wheel static." Lead-in should tely shielded and shield grounded to frame of car y points as possible. It is very essential that the e electrically "matched" to the receiver input—this lished by adjustment of the antenna trimmer and tions explained under "Antenna Circuit."

Igni —Radio frequency interference is created in the and primary ignition circuits, usually at each point repeating contact, or spark, is made. The most t sources on the average car are: (a) Distributor— suppressor-resistor in the center or common high- ad; also have points cleaned and adjusted, if neces- Generator—connect an 0.5 mfd. shielded capacitor cross generator output; also see that commutator is nd brushes properly seated for minimum sparking; ine Gauge—on gauges having an electrical contact, fd. shielded capacitor may be required between the and car frame; (d) Temperature Gauge—where a device is used, interference can be eliminated with

0.5 fd. capacitor connected between the circuit and car) Spark Plugs—suppressors in leads to spark plugs bly be required in extreme cases of interference, on , and in localities where signals are very weak; see k plugs are properly adjusted and are not leaky;) A eter—the supply for the receiver is usually taken point; a 0.5 mfd. capacitor from the "hot" lead ent passage of interference into the set over this g) Dome Light—wiring to the dome light should ed; and an 0.5 mfd. capacitor attached between the d car frame, preferably at the point where lead e corner post; (h) Wiring—primary and secondary wiring should be physically separated; possible points insulation should be checked, and all connections ecure.

Car assis Bonds—Intermittent electrical connection be- embers of the car chassis, caused by vibration, will se interference. Flexible bonding connections to the ill correct this condition. The most sources are: mission case; (b) muffler; (c) steering column; (d) head; (e) dash controls; (f) rear springs; (g) brake) hood cover; (i) receiver case.

Wh Static—Interference from this source generally in the front wheels, and is related to road surface on, and atmospheric conditions. Spring devices are for attachment to the wheels for making a per- onnection between the hub and axle; these should ed where required. The wheel bearings should be for proper adjustment. Patches in tires will fre- ause wheel static; exchange front and rear wheels. ntenna is well separated from wheels of car.

tton Adjustment:

Th ush buttons should be adjusted for five favorite sta- er the receiver is installed and operating.

An andard broadcast stations may be chosen. The pref- rangement is to adjust for stations in the order of y, from low to high. Proceed as follows:

1. osen the push buttons one-half turn.
2. ing the tuning control, accurately tune in the first tion.
3. ith station accurately tuned in, press the first push tton fully in and then gently release so as not to jar chanism.
4. ghten the push button securely with fingers. Do not ce with pliers.
5. oceed in same manner to adjust the other four push ttons.

Adj nent of Push Button Mechanism:

Th mechanism should be adjusted so that when using anual or push button tuning, it operates positively hout backlash or bind. The following hints will be elpful in adjusting the mechanism properly.

1. ith the gang condenser in full mesh, the sector gear ould have the two end teeth fully meshed in the ssor gear, as shown in the illustration.
2. he position of the sector gear on the rocker-plate shaft ould be adjusted so that there is clearance between e rocker-plates and the frame of the push button echanism at both extremities of gang rotation. Thus rrect adjustment prevents the rotation of the gang ing limited by the rocker plates touching the frame.
3. he drive cord should have 6½ turns around the tun- g shaft as shown in the illustration. Three degrees of justment of the tension on the drive cord may be tained by use of the three positions for connecting e drive-cord-tension spring to the drive-cord drum on e condenser shaft as shown.
4. he push-arms, rocker-plate shaft, and pulleys should lubricated with light grease (sparingly). Care should taken to keep the lubricant off of the driv cord.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections.......... Across speaker voice coil
Output meter readings to indicate 1 watt.......... 1.8. 1.5 volts
Generator ground lead connections.......... To chassis
Dummy antenna value to be in series with generator output.......... See chart below
Connection of generator output lead.......... See chart below
Generator modulation.......... 30%, 400 cycles
Position of Volume Control.......... Fully clockwise
Chassis must be in its case when aligning R-F circuit.

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connections	Adjustment Symbol	Circuit Adjusted	Approx. Microvolts
No Signal 550-750 kc	260	.01 mfd.	6SK7 Grid (No. 4 pin)	L-10, L-11	2nd I.F. Trans.	3500●; 15,000
No Signal 550-750 kc	260	.01 mfd.	6A8 Grid	L-8, L-9	1st I.F. Trans.	500●; 600
600 kc	600 kc	100 mmfd.*	Antenna Connector	L-7 †	Osc.	1.3
1,400 kc Signal	1,400 kc	100 mmfd.*	Antenna Connector	C-9 † C7● C-2 † C1●	Det. Ant.	1
600 kc (rock)	600 kc	100 mmfd.*	Antenna Connector	L-7 †	Osc.	1.3
1,400 kc Signal	1,400 kc	100 mmfd.*	Antenna Connector	C-9 † C7● C-2 † C1●	Det. Ant.**	1

IMPORTANT ALIGNMENT NOTES

* Make the generator connection through a 100 mmfd. (.0001) capacity inserted at the antenna connector of the receiver. The lead from the signal generator to the 100 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connector.

† These adjustments should be made with unit enclosed in its shielded case, through holes provided for adjustment purposes.

** Final adjustment of C-2 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit" in "Service Hints."

Each step of the alignment should be repeated in it original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.

Alignment adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in place during alignment.

Values shown under "Microvolts" are only approximate.

●FOR MODEL 6301 CHASSIS 126-211.

Antenna Circuit:

It is very important that these instructions be followed when installing the receiver.

The antenna circuit is designed to work with an antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If an antenna having a larger capacity is to be used, it will be necessary to add a capacitor in series with the lead from the antenna filter L-1 to the antenna coil terminal ("A"). Where a "Double Under the Running Board" type of antenna is to be used having a capacity of approximately 200 mmf., the capacitor added should be approximately 300 mmf. The insulated running board type having an approximate capacity of 550 mmf. will require a capacitor of approximately 150 mmf. Cars using an insulated steel top of approximately 3,500 mmf. will require a series capacitor of 120 mmf.

After installation and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer C-2 for maximum signal output. This trimmer is accessible by removing plug button near antenna jack on side of receiver. If a maximum (peak) signal output cannot be obtained in the range of the antenna trimmer, the effective capacity should be checked and compensated for by varying series capacity as described above.

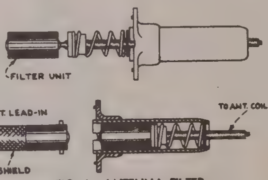
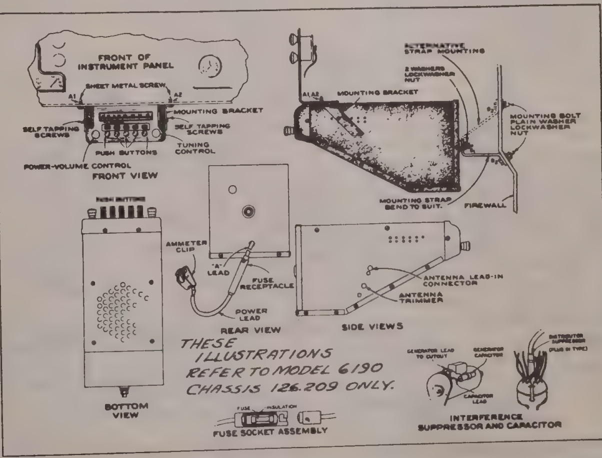


FIG. 4. ANTENNA FILTER



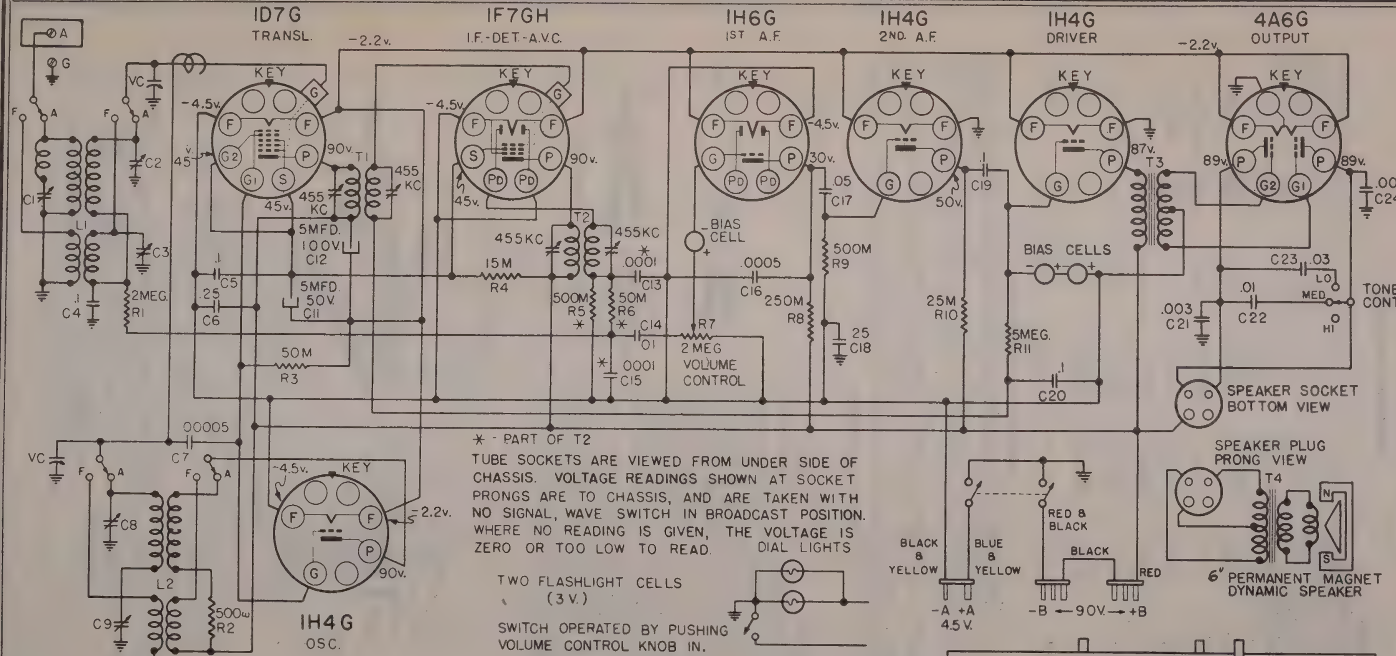
THESE ILLUSTRATIONS REFER TO MODEL 6190 CHASSIS 126.209 ONLY.

MODELS 6208,6209
Chassis 101.554
Schematic,Voltage

SEARS, ROEBUCK & CO.

Chassis,Sock
Trimmers,Tur

FOR ALIGNMENT SEE INDEX

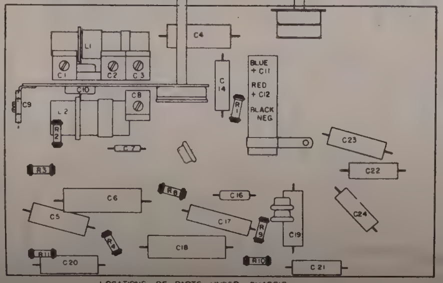


✱ - PART OF T2

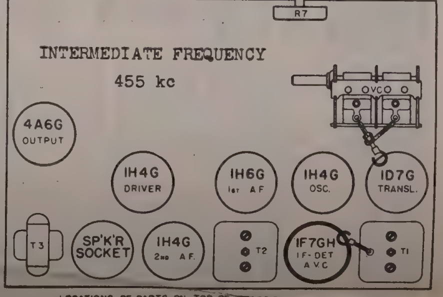
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL, WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

TWO FLASHLIGHT CELLS (3 V.)

SWITCH OPERATED BY PUSHING VOLUME CONTROL KNOB IN.



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS ON TOP OF CHASSIS

POWER SUPPLY:

"A" Battery (4½ volt dry)	1 - #5031
"A" Battery (4 volt storage)	1 - #5049
"B" Batteries	2 - #5041
"A" Drain	0.24 Amperes
"B" Drain	12 ma

POWER OUTPUT:

Type	Class "B"
Undistorted	0.43 watts
Maximum	0.95 watts

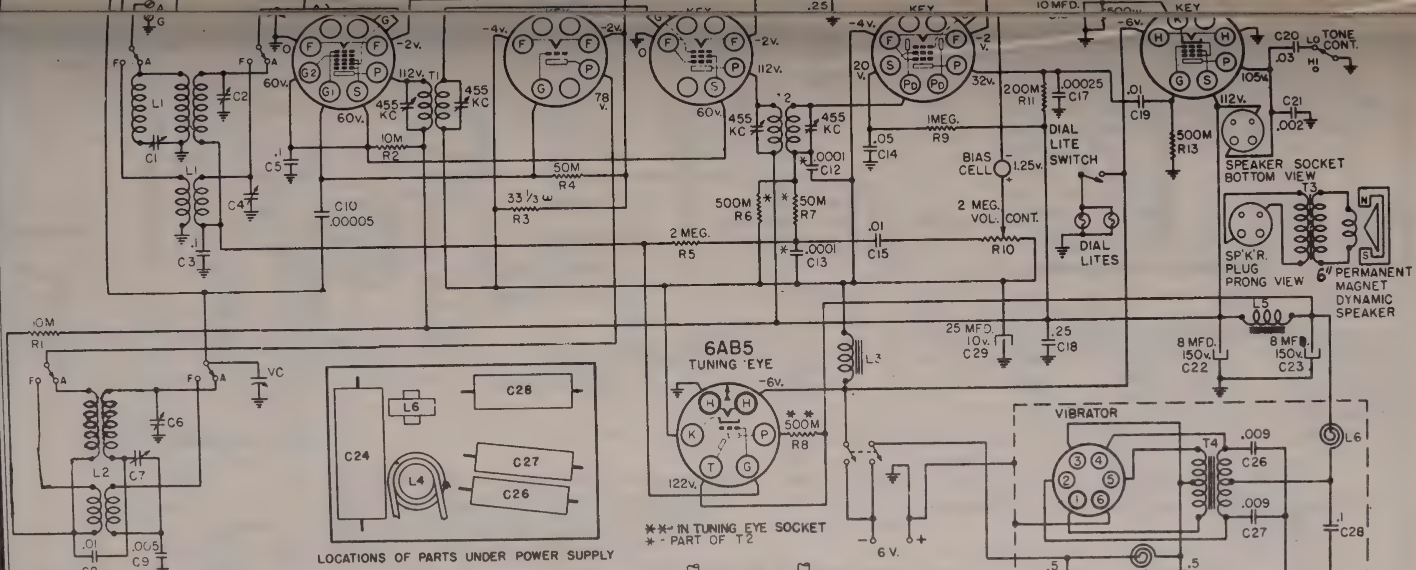
PUSH BUTTON TUNING:

The push button mechanism is locked and unlocked by tightening or loosening the wing nut at the end of the mechanism. (A separate key is supplied in the case of table [illegible] way in and accurately

R LIGNMENT SEE INDEX

SEARS, ROEBUCK & CO.

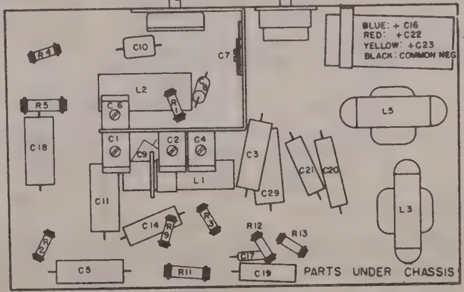
MODELS 6214,6270
Chassis 101.552,101.552A
Schematic,Voltage,Chassis
Socket,Trimmers,Notes



LOCATIONS OF PARTS UNDER POWER SUPPLY

INTERMEDIATE FREQUENCY . . . . 455 kc

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. READINGS SHOWN AT CATHODE PRONGS ARE CATHODE CURRENT IN MILLIAMPERES.

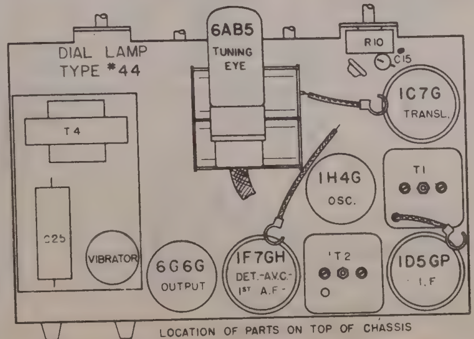


PARTS UNDER CHASSIS

POWER SUPPLY:
Six volt storage battery
Battery Drain . . . . 1.5 Amp.

POWER OUTPUT:

Type	Pentode
Undistorted	0.25 watts
Maximum	0.5 watts



LOCATION OF PARTS ON TOP OF CHASSIS

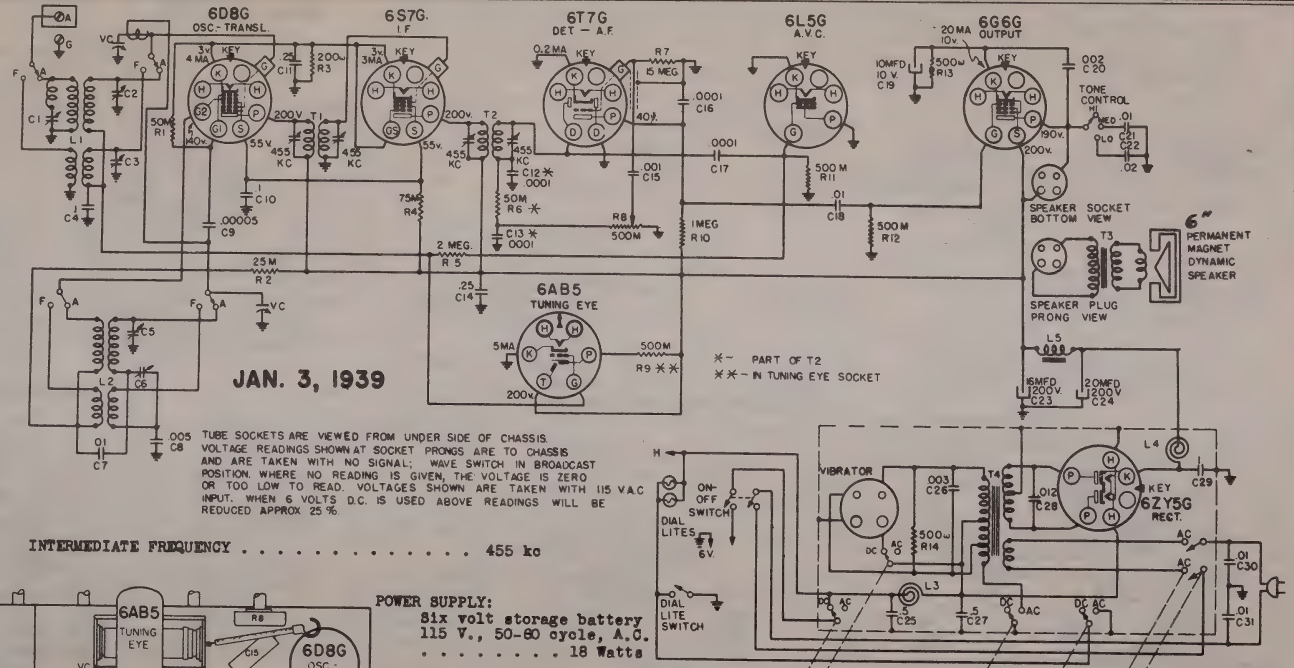
DEC. 30, 1938

DIFFERENCES BETWEEN 101.552 AND 101.552A:

Model 552A is the same electrically as Model 552. The differences are in the style (and part numbers) of the dial, escutcheons, knobs, call letter sheets, and push button tuning unit. The push buttons on 101.552 chassis are locked and unlocked by turning the button. The buttons on 101.552A chassis are locked and unlocked by turning a slotted screw, made accessible by pulling the buttons off of the push button plungers.

MODELS 6218,6271,6272
Chassis 101.553,101.553A
Schematic,Voltage,Chassis
Socket,Trimmers,Notes

SEARS, ROEBUCK & CO.



FOR ALIGNMENT SEE INDEX

JAN. 3, 1939

* - PART OF T2
** - IN TUNING EYE SOCKET

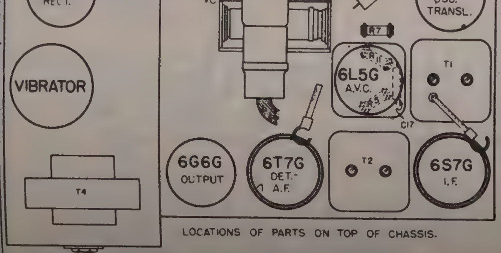
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGES SHOWN ARE TAKEN WITH 115 V.A.C INPUT. WHEN 6 VOLTS D.C. IS USED ABOVE READINGS WILL BE REDUCED APPROX 25 %.

INTERMEDIATE FREQUENCY . . . . 455 kc

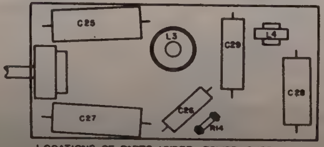
POWER SUPPLY:
Six volt storage battery
115 V., 50-60 cycle, A.C.
. . . . 18 Watts

Battery Drain . . . . 2.3 Amperes

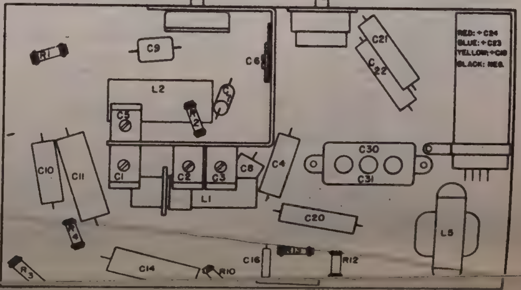
POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.8 watts on A.C.;
0.45 watts on D.C.
Maximum . . . . . . 1.8 watts on A.C.;
1 watt on D.C.



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF PARTS UNDER POWER SUPPLY



DIFFERENCES BETWEEN 101.553 AND 101.553A:

Model 553A is the same electrically as Model 553. The differences are in the style (and part numbers) of the dial, escutcheons, knobs, call letter sheets, and push button tuning unit. The push buttons on 101.553 chassis are locked and unlocked by turning the screw, made acces-

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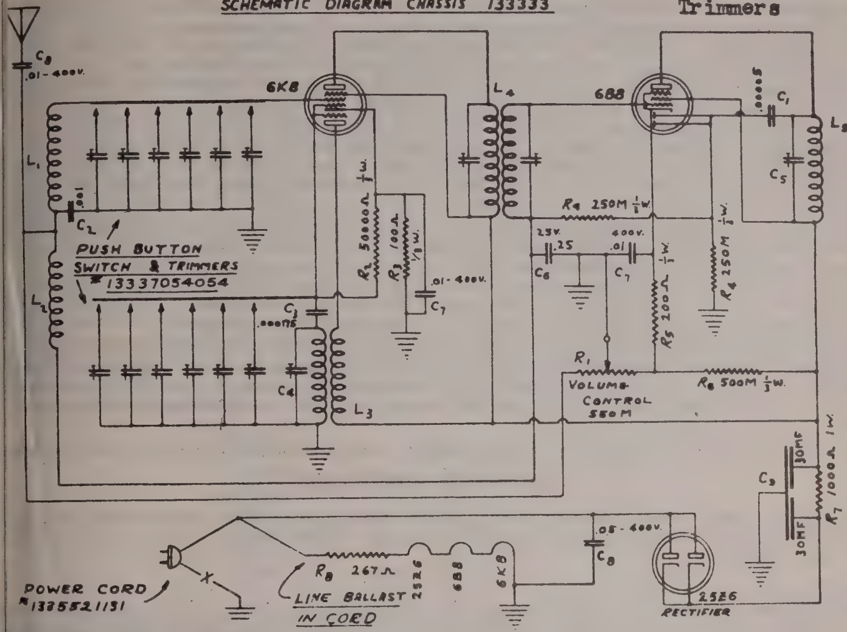
SEARS-ROEBUCK & CO.

MODEL 6225, Ch.133.333
Schematic, Chassis
Control Data
Trimmers

SCHEMATIC DIAGRAM CHASSIS 133333



IR LESS REMOTE CONTROL

MODEL 6225

TI CAL SPECIFICATIONS

A FUNCTIONS:

3 ....Oscillator-Mixer
3 ....IF-AVC
6 ....Rectifier

M T FREQUENCY:

ch tton is aligned to desired station.

ME ATE FREQUENCY: .... 1570 KC

ATI G FEATURES:

sh utton Tuning Only (6 buttons)
ato tic Volume Control

R PPLY:

5-1 volts, AC or DC, 25-60 cycle, 40 watts.

UE Y RANGE:

im r No. 1	550 — 1000 KC
im r No. 2	550 — 1000 KC
im r No. 3	600 — 1100 KC
im r No. 4	600 — 1100 KC
im r No. 5	800 — 1450 KC
im r No. 6	1150 — 1500 KC

IS EATURES:

mb IF Stages ....One
ten ....Attached
ecia Push Button Switch with ganged trimmers for an-
na d oscillator tuning.

HA ICAL SPECIFICATIONS

ATI G CONTROLS:

6 ush Buttons
1 mall Knob

RC OPERATION:

I h to select station
T rn clockwise to turn on and to increase volume.

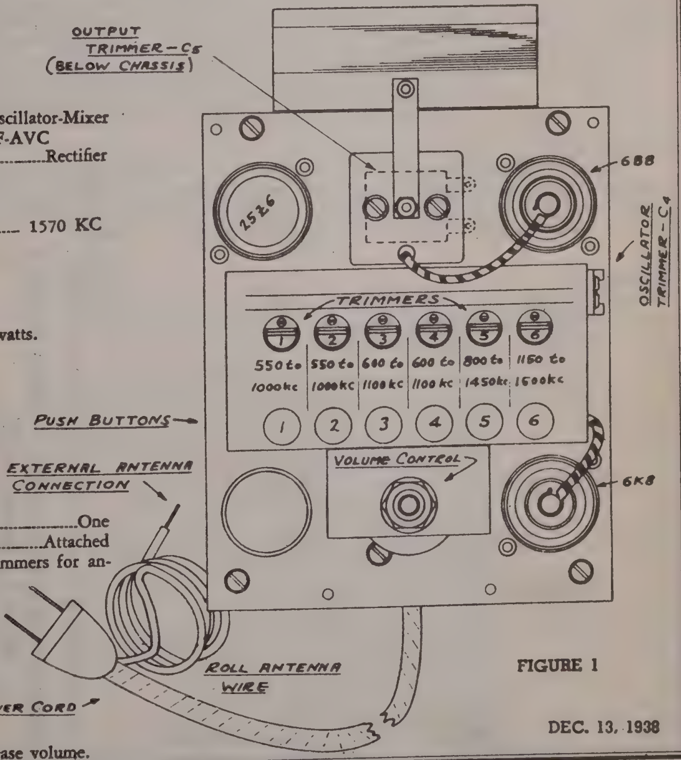


FIGURE 1

DEC. 13, 1938

MODEL 6225,Wireless
Remote Control
Alignment,Notes,Parts

SEARS. ROEBUCK & CO.
GENERAL INFORMATION AND SERVICE HINTS

The Remote Control consists simply of the mixer and IF stages only of a conventional radio. The mixer stage is conventio antenna and oscillator circuits are tuned by ganged trimmers which are selected and connected across the coils by means o button switch. There is no variable condenser. This mixer stage feeds into an IF transformer tuned to 1570 KC. The signal i amplified by the pentode section of the 6B8 tube. The plate load of this tube is a large radiating coil, also tuned to 1570 KC voltage is taken off through a small condenser to feed the diodes and develop AVC voltage for both stages. Thus when the ra which the Control is used is tuned to 1570 KC it picks up the radiation from the plate coil of the 6B8 and reproduces the prog normal manner. The volume control is in the cathode circuit of the 6B8 tube, thus controlling the gain of this tube and the R radiating coil. A little current is bled through the volume control so that the tube will be completely cut off at the minimum se

Obviously the degree of performance depends not only on the signal fed into the Control but on getting the radio tune exact output frequency of the Control and the amount of coupling between the Control output coil and the radio antenna circ maximum. While under ordinary conditions practically any set-up will be satisfactory, in places where signals are weak or a g of noise interference exists, the Control will be much more satisfactory if a lead is brought from the antenna connection of the close to the Control, thus increasing the coupling many times. Under noisy conditions any long outside antennas should be from the receiver as they will feed noise into the set on top of the Control signal. An indoor antenna can be arranged in the hom will lie close to the control thus giving good operation and also be very satisfactory for normal use with the radio.

In extremely noisy localities the above method at times will not bring about normal noise-free reception. It then will be nece loop the wire that leads from the antenna binding post of the receiver, over the transmitting radiator or coil of the remote tun turn is all that is necessary. After this turn is added, go through the alignment procedure on Page 3.

In some localities it is possible that some station or signal will come in on 1570 KC. This will be received simultaneously Control signal and a heterodyne or whistle will result. In such cases the IF system of the Remote Control should be realigne nearest frequency to 1570 KC where no trouble is experienced. (See paragraph on alignment.) These IF's can be aligned to quency from 1460 to 1700 KC. Also in cases where the radio will not tune as high as 1570 KC the Remote Control can be realig lower frequency.

For best operation the Remote Control should be operated with the volume control near the full on position to insure a goo strength.

ALIGNMENT PROCEDURE

For alignment the Control should be removed from the cabinet. First remove the four rubber feet which hold the fiber cover in place. Remove the volume control knob but not the push buttons. Finally remove the four wood screws which h chassis to the cabinet blocks.

INTERMEDIATES:

Use a standard signal generator with a modulated signal. Set the signal generator to 1570 KC (or the special IF freque extraordinary conditions as described above in "Special Helps"). The Control must be aligned in conjunction with a radio rec the Control has no audio. An output meter should be connected into this receiver to indicate resonance peaks. A short length should be connected to the antenna post of the receiver. First feed the generator output direct to the radio receiver antenna a fully tune the radio to this frequency. (*Do not change* the signal generator setting after the receiver has been tuned to it. nect the generator to the antenna of the Control at the end of the power cord and lay the short length of wire next to the large coil on the Control. Turn the volume control on the Control on full. The volume control on the receiver should be adjusted a sary to keep the output meter on scale. Keep the signal generator output level low to make the AVC ineffective. Now adjust transformer trimmers to resonance. Finally adjust the output coil trimmer on the bottom of the chassis.

BROADCAST:

Now turn the signal generator to 540 KC. Depress button number one. Turn large trimmer number one in as far as is without getting it down so tight that it cannot be tuned accurately. Be careful not to force this screw as the coupling between t can be sheared. With the trimmer in this position back the oscillator coil trimmer to the 540 KC signal. No further broadcas ment is required as this is done when the buttons are set to their stations.

Schematic Location	Part Number	Description	List Selling Price
L1	1332820851	Antenna coil	.75
L2	1333020853	Antenna choke	.30
L3	1332820852	Oscillator coil	.55
L4	13333203541	I.F. transformer with shield	.75
L5	13335203551	Output coil	.50
C1		.00005 mfd. mica condenser	.15
C2		.001 mfd. mica condenser	.15
C3		.000175 mfd. mica condenser	.15
C4	1331701549	Condenser-mica trimmer-working cap.=40 mmf.	.20
C5	1331701546	Condenser-mica trimmer-working cap.=75 mmf.	.25
C6		Condenser–.25mfd.–25 volt	.17
C7		Condenser–.01 mfd.–400 volt	.13
C8		Condenser–.05 mfd.–400 volt	.13
C9	1332001482	Condenser–electrolytic–30–30 mfd.	.75
R1	13324181003	Volume control and switch–550M	.60
R2		Resistor – 50M – 1/3 watt	.15
R3		Resistor – 100 ohm 1/3 watt	.15
R4		Resistor – 250M – 1/3 watt	.15
R5		Resistor – 200 ohm 1/3 watt	.15
R6		Resistor – 500M – 1/3 watt	.15
R7		Resistor – 1000 ohm – 1 watt	.15
R8		Line ballast – 267 ohm (part of power cord)	

CHASSIS—IDENTIFICATION NUMBER 133.333
HOW TO ORDER PARTS

1. Use Purchase Order Form 5284.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER and DESCRIPTION for each part ordered.
   (2) The IDENTIFICATION NUMBER, which is 133.333.
   This number is found on the top of the chassis.

PARTS LIST-SOURCE NO. 133

1335521131	Power cord with resistance	.65
13355231220	Roll antenna wire	.10
13337054054	Push button switch and trimmers	4.00
13360363026	Cabinet	3.00
13360363027	Cabinet bottom	.15
1333905194	Push button knobs	.20
1333905191	Volume control knobs	.10

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SEARS-ROEBUCK & CO.

MODEL 6225
Push-Button Data
Notes

UP THE BUTTONS:

Control has no audio system it is necessary to use it in conjunction with a radio when setting push-buttons at any other operations.

setting the push buttons it is necessary to tune the radio which is being used exactly to the resonant frequency of the IF the Control. This can be accomplished by the following steps:

Place the Remote Control on or beside the radio with which it is to be used. Disconnect any aerials on the radio and connect gth of wire which will reach the Remote Control and should be laid very close to the high end of the Remote Control Cabinet. the antenna hank on the end of the power cord on the Remote Control.

Plug in the Remote Control and turn the volume control on fully clockwise and leave in this position throughout the entire pro- rn on the receiver and turn up the volume until the noise between stations is audible. Allow the radio and the Remote Control at least one quarter hour in order that they may become fully heated. *All* the buttons on the Remote Control should be released. slightly depressing any released button.

Tune the receiver to approximately 1570 KC on the broadcast band. Tune back and forth at this point and listen for a point of reased noise level. This spot should be tuned in in the same manner you would tune in a station. You are actually tuning *tivity noise* of the Remote Control.

e the Control is also being realigned, a short cut is made possible by tuning the receiver to the signal generator output, anging the setting at which the Control IF's are aligned.

SET UP PUSH BUTTONS:

ke a list of station call letters of six nearby powerful broadcast stations that it is desired to set up on the buttons. Arrange in the list in the order of their frequency. That is, the station of lowest frequency will be first; the next higher second, marking down the frequencies on the chart along side of the station call letters and arranging them in their proper order, 2, 3, 4, 5 and 6 respectively. Check each frequency with figure 1. A typical list appears below.

Station Call Letters	Frequency	Button No.
WMAQ	670 KC	1
WLW	700 KC	2
WGN	720 KC	3
WENR-WLS	870 KC	4
WHO	1000 KC	5
WCKY	1490 KC	6

that buttons No. 1 and No. 2 will tune only stations with frequencies from 550 to 1000 KC. Similarly but- and No. 4 will only tune stations with frequencies from 600 to 1100 KC. Button No. 5 from 800 to 1450 KC and No. 6 from 00 KC.

e Remote Control is shipped with the holes in the escutcheon open, exposing the trimmer adjusting screws. After com- adjusting procedure, as outlined below, tear out the tabs bearing the proper call letters of the stations set up on each d button, from the sheet of tabs supplied. These tabs will slip into the recess around the trimmer holes and close them, hole a neat appearance. The trimmers are more easily accessible if the two screws and escutcheon are removed.

ith the manual dial knob on the receiver find station No. 1 on the list, noting its program.

urn the pointer to the control frequency setting near 1570 KC as outlined above.

press button No. 1 (see figure 1).

ith a small screw driver turn large trimmer screw No. 1 in or out until the program previously heard is heard again. Tune accurately. This can be determined by ear. Rotate the trimmer screw back and forth across the station to find a setting where deepest and the noise level lowest.

w adjust small screw No. 1, turning it to the right or left until the program is received with maximum volume. If the radio ng eye, the correct setting for this screw is indicated when the sides of the shadow are closest together.

EIVERS WITH PUSH BUTTON TUNING ONLY)

setting up the control in a home with a receiver with push buttons.

determining the proper setting of the receiver dial, for Remote Control operation, set up this frequency on the proper push utlined in the operating instructions for the receiver. This will simplify the set up procedure for the remaining buttons of the ntrol. Additionally it will simplify the location of the proper dial setting for Remote Control operation whenever the Re- rol is to be used.

cate the second station on your list on the radio dial, noting its program.

sh button No. 1 and tune the radio to the preset frequency of about 1570 KC as outlined in paragraph (C), only this e station set on button No. 1 for the 1570 KC reference point, instead of noise.

ithout changing radio dial press button No. 2 and use procedure outlined in points 6 and 7, only using trimmer screws No. 2.

up remaining buttons as outlined in points 8, 9, and 10, substituting in point 10 the number of the button and the trimmer e adjusted.

est to set the buttons on the stations themselves rather than trying to duplicate their frequencies on a signal generator.

ENNA:

ntenna wire is supplied with the Control. It is connected through an extra wire in the power cord. It should be uncoiled and s far as possible from the Control. In locations remote from broadcasting stations additional pickup can be had by connect- l of the antenna to a conventional outdoor antenna.

MENT CIRCUIT AND POWER SUPPLY:

the tubes are conected in series. Accordingly, if any one tube burns out the others will not light. It is necessary to re- the burned out tube; the others will then light. A resistor is built into the line cord to reduce the voltage for the tube

ne cord must not be shortened or altered in any way.

:

no condition should a ground be attached to this Control, also no grounded object should be allowed to come in contact assis.

MODEL 6229 Ch.126.210
MODEL 6233 Ch.126.222
Wireless Record Players
Operation,Notes

SEARS, ROEBUCK & CO.

General Information and Service Hints

This Wireless Record Player is designed to operate in conjunction with any radio receiver having a frequency range which includes 530 to 625 kc.

The output of the crystal pickup, shunted by a 250,000 ohm volume control, a 560,000 ohm resistor and a 0.1 mfd. condenser, is connected to grid No. 1 of the 12A8GT modulator-oscillator tube. The 12A8GT tube acts as a modulated-oscillator producing a signal whose frequency may be
from 530 to 625 kc by means of the screwdriver adj
at the rear of the cabinet.

The antenna or output wire is connected thru a c
condenser to the grid circuit of the oscillator, and run
with the power cord. The output is sufficient to permi
tion within approximately 20 feet of the radio receiver

OPERATING PROCEDURE

1. After inserting plug in proper power supply outlet, turn the power-switch-volume control knob on top of cabinet to full clockwise position. Place either 10 or 12 inch record on the turntable, starting the synchronous motor by a clockwise twirl with the hand.

2. Tune the radio receiver to a quiet point between 530-625 kc.

3. Tune the oscillator in the record player to the tuned frequency of the receiver by adjusting the button on the rear of the record player cabinet to obtain peak output on the receiver. Rotating the button to the right decreases the frequency; to the left increases the frequency.

4. Adjust volume control on radio receiver to the
volume that may be required, and then use the recorc
volume control for further adjustment.

5. In noisy locations, it may be desirable to leave the
player volume control turned full on, and regulate th
receiver volume control for the desired level.

6. If there is insufficient volume, or excessive noi
record player may be coupled to the receiver, by rur
piece of insulated wire between the two units; wrap t
four turns of the coupling wire around the antenna
on the radio receiver and connect the other end in th
way to the short wire that projects from the plug
power cord of the record player.

Phonograph Motor Service Data

The synchronous motor used in this instrument is designed to be simple and foolproof. Among its many features are constancy of speed, low power consumption, single moving part, ease of starting, rubber damper, ease of repair, and long life. The parts that may require attention are plainly shown on "Motor Details." The motor is started by turning "on" the power switch and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Rotor Adjustment

Use three shims (22 mil for 60 cycle and 16 mil for 25 cycle motors), spaced equally around the gap between rotor and stator. When rotor is suitably adjusted, securely tighten the three screws which hold the rotor to the turntable. The centering operation is very similar to that done with a dynamic speaker.

*If top of rotor lamination assembly is not flush with top of stator laminations, additional steel washers should be inserted beneath the stator until it is raised to the desired level.
*Model 6229 only.

Lubrication

Both the rotor and stator have bearing surfaces about the center vertical axis. These bearings and the ball bearing at the bottom of the turntable's shaft should be oiled whenever player is serviced. The leather washer beneath the stator is to be pliable and soaked in light oil.

Removing the Rotor from the Stator

The rotor and turntable assembly simply rests on the ball bearing at the bottom of the vertical bearing, and may be removed by lifting out. Don't turn player upside down without holding turntable.

Hum and Vibration

A small amount of hum when starting, decreasing
negligible amount while running, is normal. If ex
vibration occurs either at starting or running, it may
to one of the following:

(1) Insufficient lubrication in outer bearing or any
failure that will cause the stator to bind.

(2) Metal and leather washers in improper positio
"Motor Details."

(3) Leather washer not oiled. When replacing the
washer, make sure that it is thoroughly soaked

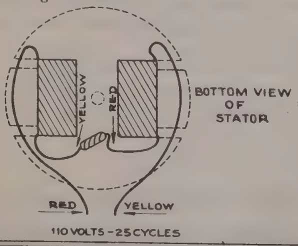
(4) Motor not properly supported from motor
Unless the motor is properly supported fro
motor board, vibration will be excessive.

(5) Burrs on poles of rotor or stator. They shou
removed with fine emery cloth.

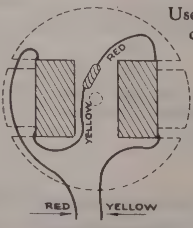
(6) Loose laminations of the stator.

(7) Improper horizontal alignment of the rotor and
Correct horizontal alignment is as shown in the
assembly drawing.

The damper spring must fit without bindi
chattering, in the slot in the stator. The stator m
free to deflect in either direction between the
of the damper spring. Any binding in the wash
stator bearing which prevents the movement o
stator may cause speed variations in the motor.
damper spring must exert equal force in rest
the stator to its mid-position when the stator i
flected manually in either direction.



110 VOLTS - 25 CYCLES

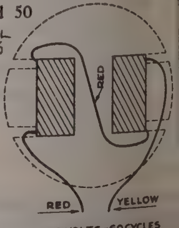


110 VOLTS - 50 CYCLES

Use three 13-mil shims (on 25 and 50 cycle motors, use 16-mil)—Model 6233

MODEL 6233

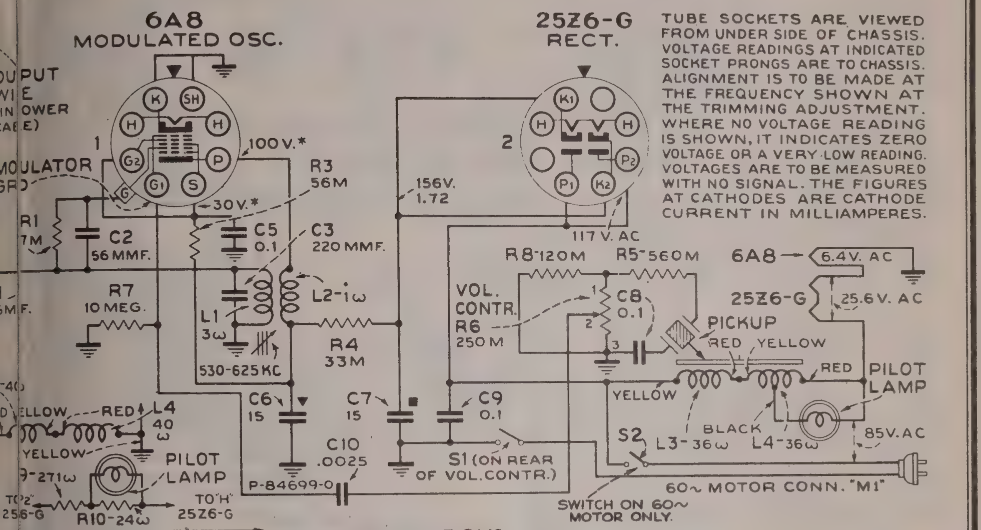
BOTTOM VIEWS
OF MOTOR
STATOR SHOWING
COIL WIRING



110 VOLTS - 60 CYCLES

MODEL 6229
Schematic, Voltage
Chassis Wiring

SEARS, ROEBUCK & CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT THE TRIMMING ADJUSTMENT. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. THE FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

SPECIFICATIONS

UB AND FUNCTIONS:

6A8	Modulator—Oscillator
25Z6-G	Half-Wave Rectifier

IAL LAMP	Mazda 47, 6-8 volts, .15 amp.
REQUENCY RANGE	530-625 kc
OLUME CONTROL	250,000 ohms-Power Switch-Volume

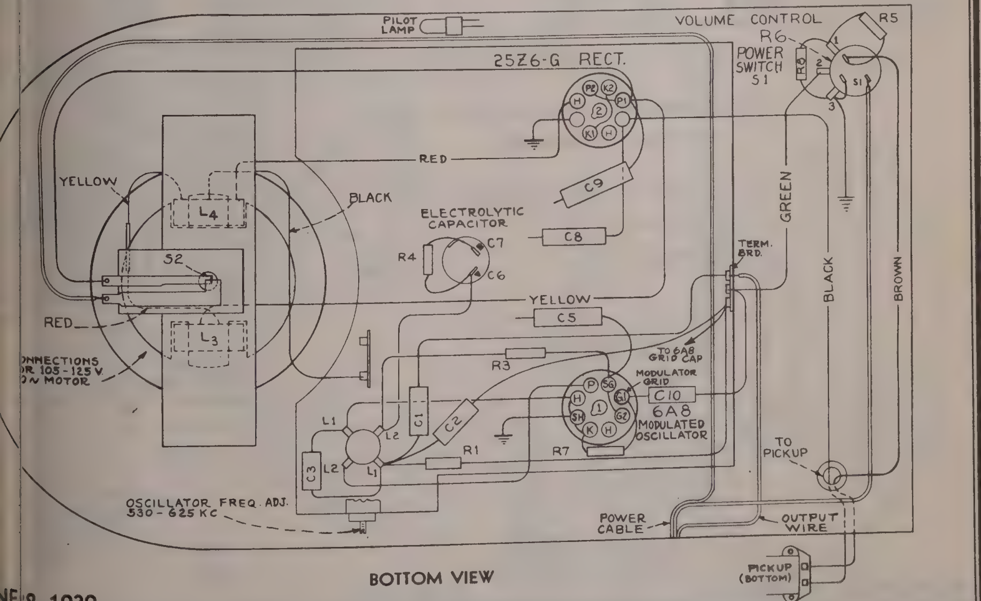
CRYSTAL PICKUP

Impedance	100,000 ohms at 1,000 cycles
Average Output Volts	1½ volts at 1,000 cycles with 250,000 ohm load

POWER SUPPLY

A-6	105-126 volts, 60 cycles, 50 watts
A-5	105-126 volts, 50 cycles, 50 watts

MOTOR	78 r.p.m. Synchronous (manual starting)



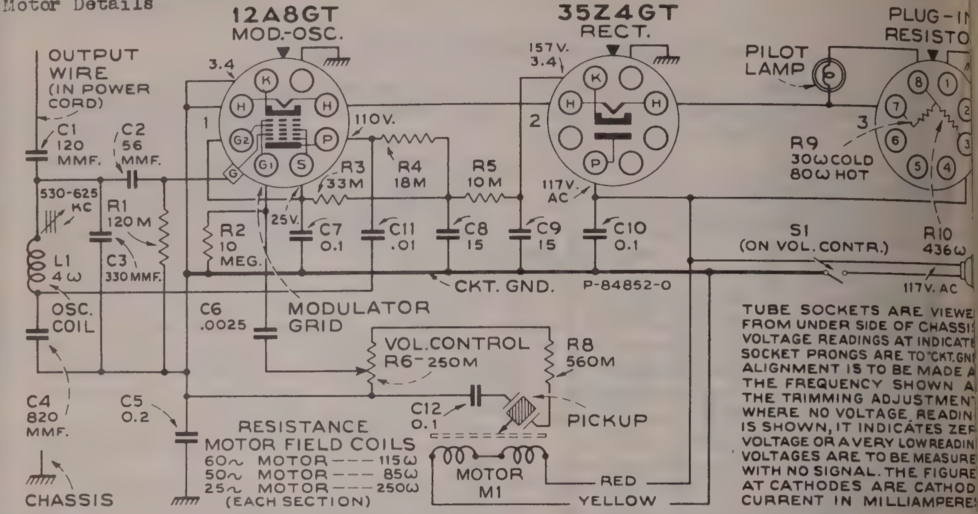
BOTTOM VIEW

NE 2, 1939

MODEL 6233
Schematic, Voltage
Chassis Wiring
Motor Details

SEARS, ROEBUCK & CO.

MODEL 622
Motor Det ls



TUBE SOCKETS ARE VIEWE
FROM UNDER SIDE OF CHASSI
VOLTAGE READINGS AT INDICATE
SOCKET PRONGS ARE TO "CKT. GN
ALIGNMENT IS TO BE MADE A
THE FREQUENCY SHOWN A
THE TRIMMING ADJUSTMEN
WHERE NO VOLTAGE READIN
IS SHOWN, IT INDICATES ZER
VOLTAGE OR A VERY LOW READIN
VOLTAGES ARE TO BE MEASURE
WITH NO SIGNAL. THE FIGURE
AT CATHODES ARE CATHOD
CURRENT IN MILLIAMPERE

DIAL LAMP .... Mazda 44, 6.3 volts., 0.25 amp.

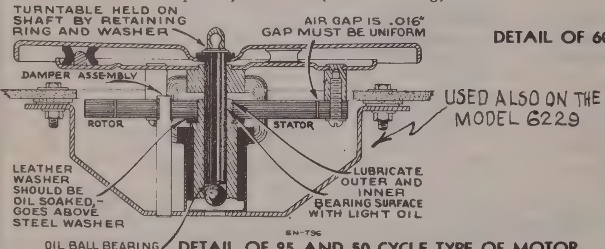
FREQUENCY RANGE .... 530-625 kc

VOLUME CONTROL ...... 250,000 ohms-Power Switch-Volume

MOTOR .... 78 r.p.m. Synchronous (manual starting)

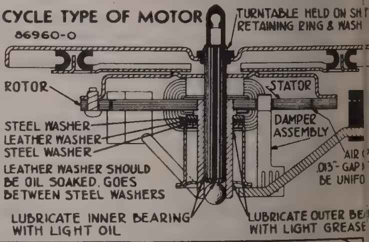
CRYSTAL PICKUP
Impedance............ 100,000 ohms at 1,000
Average Output Volts...... 1½ volts at 1,000
with 250,000 oh

POWER SUPPLY
A-6 .... 105-125 volts, 60 cycles, 30
A-5 .... 105-125 volts, 50 cycles, 30
B .... 105-125 volts, 25 cycles, 30

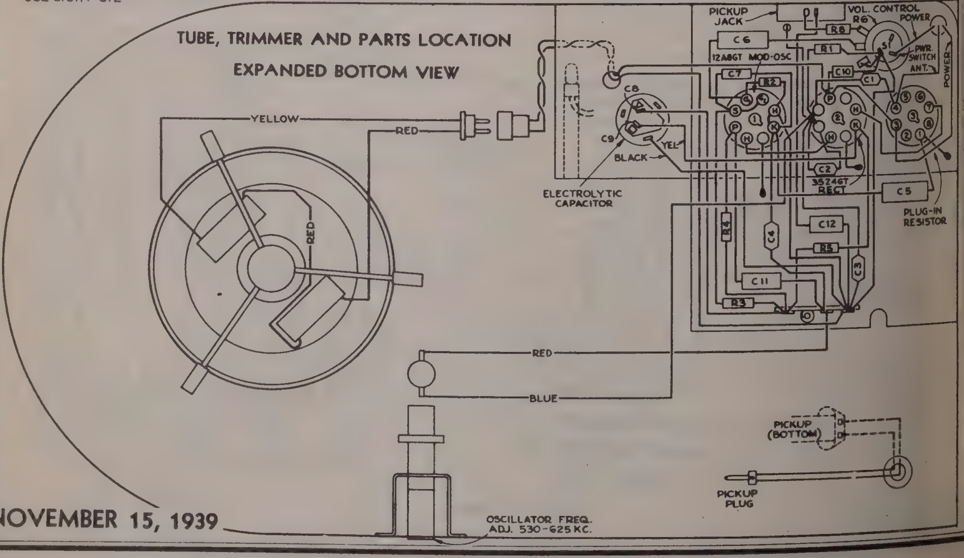

TURNTABLE HELD ON SHAFT BY RETAINING RING AND WASHER
AIR GAP IS .016" GAP MUST BE UNIFORM
DAMPER ASSEMBLY
ROTOR
STATOR
USED ALSO ON THE MODEL 6229
LEATHER WASHER SHOULD BE OIL SOAKED,- GOES ABOVE STEEL WASHER
LUBRICATE OUTER AND INNER BEARING SURFACE WITH LIGHT OIL
OIL BALL BEARING USE LIGHT OIL
SN-796

DETAIL OF 25 AND 50 CYCLE TYPE OF MOTOR

DETAIL OF 60 CYCLE TYPE OF MOTOR
86960-0

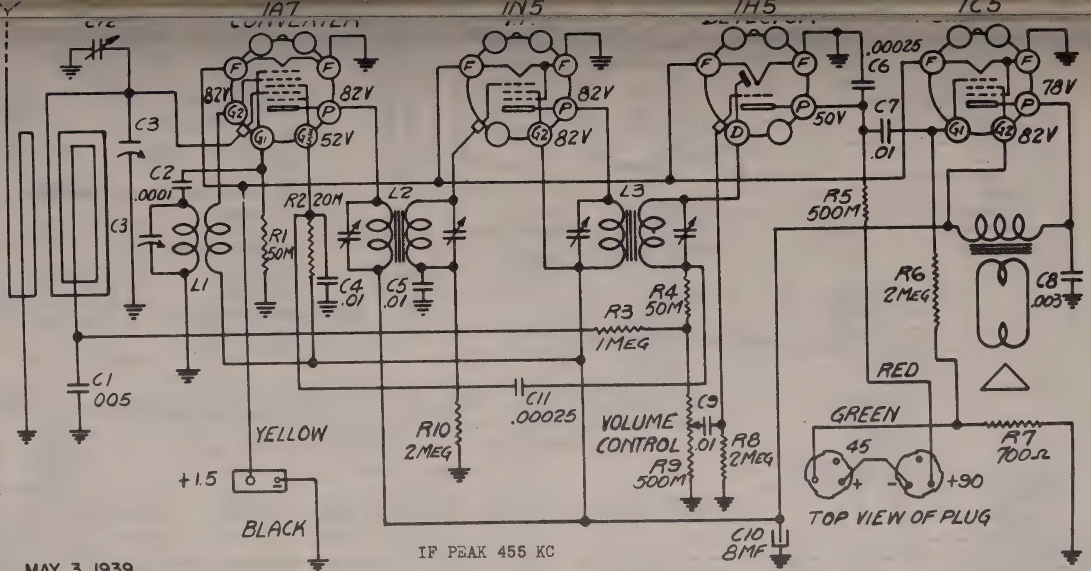


TUBE, TRIMMER AND PARTS LOCATION
EXPANDED BOTTOM VIEW

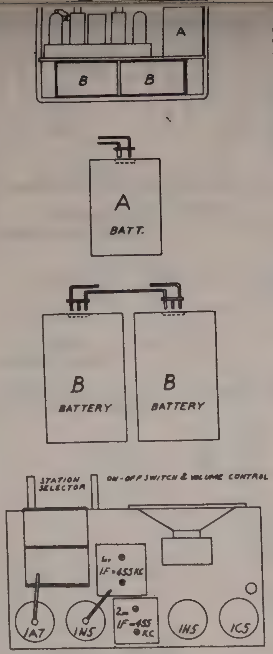


SEARS, ROEBUCK & CO.

MODEL 6256,Ch.109.290
Schematic,Voltage
Socket,Trimmers
Alignment



IF PEAK 455 KC



MAY 3, 1939

VOLTAGES MEASURED TO CHASSIS WITH 90VB AND 1.5VA. VOLUME CONTROL OPEN-NO SIGNAL

ALIGNMENT FREQUENCIES,455-1580-1400 KC.

LOUD SPEAKER
Type.....................P.M. Dynamic
Size........................ 5 inch

POWER SUPPLY.......................Batteries

FREQUENCY RANGE...............540 to 1580 KC.

POWER OUTPUT
Type........................Pentode
Undistorted.............. .150 watt
Maximum .... .3 watt

IF ALIGNMENT

Connect the ground side of the signal generator to the chassis. Connect the high side of the generator to the grid of the 1A7 tube thru a .1 mfd. condenser.

Connect an output meter or other resonance indicator to either the speaker voice coil or the plate of the output tube.

Using a 455 kc. signal and with the volume control full on so that only a very weak signal is necessary, adjust first the 2nd and then the 1st IF transformer for maximum resqnance indication.

RF ALIGNMENT

Using the same signal generator connections as for IF alignment, turn the tuning condenser to minimum capacity and adjust the oscillator to 1580 kc. (The oscillator trimmer is on the variable condenser).

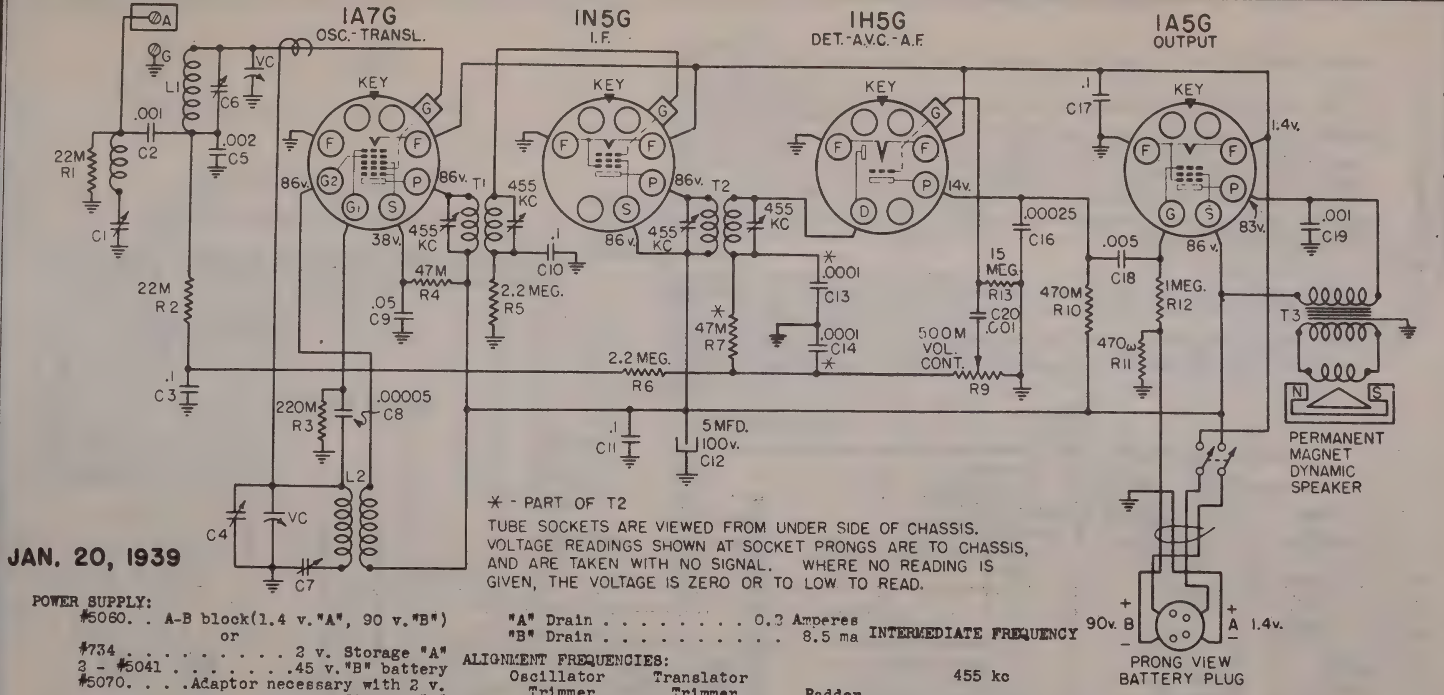
Slide the shelf and chassis back in the cabinet and place the batteries in their proper position. Connect the signal generator leads to a single loop of wire about eight inches in diameter. Place this loop about one foot from the cabinet in the same plane as the front of the cabinet. Set the signal generator at 1400 Kc., tune the receiver until this signal is heard and adjust the trimmer on the back of the variable condenser.

The tuning condenser is of the cut plate oscillator type and no adjustment is necessary at 600 Kc.

ALWAYS USE A WEAK SIGNAL FROM THE GENERATOR. Strong signals tend to cause improper adjustments.

MODEL 6260,Ch.101.558
Schematic,Voltage
Chassis,Socket,Trimmers

SEARS, ROEBUCK & CO.



JAN. 20, 1939

✱ - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TO LOW TO READ.

POWER SUPPLY:
#5060. . A-B block(1.4 v."A", 90 v."B")
or
#734 . . . . 2 v. Storage "A"
2 - #5041 . . . . .45 v."B" battery
#5070. . . .Adaptor necessary with 2 v. Storage "A"

FREQUENCY RANGE:
Broadcast . . . . 540-1750 kc

"A" Drain . . . . 0.3 Amperes
"B" Drain . . . . 8.5 ma

INTERMEDIATE FREQUENCY

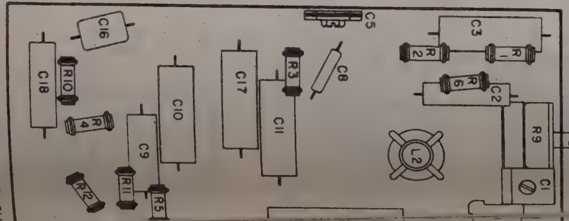
455 kc

ALIGNMENT FREQUENCIES:

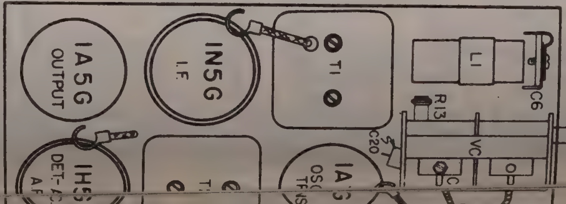
Oscillator Trimmer	Translator Trimmer	Padder
1750 kc	1400 kc	600 kc

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . 5 inch

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . .0.09 watts
Maximum . . . . .0.17 watts



LOCATIONS OF PARTS UNDER CH



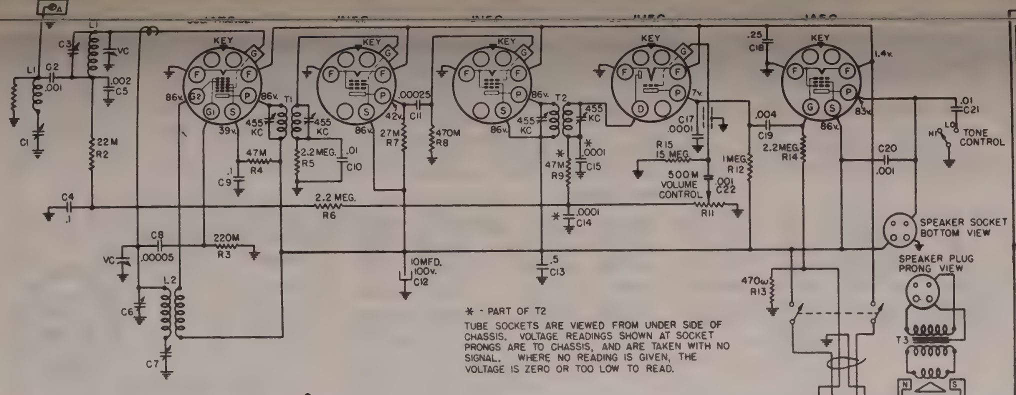
LOCATIONS OF PARTS O
OF CHASSIS

FOR ALIGNMENT
SEE INDEX

ke,Trimmers
er

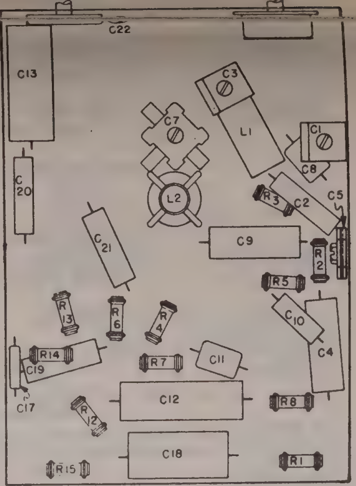
SEARS, ROEBUCK & CO.

MODEL 6261,Ch.101.561
Schematic,Voltage
Chassis,Alignment



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF PARTS UNDER CHASSIS

INTERMEDIATE FREQUENCY . . . . 455 kc

ALIGNMENT PROCEDURE

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T2,T1	IF	50
600 kc	455 kc	.0003 mfd.	Ant. Term.	C1*	IF Wave Trap	--
Fully open	1750 kc	.0003 mfd.	Ant. Term.	C6	Oscillator	50
1400 kc**	1400 kc	.0003 mfd.	Ant. Term.	C3	Translator	20
600 kc (rock)	600 kc	.0003 mfd.	Ant. Term.	C7	Padder	20

* The generator should be adjusted to give high output. The trimmer should be adjusted for minimum output meter reading instead of the customary maximum reading. If the frequency of an interfering station near 455 kc is known, the generator and trimmer should be adjusted for the frequency of the interfering station rather than 455 kc.

** Using the dial as a template make a dummy dial of cardboard with only the 1400 kc calibration on it. Slip this dummy dial over the shaft, hold it horizontal so that the 1400 mark will come at the same position as the 1400 mark on the actual dial and turn the dial pointer to the 1400 kc mark. (The dial pointer should be horizontal when the condenser is fully open or fully meshed.)

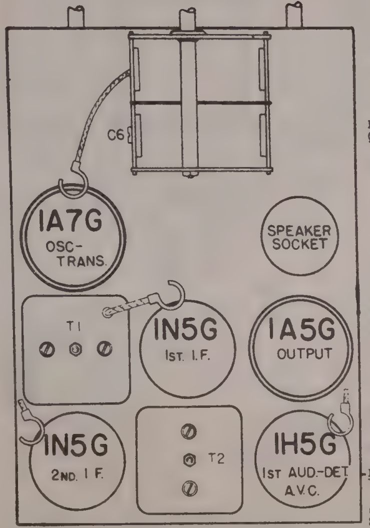
The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.



LOCATIONS OF PARTS ON TOP OF CHASSIS

POWER SUPPLY:
#5060. . A-B block (1.4v. "A", 90v."B")
or
#734 . . . . 2v. Storage "A"
2 - #5041 . . . . . . 45v. "B" battery
#5071 . . . . . .Adaptor necessary with 2v. Storage "A"
"A" Drain . . . . .0.25 amperes
"B" Drain . . . . 10 ma

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . 5"

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.09 watts
Maximum . . . . .0.17 watts

FREQUENCY RANGE:
Broadcast. . . . . .540-1750 kc

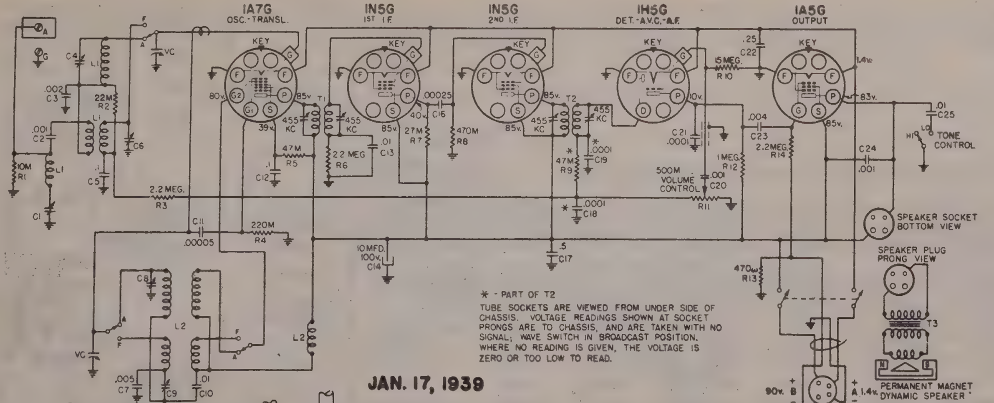
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc

JAN. 17, 1939

MODEL 6262,Ch.101.550
Schematic,Voltage
Chassis,Alignment
Socket,Trimmers,Tuner

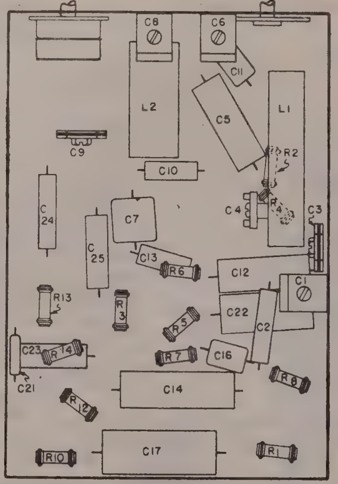
SEARS, ROEBUCK & CO.



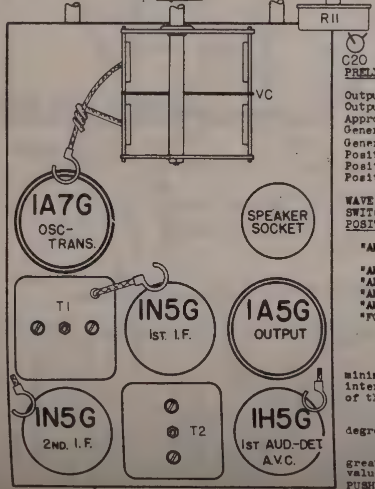
* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

JAN. 17, 1939



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS ON TOP OF CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts. . . . . .0.3 volts
Approximate average sensitivity in microvolts for 50 milliwatts output. . . .See chart below
Generator ground lead connection. . . . . Receiver chassis
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control. . . . . .Fully clockwise
Position of Tone Control . . . . .HI
Position of Dial Pointer with variable fully closed . . . . Horizontal

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T2, T1	IF Output IF Input	80
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"AM"	Fully open	1750 kc	.0002 mfd.	Ant. Term.	C8	Oscillator	40
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C4	Translator	25
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C9	Padder	25
"FOR"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C6	Translator	30

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station,

POWER SUPPLY:

#5060. . .A-B block (1.4v. "A", 90v."B")
or
#734 . . . . 2v. Storage "A"
2 - #5041 . . . . 45v. "B" battery
#5071. . .Adaptor necessary with 2 volt Storage "A"

"A" Drain . . . . 0.25 amperes
"B" Drain . . . . 10.25 ma

FREQUENCY RANGES:

Broadcast . . . . 540-1750 kc
Short Wave . . . . 5.95-18.3 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc
None	15 mc	Fixed

INTERMEDIATE FREQUENCY . . . . 455 kc

LOUD SPEAKER:

Type . . . . PM Dynamic
Size . . . . 6 inch

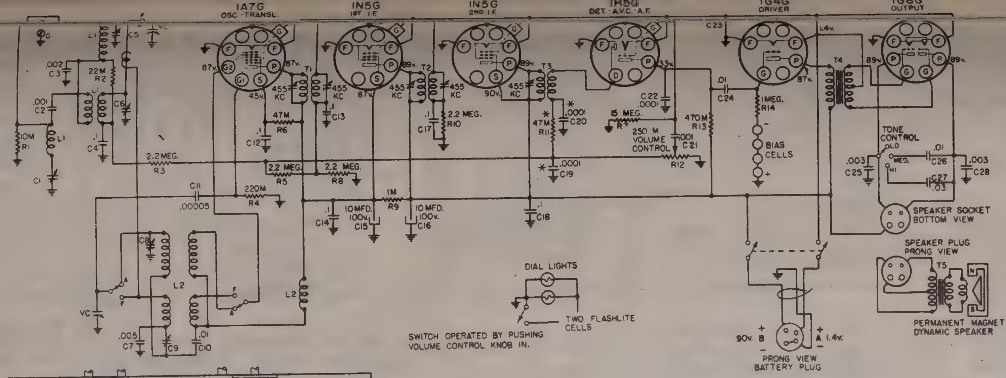
POWER OUTPUT:

Type . . . . .Pentode
Undistorted . . . . 0.089 watts
Maximum . . . . .0.18 watts

S] 101.553, -A
nt

SEARS, ROEBUCK & CO.

MODEL 6263, Ch. 101.562
Schematic, Voltage
Chassis, Alignment
Socket, Trimmers, Tuner



POWER SUPPLY:
#5061. .A-B block(1.4 v."A", 90 v."B")
2 - #5043. . . . . 45 v. "B" Battery
#5072. . . .Adaptor necessary with 2 v. Storage "A"

"A" Drain. . . . . 0.35 Amperes
"B" Drain. . . . . 13 ma

LOUD SPEAKER:
Type. . . . . .PM Dynamic
Size. . . . . .6 inch

POWER OUTPUT:
Type. . . . . Class "B"
Undistorted. . . . . 0.41 watts
Maximum. . . . . 0.74 watts

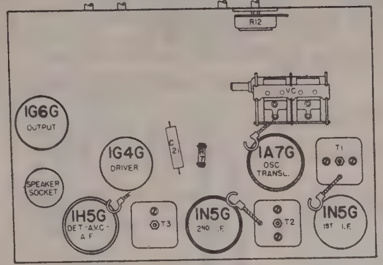
FREQUENCY RANGES:
Broadcast . . . . 540-1730 kc
Short Wave . . . . 5.95-18.5 mc

ALIGNMENT FREQUENCIES:

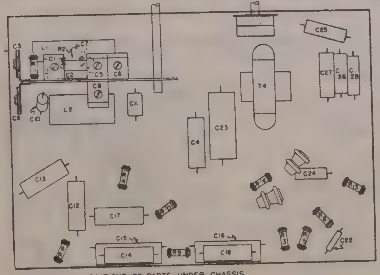
Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1730 kc	1400 kc	600 kc
None	16 mc	Fixed

* - PART OF T3

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS.

INTERMEDIATE FREQUENCY . . .455 kc

CHASSIS FEATURES:
Number IF stages. . . . . Two
Number condensers in gang. . . . .Two
Antenna. . . . . .Marconi
Built-in IF Wave Trap

OPERATING FEATURES:
Tone Control. . . . . . .Three position
Automatic Volume Control
"On-Off" Indicator
Dial FLASH-O-LITE
Push Button Tuning (6 button)

OPERATING CONTROLS:
1. Upper left knob . . . . Volume and dial light
2. Lower left knob. . . . . Wave Switch
3. Upper right knob. . . . . . . Tuning
4. Lower right knob . . "On-Off" Switch and Tone

CONTROL OPERATION:
Turning right:. . . . Volume increase
Pushing in: Dial lights
Turning right: "AM", "FOR"
Tuning ratio: 10:1
Turning right: "ON", "HI","MED","LO"

JAN. 20, 1939

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . . Ⓐ(0.37 volts). . . . . . .0.34 volts
Approximate average sensitivity in microvolts for 50 milliwatt output. . . . See chart below
Generator ground lead connection . . . . .Receiver chassis
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . .To fall in center of heavy block to left of 550 kc mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN) Ⓐ	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS Ⓐ
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid Ⓐ 6D8G "	T3, T2, T1 T2, T1 T1	IF Output IF Interstage IF Input	30 95
"AM"	600 kc	455 kc*	.0002 mfd.	Ant.Term.	C1 C1*	Wave Trap	-- --
"AM"	Fully open	1730 kc	.0002 mfd.	Ant.Term.	C8 ---	Oscillator	35 } 80
"AM"	1400 kc Ⓐ1500	1400 kc Ⓐ1500	.0002 mfd.	Ant.Term.	C5 C5 C2	Translator	10 }
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant.Term.	C9 C6	Padder	10 55
"FOR"	Ⓐ15 -16 mc(rock)	Ⓐ15-16 mc	400 ohms	Ant.Term.	C6 C3	Translator	8 60

Ⓐ For Models 6218,6271,6272. Chassis 101.533, 101.533A

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

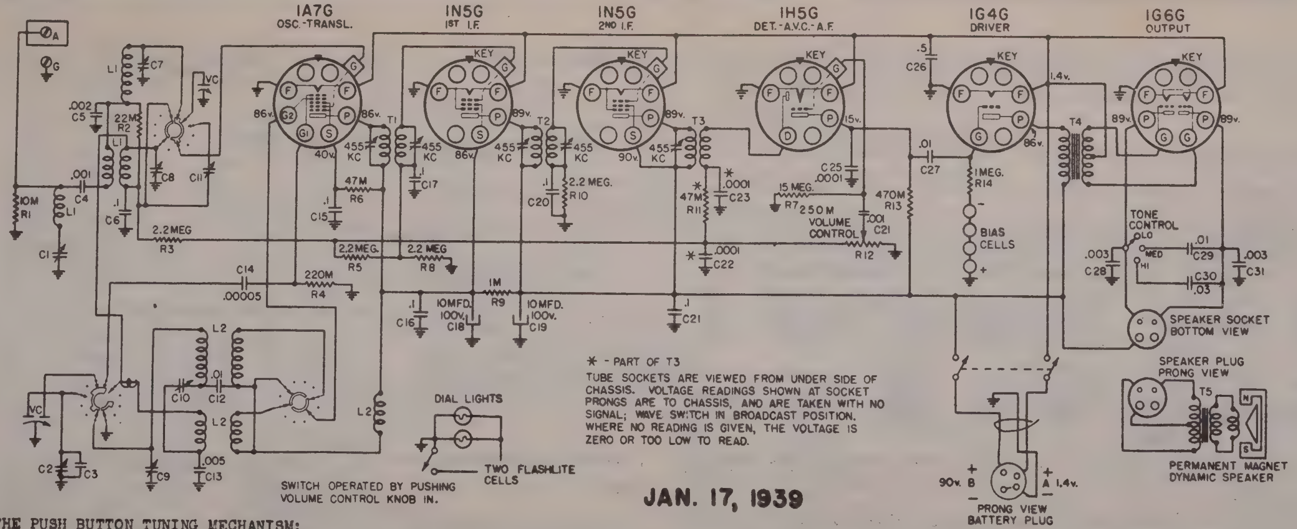
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

PUSH BUTTON TUNING:

The push button mechanism is locked and unlocked by tightening or loosening the wing nut at the end of the mechanism. (A separate key is supplied in the case of table models instead of the wing nut.) Stations are set up by holding the button all the way in and accurately tuning to the station. Then release the button. After all of the buttons have been set up, lock the mechanism securely to prevent slipping.

MODELS 6264,6265
Chassis 101.551
Schematic,Voltage,Socket
Chassis,Tuner,Trimmers

SEARS, ROEBUCK & CO.


1A7G OSC.-TRANSL.
1N5G 1ST I.F.
1N5G 2ND I.F.
1H5G DET.-A.V.C.-A.F.
1G4G DRIVER
1G6G OUTPUT
KEY
86v. 40v. 89v. 90v. 15v. 86v. 1.4v.
455 KC
T1 T2 T3 T4 T5
L1 L2 VC
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C25 C26 C27 C28 C29 C30 C31
10M R1 22M R2 2.2MEG R3 220M R4 2.2MEG. R5 47M R6 15 MEG. R7 2.2 MEG R8 1M R9 2.2 MEG. R10 47M R11 R12 470M R13 1MEG. R14
250M VOLUME CONTROL
BIAS CELLS
TONE CONTROL LO MED HI
SPEAKER SOCKET BOTTOM VIEW
SPEAKER PLUG PRONG VIEW
PERMANENT MAGNET DYNAMIC SPEAKER
DIAL LIGHTS
TWO FLASHLITE CELLS
SWITCH OPERATED BY PUSHING VOLUME CONTROL KNOB IN.
90v. B
A 1.4v.
PRONG VIEW BATTERY PLUG

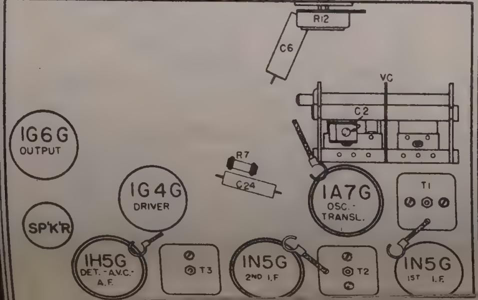
* - PART OF T3

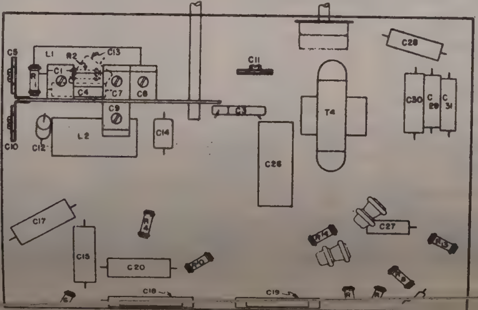
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

JAN. 17, 1939

THE PUSH BUTTON TUNING MECHANISM:

The push button mechanism is locked or unlocked by tightening or loosening the wing nut at the end of the mechanism. (A key, instead of the wing nut, is supplied with table models. Remove the snap-in button at the side of the cabinet and engage the key with the slot at the end of the push button mechanism.) Stations are set up by unlocking the mechanism, holding the button all the way in, tuning to the desired station, and then releasing the button. After all of the buttons have been set, the mechanism should be locked by securely tightening the wing nut.




C5 L1 R2 C13 C1 C4 C7 C8 C9 C10 C12 L2 C14 C11 C3 T4 C26 C28 C30 C29 C31 C27 C17 C15 C20 C18 C19

POWER SUPPLY:
#5061. . A-B block (1.4v. "A", 90v. "B")
or
#734 . . . . 2v. Storage "A"
2 - #5043 . . . . 45v. "B" battery
#5072 . . . . . .Adaptor necessary with 3v. Storage "A"

"A" Drain . . . . .0.35 amperes
"B" Drain . . . . 12 ma

INTERMEDIATE FREQUENCY

455 kc

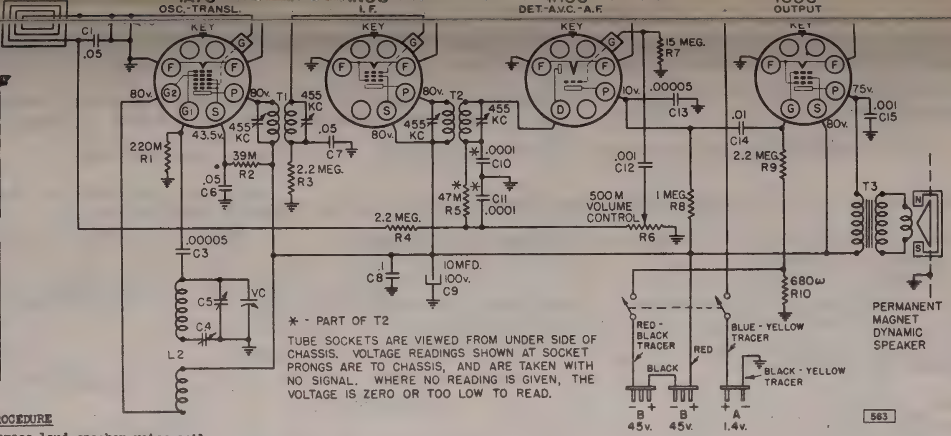
FOR ALIGNMENT
SEE INDEX

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . 6 and 8 inch

POWER OUTPUT:
Type . . . . .Class "B"
Maximum . . . . 0.7 watts

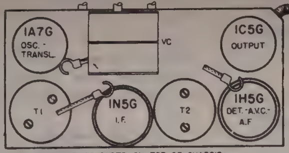
SEARS, ROEBUCK & CO.

MODEL 6266
Ch.101.563,101.563-1A
Schematic, Voltage, Chassis Socket, Trimmers, Alignment

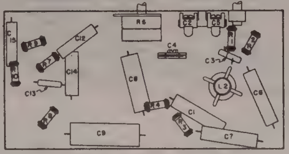


* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

Output meter connections . . . . .Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . .0.38 volts
Generator ground lead connection . . . . To ground
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . .Fully on
Position of Dial Pointer with variable fully closed To fall on bar just below 550 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION
Closed	455 kc	1A7G Transl.Grid with .1 mfd. in series	T2, T1	IF
Fully open	1610 kc	* See note below	C5	Oscillator
1400 kc	1400 kc	* See note below	C2	Translator
600 kc (rock)	600 kc	* See note below	C4	Padder

The chassis is removed from the case in order to align the IF but the loop antenna must be left connected.

* Run a wire from the output terminal of the signal generator, having it come near the receiver. However, no metallic connection is made between the signal generator and the receiver.

The back cover containing the loop antenna must be in place when making the translator, oscillator, and padder adjustments. Also, the batteries must be in place (instead of making connection to external batteries). The trimmers are accessible from the front of the receiver when the escutcheon is removed, as shown in the illustration.

The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

Alignment should be done with no connection made to the external antenna and ground terminals, even though an external antenna is normally used with the set.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

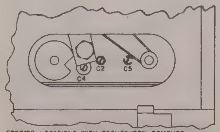
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

Chassis identified by 101.563-1A use a loop antenna that is wound directly on the back cover of the carrying case. The knob design and part number also have been changed.

Should the loop be disconnected from the receiver for any reason, be sure that the colored leads are re-connected to the same terminals as originally, indicated by the paint spot on one of the terminals.

INTERMEDIATE FREQUENCY

455 kc



TRIMMER LOCATIONS WITH ESCUTCHEON REMOVED

FEB. 13, 1939

POWER SUPPLY:
"A" Battery (1½ volt) . . . . .1 - #5063
Service rating - 150 Hours
"B" Batteries . . . . 2 - #5039
Service rating - 200 Hours

POWER OUTPUT:
Type . . . . .Single Pentode
Undistorted . . . . .0.15 watts
Maximum . . . . .0.275 watts

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . 5 inch

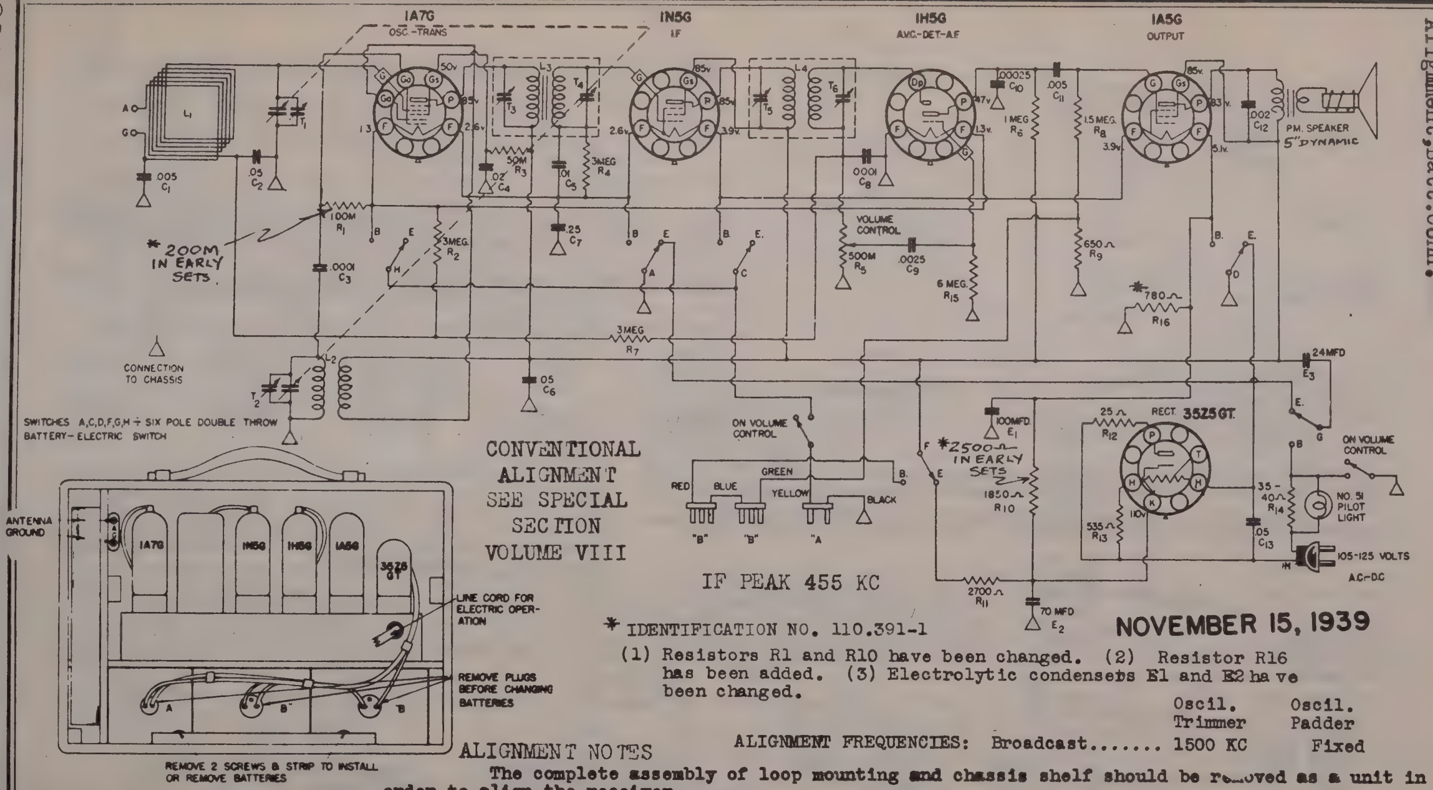
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1610 kc	1400 kc	600 kc

FREQUENCY RANGE:
Broadcast . . . . .540-1610 kc

MODEL 6274
Ch.110.391,110.391-1
Schematic,Voltage
Aligmment,Batt.Conn.

SEARS, ROEBUCK & CO.



TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS VOLTAGES AT INDICATED SOCKET PRONGS ARE MEASURED TO CHASSIS WITH THE SWITCH IN THE ELECTRIC POSITION

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

IF PEAK 455 KC

NOVEMBER 15, 1939

* IDENTIFICATION NO. 110.391-1

(1) Resistors R1 and R10 have been changed. (2) Resistor R16 has been added. (3) Electrolytic condensers E1 and E2 have been changed.

		Oscil. Trimmer	Oscil. Padder
ALIGNMENT FREQUENCIES:	Broadcast.......	1500 KC	Fixed

FREQUENCY RANGE:

Broadcast .... 540-1730 KC

POWER OUTPUT:

ALIGNMENT NOTES

The complete assembly of loop mounting and chassis shelf should be removed as a unit in order to align the receiver.

The batteries should be in the proper position when aligning the receiver.

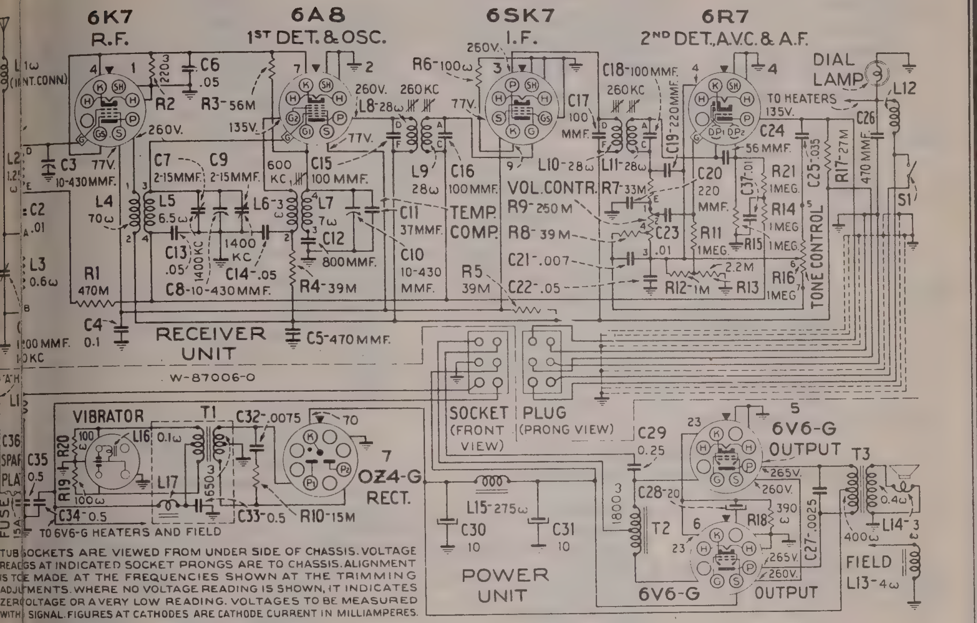
1500 KC Run a wire from the output terminal of the generator, having it come near the receiver However, no electrical connection is made between the signal generator and the receiver.

Alignement should be done with no connection made to the external antenna and ground terminals.

Always keep the output power from the generator at its lowest possible value to prevent the avc of the receiver from interfering

SEARS, ROEBUCK & CO.

MODEL 6301,Ch.126.211
Schematic ,Voltage,Dial
Assembly



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

FREC ENCY RANGE	550-1,550 kc

ALIG MENT FREQUENCIES:

-F	260 kc
\nt.	1,400 kc
)scl.	600 kc
)et.	1,400 kc

POW . OUTPUT:

'ype	Push-Pull Beam
'ndistorted	6 watts
/laximum	8 watts

POW . SUPPLY:

A"	6.3 volt Auto Storage Battery
B"	Non-Synchronous Vibrator
'urrent Drain	8.7 amps.
'use Protection	15 amperes

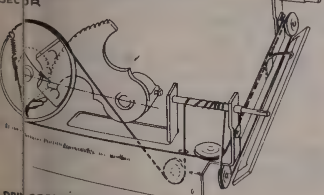
LOU PEAKER:

'ype	Electrodynamic
ize	8 inches
/.C. Impedance	3 ohms at 400 cycles
'ield Coil Resistance	4 ohms

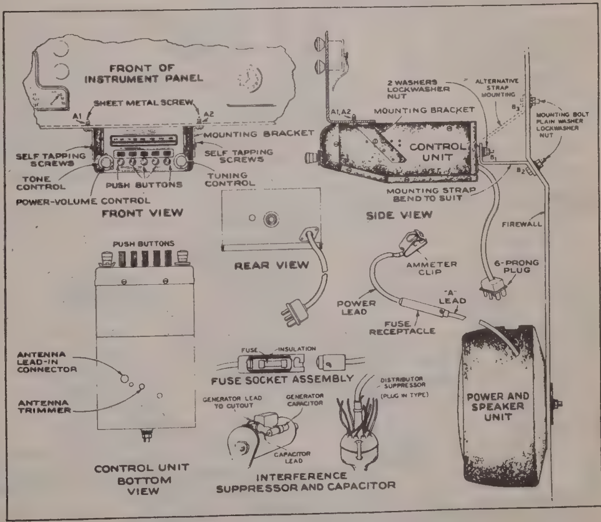
Man Tuning Dial:

A nual tuning knob is provided so that additional stations y be tuned in as desired. The manual tuning shaft is conned through a cord drive to a drum on the condenser shaft. his same cord drives the dial indicator by passing over a pu on the chassis. Figure shows the complete cord drive sembly and the correct number of turns which the cord uld be wrapped around the drive shaft and condenser drum

TUR FREE GEAR CLOCKWISE ONE OOTH TO OBTAIN SCISSOR ACT N BEFORE MESHING GEAR SEC OR



DRI CORD HOOKUP



Loudspeaker:

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

FOR OTHER DATA
SEE INDEX

MAY 3, 1939

MODEL 6301
Chassis Wiring, Socket
Trimmers

SEARS, ROEBUCK & CO.

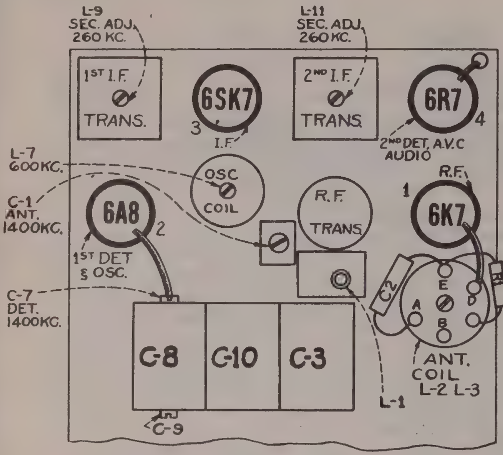


FIG. 1 CONTROL UNIT
TUBE, TRIMMER AND PARTS LOCATION
BOTTOM VIEW

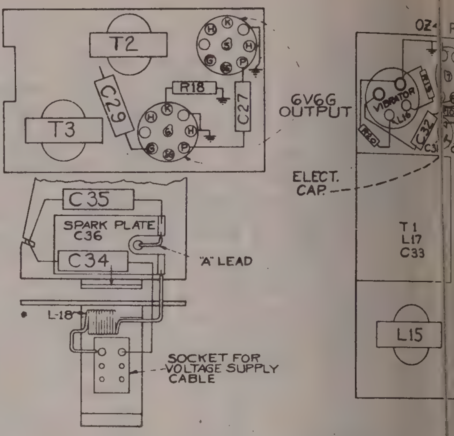


FIG. 2. POWER AND SPEAKER UNIT
TUBE AND PARTS LOCATION
EXPANDED VIEW

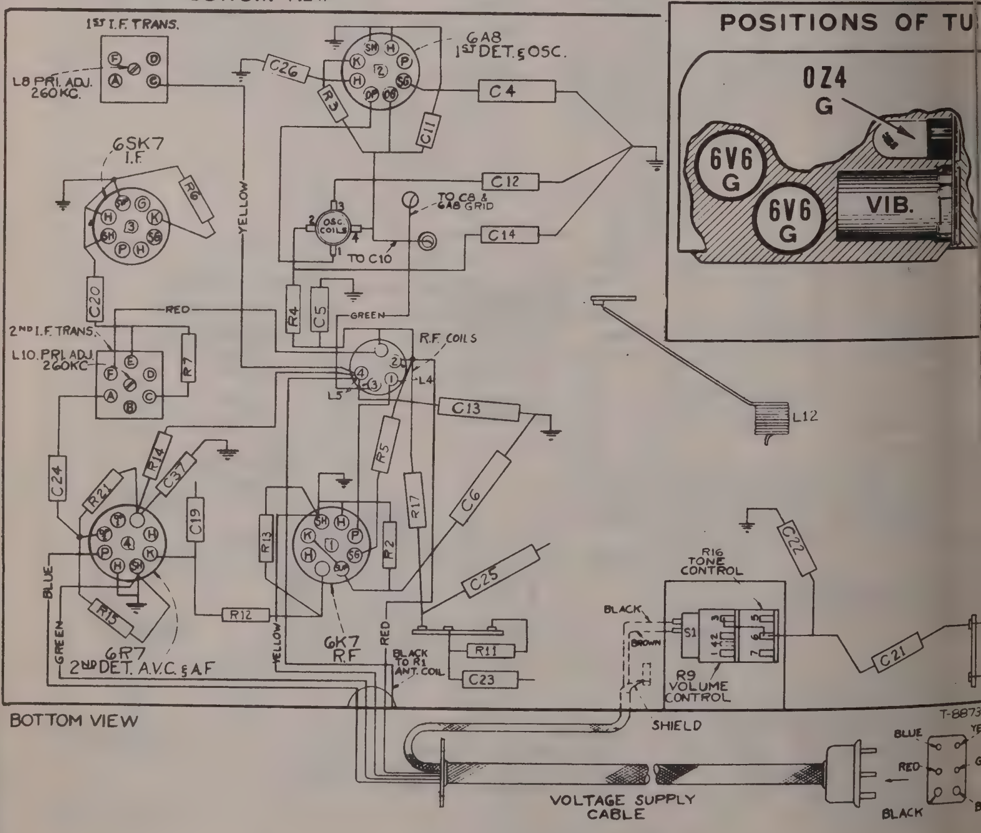


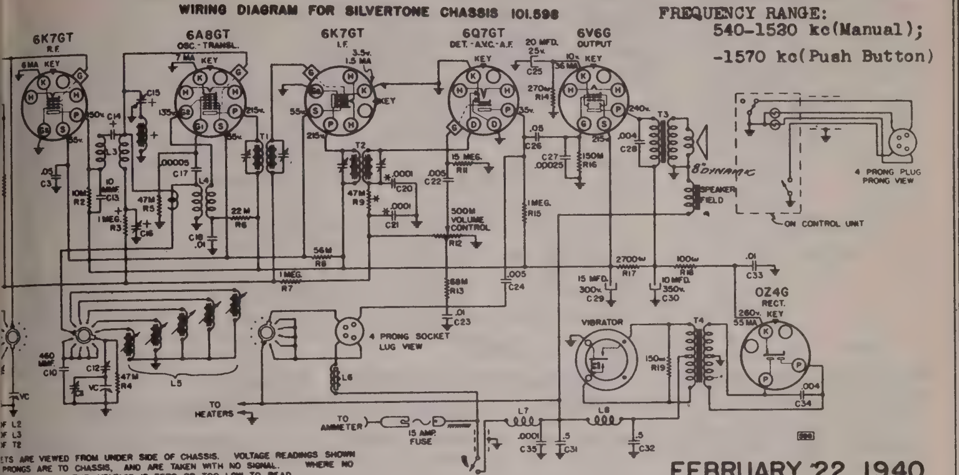
FIG. 3. CONTROL UNIT
TUBE, TRIMMER AND PARTS LOCATION — TOP VIEW

SEARS, ROEBUCK & CO.

MODEL 6302,Ch.101.598
Schematic,Voltage,Chassis
Socket,Trimmers,Alignment

FREQUENCY RANGE:
540-1530 kc(Manual);
-1570 kc(Push Button)

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.598



E S TS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN SOCK PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO DING GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

BAT Y = 6. VOLTS CURRENT DRAIN = 7.0 AMPERES

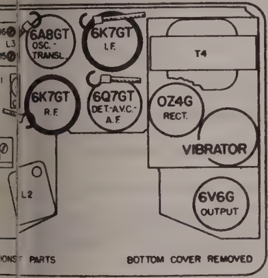
FEBRUARY 22, 1940

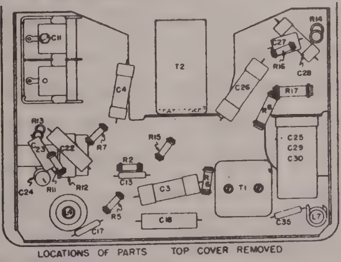
IF PEAK 455 KC

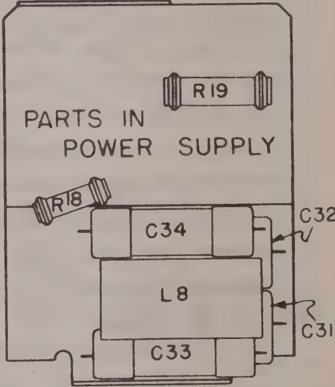
TERMEDIATE FREQUENCY
455 kc

POWER OUTPUT:

Type	Pentode
Undistorted . .	3.3 watts
Maximum	6 watts







LI NARY:

ALIGNMENT PROCEDURE

ou meter connections Across loud speaker voice coil   Position of Volume Control . Fully on
ou meter reading to indicate 1 watt . . 0.79 volts   Position of Tone Control . . Brilliant

ITON OF RIALE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS FOR 1 W. OUTPUT
Cl ed	455 kc	.1 mfd.	RF Grid	T3,T1	IF	--
Cl ed	455 kc	.1 mfd.	RF Grid	C16*	IF Wave Trap	--
Op	1530 kc	**	Ant. Conn.	C11	Oscillator	--
Op	3430 kc	**	Ant. Conn.	C15*	Image Rejector	--
Cl ed	540 kc	**	Ant. Conn.	C12	Padder	10
Op	1530 kc	**	Ant. Conn.	C11	Oscillator	10
14 kc	1400 kc	**	Ant. Conn.	C1	Antenna	10
6 kc(rock)	600 kc	**	Ant. Conn.	C12	Padder	10

he receiver must be in its case during alignment (but the covers will be removed).

The signal generator should be adjusted for high output and the trimmer should be ad-st for minimum response.

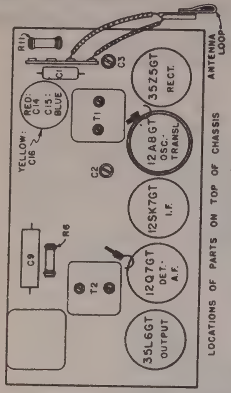
* The dummy antenna will consist of a 40 mmfd. condenser connected in series between e nerator and the receiver and another 40 mmfd. condenser connected from the receiver te a connection to the chassis.

he alignment procedure should be repeated in the original order, step by step, to insure ea r accuracy.

lways keep the output power from the generator at its lowest possible value to prevent e C of the receiver from interfering with accurate alignment, except as noted by (*) above.

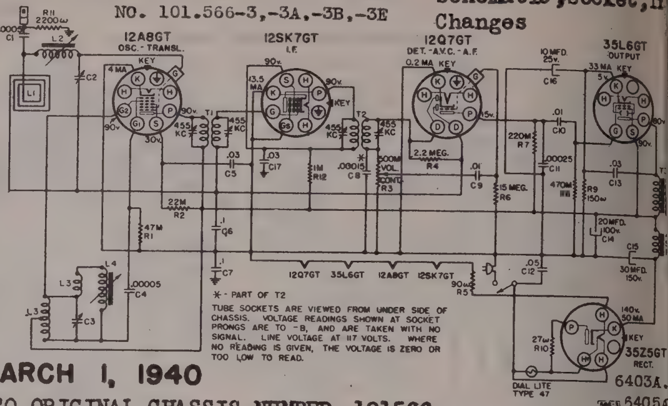
MODEL 6302,Ch.101.598
Tuner Data

MODELS 6403A to 64
Ch.101.566-3,-3A,-
Schematic ,Socket,T
Changes



SEARS, ROEBUCK & CO.

NO. 101.566-3,-3A,-3B,-3E



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MARCH 1, 1940

FOR OTHER DATA REFER TO ORIGINAL CHASSIS,NUMBER 101566.

SUBJECT: ADDITION OF SUFFIX NUMBER -3 TO CHASSIS IDENTIFICATION NUMBER 101.566:

Chassis identified by the addition of suffix number -3 use a 12SK7GT tube instead of 12K7GT. The revised schematic and top of chassis illustration are shown in this supplem Changes in the parts :-

1012842407 oscillator padder and trimmer coil L3, retail price 34¢, replaces 101282093

1012042405 20 mfd.,100 volt; 30 mfd.,150 volt; 10 mfd., 25 volt electrolytic condenser, C14, C15, C16, retail price 59¢, replaces 1012030935.

A .03 mfd., 200 volt condenser, C17, retail price 7¢, is added.

A 1M ohm, 1/10 watt resistor, R12, retail price 15¢, is added.

1013342406 IF input transformer, retail price 60¢, replaces 10133209091.

1013542435 IF output transformer, retail price 60¢, replaces 1013520910.

1012842409 loop, retail price 55¢, is used for all the bakelite cabinet models.

1012843465 loop, retail price 69¢, is used for all the wood cabinet models except 101.56

10138411422 loop and cover assembly, retail price 76¢, is used for 101.566E assembly on

FOR ALIGNMENT
SEE INDEX

MATCHING THE ANTENNA: *MODEL 6302 Ch. 101.598.*

Before proceeding with this adjustment the receiver should be left on for about 15 minu to warm up.

An adjusting screw, accessible to a screw driver through a hole in the bottom cover the case, is provided to match the receiver to the car antenna. With the receiver adjus for "DIAL" tuning, use the Station Selector knob to tune in a very weak station at about 1 kilocycles, with the volume control fully on. Then turn the adjusting screw to the point fording maximum volume.

THE PUSH BUTTON TUNING MECHANISM:

Preselection of push button tuned stations is accomplished by settings of the iron co in the oscillator coils and settings of the trimmer condensers across the antenna coil. proper coils are selected by a switch which is rotated one step at a time by means o solenoid, controlled by the tuning push button. Pushing the button also mechanically rota the station call letter drum.

Each button can be set only to a station within a certain frequency range as follows:
#1 540 to 930 kc #2 630 to 1070 kc #3 690 to 1170 kc #4 850 to 1450 kc #5 930 to 1570

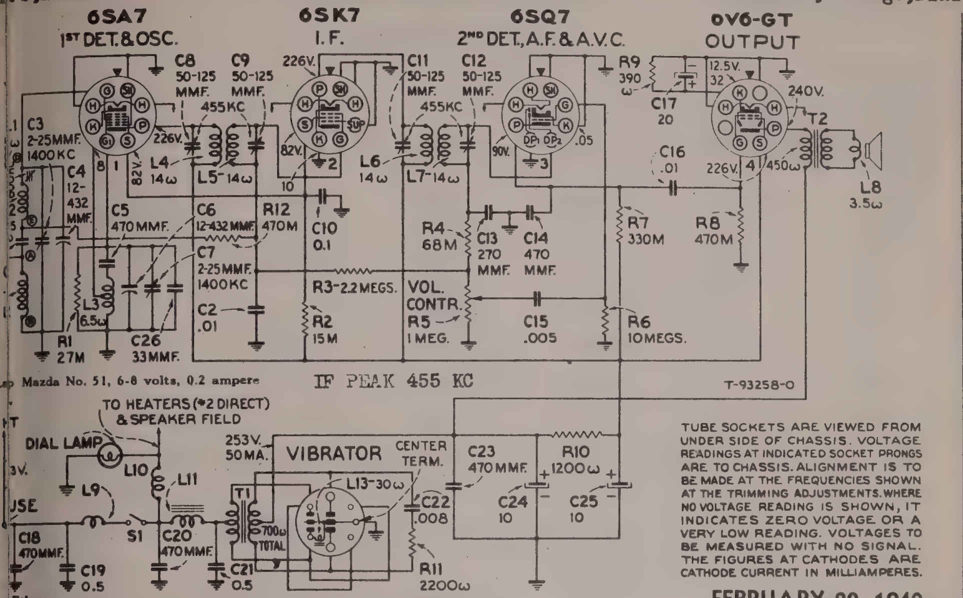
To set up the mechanism, insert the call letter tabs in their proper frequency order the call letter drum. The drum is accessible by removing the snap-in button at the top the push button unit before mounting the unit. One of the positions is for manual tuni When this position is reached, the manual tuning dial will become illuminated and the ceiver can be tuned manually.

Stations are set up by removing the front grille of the receiver, exposing the sta tuning screws. The adjusting screws are labeled. The OSC. screw must be adjusted fi then the ANT. screw. Then repeat the two adjustments.

TO SYNCHRONIZE THE MECHANISM, PUSH THE TUNING BUTTON UNTIL THE MANUAL TUNING DIAL COMES ILLUMINATED. REMOVE THE PUSH BUTTON CABLE FROM ITS SOCKET IN THE SIDE OF THE RECE CASE AND THEN PUSH THE BUTTON UNTIL THE "DIAL" TAB COMES INTO VIEW. THEN REINSERT THE CA PLUG.

Under certain conditions the mechanism may fall out of synchronism if the button is pushed all the way in and completely released when operating it. The user should be structed accordingly.

SEARS, ROEBUCK & CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. THE FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

Frequency Range 550-1,550 kc

FEBRUARY 20, 1940

Power Supply

"A"	6.3 volt Auto Storage Battery
"B"	Synchronous Vibrator
Current Drain	5.8 amps.
Fuse Protection	15 amperes

Power Output

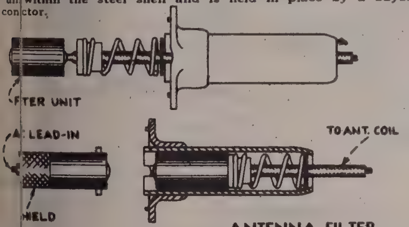
Type	Beam Power
Undistorted	2.0 watts
Maximum	4.0 watts

Loudspeaker

Type	Electrodynamic
Size	4-inch
V.C. Impedance	4 ohms at 400 cycles
Field Coil Resistance	4 ohms

enn Filter:

filte s included in the antenna circuit. Being completely shielded, even radiating ignition interference within the set. It also reduces poss lity of picking up vibrator interference. As illustrated, the uni is mounted inside a steel shell which in turn is welded to chas s. The shielded antenna lead-in makes contact with the uni within the steel shell and is held in place by a bayonet con ctor.



ANTENNA FILTER

ng iel:

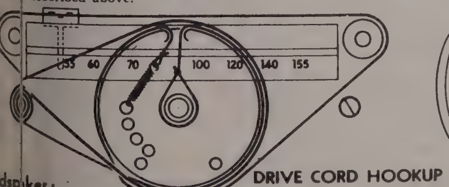
e tu ng shaft is connected through a cord drive to a drum on conc ser shaft. This same cord drives the dial indicator by ng er pulleys on the chassis. The complete cord drive assembly the rrect number of turns which the cord should be wrapped nd t drive shaft and condenser drum is shown in the "Drive Ho up" illustration.

enn Circuit:

s ve important that these instructions be followed when installing recei r.

e a nna circuit is designed to work with an antenna having a cap ity including the shielded lead-in not to exceed 100 mmf. a a nna having a larger capacity is to be used, it will be sar o add a capacitor in series with the lead from the antenna L- o the antenna coil terminal ("A").

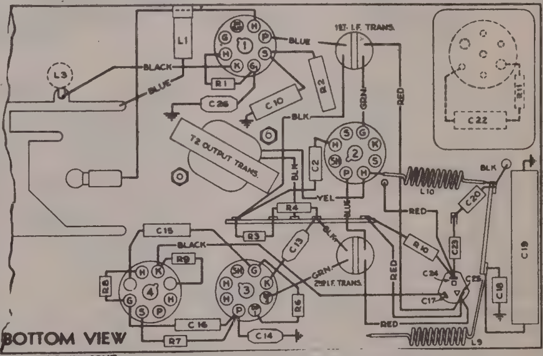
ter i tallation and with antenna connected, tune in a weak station 1,4 kc and adjust compensator trimmer C-3 for maximum l ou ut. This trimmer is accessible by removing plug button (see rati) on side of receiver. If a maximum (peak) signal output ot b obtained in the range of the antenna trimmer, the effective city hould be checked and compensated for by varying series city described above.

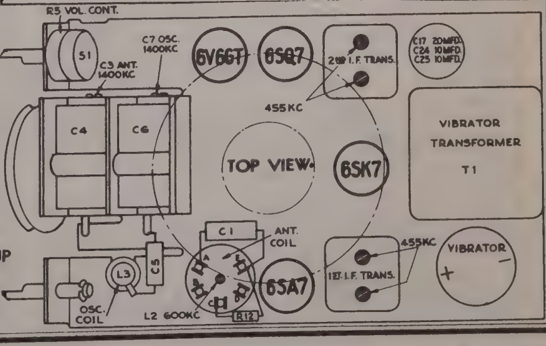


DRIVE CORD HOOKUP

dsp ker:

e l speaker cone may be centered in the usual manner with ce loid or paper feelers after gently cutting away the front cov A new cover should be cemented in place upon completion e a stment.





MODEL 6303,Ch.126.223
Alignment,Noise Notes

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections .... Across speaker voi coil
Output meter readings to indicate 1 watt .... 2 olts
Generator ground lead connections .... To c ssis
Dummy antenna value to be in series with generator output .... See chart low
Connection of generator output lead .... See chart low
Generator modulation .... 30%, 400 cles
Position of Volume Control .... Fully cloc rise

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connections	Adjustment Symbol	Circuit Adjusted	Approx. Microvolt
No Signal 550-750 kc	455	.01 mfd.	6SK7 Grid (No. 4 pin)	C11, C12	2nd I.F Trans.	2,400
No Signal 550-750 kc	455	.01 mfd.	6SA7 Grid (No. 8 pin)	C8, C9	1st I.F. Trans.	55
600 kc Signal	600 kc	100 mmfd.*	Antenna Connector	L2	Ant.	7
1,400 kc	1,400 kc	100 mmfd.*	Antenna Connector	C7 C3	Osc. Ant.	2
600 kc Signal	600 kc	100 mmfd.*	Antenna Connector	L2	Ant.	7
1,400 kc Signal	1,400 kc	100 mmfd.*	Antenna Connector	C3	Ant.**	2

* Make the generator connection through a 100 mmfd. (.0001) capacity inserted at the antenna connector of the receiver. The lead fror he signal generator to the 100 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connec .

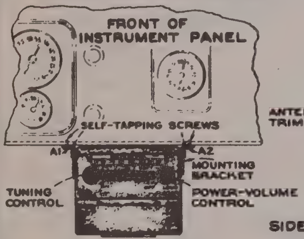
** **Final adjustment of C3 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit".**

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator ite lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.

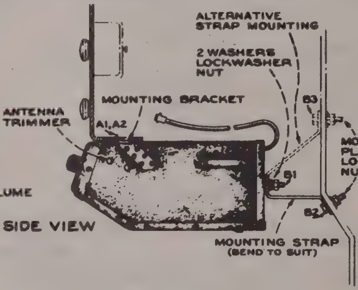
Alignment adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular frequency should be used.

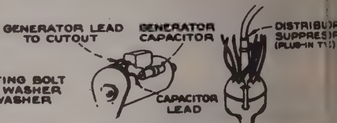
Values shown under "Microvolts" are only approximate.



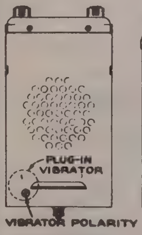
FRONT VIEW



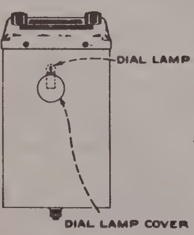
SIDE VIEW



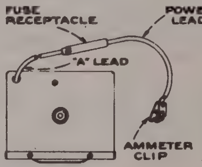
INTERFERENCE SUPPRESSOR AND CAPACITOR



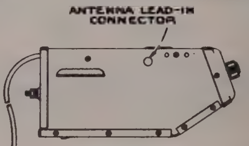
BOTTOM VIEW



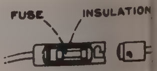
TOP VIEW



REAR VIEW



SIDE VIEW



FUSE SOCKET ASSEMBL

Noise Elimination:

The presence of noise is generally due to the high intensity of electrical disturbances from the car ignition system in relation to strength of desired station. The reduction of such noise should be carried out methodically by: (1) Increasing effectiveness of the antenna and providing for protection against stray pickup; (2) subduing the interference at its source; and (3) installation of filter devices to prevent transmission of interference into the receiver circuits.

Antenna—Should be located well away from engine compartment to avoid ignition disturbance, and as far as possible from front wheels to eliminate "wheel static." Lead-in should be completely shielded and shield grounded to frame of car at as many points as possible. It is very essential that the antenna be electrically "matched" to the receiver input—this is accomplished by adjustment of the antenna trimmer and the operations explained under "Antenna Circuit."

Ignition—Radio frequency interference is created in the secondary and primary ignition circuits, usually at each point where a repeating contact, or spark, is made. The most prominent sources on the average car are: (a) Distributor—add the suppressor-resistor in the center or common high-voltage lead; also have points cleaned and adjusted, if necessary; (b) Generator—connect an 0.5 mfd. shielded capacitor directly across generator output; also see that commutator is smooth and brushes properly seated for minimum sparking; (c) Gasoline Gauge—on gauges having an electrical contact, an 0.5 mfd. shielded capacitor may be required between the terminal and car frame; (d) Temperature Gauge—where a contacting device is used, interference can be eliminated with an 0.5 mfd. capacitor connected between the circ and car frame; (e) Spark Plugs—suppressors in leads to spark plu may possibly be required in extreme cases of interference, on older ca and in localities where signals are very weak; see that spark plugs properly adjusted and are not leaky; (f) Ammeter—the supply for t receiver is usually taken from this point; a 0.5 mfd. capacitor from t "hot" lead will prevent passage of interference into the set over t circuit; (g) Dome Light—wiring to the dome light should be shielde and an 0.5 mfd. capacitor attached between the circuit and car fran preferably at the point where lead enters the corner post; (h) Wiring primary and secondary ignition wiring should be physically separate possible points of poor insulation should be checked, and all connectio must be secure.

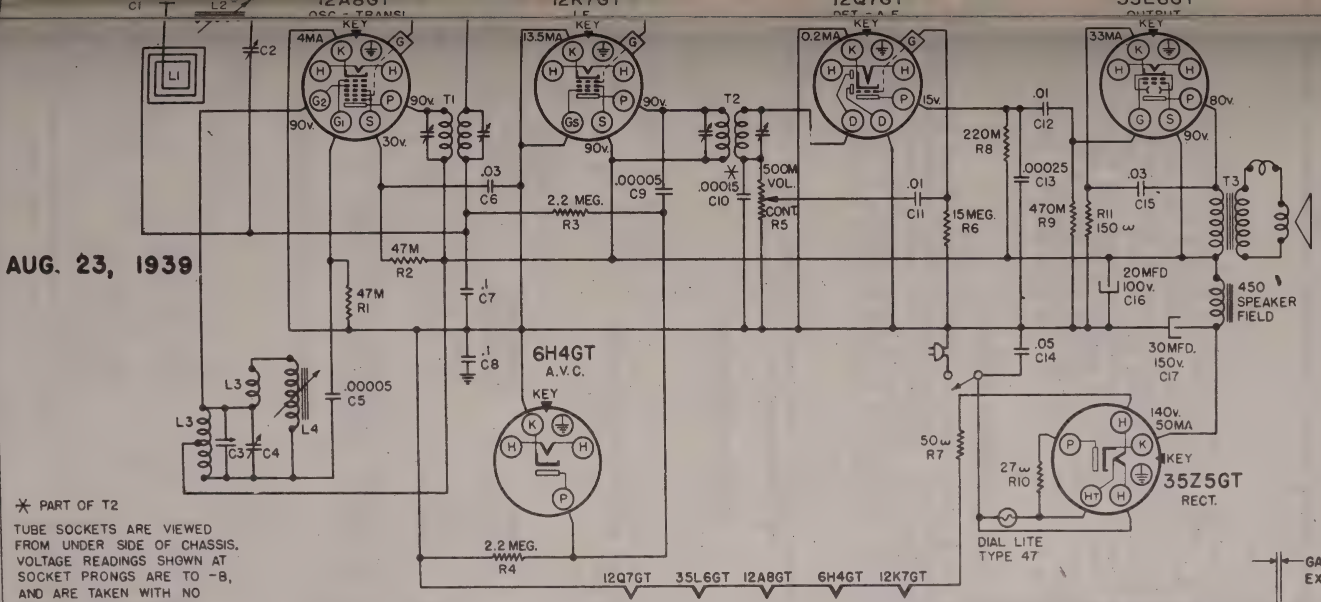
Car Chassis Bonds—Intermittent electrical connection betwe members of the car chassis, caused by vibration, will cause noise inte ference. Flexible bonding connections to the frame will correct th condition. The most sources are: (a) transmission case: (b) muffle (c) steering column; (d) cylinder head; (e) dash controls; (f) re springs; (g) brake cables; (h) hood cover; (i) receiver case.

Wheel Static—Interference from this source generally originates the front wheels, and is related to road surface composition, an atmospheric conditions. Spring devices are available for attachment the wheels for making a permanent connection between the hub an axle; these should be installed where required. The wheel bearing should be checked for proper adjustment. Patches in tires will fr quently cause wheel static; exchange front and rear wheels. Be su antenna is well separated from wheels of car.

SEARS, ROEBUCK & CO.

MODEL 6320,Ch.101.585
Schematic,Voltage,Dial

AUG. 23, 1939



✱ PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:
All models available . . . . 105-125 volts, AC-DC, 30 watts

FREQUENCY RANGE . . . . .540-1630 kc **ALIGNMENT FREQUENCIES:** . . .Osc. - 540 kc;
Transl. - 900 kc

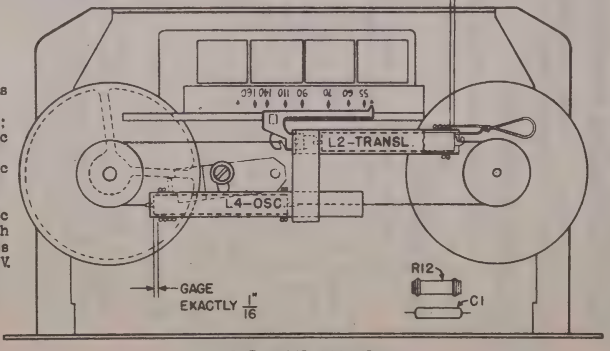
INTERMEDIATE FREQUENCY . . . . 455 kc

POWER OUTPUT:
Type . . . . .Beam Tube
Undistorted . . . . 0.8 watts
Maximum . . . . .1.25 watts

LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . 5 inch
Field coil resistance . . . . 450 ohms
Approx.field coil voltage drop. . 50 V.

OPERATING FEATURES:
Automatic Volume Control
AC-DC
Push Button Tuning (4 button)

CHASSIS FEATURES:
Number IF stages . . . . One
Permeability tuned
Built-in loop with provision for external antenna



CORE DRIVE ASSEMBLY

MODEL 6320
Chassis,Socket,Trimmers
Notes,Tuner,Alignment

SEARS. ROEBUCK & CO.

REMOVING THE CHASSIS FROM THE CABINET:

In addition to the two screws that hold the back of the chassis there is also a s
that holds the speaker frame to the cabinet.

DIAL LIGHT REPLACEMENT:

The dial light socket is attached to a bracket at the rear of the chassis, held with a
screw.

COIL REPLACEMENT:

No regard need be paid to the colors of paint spots on coils or cores. Coils may be replaced individually; however, cores must be replaced in pairs to secure proper matching and are furnished in pairs for service. To replace a coil, cut away the cement from the old coil and remove the coil. Insert the new coil in the bracket and position it so that, when the tuning knob is turned to its low frequency limit, the core will extend exactly 1/16" beyond the end of the coil winding. A gauge, easily made of a piece of wire as illustrated, should be used for determining this dimension. Similarly, when replacing cores, the coil positions must be checked to see that there is exactly 1/16" overlap of the core beyond the end of the coil winding with the tuning knob at the low frequency limit. This is true for both oscillator and translator cores and coils. New coils can be cemented to the bracket with Major's, Du Pont, or equivalent cement.

ELIMINATING HUM MODULATION WHEN USING AN EXTERNAL ANTENNA:

As shown by the Schematic and by the Location of Parts diagram, there is a 2200 ohms
sistor, connected from the external antenna clip to chassis. This resistor prevents hum
lation when using an external antenna. If such hum is experienced, examine the chassi
see if this resistor has been incorporated. (The resistor is mounted alongside of the
antenna connection board as shown in the Location of Parts diagram. It was not incorpor
in early production.) If necessary, addition of the resistor will eliminate the complai

PUSH BUTTON TUNING:

Each button is set up by loosening the screw (under the call letter tab), tuning in
station, depressing the button and then tightening the screw.

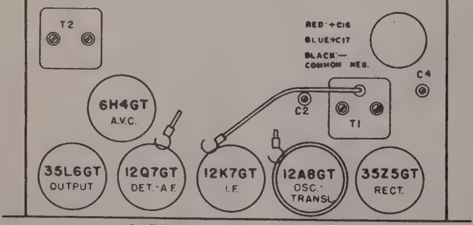
ALIGNMENT PROCEDURE

PRELIMINARY:

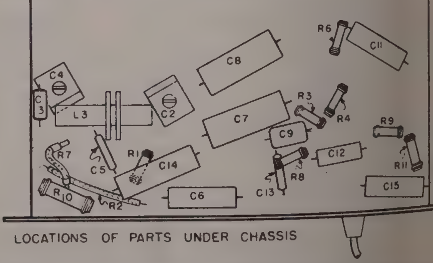
Output meter connection	Across loud speaker voice
Output meter to indicate 50 milliwatts	0.36
Dummy antenna value to be in series with generator output	See chart b
Connection of generator ground lead	To external gr
Position of Volume Control	Full

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIM FUNCT
550 kc	455 kc	.1 mfd.	12A8GT Grid	T2,T1	IF
540 kc	540 kc	.0002 mfd.	Ant. Clip	C4	Oscill
900 kc	900 kc	.0002 mfd.	Ant. Clip	C2	Transl

The alignment procedure should be repeated stage by stage, in the original order,
greatest accuracy. Always keep the output from the test oscillator at its lowest poss
value to make the AVC action of the receiver ineffective.



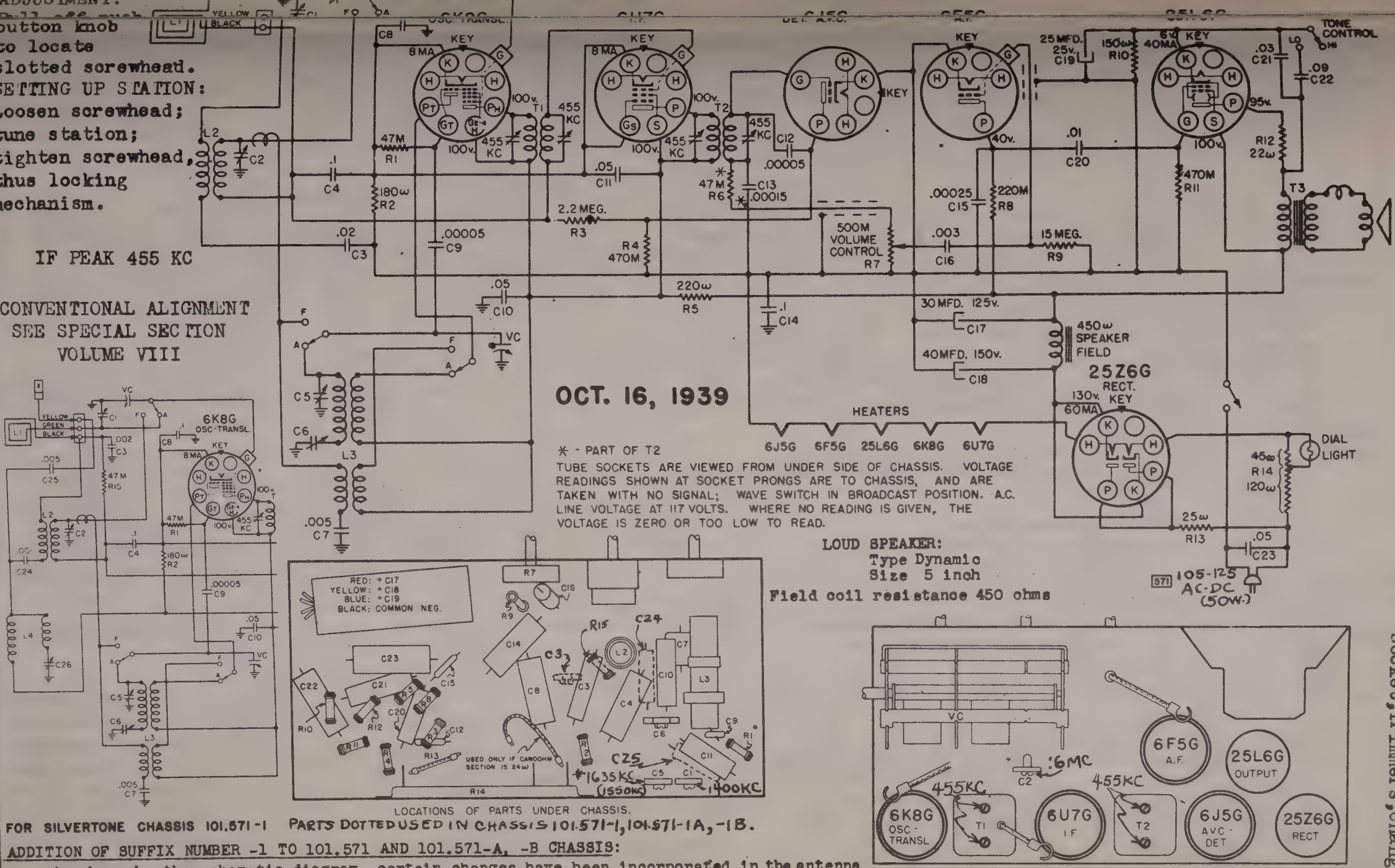
LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

SEARS, ROEBUCK & CO.

MODELS 6321,6322,6323,6421
Ch.101.571,101.571-1,-1A,-1B
Schematic,Voltage,Chassis
Socket,Trimmers,Changes



ADJUSTMENT:
Pull off push
button knob
to locate
slotted screwhead.
SETTING UP STATION:
Loosen screwhead;
tune station;
tighten screwhead,
thus locking
mechanism.

IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

OCT. 16, 1939

* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

LOUD SPEAKER:
Type Dynamic
Size 5 inch
Field coil resistance 450 ohms

LOCATIONS OF PARTS UNDER CHASSIS.

FOR SILVERTONE CHASSIS 101.571-1 PARTS DOTTED USED IN CHASSIS 101.571-1, 101.571-1A, -1B.

LOCATIONS OF PARTS ON TOP OF CHASSIS

ADDITION OF SUFFIX NUMBER -1 TO 101.571 AND 101.571-A, -B CHASSIS:

As shown by the schematic diagram, certain changes have been incorporated in the antenna circuit of this model, including the addition of an I.F. wave trap. Chassis incorporating the changes are identified by the addition of suffix number -1.

* The top frequency for adjusting the broadcast oscillator trimmer with the variable fully open becomes 1550 kc instead of the original 1635 kc.

POWER OUTPUT:

Type	Beam tube
Undistorted	1 watt
Maximum	1.8 watt

MODELS 6324,6424,Ch.101.570
6324,6424,6493,Ch.101.570-1A,
101.570-1B

SEARS, ROEBUCK & CO.

Schematic,Voltage,
Socket,Trimmers,Ch

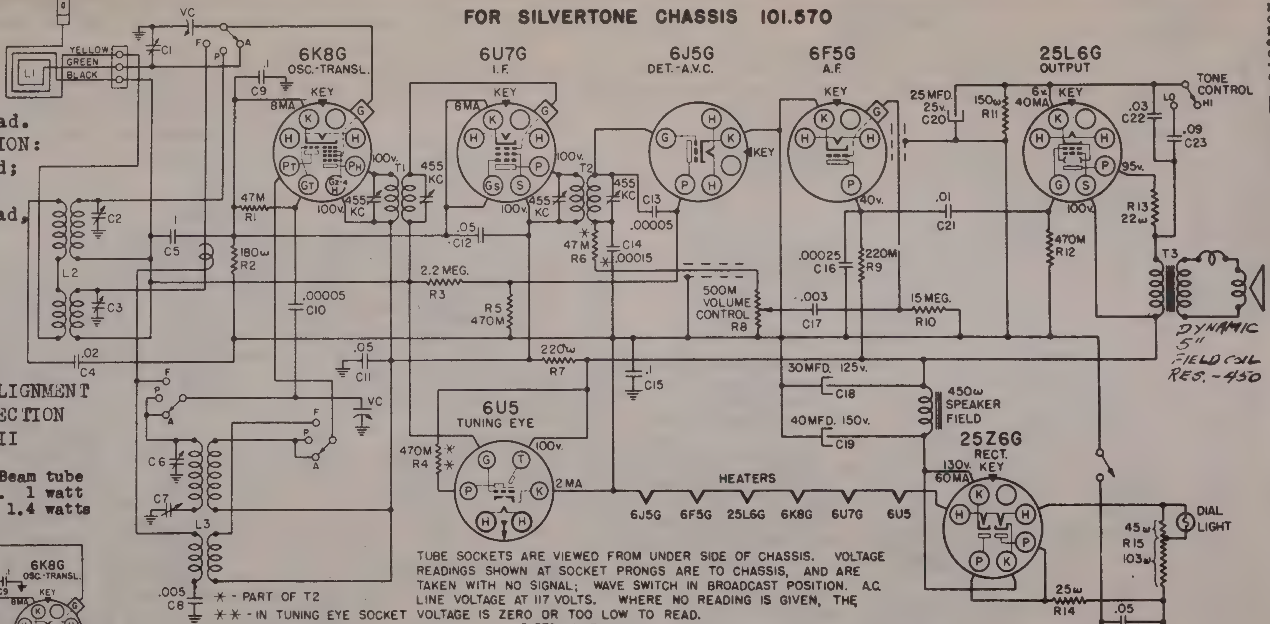
FOR SILVERTONE CHASSIS 101.570

PUSH-BUTTON ADJUSTMENT: Pull off push button knob to locate slotted screwhead.
SETTING UP STATION: Loosen screwhead; tune station; tighten screwhead, thus locking mechanism.

IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

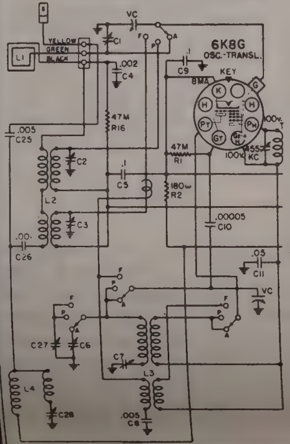
POWER OUTPUT:
Type . . . Beam tube
Undistorted . 1 watt
Maximum . . 1.4 watts

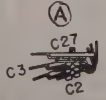


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. AC LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

PARTS DOTTED USED ON
101.570-1,-1A CHASSIS

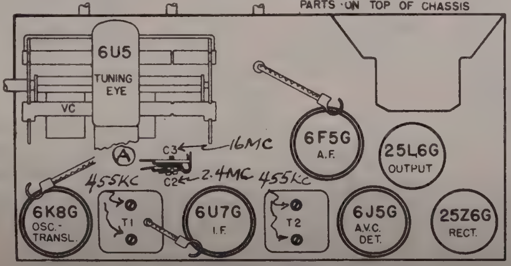
105-125V
570 AC-DC
50W



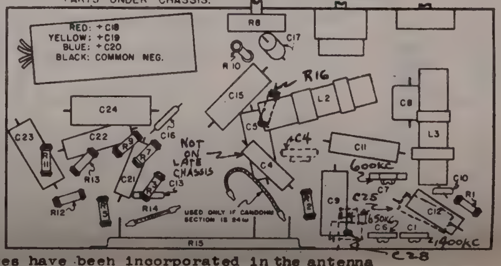


TRIMMERS
ON LATE
CHASSIS.
TRIM C27
AT
2550 KC.
SEE NOTE
MARKED *

PARTS ON TOP OF CHASSIS



PARTS UNDER CHASSIS.

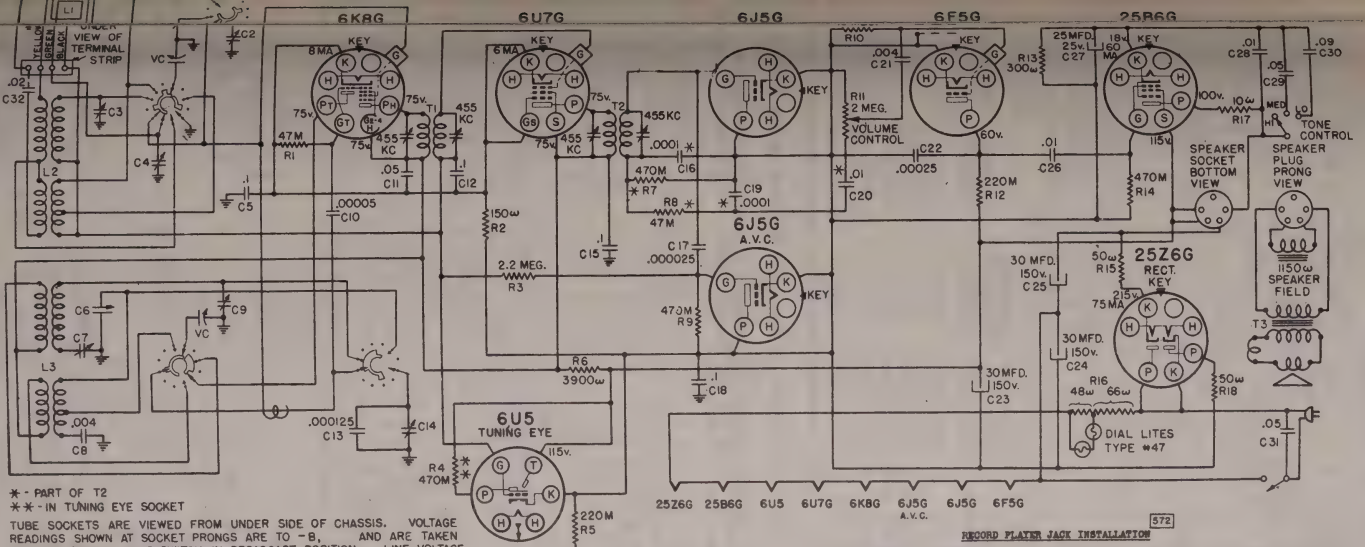


ADDITION OF SUFFIX NUMBER -1
TO 101.570 AND 101.570-A CHASSIS:

As shown by the schematic diagram, certain changes have been incorporated in the antenna circuit of this model, including the addition of an I.F. wave trap.

SEARS. ROEBUCK & CO.

MODELS 6325,6425
Ch. 101.572
Schematic,Voltage
Jack Installation



* - PART OF T2
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:
All models available . .105-125 v., 25-60 cycles AC: 60 watts

INTERMEDIATE FREQUENCY . . . . .455 kc

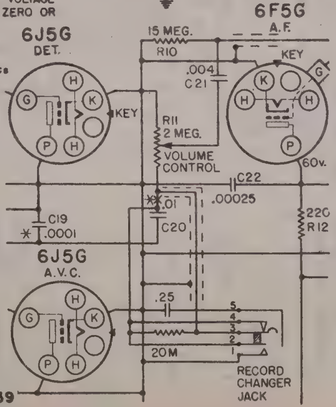
LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . 8 inch
Approx.field coil res. . . .1150 ohms
Approx.field coil voltage drop. . 95 v.

POWER OUTPUT:
Type . . . . Beam
Undistorted . . . . 1.8 watts
Maximum . . . . 2.9 watts

FREQUENCY RANGES:
Band "A" . . . . .545-1650 kc
Band "B" . . . . 1475-2525 kc
Band "C" . . . . 5.95-18.15 mc
Band "D" . . . . 9.4-9.85 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1600 kc	1400 kc	600 kc
None	2.4 mc	Fixed
None	15 mc	Fixed
9.55 mc	9.55 mc	Fixed



AUGUST 17, 1939

572

RECORD PLAYER JACK INSTALLATION

Catalog #5798 kit contains all of the parts necessary for installing a record player connection jack in this chassis.

There is a hole provided for the jack in the rear of the chassis. Mount the jack, using the two insulating washers, so that all parts of the jack are insulated from the chassis. The connections, shown in the schematic section, are as follows:

Remove the yellow lead that goes to the high side of the volume control and conneqt the lead instead to jack terminals #2 and #4.

Connect the .25 mfd. condenser from jack terminal #5 to B-.

Connect the 20M ohm resistor between terminals #3 and #4.

Connect the piece of shielded wire from jack terminal #3 to the high side of the volume control. Connect the end of the shield to the B- side of the volume control.

Connect jack terminal #1 to B- using the piece of push-back wire.

If hum is objectionable, the following operations will eliminate it:

The pickup connecting cord must be a two conductor shielded lead and the shield must be connected back to the receiver chassis. The other end of the shield must be connected to the record player volume control shell.

The pickup circuit must not be grounded or connected back to B- at any point external to the receiver. For example, in the Silvertone Model 6237 record player one side of the pickup circuit is connected to the tone arm. This connection must be eliminated by unfastening and taping up the lug that connects the lead to the tone arm. The tone arm itself must be grounded to the receiver chassis.

Both positions of the receiver line cord plug and of the record player line cord plug in their receptacles should be tried. Usually one position will give considerably less hum.

In cabinet styles fitted with a back cover, it will be necessary to cut away a portion of the cover to permit convenient insertion of the plug in the jack.

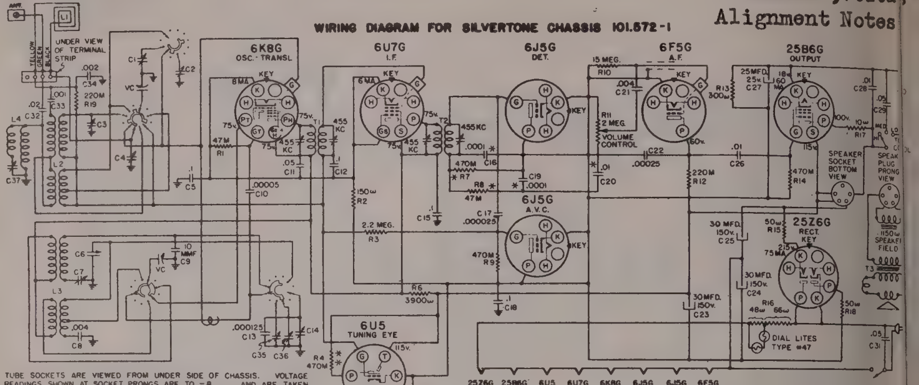
Usually better tone will be had by leaving the receiver volume control set near maximum and controlling the volume by means of the control on the record player.

MODELS 6325,6425
Ch.101.572
Alignment,Chassis

SEARS, ROEBUCK & CO.

Socket,Trimmers
Chassis 101.572
Schematic,Volta
Alignment Notes

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.572-1



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO −B, AND ARE TAKEN WITH NO SIGNAL, WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMA MICROVOL
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	1600 kc	1600 kc	.0002 mfd.	Ant. Term.	C9	Oscillator	200
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C4	Translator	35
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	130
"B"	2.4 mc(rock)	2.4 mc	400 ohms	Ant. Term.	C3	Translator	220
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C1	Translator	85
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C14*,C2	Osc.,Transl.	160

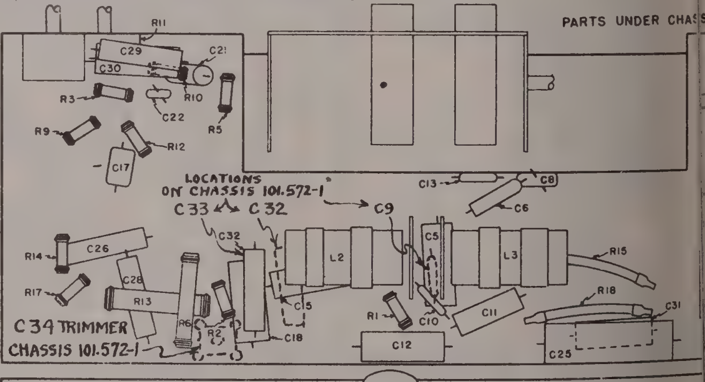
Where indicated by the word, "Rock", the variable should be rocked back and forth degree or two while making the adjustment.

* If two peaks can be had, the correct adjustment is with the trimmer screw further ou The other peak is the image.

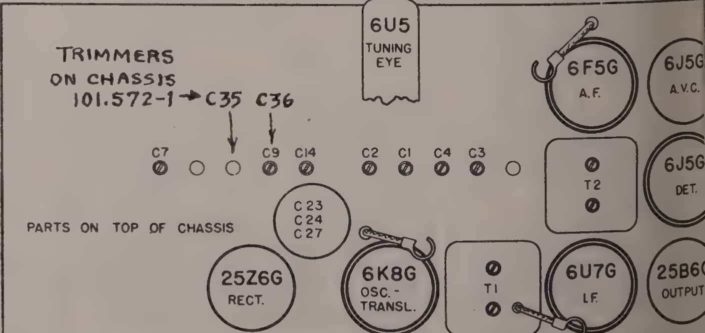
The alignment procedure should be repeated stage by stage, in the original order, fo greatest accuracy. Always keep the output from the test oscillator at its lowest possibl value to make the AVC action of the receiver ineffective.

PUSH-BUTTON ADJUSTMENT: Pull off push-button knob to locate slotted screwhead.

SETTING UP STATION: Loosen screwhead; tune station; tighten screwhead, thus locking mechanism.



CHASSIS 101.572-1 Top frequency, variable completely open, is 1530 kc. Has wave-trap adjustment C37, to be made with variable at 600 kc and signal at 455 kc. Make this adjustment for min. output reading.



OCT. 2, 1939

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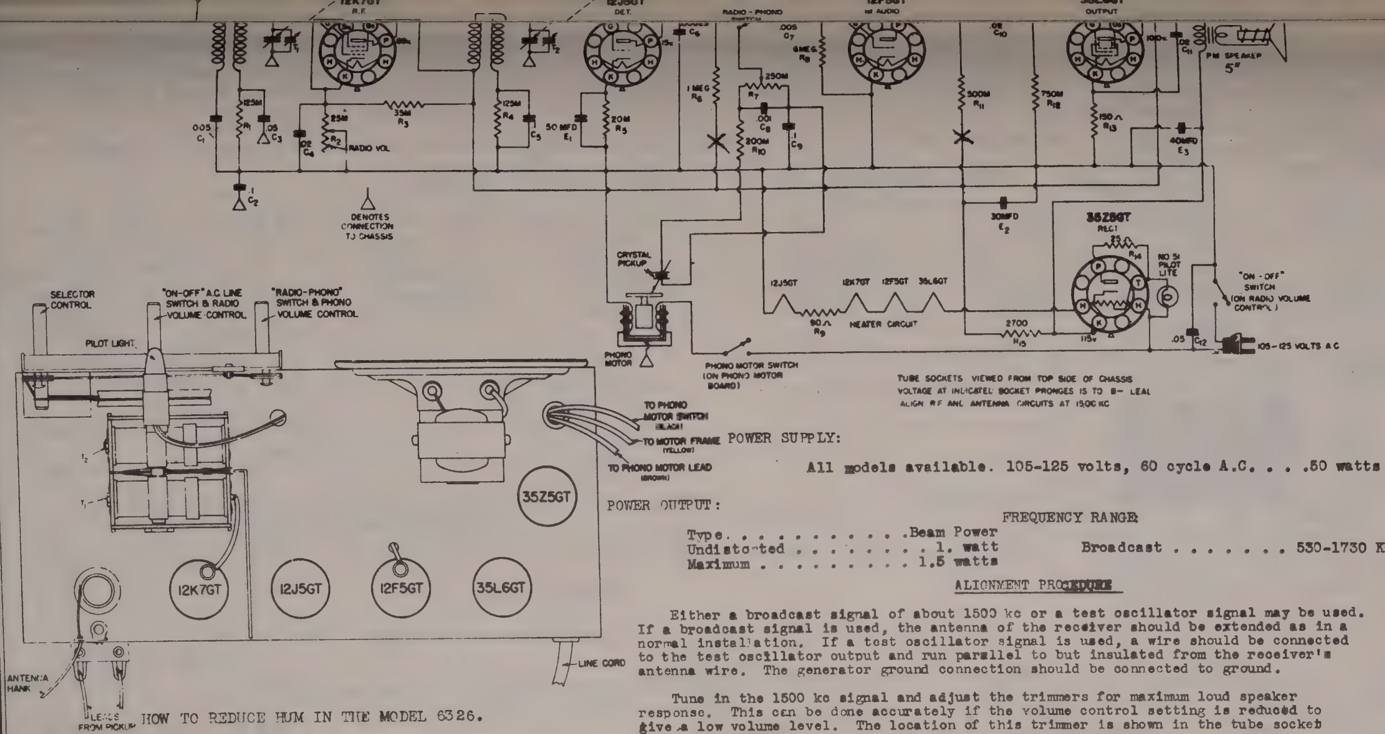
SEARS, ROEBUCK & CO.

MODEL 6326,Ch.110.987
Schematic,Voltage
Alignment,Trimmers
Socket,Notes



POWER SUPPLY:

All models available. 105-125 volts, 60 cycle A.C. . . .50 watts

POWER OUTPUT:

Type. . . . . .Beam Power
Undistorted . . . . 1. watt
Maximum . . . . 1.5 watts

FREQUENCY RANGE

Broadcast . . . . 530-1730 KC

ALIGNMENT PROCEDURE

Either a broadcast signal of about 1500 kc or a test oscillator signal may be used. If a broadcast signal is used, the antenna of the receiver should be extended as in a normal installation. If a test oscillator signal is used, a wire should be connected to the test oscillator output and run parallel to but insulated from the receiver's antenna wire. The generator ground connection should be connected to ground.

Tune in the 1500 kc signal and adjust the trimmers for maximum loud speaker response. This can be done accurately if the volume control setting is reduced to give a low volume level. The location of this trimmer is shown in the tube socket location diagram.

HOW TO REDUCE HUM IN THE MODEL 6326.

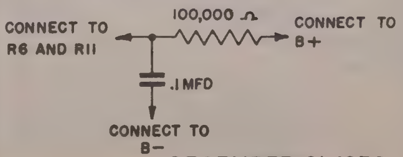
In cases where excessive hum is encountered, it may be reduced by either one of the following methods.

1. In many cases, heater to cathode leakage in the 12J5GT or 12F5GT tubes may be causing excessive hum. If replacing the faulty tubes does not materially reduce the hum, it will be necessary to proceed as follows.

2. Disconnect the plate resistors (R6 and R11) of the 12J5GT and the 12F5GT tubes from the plate supply at the points marked "x" in the circuit diagram and connect them to the filter network as shown in the filter network diagram. The filter network consists of a .1 mfd 400 volt paper condenser and a 100,000 ohm 1/4 watt resistor.

A number of these sets were sent to the field without a shield on the 12F5GT tube. One should be on this tube in order to reduce the hum level. Currently produced models have this shield installed at the factory.

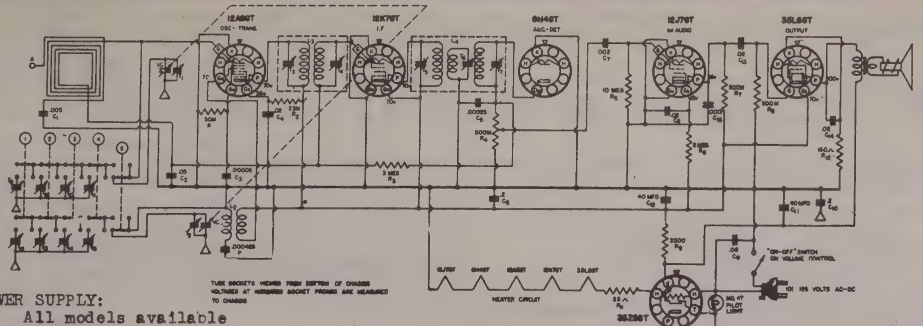
FILTER NETWORK

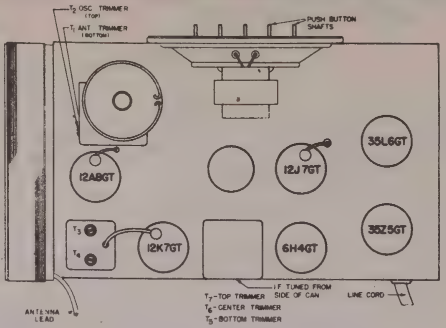


DECEMBER 21,1939

MODEL 6327,Ch.110.990
Schematic,Voltage,Socket
Trimmers,Alignment

SEARS, ROEBUCK & CO.





POWER SUPPLY:
All models available
. . . . 110-125 volts, 25-60 cycle AC or DC, 30 watts

IF PEAK 455 KC

ALIGNMENT PROCEDURE

Output meter connections. . . . . Across primary output transformer

Output meter reading to indicate 0.050 watt
for Weston type 571 output meter on 15 volt scale . . . . 10.5 volts

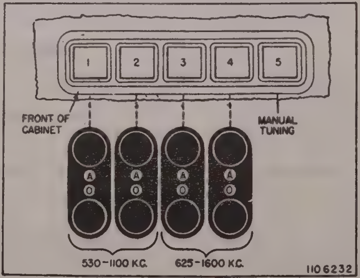
Dummy antenna value in series with generator output. . . . . 100 mmfds.

Connection of generator ground. . . . . .B- Bus

Generator modulation. . . . . .App. 30% @ 400 cycles

Position of volume control . . . . .Fully clockwise

PUSH BUTTON SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
Manual "IN"	**	455 kc	12K7GT, Grid	T6*,T5,T7 T6,T5,T7	I.F.
"	**	455 kc	12A8GT, Grid	T3,T4	I.F.
"	1500 kc	1500 kc	***	T2,T1	Osc., R.F.



TRIMMER
ADJUSTMENT CARD

FREQUENCY RANGE:

Broadcast. . .535-1700 KC

POWER OUTPUT
Type...........Beam Power
Undistorted...........1.0
Maximum...............1.5

LOUD SPEAKER:
Type...............Dynamic
Size.....................5"
Field.................P.M.

IMPORTANT ALIGNMENT NOTES

FOR TUNER SEE INDEX

It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

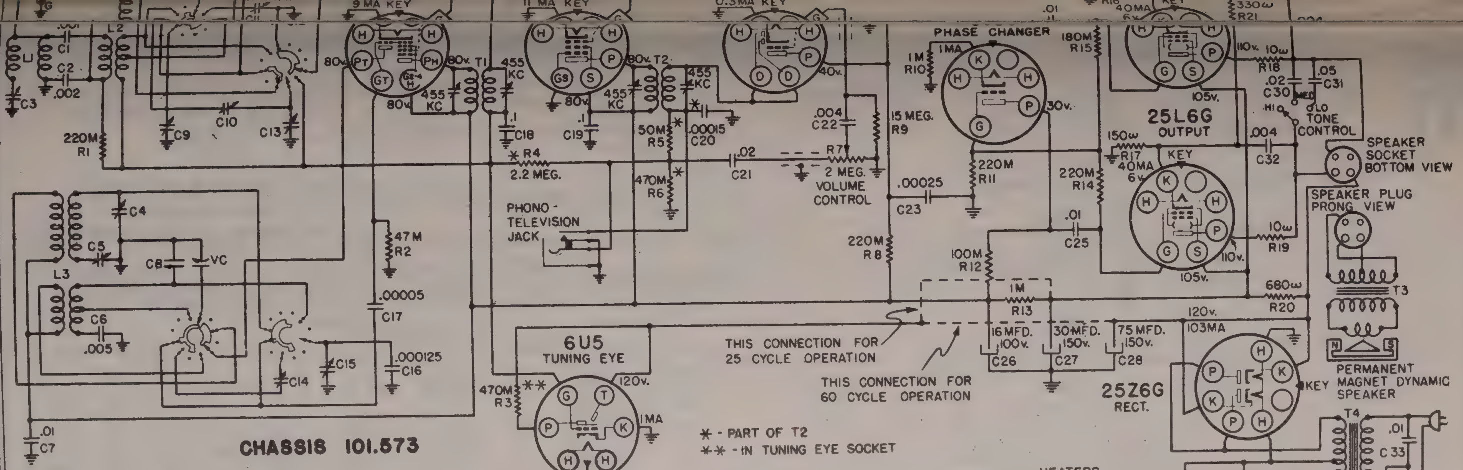
*First time T 5 is misaligned by loosening center screw one turn.

**Short oscillator section of variable condenser. Second I.F. alignment must be done

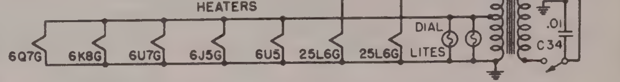
flat top tuning.

SEARS, ROEBUCK & CO.

MODELS 6335,6435,6490
6495,Ch.101.573
Schematic,Voltage,Tuner
MODEL 6490A,Ch.101.573-1,-1B
Change in Schematic



CHASSIS 101.573



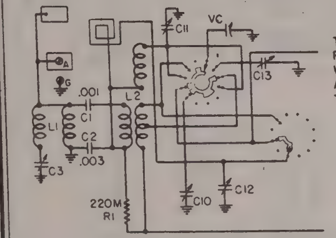
* - PART OF T2

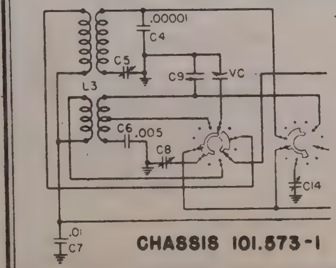
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO – B, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

573

JUNE 19, 1939





CHASSIS 101.573-1

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER SUPPLY:
All models available .105-125 v., 50-60 cycles AC; 65 watts
All models available .105-125 v., 25-60 cycles AC; 65 watts

POWER OUTPUT:
Type . . . . Push-pull beam
Undistorted . . . . 3 watts
Maximum . . . . 3.7 watts

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . .8 and 10 inch

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

MODELS 6335,6435,6490
6495,Ch.101.573;6490A
Ch.101.573-1, -1B
Alignment,Chassis

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.28 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . To external ground
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . At block to left of 550 kc calibration mark.

FOR CHASSIS 101.573-1

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	0002 mfd.	Ant. Term.	C3*	Wave Trap	--
"B"	2.6 mc	2.6 mc	400 ohms	Ant. Term.	C14	Oscillator	100
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C11	Translator	100
"A"	Fully open	1600 kc	.0002 mfd.	Ant. Term.	C8	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C12	Translator	40
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C5	Padder	40
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C13	Translator	15
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C15,C10	Osc.,Transl.	60

FOR CHASSIS 101.573

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	.0002 mfd.	Ant.Term.	C3*	Wave Trap	--
"A"	Fully open	1750 kc	.0002 mfd.	Ant.Term.	C4	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C12	Translator	40
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant.Term.	C5	Padder	40
"B"	2.3 mc	2.3 mc	400 ohms	Ant.Term.	C14,C10	Osc. Pad., Transl.Pad.	100
"B"	2.5 mc	2.5 mc	400 ohms	Ant.Term.	C13	Translator	100
"C"	15 mc(rock)	15 mc	400 ohms	Ant.Term.	C11	Translator	15
"D"	9.55 mc	9.55 mc	400 ohms	Ant,Term.	C15,C9	Osc.,Transl.	60

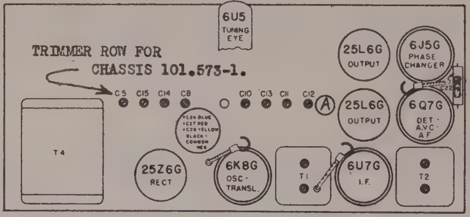
Repeat the C14, C10 and C13 adjustments until perfect alignment is obtained. This will require going back and forth over these adjustments several times.

IMPORTANT ALIGNMENT NOTES

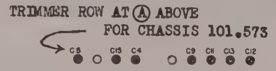
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc. C3 is mounted under chassis.

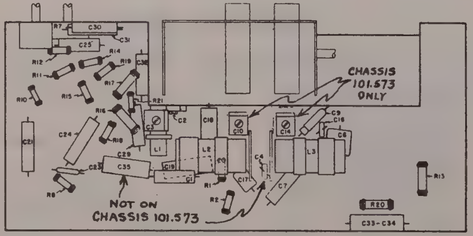
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

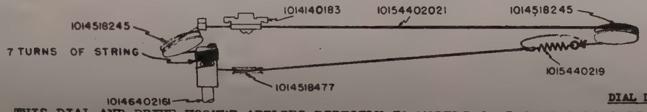


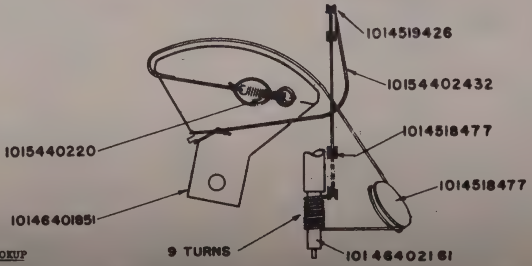
LOCATIONS OF PARTS ON TOP OF CHASSIS





LOCATIONS OF PARTS UNDER CHASSIS



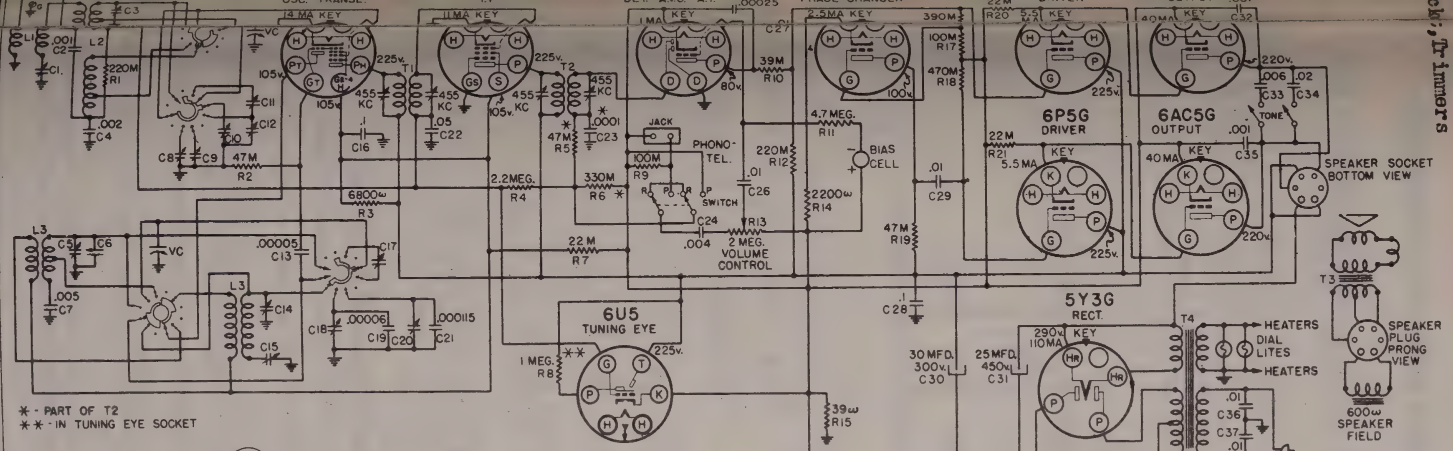


DIAL DRIVE HOOKUP

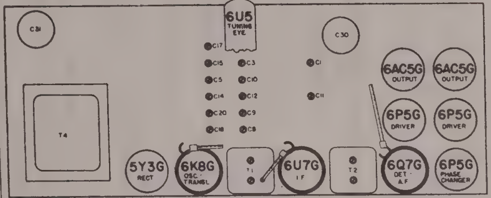
THIS DIAL AND DRIVE HOOKUP APPLIES DIRECTLY TO MODELS 6335,6435,6490,6495,CHASSIS 101.573; 6490A CHASSIS 101.573-1,-1B; 6359,6360,6361,6379, 6380,6381 CHASSIS 101.579; 6368 CHASSIS 101.582;6382 CHASSIS 101.594;Also to MODELS 6362,6363,6364 CHASSIS 101.581 EXCEPT THAT PART NO. 1014141219 REPLACES PART 101414183 SHOWN ABOVE. THE ABOVE ALSO APPLIES TO MODEL 6441 CHASSIS

SEARS, ROEBUCK & CO.

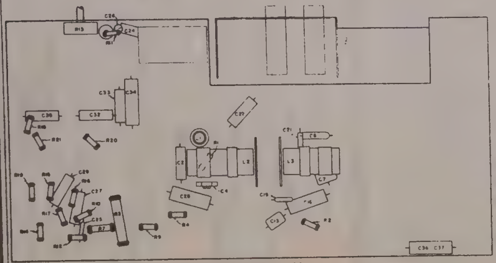
MODELS 6336,6436
Ch.101.574



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER SUPPLY:
All models available . . . . .105-125 volt AC; 25 and 50-60 cycle; 105 watts

LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . .10 inch
Approx. field coil res. . . .600 ohms
Approx. field coil voltage drop..65 v.

POWER OUTPUT:
Type . . . . .Push-pull direct coupling
Undistorted . . . . 4 watts
Maximum . . . . 7 watts

FOR ALIGNMENT
SEE INDEX

GENERAL INFORMATION & SERVICE HINTS

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

RECOMMENDED ANTENNA EQUIPMENT:

Catalog #5523:	Greatest pickup and noise reduction.
Catalog #5522:	Less effective pickup and noise reduction than Catalog #5533.
Catalog #5575:	Conventional antenna.

JUNE 19, 1939

MODELS 6336,6436
Ch.1Q1.574
Circuit Change,Notes

SEARS, ROEBUCK & CO.

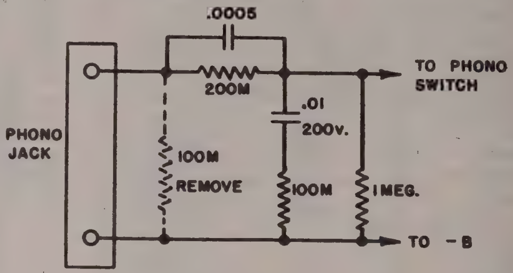
CIRCUIT CHANGE TO IMPROVE TONE WHEN USING CATALOG #6227 RECORD PLAYER.

REDUCING MICROPHONICS.

Bass response can be increased and record reproduction tone improved when this rec ver is used in conjunction with a Catalog #6227 record player, by inserting the network own schematically below.

The 100M ohm resistor at present across the phono jack terminals is to be removed. As shown below, the lead going to the high side of the phono jack is to be broken and a 200k hm resistor shunted by a .0005 mfd. mica condenser is to be inserted in series with it. he 100M ohm and the 1 megohm resistors and the .01 mfd. condenser are to be connected as sh m.

Because of the increased bass response, there may be a greater tendency toward mi o-phonics. For this reason, the record player should not be put directly on top of the rece er cabinet.



REDUCING MICROPHONICS:

1. Be sure that the two shipping bolts and the wood spacer strips have been removed.

2. See that knobs, control shafts, and dial lights or dial mechanism do not touch e cabinet.

3. See that the rubber bumpers at the rear of the chassis do not press on it more th n enough to prevent shifting.

Although the foregoing three points are simple, and commonly known, very often insu-ficient attention is paid to them. It is very important that the points mentioned be ve thoroughly checked.

4. Any means of reducing the signal input will help, such as using a shorter antenna connecting a small mica condenser (.0001 to .0002 mfd.) in series with the antenna lead.

5. All but initial production cabinets have two bracing strips added under the chass mounting shelf at its ends. A kit, part number 1016041718, can be obtained from source l and contains the necessary material and instructions for adding these reinforcing braci strips.

6. If the predominant microphonic tone is of low frequency, improvement can be had reducing the capacity of the coupling condensers in the audio amplifier. These are C27 a C29, which should be reduced from .01 mfd. to .006 mfd., 600 v. Both condensers must changed to avoid unbalancing the push pull circuit. This change will reduce the low frequen response and is not recommended except for extreme cases.

INSTRUCTIONS FOR ADDING BRACING STRIPS, MENTIONED IN PARAGRAPH #5, PRECEDING:

Turn the cabinet upside down. (Be careful to protect the cabinet finish.)

Clamp one of the cleats along the under side-edge of the chassis shelf. The end of t cleat should be against the cabinet back rail.

Using the cleat as a template, drill three 9/32" holes in the chassis mounting shel Be careful that none of the dirt from drilling gets into the speaker or chassis.

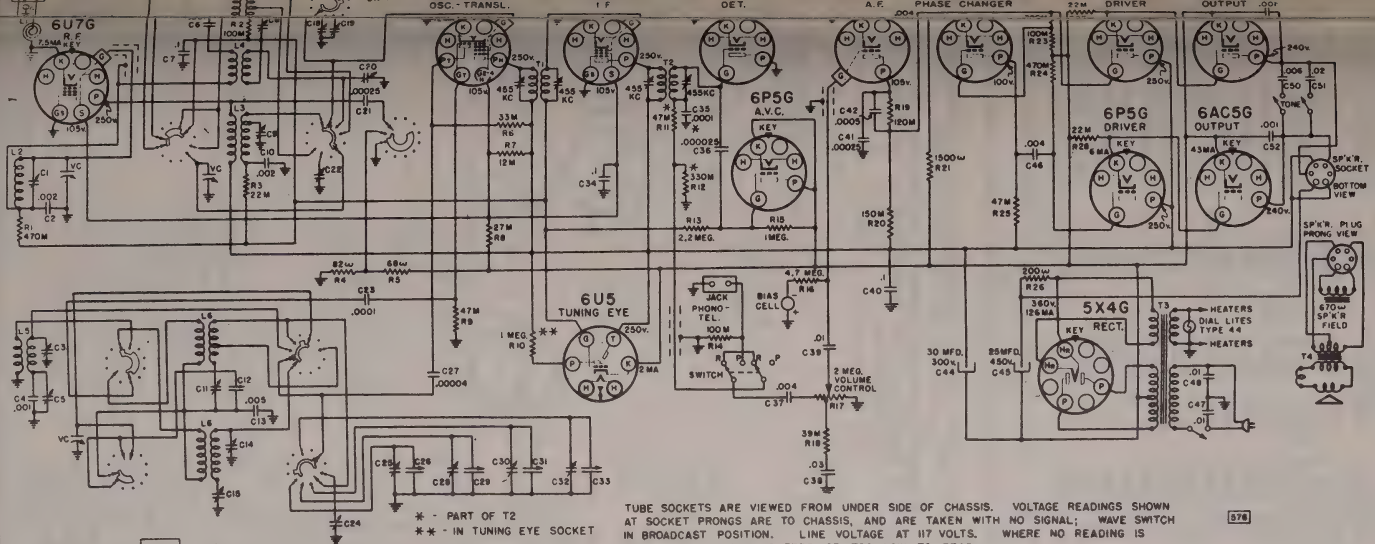
In the same manner, drill three holes at the other end of the chassis mounting shelf.

Clean off any splinters and bolt the cleats tightly to the underside of the chassi mounting shelf, with the bolt heads on the top side of the shelf. The flat washers go unde the nuts.

DIAL AND DRIVE HOOKUP: This is similar to that of Model 6335 . In ordering par s use 1014140301 instead of 1014140183; 10154402051 instead of 10154402021 and 1014540331 instead of 1014516245.

SEARS, ROEBUCK & CO.

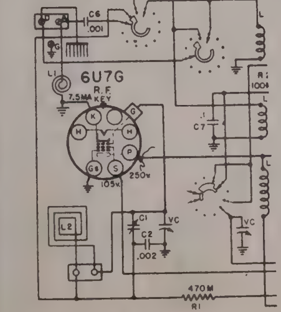
MODELS 6337,6437
Chassis 101.576
6437A,Ch.101.576-1
Schematic,Voltage
Tuner,Changes



* - PART OF T2

** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



FOR SILVERTONE CHASSIS 101.576-1

AUGUST 18, 1939

THE DIAL AND DRIVE HOOKUP IS IDENTICAL TO THAT OF MODEL 6336.

PUSH BUTTON TUNING MECHANISM: INTERMEDIATE FREQUENCY . . . . .455 kc

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station) and then securely locking the adjustment.

POWER SUPPLY:
All models available . . . . 105-125 volt; 50-60 cycles AC; 135 watts
All models available . . . . 105-125 volt; 25-60 cycles AC; 140 watts

POWER OUTPUT:
Type . . . . .Push pull direct coupling
Undistorted . . . . 6 watts
Maximum . . . . .10 watts

LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . .15 inch
Approx. field coil res. . . .670 ohms
Approx. field coil voltage drop..85 v.

DIFFERENCES BETWEEN 101.576 & 101.576-1:

The 101.576-1 contains a built-in loop antenna and short wave antenna plate ("RADIONET" Antenna System).

RECOMMENDED ANTENNA EQUIPMENT:
Catalog #5523: Greatest pickup and noise reduction.
Catalog #5522: Less effective pickup and noise reduction than Catalog #5523.
Catalog #5575: Conventional antenna.

MODELS 6337,6437
Ch.101.576;6437A,
Ch,101.576-1

SEARS. ROEBUCK & CO.

Alignment,Trimmer
Chassis,Sock

The alignment must be done in the order given.

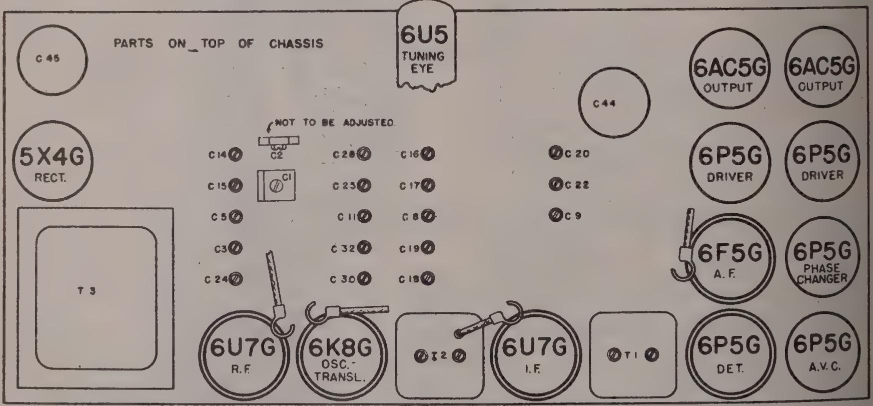
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1720 kc	.0002 mfd.	Ant. Term.	C14	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1,C9	RF,Transl.	25
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C15	Padder	35
"B"	5 mc	5 mc	400 ohms	Ant. Term.	C3*	Oscillator	--
"B"	4 mc	4 mc	400 ohms	Ant. Term.	C20	Translator	180
"B"	1.8 mc(rock)	1.8 mc	400 ohms	Ant. Term.	C5	Padder	260
"C"	15 mc	15 mc	400 ohms	Ant. Term.	C24*,C22	Osc.,Transl.	60
"D"	6 mc	6 mc	400 ohms	Ant. Term.	C32*	Oscillator	--
"D"	6.2 mc(rock)	6.2 mc	400 ohms	Ant. Term.	C19	Translator	130
"F"	11.7 mc	11.7 mc	400 ohms	Ant. Term.	C28	Oscillator	100
"F"	12.1 mc	12.1 mc	400 ohms	Ant. Term.	C11	Padder	--
"E"	9.6 mc	9.6 mc	400 ohms	Ant. Term.	C30*	Oscillator	--
"E"	9.4 mc(rock)	9.4 mc	400 ohms	Ant. Term.	C18	Translator	145
"E"	9.9 mc	9.9 mc	400 ohms	Ant. Term.	C8	Padder	--
"F"	11.9 mc	11.9 mc	400 ohms	Ant. Term.	C16	Translator	--
"G"	15.1 mc	15.1 mc	400 ohms	Ant. Term.	C25*,C17	Osc.,Transl.	100

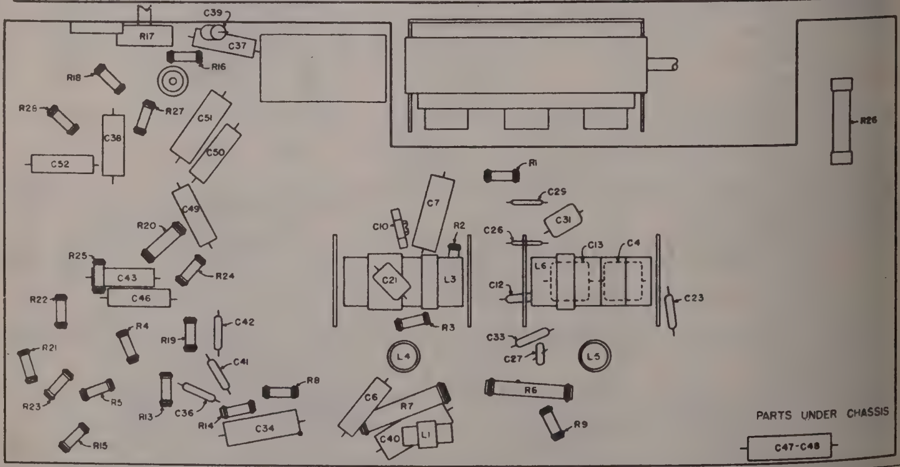
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

*If two peaks can be had, the correct adjustment is with the trimmer screw further o. The other peak is the image.

The C30, C18, C8 adjustments will affect each other so that they must be repeated seve times to secure proper alignment and calibration, ALSO C28 and C19 adjustments.

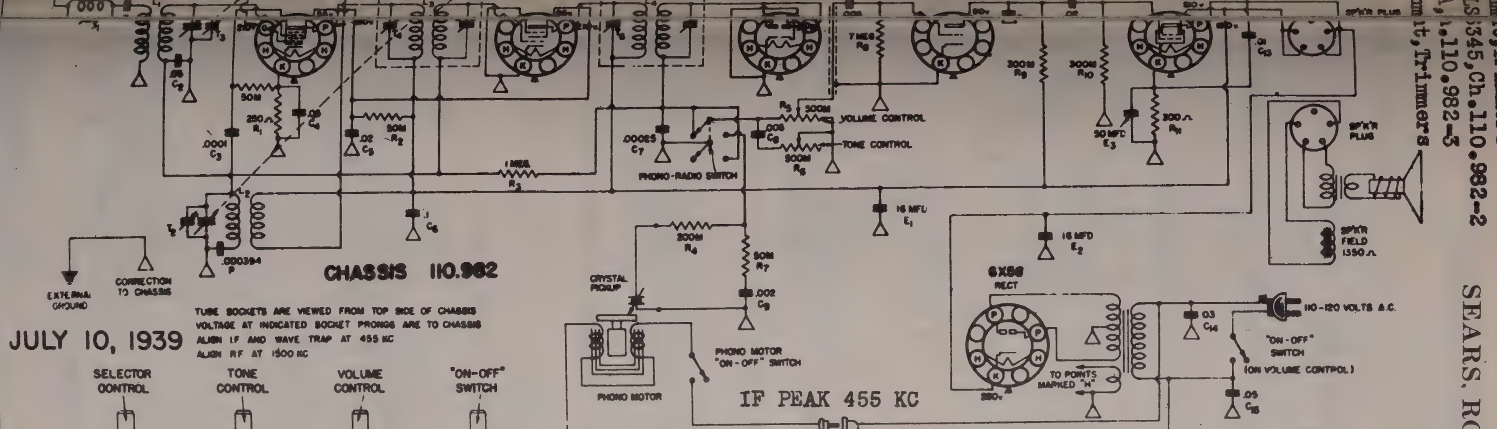
The alignment procedure should be repeated stage by stage, in the original order, r greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

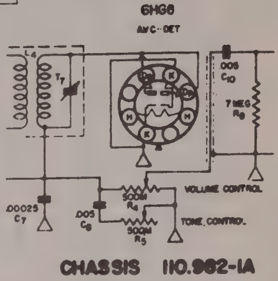


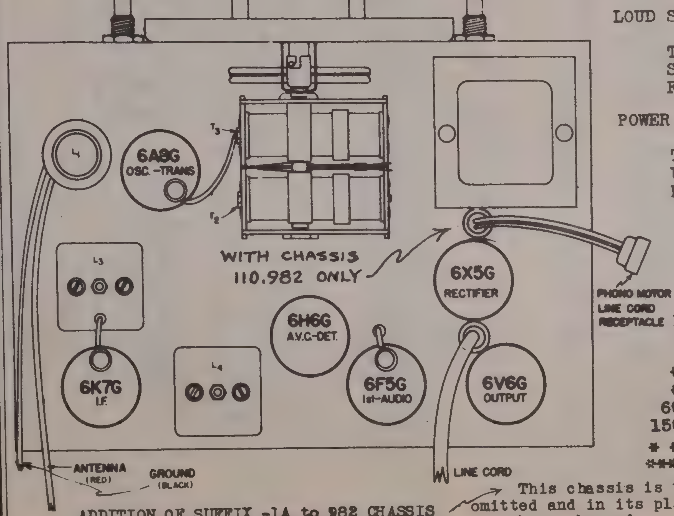


SEARS, ROEBUCK & CO.

MODELS 6345,Ch.110.982,
6491,6494,Ch.110.982-1A
Schematic,Voltage,Socket







LOUD SPEAKER:

Type..............................Dynamic
Size.................................. 8"
Field Resistance................1350 ohms

POWER OUTPUT:

Type..............................Beam Power
Undistorted............................ 2.0
Maximum................................ 3.0

POWER SUPPLY:

All models available

105-125 volts, 60 cycle AC, 70 watts

ALIGNMENT PROCEDURE

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
* *	455 KC	6K7G, Grid	T6, T7	I F.	2000
* *	455 KC	6A8G, Grid	T4, T5	I.F.	110
600 KC	455 KC	ANT.	T1	Wave Trap	***
1500 KC	1500 KC	ANT.	T2, T3	Osc. R.F.	60

* * Short oscillator section of variable condenser.
*** Adjust trimmer for minimum output with large signal input.

ADDITION OF SUFFIX -1A to 982 CHASSIS

This chassis is the same as 110.982 except that the radio-phono switch and connections are omitted and in its place an "on-off" switch is used. The escutcheon knobs and volume controls have also been changed.

MODELS 6345,Ch.110.982-2,
6345A,Ch.110.982-3
Schematics,Voltage

SEARS, ROEBUCK & CO.

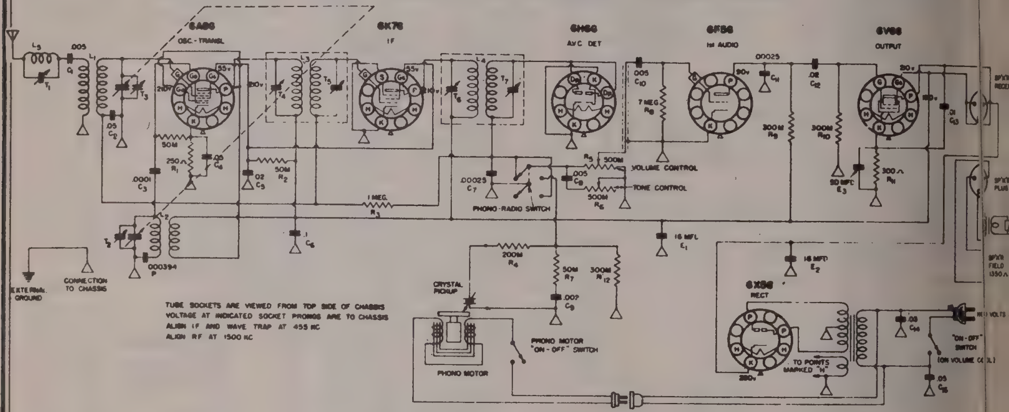
FOR ALIGNMENT SEE NDE

CHASSIS IDENTIFIED BY 110.982-2 HAVE HAD A CIRCUIT CHANGE MADE TO DECREASE THE TENDENCY OF T SET TO BECOME MICROPHONIC AT HIGH LEVELS OF PHONOGRAPH REPRODUCTION.

THE RESISTOR R12 HAS BEEN ADDED.

FOR ELECTRICAL AND MECHANICAL SPECIFICATIONS, GENERAL INFORMATION, ALIGNMENT PROCEDURE ETC.
See Model 6345, Chassis 110.982.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.982-2

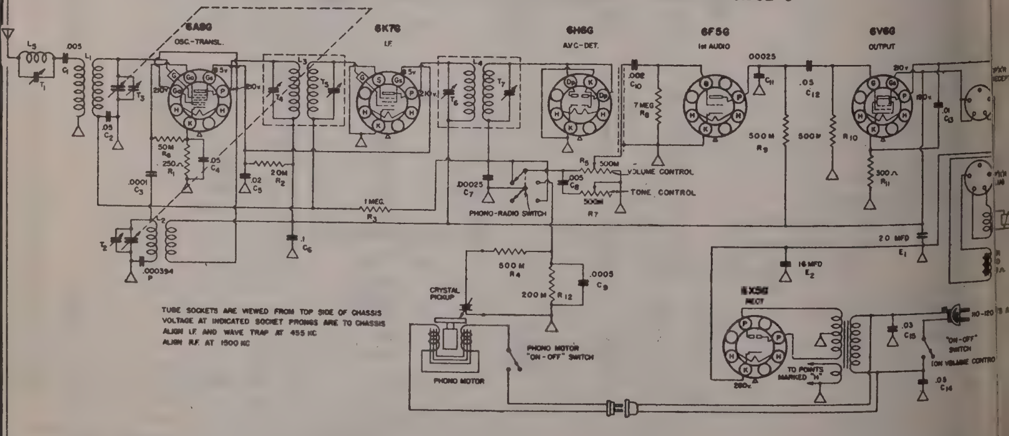


TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS
ALIGN I.F. AND WAVE TRAP AT 455 KC
ALIGN R.F. AT 1500 KC

CHASSIS IDENTIFIED BY 110.982-3 HAVE HAD CIRCUIT CHANGES MADE TO INCREASE THE SENSITIVITY IN THE R.F. PORTION OF THE CIRCUIT AS WELL AS TO INCREASE THE AUDIO GAIN AND INCREASE THE UNDISTO ED OUTPUT. THE ELECTROLYTIC CONDENSER E3 HAS BEEN ELIMINATED AND THE PART NUMBERS OF RESISTORS 1, R2,R4,R6, R7,R9,R10 and R12 AS WELL AS CONDENSERS C9, C10, C12, C14, C15 AND OUTPUT I.F. L4 VE BEEN CHANGED.

FOR ELECTRICAL AND MECHANICAL SPECIFICATIONS, GENERAL INFORMATION, ALIGNMENT PROCEDURE, ETC.
See Model 6345, Chassis 110.982.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.982-3



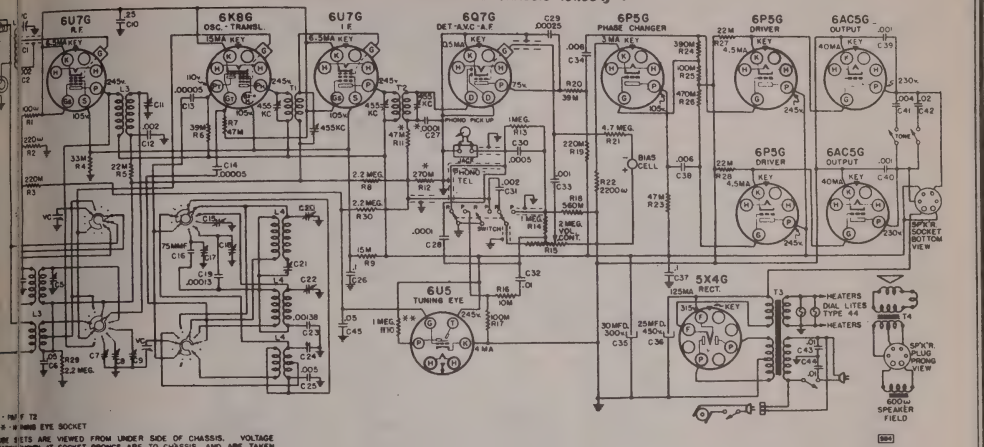
TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS
ALIGN I.F. AND WAVE TRAP AT 455 KC
ALIGN R.F. AT 1500 KC

OCTOBER 6, 19

SEARS, ROEBUCK & CO.

MODELS 6346,6346A,6446,6446A
Ch.101.584,-1,-2,-3,-4,-5
Schematics, Voltages, Changes

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.584,-3



* - PR F T2
** - T NG EYE SOCKET
S ETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE 117 V S. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR O LO O READ.

ION OF SUFFIX NUMBERS:

Chassis 101.584-1 (Catalog #6346A) is the same as chassis 101.584 except that it has a -in loop antenna (in the cabinet) for broadcast reception and a short wave antenna plate hort wave reception (RADIONET Antenna System). Because of the antenna system change, roadcast band frequency range extends to 1625 kc instead of 1730 kc.

Chassis 101.584-2 is the same as 101.584-1 except that it uses a different tone arm and p cartridge, not interchangeable with the ones used in 101.584 and 101.584-1. Accordingly, ordering either a tone arm or a pickup cartridge, be sure the proper part number is used he correct chassis number indicated in the order.

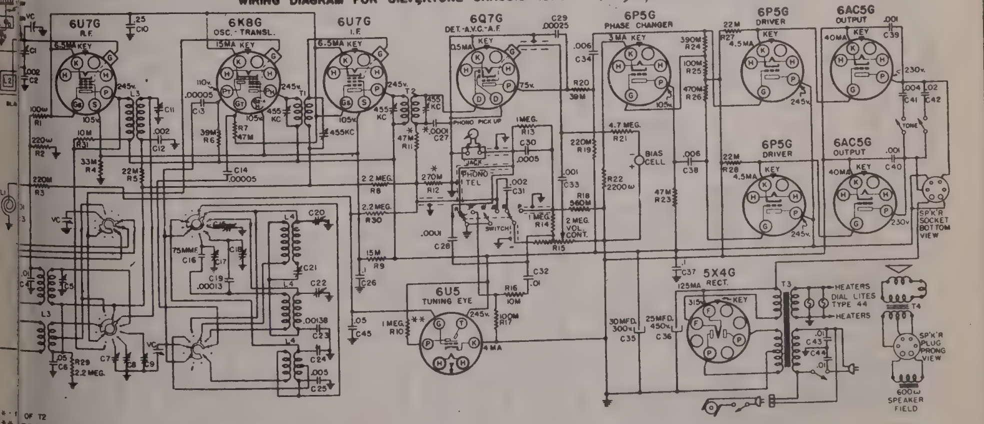
SUPPLY:
All models available . . . . 105-125 volts, 60 cycle; 120 watts
All models available . . . . 105-125 volts, 50 cycle; 120 watts
All models available . . . . 105-125 volts, 25 cycle; 130 watts

MEDIATE FREQUENCY . . . . 455 kc

OUTPUT:
Type . . . . . .Push pull direct coupling
Undistorted . . . . 6 watts
Maximum . . . . 10 watts

LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . .12 inch
Approx. field coil res. . . . 600 ohms
Approx. field coil voltage drop. .70 v.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.584-1,-2,-4,-5



* - OF T2
** TUNING EYE SOCKET
TUBE CKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READ SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH SIGNAL. WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT LTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO TO READ.

SEPTEMBER 27, 1939

MODELS 6346,6346A,6446,6446A
Alignment,Chassis,Socket
Trimmers,Dial Drive Data

SEARS, ROEBUCK & CO.

MODELS See Belo
Dial Drive Data

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.6 volt
Average sensitivity in microvolts for 500 milliwatts output . . . . See chart below
Connection of generator output lead . . . . See chart below
Connection of generator ground lead . . . . To chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . Both buttons out
Position of Dial Pointer with variable fully closed. . . . . On mark to left of 550 kc calibration

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Open	1730 kc	.0002 mfd.	Ant. Term.	C20	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1,C11	RF,Transl.	20
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C21	Padder	20
"B"	5 mc	5 mc	400 ohms	Ant. Term.	C22,C5	Osc.,Transl.	150
"C"	18.3 mc	18.3 mc	400 ohms	Ant. Term.	C15*	Oscillator	--
"C"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C9	Translator	75
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C18*,C8	Osc.,Transl.	100
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C17*,C7	Osc.,Transl.	100

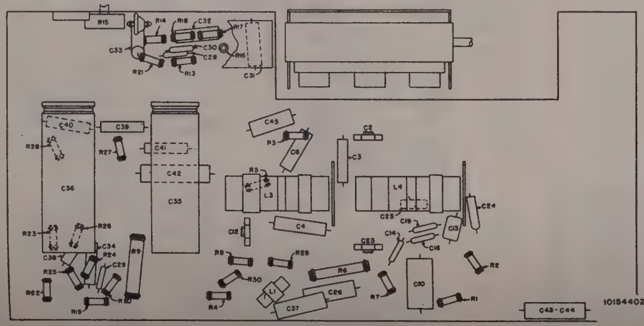
IMPORTANT ALIGNMENT NOTES

The alignment procedure for 101.584-1,-2 is the same as above except that the C20 adjustment is made with the generator at 1625 kc. After the alignment has been completed, the C1 and C11 adjustments should be repeated, using a 1400 kc broadcast signal.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

*If two peaks can be had, the correct adjustment is with the trimmer screw further out. The other peak is the image.

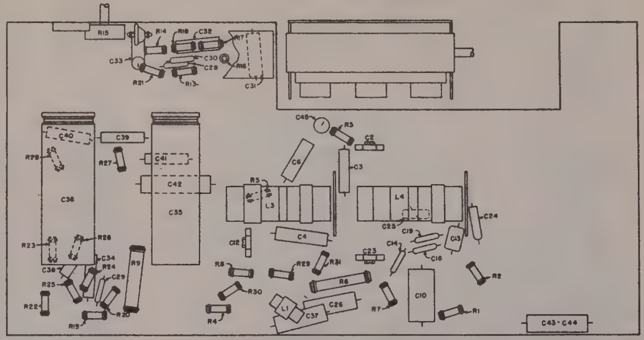
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



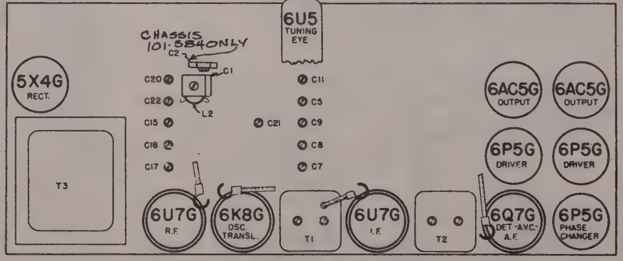
LOCATIONS OF PARTS UNDER CHASSIS 101.584,-3.

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screwdriver lightly in the screw head allowing the [illegible]

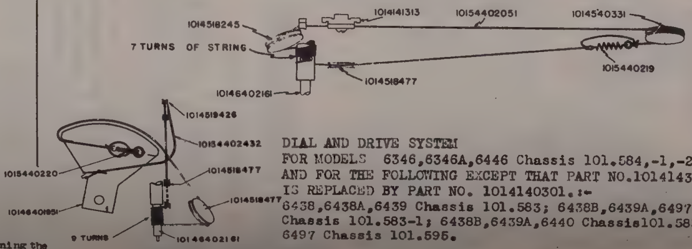


LOCATIONS OF PARTS UNDER CHASSIS 101.584-1,-2,-4,-5.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.584

Before ordering parts for Dial Drive System, check these drawings:



DIAL AND DRIVE SYSTEM
FOR MODELS 6346,6346A,6446 Chassis 101.584,-1,-2,-3.
AND FOR THE FOLLOWING EXCEPT THAT PART NO.101414313
IS REPLACED BY PART NO. 1014140301.:-
6438,6438A,6439 Chassis 101.583; 6438B,6439A,6497
Chassis 101.583-1; 6438B,6439A,6440 Chassis101.583-2;
6497 Chassis 101.595.

RECOMMENDED ANTENNA EQUIPMENT:

Catalog #5523: Greatest [illegible]
Catalog #5575: Conventional antenna.

SEARS. ROEBUCK & CO.

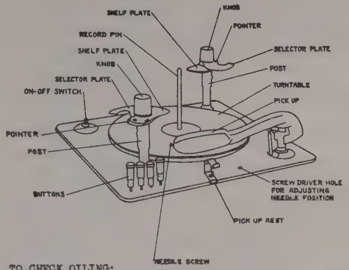
MODELS 6346,6346A,6446,6446A
MODEL 6447,Ch.101.590-1 to -5
Automatic Record Changer
Assembly,Adjustments,Notes

The Changer plays twelve 10" or ten 12" records. To reload, revolve the two posts slightly, grasping them underneath the Shelf Plates. Turn them back after the played records are removed; they will fall and lock when in proper position. Then place the new records on the Shelf Plates, and push "R" button to put Changer in operation. To play the other size records, turn the knob at top of each post until proper figure is opposite pointer, and press the "10" or "12" button, to agree with pointer setting. To reject a record (or to start a change cycle as for testing purposes) simply press the "R" (Release or Reject) button, at any time while needle is upon a record. To play manually, turn plates out of the way as for reloading, and press "M" button.

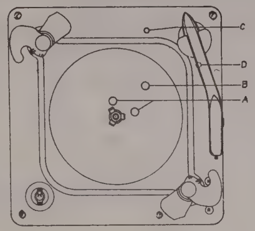
OILING:

The Changer should be lubricated once a year with about a dozen drops of Kenmore #9724 stainless oil at each of the following 6 points. All points can be reached from above, through holes in the mounting plate, as follows:

No. 1) No. 2) No. 3)	Three oil holes on motor gear housing. Reach all three through two holes marked "A" on drawing.	No. 5	Through holes marked "C", see felt wick, and drop the oil directly upon it.
No. 4	Through hole marked "B", drop the oil upon flat surface of cam. It will distribute itself to proper points.	No. 6	Through hole marked "D", see felt wick, and drop the oil directly upon it.



OIL HOLES IN MOUNTING PLATE



TO CHECK OILING:

If squeaks are heard compare the squeak with and without a load of records; stacked records themselves sometimes squeak against a center pin. See that all five wicks are in position, including three 1/4" wicks in frame of Motor. See that each wick is thoroughly saturated (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks, with tweezers; see if old oil has become gummy (commonly due to use of low-grade oil). If necessary, clean gummed-up wicks with kerosene. See that each is saturated with good oil; then, before replacing them, drop a little good oil into the holes.

ADJUSTMENTS:

There are three adjustments that can be made. All are correctly made at the factory, and ordinarily need never be altered. Should it become necessary to remake any of these adjustments, due to accident or tampering, proceed as follows:

A. ADJUSTING LANDING POSITION OF NEEDLE ON THE RECORD. (See Top View. This adjustment is made with a screw driver from above--does not require removing Changer from cabinet.) If needle comes down too far from edge of record, playing of records will not start at their beginning. Turn Needle - Landing Adjusting Screw very slightly counter-clockwise. If needle comes down too close to edge of record, needle may slip off edge of record. Turn the adjusting screw clockwise.

Also see Paragraph 12, following.

B. ADJUSTING DISTANCE FROM RECORD PIN AT WHICH TRIGGER WILL TRIP AND CHANGE CYCLE WILL BEGIN. Turn Trip Adjusting Screw 18, toward the trigger for earlier tripping, or away from it for later tripping. This Changer does not depend, for automatic tripping, on the records being provided with any special grooves at end; it trips whenever needle comes within a certain distance of Record Pin. The factory adjustment is for 1-7/8" from center of Record Pin. This is the most generally satisfactory distance; no modern record will then be cut off before playing is finished, and none will fail to trip at end. For certain records of early manufacture, it may not be possible to find an adjustment that will always trip and never cut off.

C. ADJUSTING HEIGHT TO WHICH PICKUP ARM RISES. The arm should rise, during the change cycle, high enough so that it clears by only*1/8" the stack of records resting above it. [illegible] 32 (see photographs) and turn the Sleeve to lengthen or shorten Pickup Plunger 21. When correct adjustment is found, tighten locknut again.

*This dimension may be made 1/4". If the pickup is made to rise too close to the bottom record, the stud may never clear the groove in the cam gear and the arm will keep moving back and forth continuously.

REPLACING MOTOR: When mounting replacement Motor, it is most important to see that Record Pin is centered between the two Posts of the Changer, that it stands perpendicular to Main Plate 53, and that it has not become bent so as to wobble. Even though the Posts are stout and not easy to bend, it is well to check them also, with a 12" combination square laid clear across the concave upper surface of Main Plate. When the new Motor has been attached, with three screws through Grommet Sleeves 51 (spacers) into its frame, and Record Pin is seen to revolve without appreciable wobble (a wobble would indicate that it has been bent in transit from factory) the correct position of Pin midway between the Posts can be accurately checked in this way: Place a single 12" record on the Shelf Plates, press "R" button, and turn turntable forward by hand. Immediately after the Shelf Plates open and let it fall, turn Turntable slightly backward, and with other hand support the record between the Shelf Plates; it can then be readily seen whether Record Pin is off center. If it is, remove the record and Turntable, and loosen slightly the screw or screws nearest the Shelf Plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 53 on photo, showing a shim in place upon one of the Grommet Sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard. They should be inserted, around proper screws (when screws have been sufficiently loosened) between Motor Frame and the metal Grommet Sleeve. Do not insert shims next to rubber grommet.

TROUBLE SHOOTING:

Cases of failure to operate satisfactorily will generally be found due either to neglect of proper lubrication, or to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage) even though the utmost factory precautions are taken against it---or that setscrews may work loose due to some external vibration. Damage from tampering is likely to take the form of bent parts; never bend any part during examination. Be careful, especially, never to push upward from below on Cam Connecting Rod Lift 37 while mechanism is operating; bending may result, and even slight bending here might interfere with correct timing of the cycle operations.

Among the principal trouble symptoms to which such causes may give rise, are the following:

1. MECHANISM IS SLOW IN STARTING, OR STALLS DURING A CHANGE CYCLE, BUT A SLIGHT FORWARD PUSH WITH THE HAND STARTS IT AGAIN. May be caused by

a. Failure to lubricate properly. Oil thoroughly, per instructions above.
b. Loose setscrews.

c. Weakness of drive: line voltage may be abnormally low, or motor windings damaged. If windings are found damaged, remove motor and return it to factory for repair or replacement. See above: "Replacing Motor".

2. MOTOR FAILS TO RUN, EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM OTHER WIRING AND PROPER VOLTAGE IS APPLIED DIRECTLY TO THE TWO ENDS OF ITS WINDINGS. This indicates trouble in Motor windings. Unless the damage is easily seen and repaired, replace Motor, as above described.

3. MOTOR IS SLOW IN STARTING.

a. Check oiling, as directed above. It may not have been properly done; old oil may have become gummy.

b. Changer may have been in a very cold place, and may not yet have reached room temperature. Give it a fair chance to get warmed up, before concluding that Motor is defective, and proceeding as in Paragraph 2.

4. SQUEAKS OR OTHER NOISES, DURING PLAYING OF RECORDS.

a. Check oiling, as directed previously. (If squeaks are heard, they will usually be found to come from the records--not from the mechanism).

b. See that all setscrews are tight.

c. Examine Motor windings; especially the shading coils (not visible in photos) which encircle a portion of each laminated pole and make the Motor self-starting. If coils have been jarred loose at any point, they may be tightened accordingly.

5. CHANGER IS NOISY WHEN IN CYCLE. Check oiling.

MODELS 6346,6346A,6446,6446A
MODEL 6447
SEARS, ROEBUCK & CO.
Record Changer Notes,Assembly

6. MOTION OF PICKUP TOWARD RECORD PIN WILL NOT TRIP CHANGER MECHANISM.

a. It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring 95 (joining the lugs at ends of Swivel Spreaders 90 and 91), allowing the spreaders to open. Increase tension of Spring 95, by bending slightly the lug on either Spreader. If this increased tension causes needle to jump across the record, needle may be a little out of vertical, radially--it may "lean" toward center of record. To remedy this, grasp Pickup arm and twist it, very slightly, in a clockwise direction, so that it stands vertical, or even leans a little in outward direction.

b. If trigger is being properly actuated, probably Cam Lever 39 is binding against Sub-Plate 41. Look for dirt or obstructions; see that rivets are working freely. If the Lever engages Cam Lever Pawl 34, so that Lift 37 forces its roller up into the groove on Cam Gear 82, and if setscrews are tight, the change cycle must operate, as Cam Gear turns.

7. PRESSING "R" BUTTON DOESN'T TRIP CHANGER MECHANISM.

a. Check Key Control Unit 75: see whether there is an obstruction or a bent part which prevents "R" button from going clear down to the end of its travel.

b. Examine Reject Rod 78. If it does not trip, even when properly revolved by complete depressing of "R" button, the rod has probably been bent, and must be restored in same way. Grasp the two ends and twist it slightly.

c. If Trigger 16 is being properly actuated but without starting a change cycle, see directions above, Paragraph 6-b.

8. PRESSING "M" BUTTON FAILS TO PUT CHANGER MECHANISM OUT OF ACTION SO AS TO ENABLE MANUAL OPERATION. Check Key Control Unit as in preceding paragraph. First see that button goes clear down; then follow its action through Manual Rod 77.

9. MOTOR STOPS IMMEDIATELY WHEN CHANGER SWITCH IS TURNED OFF DURING A CHANGE CYCLE (instead of continuing to run, as it should, until needle is again upon a record, and then stopping). Or--

10. TURNING CHANGER SWITCH OFF FAILS TO STOP CHANGER AT ALL. Either of these two conditions would indicate failure of Cycling Switch 85. Cycling Switch operates normally to short-circuit the manual Changer Switch (which may be located in position shown at 54, or elsewhere) during change cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning the entire Changer to source 101.

11. CHANGER FAILS TO REPEAT LAST RECORD. See Paragraph 6, above.

12. NEEDLE LANDS PROPERLY ON RECORD BUT FAILS TO MOVE OVER INTO RECORD GROOVE. Pickup arm is normally impelled toward center of records by Lead Spring 97. Should a slight increase in its tension be found necessary, this can be easily obtained by bending the lug, to which it is attached, down against Main Plate. If tendency then appears for needle to jump across record, check angle of needle (see Paragraph 6-a above).

13. RECORDS FALL UNEVENLY UPON TURNTABLE. Seldom objectionable, this is due to Record Pin not being correctly centered between Posts. If necessary, it can be corrected as described above; see "Replacing Motor".

14. LAST RECORD DROPS ON ONE SIDE ONLY. This suggests a Post bent out of perpendicular to Main Plate. Test with square as directed(see "Replacing Motor"). If Post must be straightened, be careful not to bend other parts.

15. CHANGER CONTINUES CYCLING. Due to failure of Lift 37 to fall back out of engagement with Cam Gear. Check the various rivets at which motion occurs, to find the point where friction or binding is interfering with freedom of motion.

16. RECORD IS DRIVEN, BUT NOT HEARD, OR NOT HEARD WITH PROPER VOLUME. See that Pickup cord is plugged in. Check amplifier and speaker and connections to them, thoroughly. If then trouble is still suspected in pickup, test its output with a vacuum-tube voltmeter. Playing an average record, output should test 1 to 2.5 volts. If pickup cartridge is found not to deliver proper output, remove it and install another.

17. SELECTOR PLATE FAILS TO SEPARATE BOTTOM RECORD FROM STACK. This is due either to a badly warped condition of the record, or to its being of a thickness very considerably different from those now in standard use. The design of both Selector and Shelf Plates is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be impracticable for use in automatic changers.

Improper spacing between blades could also result in jamming or failure of the blade to separate the bottom record from the stack. The proper spacing of the blades in the 10" position is .050"-.055"; in the 12" position it is .070"-.075". A special long gauge is necessary to measure this dimension since the blades are not directly over each other. However, it is extremely unlikely that the blades could become bent out of their proper adjustment since they are very rigid. Adjustment is secured by bending of the blades.

IF NECESSARY TO DISASSEMBLE THE CHANGER:

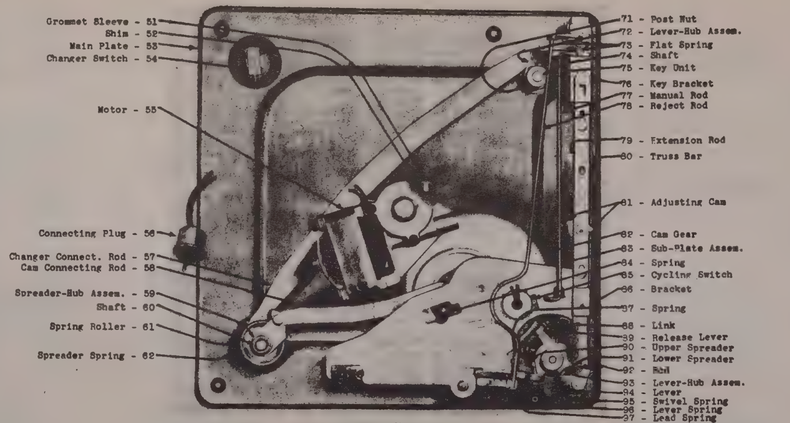
Before attempting to remove Sub-Plate Assembly 83, detach Key Control Unit 75 from Main Plate. To do this, start with Control Unit Truss Bar 80. Then take out the screw which holds left end of Adjusting Rod Lever 94. Next remove Adjusting Rod 92 and Adjusting Rod Extension 79. Take out the screw holding Spring 73; then the screws holding Key Control Unit 75 to Main Plate. Rods 77 and 78 can then, with due care, be extracted without bending. Free the Cam Connecting Rod 58 by loosening setscrew holding Spreader and Hub Assembly 59. Sub-Plate Assembly can then be detached without bending parts. In reassembling, reverse the procedure.

FAILURE TO PLAY THROUGH THE ENTIRE RECORD WHEN ONLY ONE OR TWO RECORDS ARE ON THE TURNTABLE:

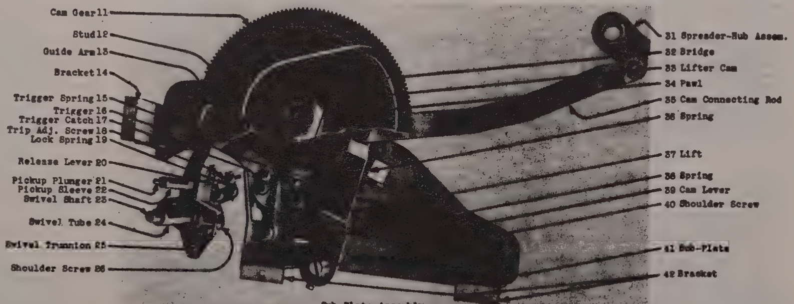
If the mechanism fails to play more than just a small portion of the record when only one or two records are on the turntable, in all likelihood it is due to the use of a needle shorter than the ones furnished and to which the mechanism has been adjusted. The needles used must not be less than 11/16" in length, although they may be of greater length.

ELIMINATING RUMBLE:

The record changer plate must be completely free in its mounting to avoid excessive rumble. The split nuts on the mounting screws, under the changer plate, should be loosened for three or four turns. The mounting screws themselves should be unscrewed for three or four turns since they may form a thread in the rubber bushings and thereby compress the bushings excessively.



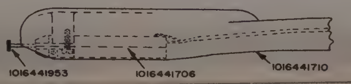
Bottom View

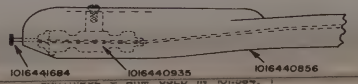


Sub-Plate Assembly

ADDITION OF SUFFIX NUMBER -3 TO 101,584 CHASSIS:

Assemblies identified as 101.584-3 are the same as 101.584 except that they use a different tone arm and pickup cartridge, not interchangeable with the ones used in 101.584. The drawings below illustrate the tone arms and cartridges used in 101.584,-1,-2,-3. Be sure to give the proper part number and also mention the complete identification number including the dash number when ordering these parts.





te,Assembly Views

SEARS, ROEBUCK & CO

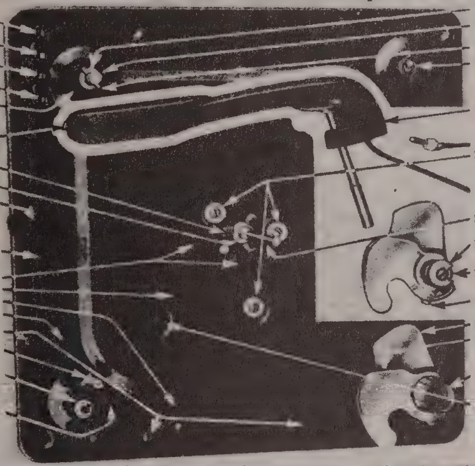
MODELS 6346,6346A,6446,6446A
MODEL 6447

DDITION OF SUFFIX NUMBERS -4 AND -5 TO CHASSIS IDENTIFICATION NUMBER 101.590, 101.584:

Chassis identified by the suffix number -4 are the same as those identified by the suf- fi number *1 except that the record changer unit has certain changes incorporated, as ex- pl ned below. *same as 101.590-2 in the case of the chassis 101.590).

Chassis identified by the suffix number -5 are the same as those identified by -2 except th the record changer unit has certain changes incorporated;- *(-3 for chassis 101.590).

The record changer design has been changed so that the adjustment, controlling the distance from the record pin at which the trigger will trip and the change cycle will begin, can be made through a hole in the top plate, marked "AR" in the photograph. Turn the screw head clockwise for earlier tripping; counter-clockwise for later tripping. (The effect is to alter the position of the Cam CJ which strikes the Trigger CP. It may be found that the cam has been revolved through a half turn; in this case, the above directions would apply only after the cam has been returned to the correct position by revolving the screw head half a turn.)


P Button Assembly "R" . . . . AA
P Button Assembly "M" . . . . AB
P Button Assembly "12" . . . AC
P Button Assembly "10" . . . AD
C ger Post . . . . AE
Needle Setscrew AF
N prene Tubing . . . . AG
D e Pinion Assembly . . . . . AH
P kup Support Bracket Assembly AI
N ile Landing Adjustment Hole AJ
or Oiling Holes . . . . AK
ing Hole . . . . AL
ing Hole . . . . AM
ing Hole . . . . AN
Sub-Plate Attachment Screws AO
ter Rod Nut (CE) . . . . . . AP
vel Post . . . . AQ
p Adjustment Hole . . . . . . AR
BA Changer Post Washer . . . . . .
BB Changer Shaft--Front . . . . .
Changer Shaft--Rear (Not shown)
BC Changer Shaft Pin . . . . . .
BD On-Off Switch
BE Pickup . . .
BF Grommet (3 required) . . . . .
Washer (3 required) . . . . .
BG Record Pin . . . .
BH Changer Plate Washer . . . . . .
BI Changer Plate Spring . . . . . .
BJ Pointer
BK Shelf Plate
BL Selector Plate
Changer Plate Assembly (2 reqd
BM Changer Cup or Knob (2 reqd) .
BN Cam Gear Screw

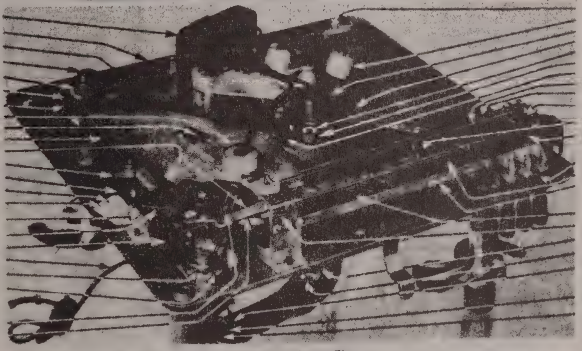

Changer Motor EA
Main Mounting Plate Assm. EB
Cam C ecting Rod . . . EC
Chang Shaft Collar . . . . ED
Sprea Hub Assembly . . . . . . EE
Spri Roller . . . . EF
Chan Spreader Spring . . . . . EG
Cycl Switch . . . . EH
Cam Lev Spring . . . . EI
Sub-Pla and Gear Assem. (DI) . . EJ
Adju g Rod Assembly . . . . . . EK
Cam C ecting Rod Lift (CV). . . EL
Cam C ecting Rod Lift Spring . EM
Chan Model Number . . . . EN
Chan Serial Number . . . . EO
Reje n Rod Support . . . . . . EP
Adju g Rod Lever Spring . . . EQ
Pick Leader Spring (CO) . . . . ER
Pickup Cord . . . ES
Post t . . . . ET
Shak of Washer . . . . EU
Male g (on end of cord) . . . EV
Lug Lever-Hub Assem. . . . . . . EW
Adju g Rod . . . . EX
FA On-Off Switch
FB Male Plug with #7002 Shell . .
FC Cord Clamp . . . .
FD Changer Connecting Rod Assem..
FE Shim . . . . (Assortment)
FF Grommet Sleeve (3 reqd.) . . .
FG Idler Gear
FH Manual Key Rod . . . .
FI Rejection Rod . . . .
FJ Manual and Rejection Rod Spring
FK Extension Rod
FL Key Control Bracket . . . . .
FM Key Control Unit . . . .
FN Adjusting Rod Spring . . . . .
FO Control Unit Truss Bar . . . .
FP Needle Landing Adjusting Cam
FQ Adjusting Rod Bracket . . . .
FR Pickup Cartridge
FS Cartridge Clamp . . . .
FT Tone Arm Lift Plate . . . . .
FU Hinge Pin Spring . . . . . .
FV Tone Arm Hinge Pin . . . . .

Photo E-F. Bottom View

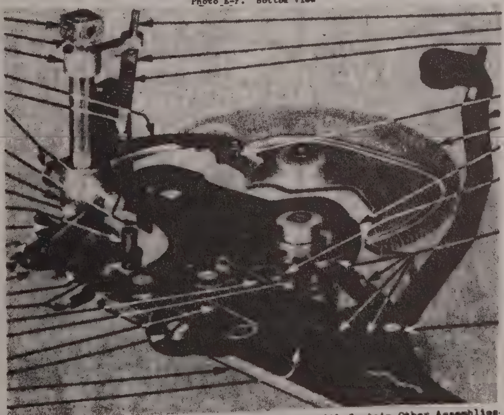

Sw l Shaft and Head Assem. . . CA
Fi Washer (2 required) . . . CB
Li r Guide CC
Sw l Guide Arm Assembly . . . CD
Li r Rod Nut (AP) . . . . CE
Tr ion Shoulder Screw (2 reqd) CF
Li . . . . CG
Sw l Tube and Trunnion Assem. CH
Sw l Guide Arm Spring CI
Tr Adjusting Cam . . . . CJ
Sw l Spreader Spring . . . . . CK
St Lever and Trigger Adj.Assem. CL
Up Swivel Spreader . . . . . . CM
Lo Swivel Spreader . . . . . . CN
Pi p Leader Spring (ER) . . . . CO
Tr er. . . . . CP
Pa Spring . . . . CQ
Ca ever Spring . . . . CR
Ca ever . . . . CS
Sh der Screw . . . . CT
Su late . . . . CU
Ca onnecting Rod Lift CV
DA Pickup Plunger . . . .
DB Pickup Plunger Sleeve . . .
DC Pickup Plunger Spring . . .
DD Stud
DE Cam Connecting Rod
DF Cam Gear
DG Lifter Cam
DH Pawl
DI Sub-Plate and Gear Assembly
DJ Roller

Photo C-D. View of Sub-Plate Assembly, Together with Certain Other Assemblies.

FEB. 28, 1940

MODEL 6329,Ch.110.989
Schematic,Socket
Trimmers,Alignment

SEARS, ROEBUCK & CO.

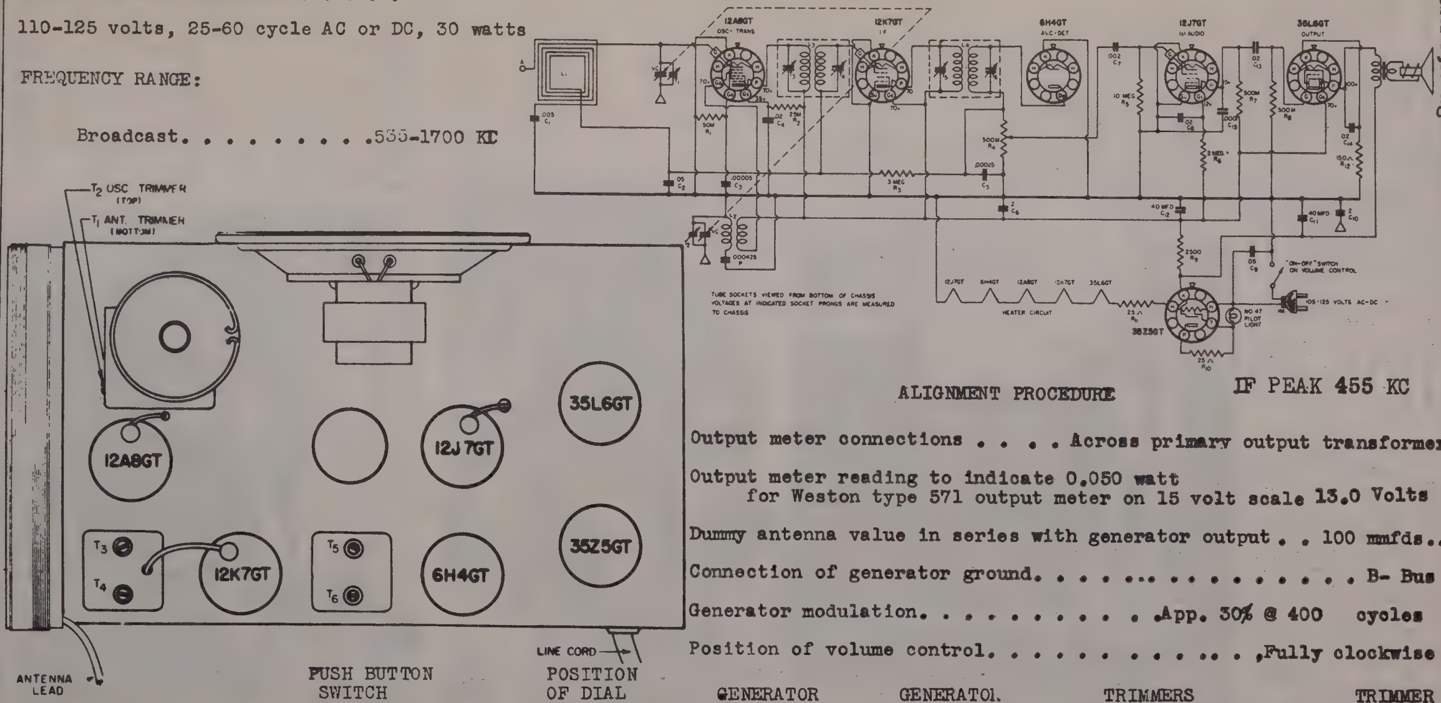
POWER SUPPLY:
All models available. . . . .

110-125 volts, 25-60 cycle AC or DC, 30 watts

FREQUENCY RANGE:

Broadcast. . . . . .535-1700 KC

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.989



TUBE SOCKETS VIEWED FROM BOTTOM OF CHASSIS
VOLTAGES AT INDICATED SOCKET PRONGS ARE MEASURED TO CHASSIS

IF PEAK 455 KC

ALIGNMENT PROCEDURE

Output meter connections . . . . Across primary output transformer

Output meter reading to indicate 0.050 watt
for Weston type 571 output meter on 15 volt scale 13.0 Volts

Dummy antenna value in series with generator output . . 100 mmfds..

Connection of generator ground. . . . . B- Bus

Generator modulation. . . . . App. 30% @ 400 cycles

Position of volume control. . . . . ,Fully clockwise

PUSH BUTTON SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
Mannual "IN"	**	455 kc	12K7GT,Grid	T5,T6	I.F.
"	**	455 kc	12A8GT,Grid	T3,T4	I.F.
	1500 kc	1500 kc	***	T2,T1	Osc.,R.F.

LOUD SPEAKER:
Type...Dynamic
Size........5"
Field.....P. M.

It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

POWER OUTPUT
Type.......Beam Power
Undistorted.......1.0
Maximum..........1.5

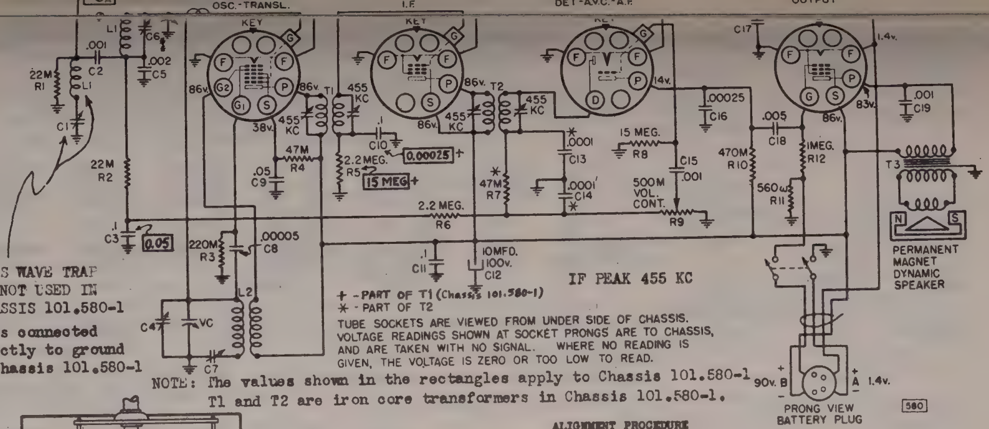
Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

** Short oscillator section of variable condenser.

***Connect generator output to a separate radiating loop and pickup 1500 KC signal on receiver.

MODELS 6350,6351,6352
Ch.101.580, 101.580-1
Schematic,Voltage

SEARS. ROEBUCK & CO.



IF PEAK 455 KC

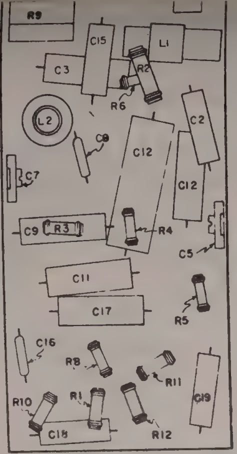
THIS WAVE TRAP
IS NOT USED IN
CHASSIS 101.580-1

‡C6 is connected
directly to ground
in Chassis 101.580-1

+ - PART OF T1 (Chassis 101.580-1)
* - PART OF T2

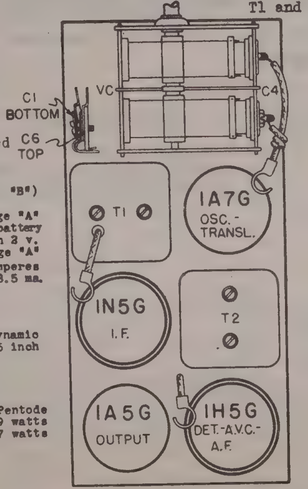
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

NOTE: The values shown in the rectangles apply to Chassis 101.580-1
T1 and T2 are iron core transformers in Chassis 101.580-1.



PARTS UNDER CHASSIS

In Chassis 101.580-1, a new variable condenser is used; trimmers C4 and C6 are mounted on this condenser.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

POWER SUPPLY:
#5060. . A-B block(1.4v. "A", 90v. "B")
or
#734 . . . . 2v. Storage "A"
2 - #5041 . . . . 45v. "B" battery
#5070 . . . Adaptor necessary with 2 v. Storage "A"

"A" Drain . . . . .0.2 Amperes
"B" Drain . . . . 8.5 ma.

LOUD SPEAKER:
Type . . . . .PM Dynamic
Size . . . . .5 inch

POWER OUTPUT:
Type . . . . .Pentode
Undistorted . . . . .0.09 watts
Maximum . . . . .0.17 watts

FEB. 14, 1940

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . .Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.3 volts
Approximate average sensitivity in microvolts for 50 milliwatts output . . . See chart below
Generator ground lead connection . . . . .Receiver chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . .Fully on
Position of pointer with variable fully closed . . . . .Horizontal (To fall on block below 550 kc calibration mark.)

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T2, T1	IF	110
600 kc	455 kc	.0002 mfd.	Ant. Term.	C1*	IF Wave Trap	--
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C6, C4	Translator Oscillator	90
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	90

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted to give high output. The trimmer should be adjusted for minimum output meter reading instead of the customary maximum reading. If the frequency of an interfering station near 455 kc is known, the generator and trimmer should be adjusted for the frequency of the interfering station rather than 455 kc.

The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

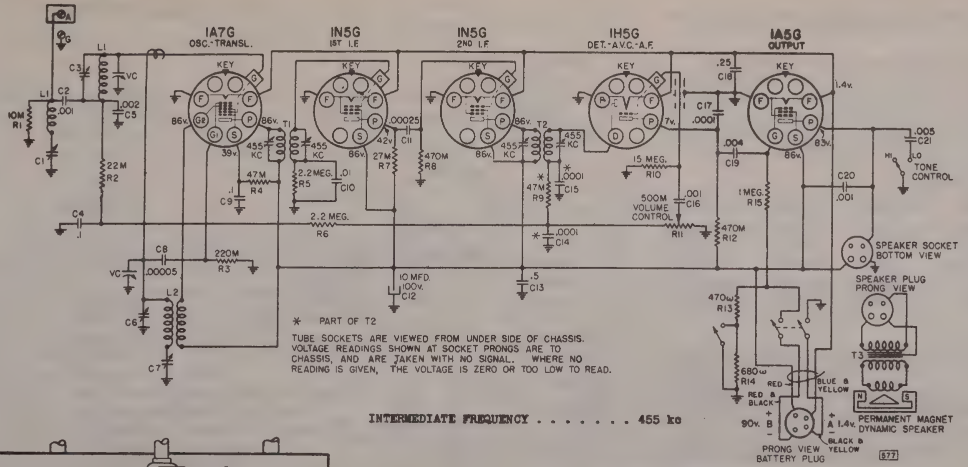
The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

MODELS 6353,6354,6355
Ch. 101.577
Schematic,Voltage
Chassis,Alignment
Socket,Trimmers

SEARS, ROEBUCK & CO.

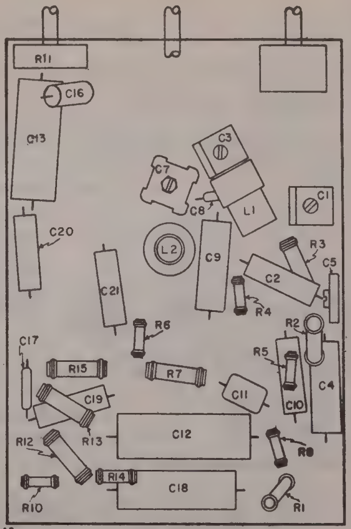
MODEL 6260,Ch.101.558
Alignment



* PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

INTERMEDIATE FREQUENCY . . . . 455 kc



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections .Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.3 volts
Approximate microvolts input to indicate 50 milliwatts output . . . . See chart below
Generator ground lead connection . . . . .Receiver chassis
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . .Fully on
Position of Tone Control . . . . .HI
Position of pointer with variable fully closed . . . . .Horizontal (To fall on block below 550 kc calibration mark.)

(For Model 6260 dial pointer should be horizontal when fully open or fully meshed).

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN) Ⓐ	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS Ⓐ
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T3, T1 T2,T1	IF	125 65
600 kc	455 kc	.0002 mfd.	Ant. Term.	C1* C1*	IF Wave Trap	--- --
Fully open	1750 kc	.0002 mfd.	Ant. Term.	C6 C4	Oscillator	125 45
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3 C6	Translator	80 30
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7 C7	Padder	85 25

Ⓐ For 6260,Chassis.101.558

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted to give high output. The trimmer should be adjusted for minimum output meter reading instead of the customary maximum reading. If the frequency of an interfering station near 455 kc is known, the generator and trimmer should be adjusted for the frequency of the interfering station rather than 455 kc.

The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the [illegible]

FREQUENCY RANGE:
Broadcast . . . . 545-1750 kc

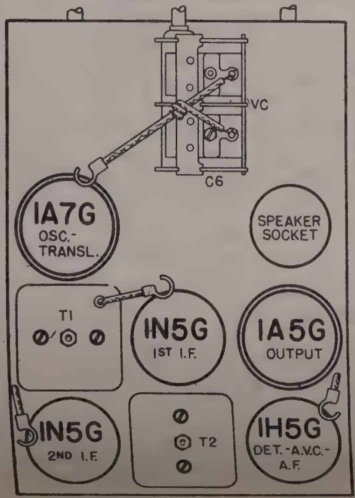
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc

POWER OUTPUT:
Type . . . . .Pentode
Undistorted . . . . .0.09 watts
Maximum . . . . .0.17 watts

LOUD SPEAKER:
Type . . . . .PM Dynamic
Size . . . . 5 inch

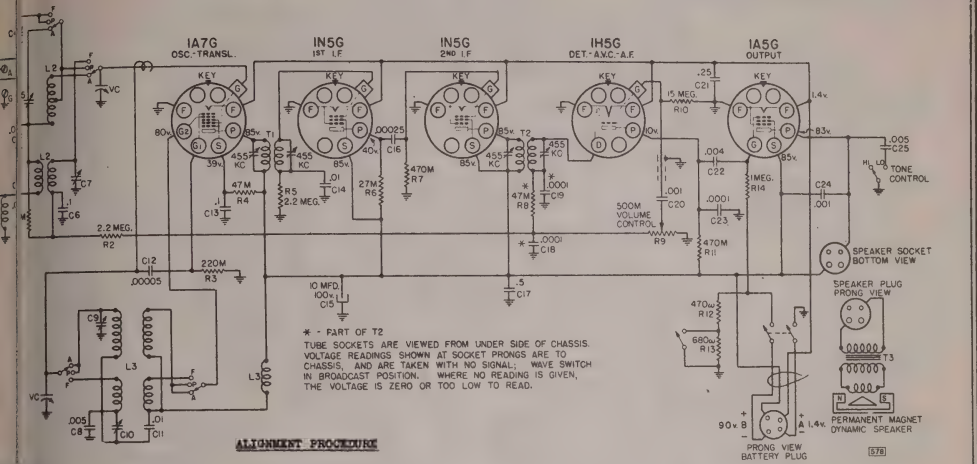
POWER SUPPLY:
#5060. . A-B block (1.4v. "A", 90v. "B")
or
#734 . . . . .2v. Storage "A"
2 - #5041 . . . . .45v. "B" battery
#5071 . . . . . . .Adaptor necessary with 2v. Storage "A"
"A" Drain. . . . . .0.25 amperes
"B" Drain. . . . . .10.25 ma



LOCATIONS OF PARTS ON TOP OF CHASSIS

SEARS. ROEBUCK & CO.

MODELS 6356,6357,6358 Ch. 101.578



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ALIGNMENT PROCEDURE

RE INARY:

utp meter connection	Across loud speaker voice coil
utp meter reading to indicate 50 milliwatts	0.3 volts
ppr imate microvolts input for 50 milliwatts output	See chart below
ene tor ground lead connection	Receiver chassis
ene tor modulation	30%, 400 cycles
osi on of Volume Control	Fully clockwise
osi on of Tone Control	HI
osi on of Dial Pointer with variable fully closed	Horizontal

AVE AND WIT OSI ON	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A	Closed	455 kc	.1 mfd.	1A7G Grid	T2, T1	IF Output IF Input	65
"A	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"A	Fully open	1750 kc	.0002 mfd.	Ant. Term.	C9	Oscillator	45
"A	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C5	Translator	22
"A	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	35
"P"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C4	Translator	80
"F"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C7	Translator	20

The generator should be adjusted for high output. The trimmer should be adjusted for ini a output meter reading instead of the usual maximum reading. If the frequency of an nte ering station around 455 kc is known, the generator should be adjusted to the frequency t station instead of to 455 kc.

ere indicated by the word, "Rock", the variable should be rocked back and forth a egr or two while making the adjustment.

e alignment procedure should be repeated stage by stage, in the original order, for rea st accuracy. Always keep the output from the test oscillator at its lowest possible alu o make the AVC action of the receiver ineffective.

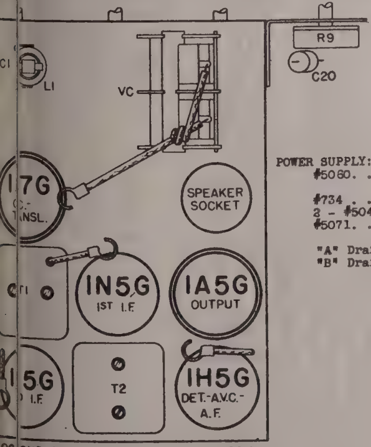
FREQUENCY RANGES:
Broadcast . . . 545-1750 kc
Police . . . . 1455-2650 kc
Short Wave . . . 5.95-18.2 mc

LOUD SPEAKER:
Type . . . . . . PM Dynamic
Size . . . . 6 inch

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . 0.09 watts
Maximum . . . . . 0.18 watts

RECOMMENDED ANTENNA EQUIPMENT:

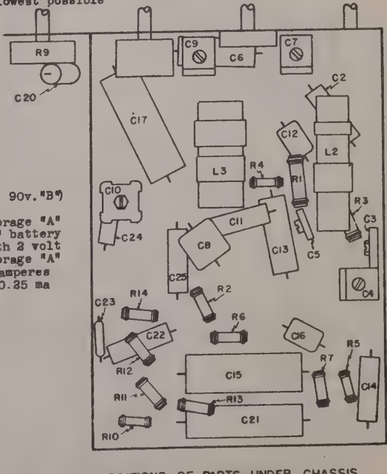
Catalog #5523, #5522, #5575.



LOC ONS OF PARTS ON TOP OF CHASSIS

POWER SUPPLY:
#5060. . .A-B block (1.4v. "A", 90v."B")
or
#734 . . . . 2v. Storage "A"
2 - #5041. . . . . 45v. "B" battery
#5071. . .Adaptor necessary with 2 volt Storage "A"
"A" Drain. . . . . 0.25 amperes
"B" Drain. . . . . 10.25 ma

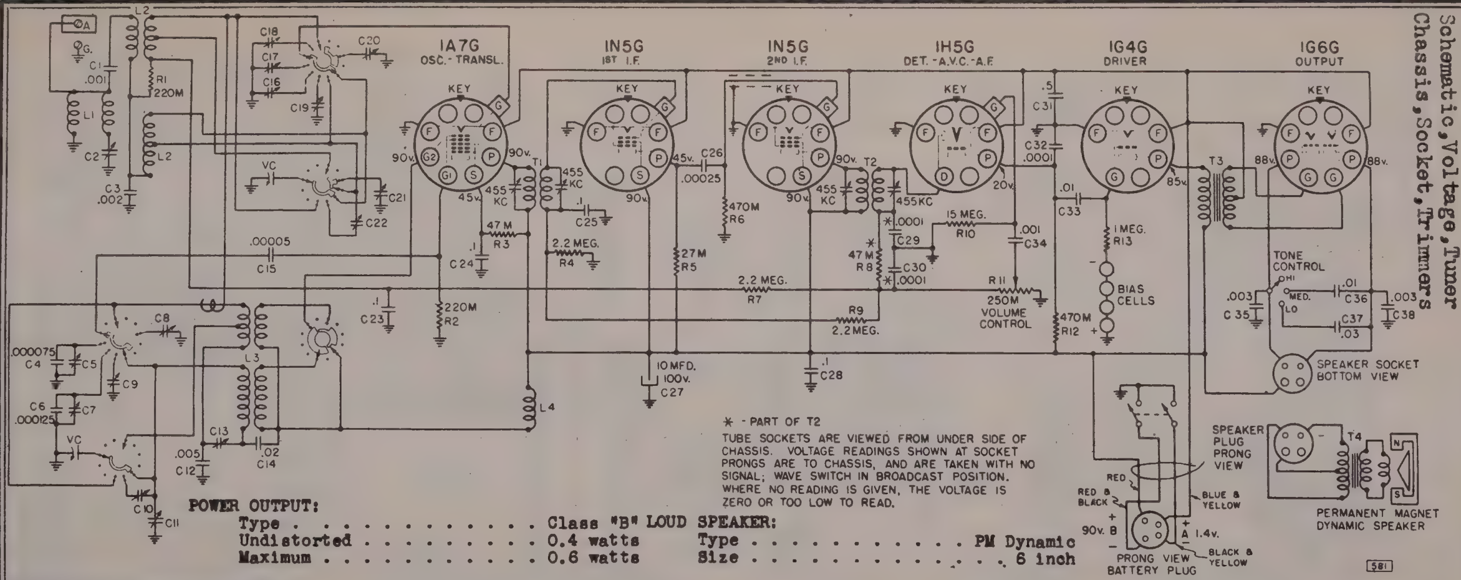
MAY 12, 1939



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 6362,6363,6364
Ch.101.581
Schematic,Voltage,Tuner
Chassis,Socket,Trimmers

SEARS, ROEBUCK & CO.



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER OUTPUT:

Type . . . . Class "B"
Undistorted . . . . 0.4 watts
Maximum . . . . 0.6 watts

LOUD SPEAKER:

Type . . . . PM Dynamic
Size . . . . 6 inch

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

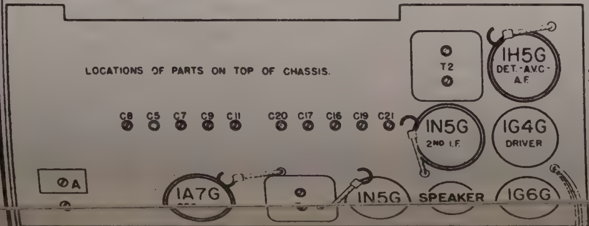
RECOMMENDED ANTENNA EQUIPMENT:

Catalog #5523: Greatest pickup and noise reduction.
Catalog #5522: Less effective pickup and noise reduction than Catalog #5523.
Catalog #5575: Conventional antenna.

POWER SUPPLY:

#5061. .A-B block (1.4 v. "A", 90 v."B")
or
#734 . . . . 2 v. Storage "A"
2 - #5043 . . . . .45 v. "B"Battery
#5072. . . .Adaptor necessary with 2 v. Storage "A"

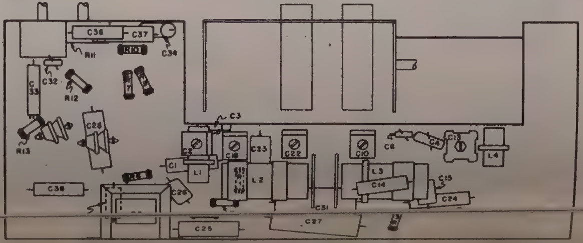
"A" Drain . . . . .0.35 Amperes
"B" Drain . . . . 12 ma


LOCATIONS OF PARTS ON TOP OF CHASSIS.
C8 C5 C7 C9 C11 C20 C17 C16 C19 C21
T2
1H5G DET.-AVC-A.F.
1N5G 2ND I.F.
1G4G DRIVER
ØA
1A7G
1N5G
SPEAKER
1G6G

INTERMEDIATE FREQUENCY

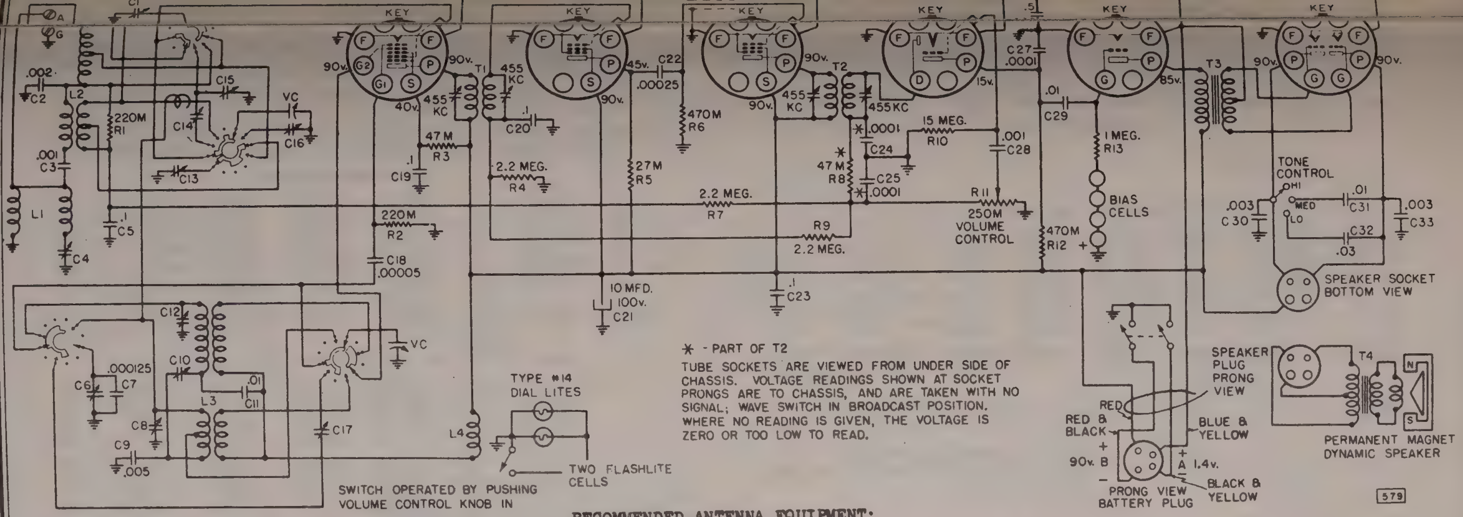
455 kc

FOR ALIGNMENT
SEE INDEX


C36 C37 C34 R10 R11 R12 C32 C33 R13 C28 C3 C2 C18 C23 C22 C10 C6 C4 C13 L4 C1 L1 L2 L3 C14 C15 C24 C38 C26 C31 C27 C25

SEARS, ROEBUCK & CO.

MODELS 6359,6360,6361,6379
6380,6381. Ch.101.579
Schematic,Voltage,Chassis
Socket,Trimmers,Tuner



✱ - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

RECOMMENDED ANTENNA EQUIPMENT:

Cat.#5523:	Greatest pickup and noise reduction.
Cat.#5522:	Less effective pickup and noise reduction than Catalog #5523.
Cat.#5575:	Conventional antenna.

INTERMEDIATE FREQUENCY . . . . . . 455 kc

POWER SUPPLY:

#5061. .A-B block(1.4 v."A", 90 v. "B")
or
#734 . . . . 2 v. Storage "A"
2 - #5043 . . . . 45 v. "B" Battery
#5072. . . .Adaptor necessary with 2 v. Storage "A"

"A" Drain . . . . .0.35 amperes
"B" Drain . . . . 12 ma

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

POWER OUTPUT:

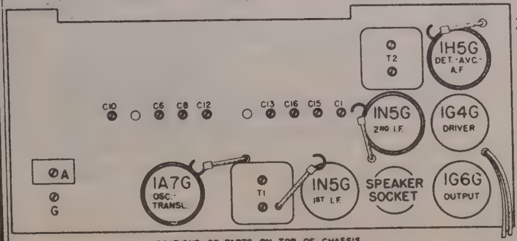
Type . . . . .Class "B"
Undistorted . . . . . 0.4 watts
Maximum . . . . 0.6 watts

LOUD SPEAKER:

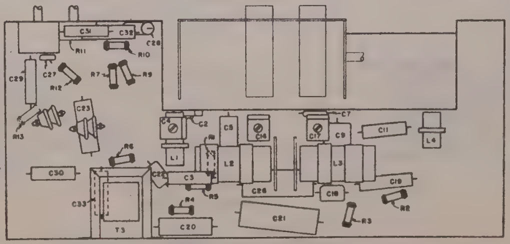
Type . . . . PM Dynamic
Size . . . . 6 and 8 inch

FOR ALIGNMENT
SEE INDEX

JUNE 19, 1939



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF PARTS UNDER CHASSIS

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY: For all Models and Chassis listed in the tables below.

Output meter connection . . . . Across loud speaker voice coil
Output meter-reading to indicate 50 milliwatts . . . . 0.3 volt
Approximate microvolts input for 50 milliwatts output . . . . See chart below
Generator ground lead connection . . . . To chassis
Dummy antenna value to be in series with generator output . . . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . .30%, 400 cycles
Position of Volume Control . . . . .Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . At block to left of 550 kc calibration mark.

MODELS 6359,6360,6361,6379,6380,6381 CHASSIS 101.579

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C4*	Wave Trap	--
"A"	Fully open	1750 kc	.0002 mfd.	Ant. Term.	C12	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1	Translator	35
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	30
"B"	2.3 mc	2.3 mc	400 ohms	Ant. Term.	C17	Osc. Pad	--
"B"	2.3 mc	2.3 mc	400 ohms	Ant. Term.	C14†	Transl.Pad.	45
"B"	2.5 mc	2.5 mc	400 ohms	Ant. Term.	C15†	Translator	45
"C"	18.3 mc	18.3 mc	400 ohms	Ant. Term.	C8	Oscillator	--
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C16	Translator	40
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C6**,C13	Osc.,Transl.	40

MODELS 6362,6363,6364 CHASSIS 101.581

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF	
"A"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C2*	Wave Trap	
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C11,C21	Osc.,Transl.	
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C13	Padder	
"B"	2.3 mc	2.3 mc	400 ohms	Ant. Term.	C10,C22	Osc. Pad, Transl. Pad	
"B"	2.5 mc	2.5 mc	400 ohms	Ant. Term.	C18	Translator	
"C"	18 mc	18 mc	400 ohms	Ant. Term.	C9	Oscillator	
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C19	Translator	
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C7**,C16	Osc.,Transl.	
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C5**,C17	Osc.,Transl.	
"F"	14.9 mc	14.9 mc	400 ohms	Ant. Term.	C8**,C20	Osc.,Transl.	

MODEL 6368 CHASSIS 101582, MODEL 6382 CHASSIS 101.594

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6D8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C6*	Wave Trap	--
"B"	Fully open	5.85 mc	400 ohms	Ant. Term.	C9	Oscillator	--
"B"	5 mc	5 mc	400 ohms	Ant. Term.	C4	Translator	75
"B"	2 mc(rock)	2 mc	400 ohms	Ant. Term.	C11	Padder	110
"C"	18 mc	18 mc	400 ohms	Ant. Term.	C2**	Oscillator	--
"C"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C5	Translator	50
"A"	Fully open	1730 kc	.0002 mfd.	Ant. Term.	C7	Oscillator	100
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3	Translator	55
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	50

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

† Repeat the C14 and C15 adjustments until perfect alignment is obtained. This will require going back and forth in these adjustments several times.

** If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

ALIGNMENT PROCEDURE

PRELIMINARY: For all Models and Chassis listed in the tables below.

Output meter connection . . . . Across loud speaker voice coil
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Dummy antenna value to be in series with generator output . . . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control. . . . . .Fully clockwise
Position of Tone Control . . . . .HI
Position of Dial Pointer with variable fully closed . . . . .At block to left of 550 kc calibration mark.

MODEL 6441 CHASSIS 101.599

Output meter reading to indicate 500 milliwatts . . . . 1.28 volts
Generator ground lead connection . . . . .To external ground

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1650 kc	.0003 mfd.	Ant. Clip	C14	Oscillator	100
"A"	1400 kc	1400 kc	.0003 mfd.	Ant. Clip	C1,C8	Ant.,Transl.	25
"A"	600 kc(rock)	600 kc	.0003 mfd.	Ant. Clip	C11	Padder	10
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Clip	C7	Translator	100
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Clip	C15*	Translator	15
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Clip	C18,C16	Osc.,Transl.	60

MODELS 6438,6438A,6439 CHASSIS 101.583; 6438B,6439A,6497 CHASSIS 101.583-1
6497 CHASSIS 101595

Output meter reading to indicate 500 milliwatts . . . . .1.6 volts
Connection of generator ground lead . . . . To chassis

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS	Ⓐ
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--	--
"A"	Open	1750KC Ⓐ,1625 kc	.0002 mfd.	Ant. Term.	C19	Oscillator	--	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1,C10✝	RF,Transl.	20	10
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C20	Padder	20	15
"B"	5 mc	5 mc	400 ohms	Ant. Term.	C21,C5	Osc.,Transl.	150	130
"C"	18.3 mc	18.3 mc	400 ohms	Ant. Term.	C14*	Oscillator	--	--
"C"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C9	Translator	75	70
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C18*,C8	Osc.,Transl.	100	--
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C16*,C7	Osc.,Transl.	100	—

Ⓐ For Models 6438,6438A,6439 Chassis 101.583

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

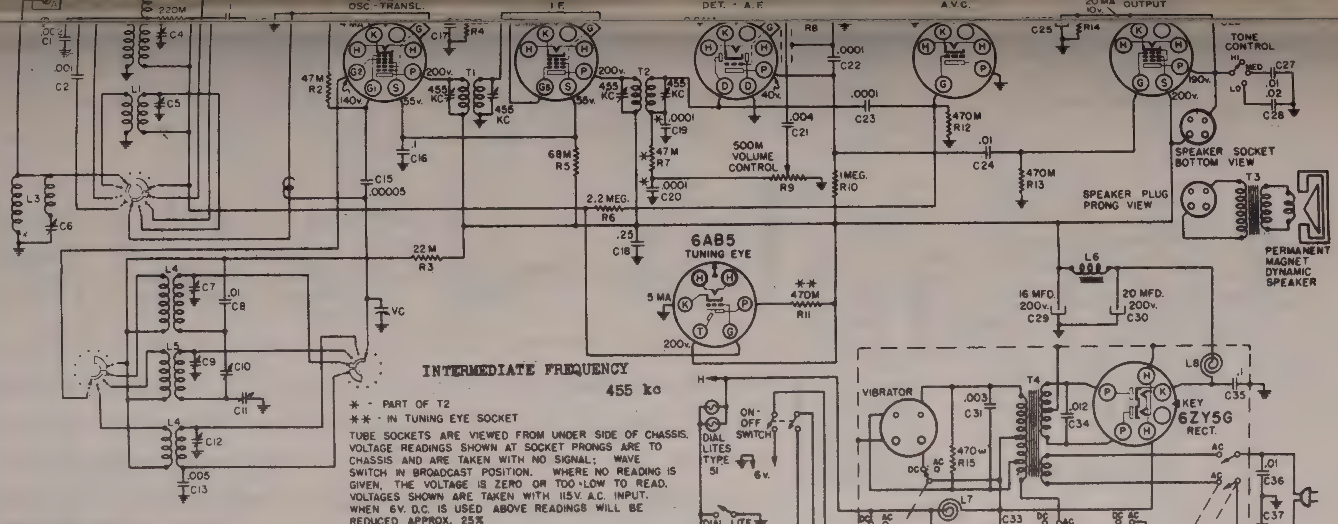
* If two peaks can be had, the correct adjustment is with the trimmer screw further out. The other peak is the image.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

✝After the alignment [illegible]

SEARS, ROEBUCK & CO.

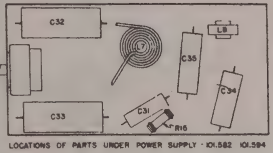
MODELS 6368,Ch.101.582,
6382,Ch.101.594
Schematic,Voltage,Chassis
Socket,Trimmers



INTERMEDIATE FREQUENCY
455 kc

* - PART OF T2
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGES SHOWN ARE TAKEN WITH 115V. A.C. INPUT. WHEN 6V. D.C. IS USED ABOVE READINGS WILL BE REDUCED APPROX. 25%



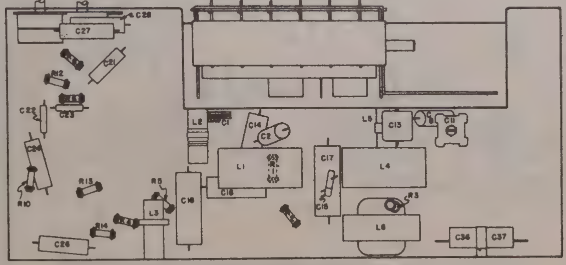
LOCATIONS OF PARTS UNDER POWER SUPPLY - 101.582 101.594

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 1.42 watts on A.C.;
.78 watts on D.C.
Maximum . . . . . . 2.8 watts on A.C.;
1.43 watt on D.C.

LOUD SPEAKER:
Type . . . . PM Dynamic
Size . . . . 6 and 8 inch

POWER SUPPLY:
Six volt storage battery Battery Drain . . . . . 3.3 Amperes
115 V., 50-60 cycle, A.C. . . . . .18 Watts

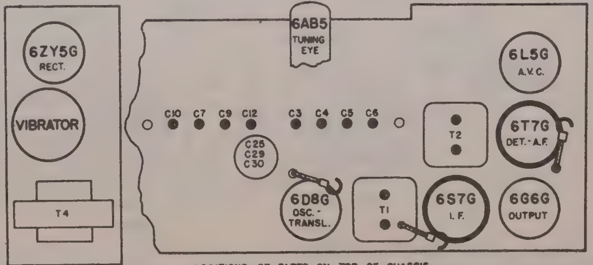
582
594



LOCATIONS OF PARTS UNDER CHASSIS - 101.582 101.594

FOR ALIGNMENT
SEE INDEX

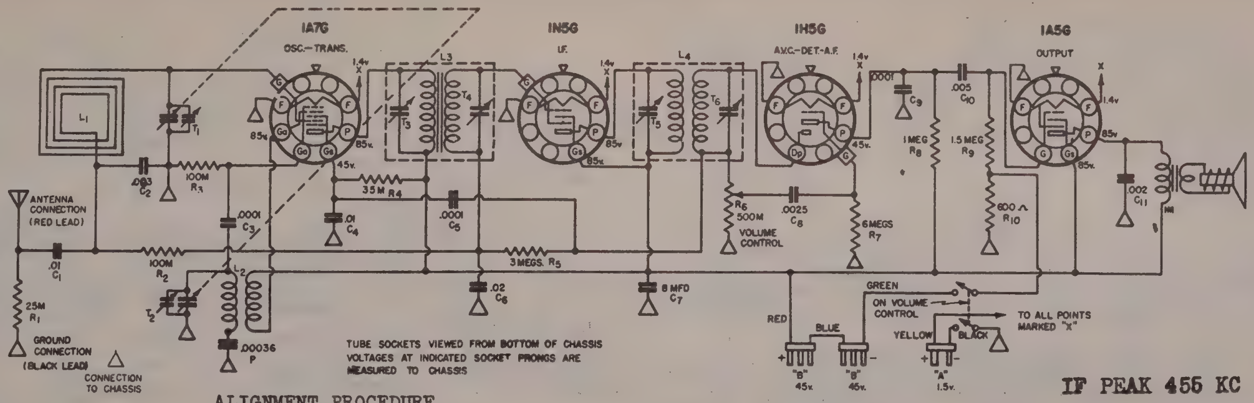
NOV. 8, 1939



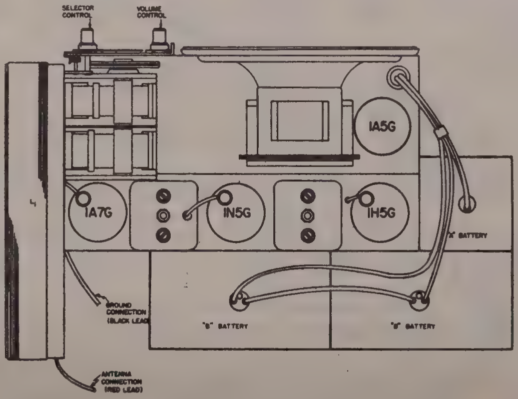
LOCATIONS OF PARTS ON TOP OF CHASSIS

MODELS 6372,6373
Chassis 110.991
Schematic,Voltage
Socket,Trimmers
Alignment

SEARS, ROEBUCK & CO.



IF PEAK 455 KC



ALIGNMENT PROCEDURE

Output meter connections......Across primary of output transformer

Generator Ground lead..................................To ground

Connection of generator output lead................See Chart below

Generator modulation..............................30%, 400 cycles

Position of Volume Control...............................Fully on

POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
Closed	455 KC	1A7G Grid	T3, T4 T5, T6	I.F.
1500 KC	1500 KC	*	T1, T2	R.F. osc.

The batteries should be in the proper position when aligning the receiver.

* Run a wire from the output terminal of the generator, having it come near the receiver However, no electrical connection is made between the signal generator and the receiver.

Alignment should be done with no connection made to the external antenna and ground terminals.

Always keep the output power from the generator at its lowest possible value to prevent

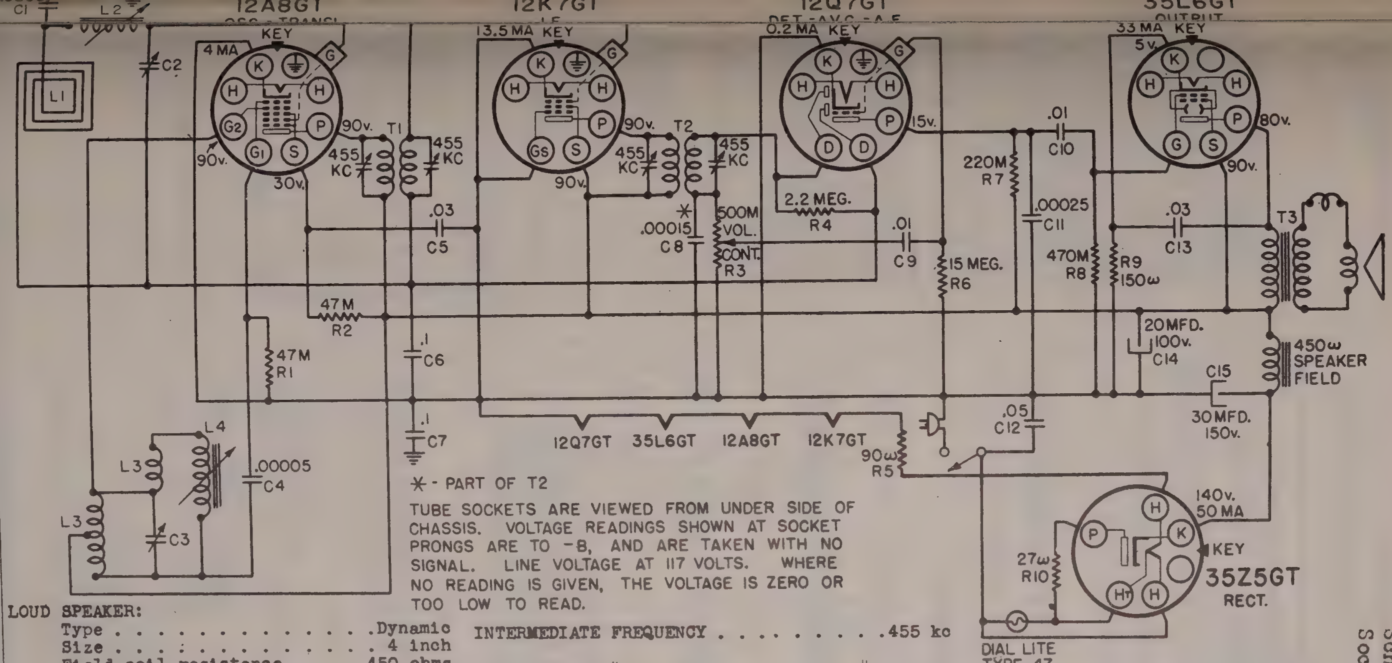
LOUDSPEAKER:
Type..............Dynamic
Size.................. 5"
Field............... P.M.

POWER OUTPUT:
Type...............pentode
Undistorted.......... 100 MW

SEARS, ROEBUCK & CO

MODELS 6403,6404,6405,6406
6492,6496.Ch.101.566A to E
Ch.101.566-1A to -1E incl.
Ch.101.566-2A to -2E incl.
Schematic,Voltage,Chassis
Socket,Trimmers

LIGNMENT SEE INDEX



∗ - PART OF T2

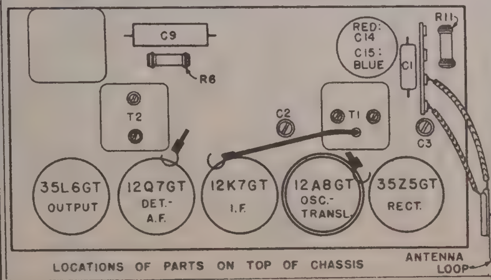
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

LOUD SPEAKER:
Type . . . . .Dynamic
Size . . . . 4 inch
Field coil resistance . . . . .450 ohms
Approx.field coil voltage drop. . 50 V.

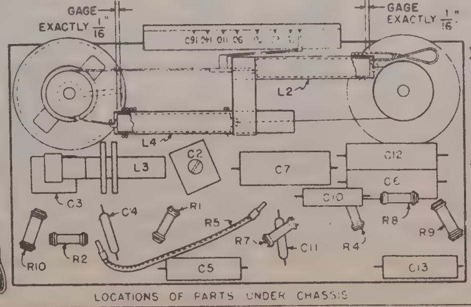
INTERMEDIATE FREQUENCY . . . . .455 kc

POWER SUPPLY:
All models available . . .
105-125 volts, AC-DC, 30 watts

POWER OUTPUT:
Type . . . . .Beam Tube
Undistorted . . . . 1 watt
Maximum . . . . . . .1.3 watt



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

NOV. 21, 1939

MODELS See Below
Alignment,Notes
MODEL 7230
Notes

SEARS. ROEBUCK & CO.

GENERAL INFORMATION & SERVICE HINTS

MODELS 6403,6404,6405,6406,6492,6496 CHASSIS 101.566 (A,B,C,D,E);101.566-1, -1A,-1B,-1C,-1D,-1E; 101.566-2,-2A,-2B,-2C,-2D,-2E. --ONLY--.

ADDITION OF SUFFIX LETTERS(-A,-B,-C,-D,-E)

Suffix letters have been added to the chassis identification number when the chassis has been used in the various different cabinets.

ADDITION OF SUFFIX NUMBERS -1 AND -2 TO CHASSIS IDENTIFICATION NUMBER:

In order to broaden the selectivity somewhat,, chassis identified with the addition of suffix number, -1, have had the connections of the 1st I.F. Transformer reversed so that the blue wire goes to B+ and the red wire to the 12A8GT plate. Some of these sets also have a 33M ohm resistor in place of the 47M ohm resistor, R3.

Chassis identified by the addition of suffix number, -2, have a different 1st I.F. Transformer, part number 10133421701, and a different 2nd I.F. Transformer, part number 1013342185, giving a still greater decrease in selectivity. The value of R3 in these chassis is 22M ohms.

DIAL LIGHT REPLACEMENT:

The dial light can be replaced without removing the chassis from the cabinet by removing the center tube making it possible to pull the dial light socket off of its bracket.

MODELS 6407,6408,6409 CHASSIS 101.567 (-A,-B), 101.567-1,(-1A,-1B), 101.567-2 (-2A,-2B) --ONLY--.

ADDITION OF SUFFIX LETTERS:

Chassis identified by 101.567 are used in Catalog number 6407, black cabinet. Suffix letter "-A" has been added when the chassis is used in Catalog number 6408, ivory cabinet. Suffix letter "-B" is added when the chassis is used in Catalog number 6409, walnut cabinet.

DIAL LIGHT REPLACEMENT:

The dial light socket is attached to a bracket at the rear of the chassis, held with a single screw.

PUSH BUTTON TUNING:

Each button is set up by loosening the screw (under the call letter tab), tuning in the station, depressing the button and then tightening the screw.

NOTE:- THE FOLLOWING INFORMATION APPLIES TO ALL CHASSIS AND MODELS LISTED ABOVE UNDER MODELS 6403,etc. AND MODELS 6407, etc.

THE LOOP ANTENNA:

The loop antenna is directional so that reception may be improved or interference lessened by turning the set to a particular position. In locations where the signal strength is too low to give satisfactory reception from the loop antenna, an outside antenna may be connected to the Fahnstock clip at the end of the lead at the rear of the receiver. No attempt should be made to use a ground connection.

REMOVING THE CHASSIS FROM THE CABINET:

In addition to the two screws that hold the back of the chassis there is also a screw that holds the speaker frame to the cabinet.

THE HEATER CIRCUIT:

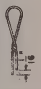
The heaters of all of the tubes are connected in series. Accordingly, if any one tube burns out, the others will not light. It is necessary to replace only the burnt out tube; the others then will light. The burnt out tube can be located through the fact that the full line voltage will appear across its heater prongs.

POSITION OF POWER CORD PLUG:

On AC, the power cord plug should be tried in both its possible positions in the receptacle and left in the position that gives least hum. On DC, the receiver will work at only one position of the plug in its receptacle.

COIL REPLACEMENT:

No regard need be paid to the colors of paint spots on coils or cores. Coils may be replaced individually; however, cores must be replaced in pairs to secure proper matching and are furnished in pairs for service. To replace a coil, cut away the cement from the old coil and remove the coil. Insert the new coil in the bracket and position it so that, when the tuning knob is turned to its low frequency limit, the core will extend exactly 1/16" beyond the end of the coil winding. A gauge, easily made of a piece of wire as illustrated, should be used for determining this dimension. Similarly, when replacing cores, the coil positions must be checked to see that there is exactly 1/16" overlap of the core beyond the end of the coil winding with the tuning knob at the low frequency limit. This is true for both oscillator and translator cores and coils. New coils can be cemented to the bracket with Major's, Du Pont, or equivalent cement.



ELIMINATING HUM MODULATION WHEN USING AN EXTERNAL ANTENNA:

As shown by the Schematic and by the Location of Parts diagram, there is a 2200 ohms resistor, connected from the external antenna clip to chassis. This resistor prevents hum modulation when using an external antenna. If such hum is experienced, examine the chassis to see if this resistor has been incorporated. (The resistor is mounted alongside of the loop antenna connection board as shown in the Location of Parts diagram. It was not incorporated in early production.) If necessary, addition of the resistor will eliminate the complaint.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection	Across loud speaker voice coil
Output meter to indicate 50 milliwatts	0.36 volt
Dummy antenna value to be in series with generator output	See chart below
Connection of generator ground lead	To external ground
Position of Volume Control	Fully on

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
550 Kc	455 kc	.1 mfd.	12A8GT Grid	T2,T1	IF
540 kc	540 kc	.0002 mfd.	Ant. Clip	C3*	Oscillator
700 kc see note A	700 kc	.0002 mfd.	Ant. Clip	C2*	Translator
900 kc see note B	900 kc	.0002 mfd.	Ant. Clip	C2*	Translator

IMPORTANT ALIGNMENT NOTES

NOTE A:- Applies only to MODELS 6403,etc as listed above.
NOTE B:- Applies only to MODELS 6407, etc as listed above.

* Adjustment accessible through holes in bottom of cabinet with chassis in cabinet.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

General Information and Service Hints

MODEL 7230 CHASSIS 126.208

Eliminating Whistle at 910 KC:

A whistle due to a beat between the second harmonic (910 kc) of the 455 kc I-F, and a 910 kc signal may be experienced. In localities where the 910 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I-F frequency of the receiver.

Determine at what point between 880 and 940 kc the whistle will be least objectionable. Dividing this frequency by two will give the new I-F frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 930 kc would not be objectionable, the I-F should be re-aligned at 930/2 or 465 kc. Try to select the new I-F frequency as close as possible to 455 kc.

An interfering whistle may also be caused by two stations having a frequency difference equal to the I-F frequency (455 kc) of the receiver. This will be evidenced by a whistle appearing when the receiver is tuned to either of the stations. It may be further localized by tuning the receiver to each of these stations and then stopping the oscillator, in each case, by grounding the oscillator stator section of the variable tuning condenser C32 (rear section) to chassis. If the whistle, in each case, still persists, it is being caused by the beat between these two stations and may be corrected by shifting the I-F frequency of the receiver to a frequency other than the difference frequency of the two local or strong signals (stations).

The I-F amplifier should not be shifted to a frequency higher than 470 kc, nor lower than 440 kc, but should be as close to 455 kc as possible.

Align the I-F at the new frequency and then re-align the rest of the receiver as described under "ALIGNMENT PROCEDURE."

Loudspeaker:

Centering of the loudspeaker voice-coil is done in the usual manner with three, narrow-paper or celluloid feelers, after first removing the front dust-cover by gently cutting it away. A dust-cover should be cemented back in place upon completion of the adjustment.

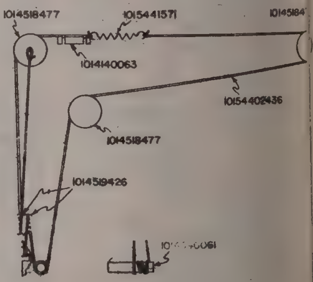
Unpacking and Assembly:

Remove the tape which holds the pickup on the pickup rest during shipment. The knobs and turntable parts will be found in a separate package. Assemble the washer, rubber spindle cap, and turntable on the spindle as shown in the diagram. The projections on the washer should fit over the pin in the spindle, and the rubber cap should be pushed down against the washer.

Motor Lubrication:

The phonograph motor should be oiled occasionally by lifting off the turntable and applying a few drops of light machine oil to the spindle.

Before ordering parts for Dial Drive System, check these drawings:

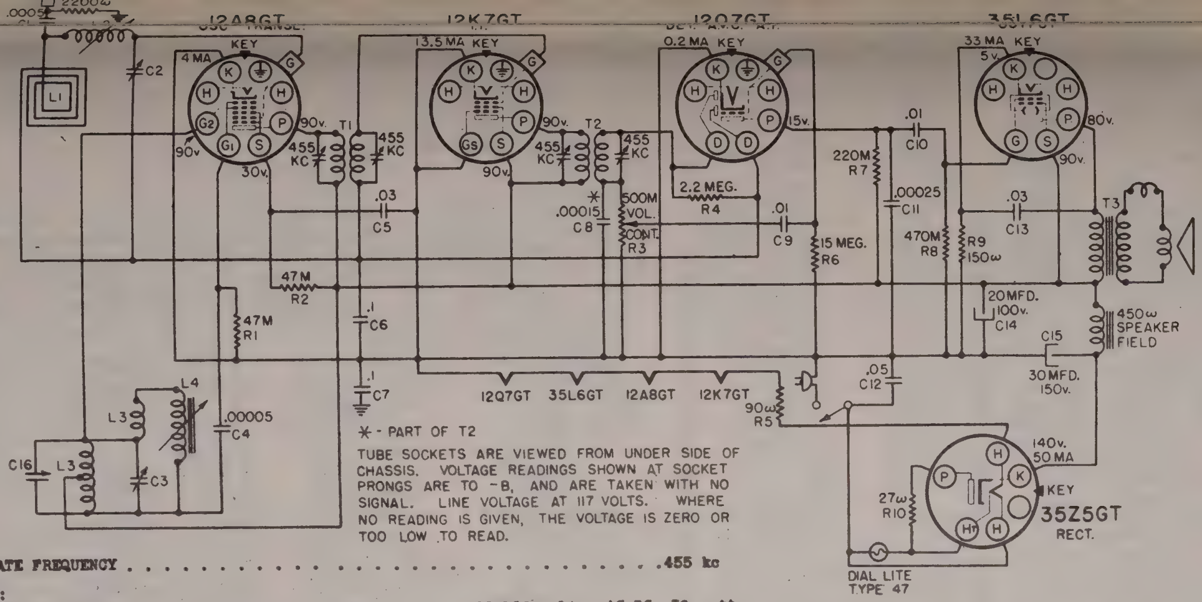


MODEL 6447 CHASSIS 101.590,-1,-2,-3.

SEARS. ROEBUCK & CO.

MODELS 6407,6408,6409
Ch.101.567,101.567-A,-B
101.567-1,-1A,-1B
101.567-2,-2A,-2B
Schematic,Voltage,Chassis
Socket,Trimmers,Drive Cord

FOR ALIGNMENT
SEE INDEX



✱ - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER SUPPLY:
All models available . . . . 105-125 volts, AC-DC, 30 watts

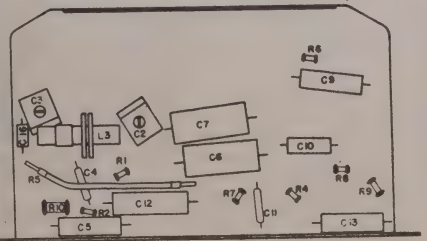
FREQUENCY RANGE . . . . .540-1620 kc

ALIGNMENT FREQUENCIES: . . .Osc. - 540 kc;
Transl. - 900 kc

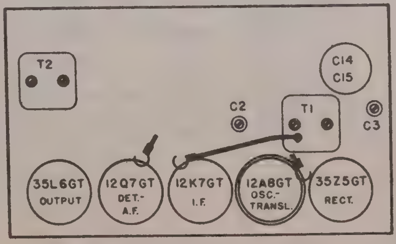
LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . 4 inch
Field coil resistance . . . . 450 ohms
Approx.field coil voltage drop. .50 V.

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted . . . . 0.8 watts
Maximum . . . . 1.4 watts

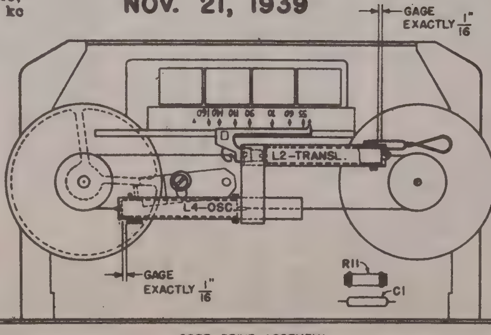
NOV. 21, 1939



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS ON TOP OF CHASSIS



CORE DRIVE ASSEMBLY

MODELS 6407,6408,6409
Changes to Chassis
MODELS 6407A,6408A,6409A
Ch.101.567-3,-3A,-3B
Schematic,Voltage

SEARS, ROEBUCK & CO.

ADDITION OF SUFFIX NUMBERS -1 AND -2 TO CHASSIS IDENTIFICATION NUMBER:

In order to broaden the selectivity somewhat, chassis identified with the addition suffix number, -1, have had the connections of the 1st I.F. Transformer reversed so that blue wire goes to B+ and the red wire to the 12A8GT plate. This decrease in selectivity proves the repeat accuracy of the push button setting. Some of these sets also have a ohm resistor in place of the 47M ohm resistor, R2.

Chassis identified by the addition of suffix number, -2, have a different 1st I.F. Tr former, part number 10133421701, and a different 2nd I.F. Transformer, part number 1013342 1, giving a still greater decrease in selectivity and a still further improvement in repeat curacy of the push button settings. The value of R2 in these chassis is 22M ohms.

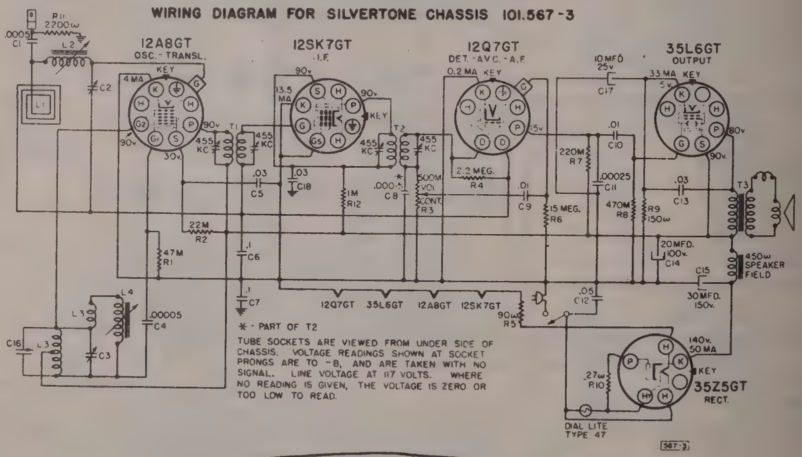
SUBJECT: ADDITION OF SUFFIX NUMBER -3 TO CHASSIS IDENTIFICATION NUMBER:

Chassis identified by the addition of suffix number 3 (plus any suffix letter) to identification number use a 12SK7GT IF tube instead of a 12K7GT. In addition, the positi of the 12Q7GT Detector and 35L6GT Output tubes have been interchanged. The revised Wir Diagram and Tube Layout are shown in this supplement.

Changes in the parts are as follows:

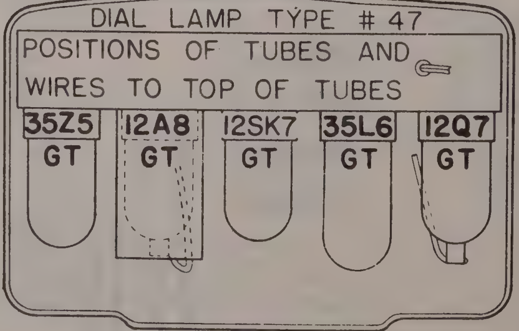
Loop antenna changed to 1012842410; retail price 48¢.
Electrolytic condenser changed to 1012042405; retail price 59¢.
IF Input Transformer changed to 1013342406; retail price 60¢.
IF Output Transformer changed to 1013542476; retail price 60¢
1M ohm 1/3 watt Resistor, R12, added; retail price 15¢.
.03 mfd., 300 volt Condenser, C18, added; retail price 7¢.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.567-3



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

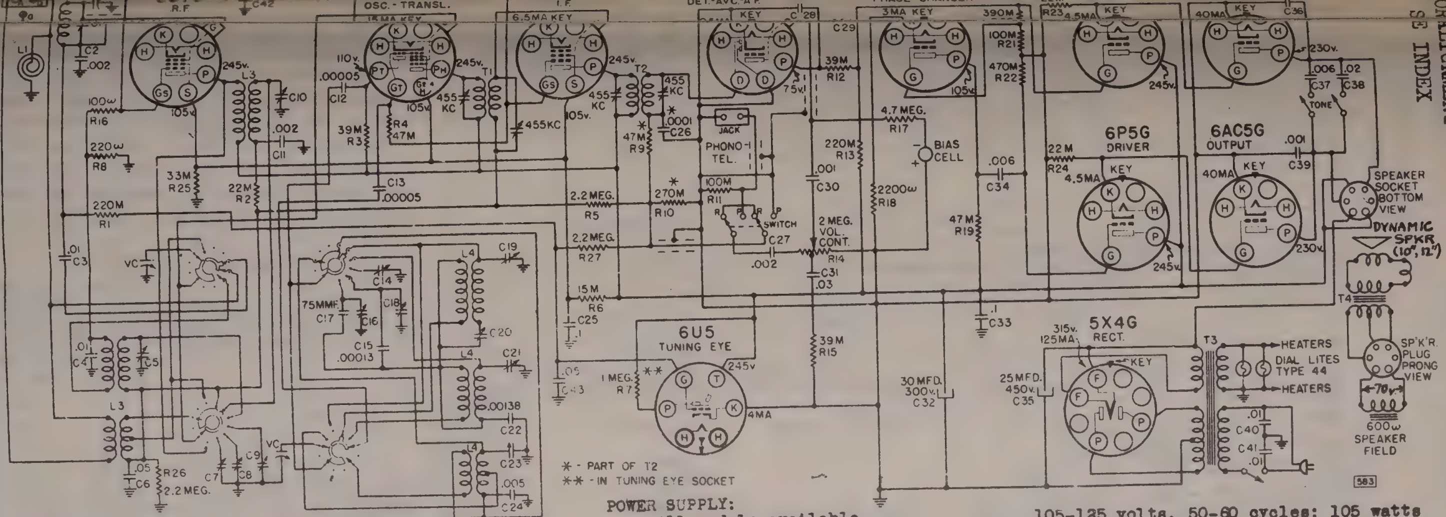


FOR ALIGNMEN
SEE INDEX

FEB. 13, 1940

SEARS, ROEBUCK & CO.

MODELS 6438,6438A,6439
Chassis 101.583
Schematic,Voltage,Chassis
Tuner,Socket,Trimmers
CHASSIS 101.583-1
Socket,Trimmers,Chassis



* - PART OF T2
** - IN TUNING EYE SOCKET

POWER SUPPLY:
All models available . . . . 105-125 volts, 50-60 cycles; 105 watts
All models available . . . . 105-125 volts, 25-60 cycles; 110 watts

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

INTERMEDIATE FREQUENCY . . . . .455 kc

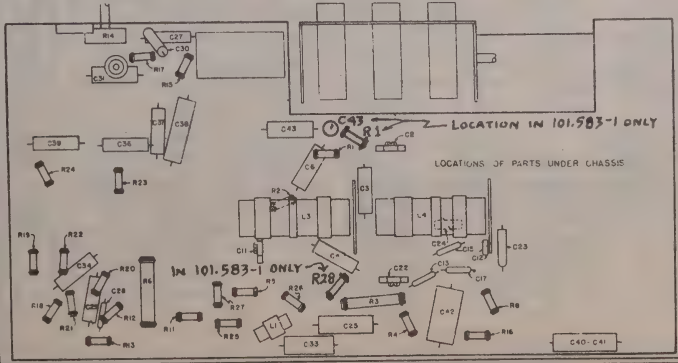
POWER OUTPUT:
Type . . . . .Push pull direct coupling
Undistorted . . . . 6 watts
Maximum . . . . .10 watts

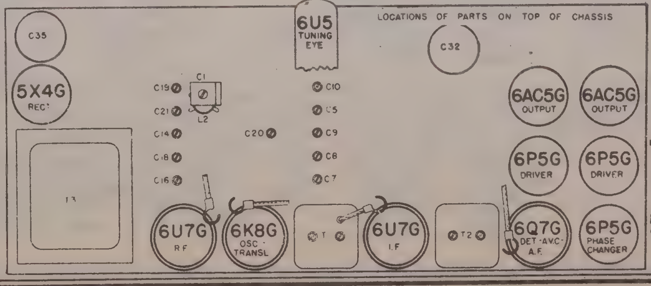
JULY 21, 1939

PUSH BUTTON TUNING MECHANISM:

CHASSIS 101.583

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, holding the plunger all the way in and tuning to the desired station, and then securely locking the adjustment.

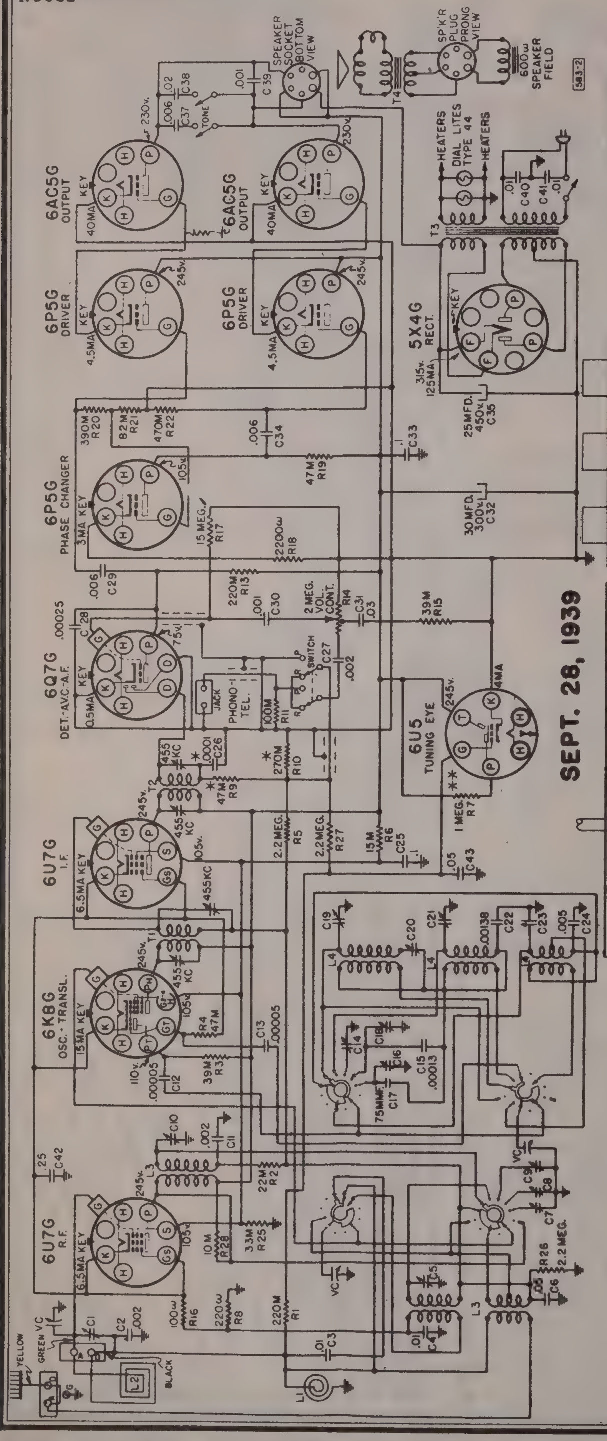




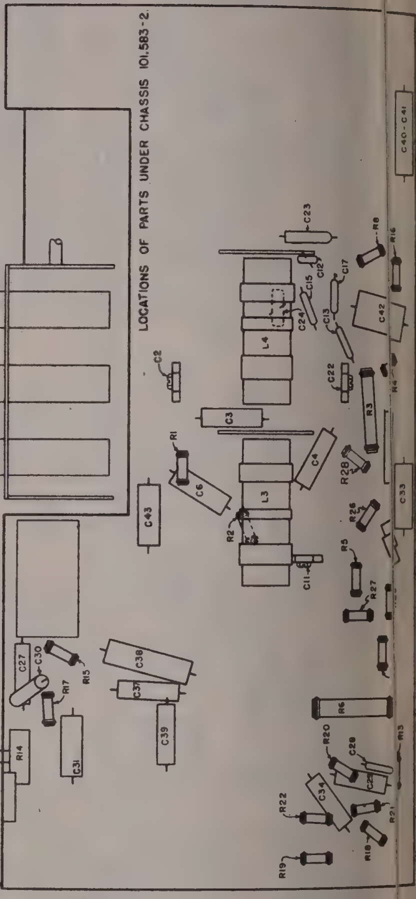
MODELS 6438B,6439A,6440
Chassis 101.583-2
Schematic,Voltage,Chassis
Notes

SEARS, ROEBUCK & CO.

FOR ALIGNMENT
SEE INDEX



SEPT. 28, 1939



* - PART OF T2

** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

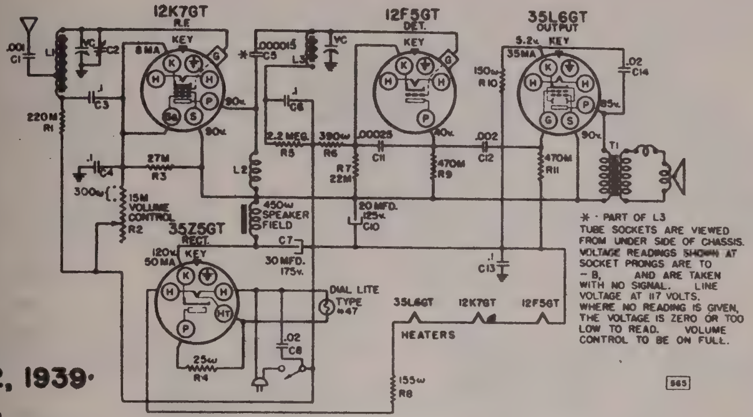
CHASSIS 101.583-2

Chassis identified as 101.583-2 are the same as 101.583-1 except for circuit changes that eliminate the bias cell and remove the 39,000-ohm resistor, R12; the 22,000-ohm resistors, R23, R24; the 4.7-megohm resistor, R17; the 100,000-ohm resistor, R21; and the 0.001-mf condenser, C36. A 15-megohm resistor, R17 and an 82,000-ohm resistor, R21 are added. All of these changes

io,Voltage,Chassis
Trimmers,Alignment

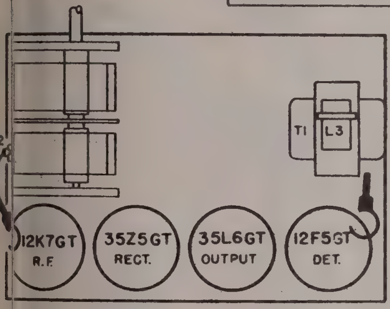
SEARS, ROEBUCK & CO.

MODELS 6400,6401,6402
Ch.101.565,101.565-A,-B
MODELS 6400A,6401A,6402A
Ch.101.593,101.593-A,-B

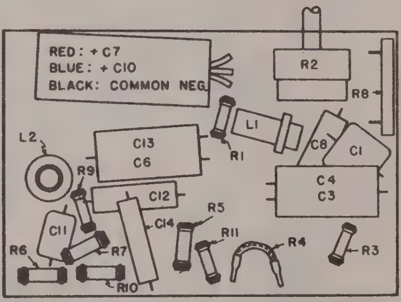


* · PART OF L3
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO - B, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLUME CONTROL TO BE ON FULL.

PT. 22, 1939



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

SUPPLY:
ll models available . . . . 105-125 volts; AC-DC, 30 Watts

OUTPUT:
ype . . . . Beam Tube
ndistorted . . . . 0.65 watts
aximum . . . . 0.85 watts

LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . 3-1/2 inch
Field coil resistance . . . 450 ohms
Field coil voltage drop. . . 30 volts

ALIGNMENT PROCEDURE

ither a broadcast signal of about 1400 kc or a test oscillator signal may be used. If dcast signal is used, the antenna of the receiver should be extended as in a normal intion. If a test oscillator signal is used, a wire should be connected to the test osor output and run parallel to but insulated from the receiver's antenna wire.

une in the 1400 kc signal and adjust the trimmer of the variable for maximum loud speaker se. This can be done most accurately if the volume control setting is reduced to give lume level. The variable should be rocked a degree or two during the adjustment.

SUFFIX LETTERS "A" & "B"

01.565 chassis is used in the black cabinet, Catalog #6400. Suffix letter "A" is added chassis identification, making it 101.565-A, for the ivory cabinet, Catalog #6401. letter "B" is added, making the chassis identification 101.565-B, for the walnut cab-Catalog #6402.

hassis 101.593,-A,-B is exactly the same as 101.565,-A,-B described in RL 207, except t uses a speaker having a higher inductance field to give more satisfactory operation cycle AC. The field coil resistance is 550 ohms instead of 450 ohms as in the 101.565 r.

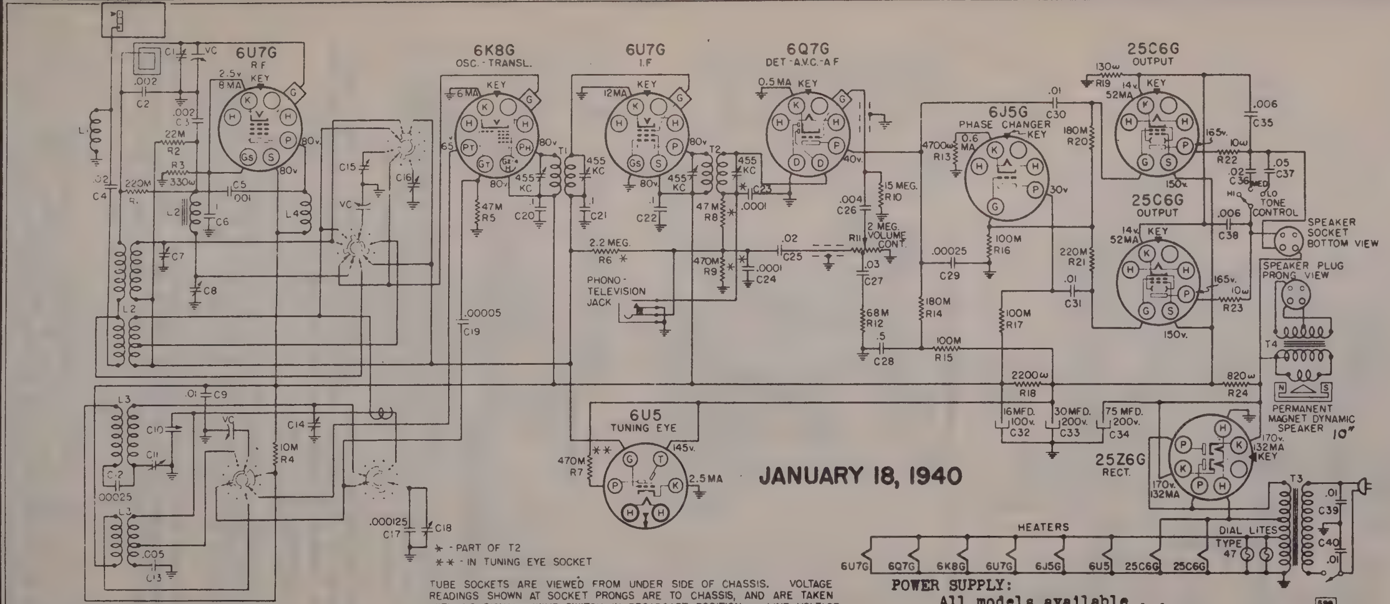
NG 35 CYCLE DIAL LIGHT FLICKER:

bjectionable 35 cycle flicker of the dial light can be eliminated, at some sacrifice in nation, by changing the connection of the 35 ohm resistor, R4, to the other side of the ight socket lead: i.e., change the R4 connection from prong #3 of the 35Z5GT tube to #2.

MODEL 6441,Ch. 101.599
Schematic,Voltage,Chassis
Socket,Trimmers,Tuner

SEARS, ROEBUCK & CO.

FOR
ALIGNMENT S
INDEX



JANUARY 18, 1940

* - PART OF T2
** - IN TUNING EYE SOCKET

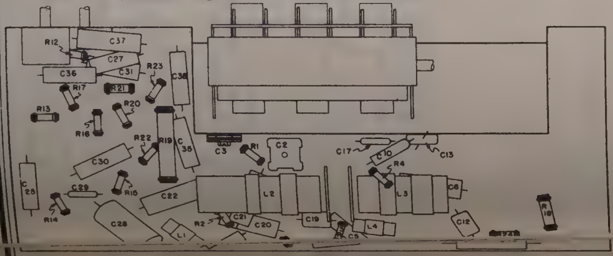
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:
All models available . . .105-125 v., 50-60 cycles AC; 85 watts
All models available . . .105-125 v., 25-60 cycles AC; 90 watts

POWER OUTPUT:
Type . . . . Push pull beam tube
Undistorted . . . . .5 watts
Maximum . . . . .8 watts

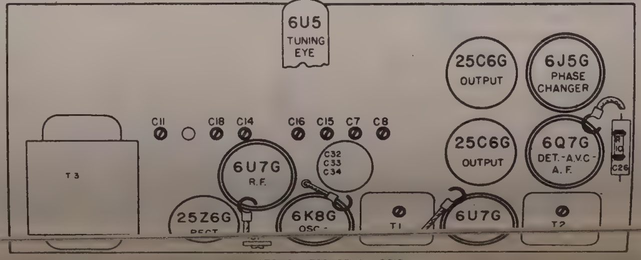
PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screw driver lightly in the screw head allowing the spring tension to hold the plunger against the screw driver.



LOCATIONS OF PARTS UNDER CHASSIS - 101.599

INTERMEDIATE
FREQUENCY
455 kc



LOCATIONS OF PARTS ON TOP OF CHASSIS

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SEARS, ROEBUCK & CO.

MODEL 6447,Ch.101.590,
101.590-1 to 101.590-5
Schematics,Voltage,Notes

ODI ION OF SUFFIX NUMBERS:

Chassis 101.590-1 is the same as 101.590 except that it uses a different tone arm and ick p cartridge, not interchangeable with the ones used in 101.590. Accordingly, when order ng ither a tone arm or a pickup cartridge, be sure the proper part number is used and the orr ct chassis number indicated in the order. 101.590,-1 use a two position tone control.

101.590-2 is the same as 101.590 except for changes in the antenna circuit, including he ddition of an I.F. wave trap. A continuously variable tone control is used.

101.590-3 is the same as 101.590-2 except that it uses the same tone arm and pickup that re sed in 101.590-1.

OWE SUPPLY:

All models available	105-125 volts, 60 cycle, AC;75 watts
All models available	105-125 volts, 50 cycle, AC;80 watts
All models available	105-125 volts, 25 cycle, AC;90 watts

NTE EDIATE FREQUENCY . . . . 455 kc

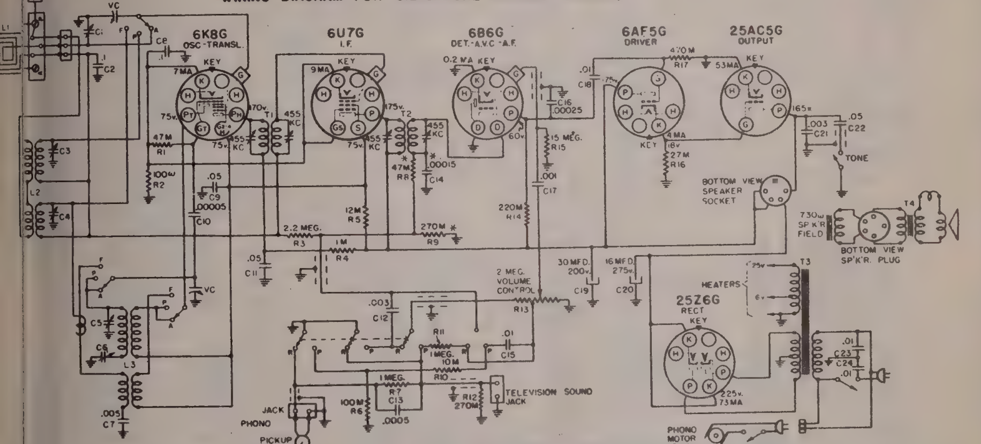
OWE OUTPUT:

Type	Direct coupled
Undistorted	3-1/2 watts
Maximum	4 watts

LOUD SPEAKER:

Type	Dynamic
Size	10 inch
Approx. field coil resistance	730 Ohms
Approx. field coil voltage drop	50 v.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.590,-1

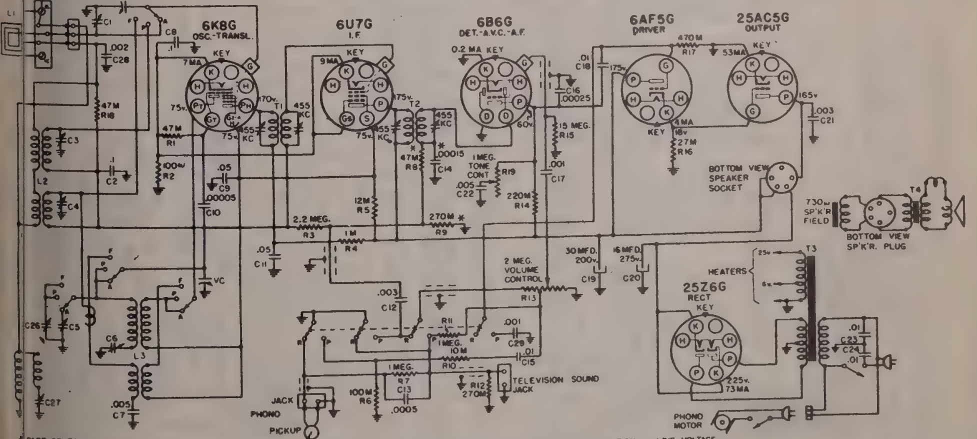


* ART OF T2

TU SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE REA GS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.590-2, -3,-4,-5.

OCTOBER 30, 1939



* PART OF T2

T SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE NGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117-VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MODEL 6447
Chassis,Socket,Trimmers
Alignment,Tuner

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 0.8 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . See chart below
Connection of generator ground lead . . . . Receiver chassis
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . Treble (HI)
Position of Dial Pointer with variable fully closed . . . . On mark below 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"AM"	600 kc	455 kc	.0002 mfd.	Ant. Clip	C27*	Wave Trap	--
"AM"	Fully open	1650 kc**	.0002 mfd.	Ant. Clip	C5	Oscillator	225
"AM"	Fully open	1550 kc***	.0002 mfd.	Ant. Clip	C5	Oscillator	225
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Clip	C1	Translator	35
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Clip	C6	Padder	100
"POL"	Fully open	2.55 mc***	400 ohms	Ant. Clip	C26***	Oscillator	--
"POL"	2.4 mc	2.4 mc	400 ohms	Ant. Clip	C3	Translator	135
"FOR"	16 mc(rock)	16 mc	400 ohms	Ant. Clip	C4	Translator	45

IMPORTANT ALIGNMENT NOTES

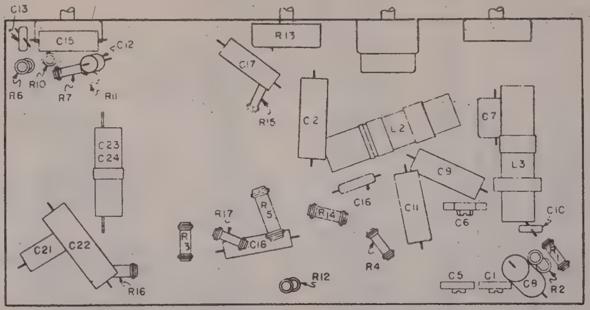
* In 101.590-2,-3 only. The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** 101.590,-1 only. *** 101.590-2,-3 only.

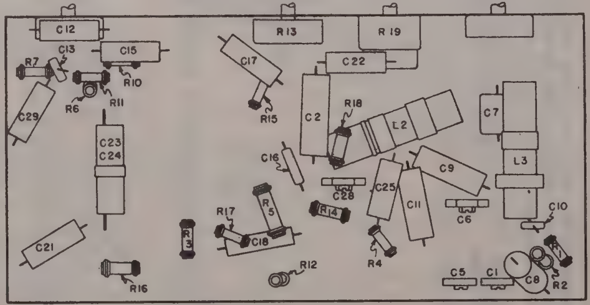
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

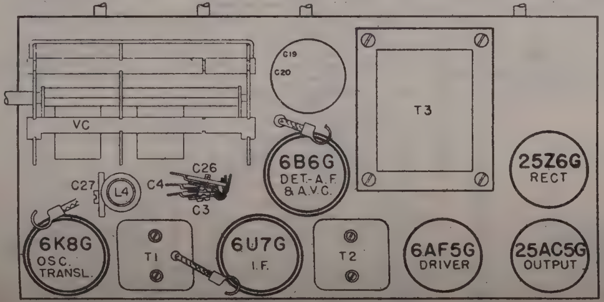
After the alignment has been completed, the C1 adjustment should be repeated on a broadcast signal of about 1400 kc with no external antenna connected to the antenna terminal.



LOCATIONS OF PARTS UNDER CHASSIS 101.590,-1



LOCATIONS OF PARTS UNDER CHASSIS 101.590-2,-3,-4,-5.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.590-2,-3,-1*
NOTE: L4, C26 and C27 shown above, are not used on Chassis 101.590-1

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screwdriver lightly in the screw head allowing the spring tension to hold the plunger against the screwdriver.

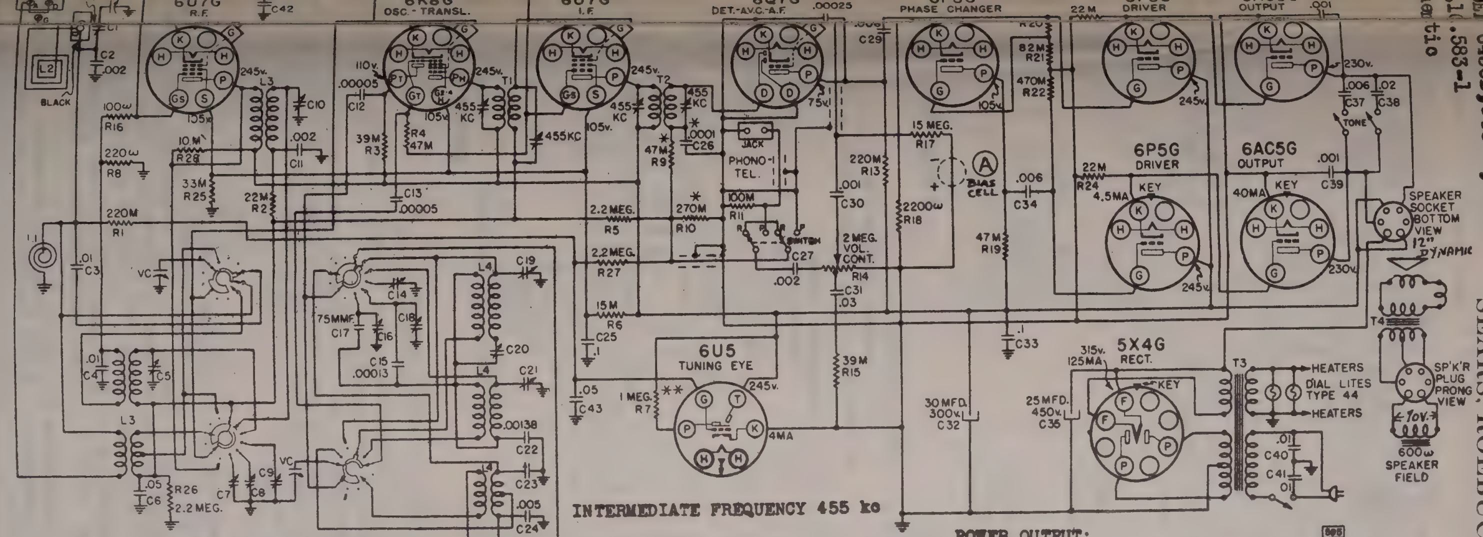
RECOMMENDED ANTENNA EQUIPMENT:

Catalog #5523: Greatest pickup and noise reduction.
Catalog #5522: Less effective pickup and noise reduction than Catalog #5523.
Catalog #5575: Conventional antenna.

6438B,6439A,6497
.583-1

SEARS, ROEBUCK & CO.

MODEL 6497,Ch.101.595
Schematic,Voltage,Chassis
Socket,Trimmers



INTERMEDIATE FREQUENCY 455 kc

POWER OUTPUT:

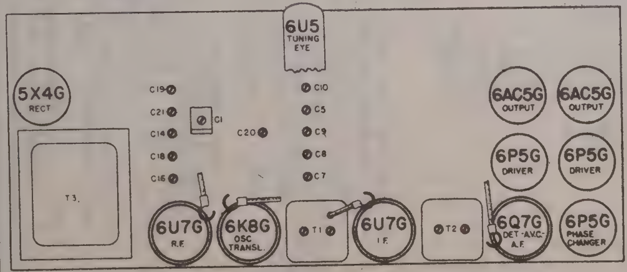
Type . . . . . Push-pull direct coupling
Undistorted . . . . 6 watts
Maximum . . . . .10 watts

FOR ALIGNMENT SEE INDEX

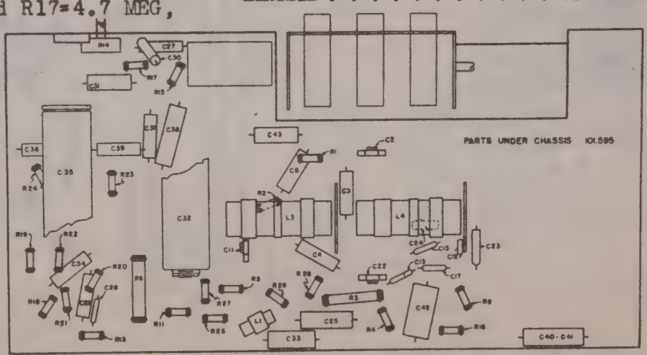
* - PART OF T2
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

Schematic for Chassis 101.583-1 is the same as above except that a bias cell is added at Ⓐ and R17=4.7 MEG, R21=100,000 ohms.



LOCATIONS OF PARTS ON TOP OF CHASSIS



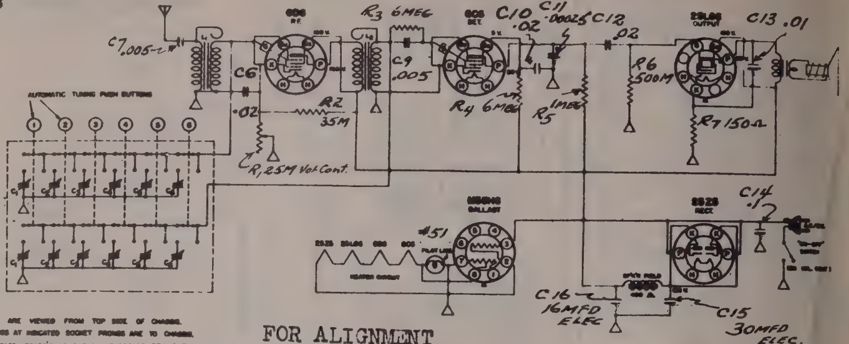
POWER SUPPLY:

All models available . . . . 105-125 volts, 50-60 cycles; 105 watts
All models available . . . . 105-125 volts, 25-60 cycles; 110 watts

NOVEMBER 24, 1939

MODEL 7219,Ch.110.7219
Schematic,Socket,Tuner
Trimmers

SEARS, ROEBUCK & CO.



TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES A VERY LOW READING.
VOLTAGE MEASUREMENTS TAKEN WITH 1000 OHMS PER VOLT METER AND VOLUME CONTROL ON FULL.

FOR ALIGNMENT
SEE INDEX

TUNING RANGE	CAPACITY RANGE
BUTTON NO.1 - 540-800KC.	[illegible]
BUTTON NO.2 - 600-1000KC.	[illegible]
BUTTON NO.3 - 600-1000KC.	[illegible]
BUTTON NO.4 - 700-1300KC.	[illegible]
BUTTON NO.5 - 700-1300KC.	[illegible]
BUTTON NO.6 - 900-1600KC.	[illegible]

LOUD SPEAKER:

Type	Dynamic
Size	5"
Field Resistance	450 Ohms

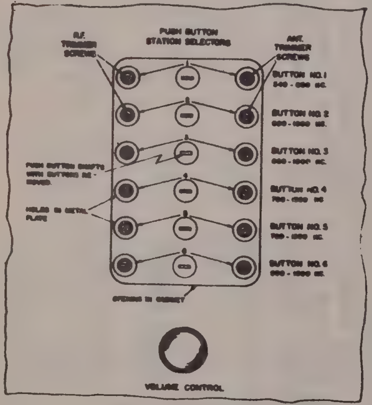
POWER OUTPUT:

Type	Beam Power
Undistorted	1.25 watts
Maximum	1.75 watts

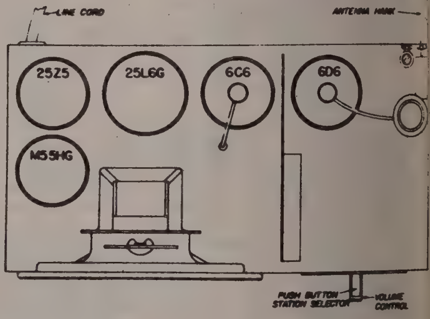
APRIL 26, 1939

POWER SUPPLY
All models available. . . . . . .D.C
or 105-125 volts, 50-60 cycle A.C. 40 wat

FREQUENCY RANGE:
Broadcast . . . . . .540-1600 KC



VIEW OF FRONT PANEL WITH PLAQUE REMOVED



INSTRUCTIONS FOR AUTOMATIC TUNING

Unscrew the wooden plaque through which the push buttons emerge, by removi the screws located at the top and bottom of the plaque.

From the figure shown , determine which pair of trimmer screws have a range including that frequency. For example: The station you might wish to receive may h a transmitting frequency of 590 kc. Since the range of the button No. 1 is 540-800 k 590 kc. would be included in this range.

Push that button "IN"

If the frequency of the desired station is higher than that of the station o which it has already been tuned at the factory, turn the Antenna and R.F. trimmer scre to the LEFT slowly until the desired station is heard. If the frequency of the desir station is lower than that of the station to which the trimmers have been adjusted the factory, turn the trimmer screws to the RIGHT until the station is heard.

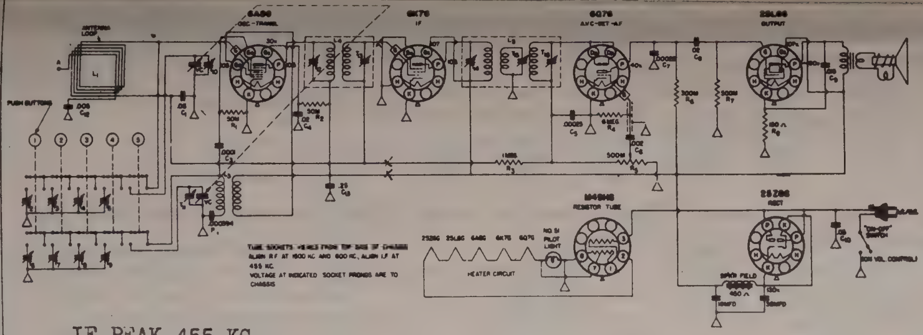
Alternately adjust the R.F. and Antenna trimmers, each time giving screws about 1 turn, until maximum volume is obtained. This completes the adjustments for one stati

Note: In some cases, it may be desirable to readjust the trimmers slightly f maximum volume after the set has been unpacked. Rough handling in transportation m have disturbed the trimmer settings.

SEARS. ROEBUCK & CO.

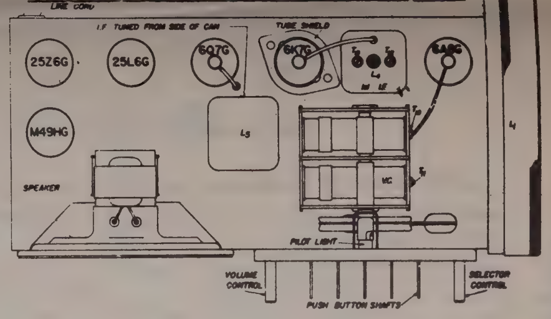
MODELS 7227,7243,Ch.110.258
7250,Ch.110.258-1
Schematic,Socket,Trimmers
Voltage

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.258-1

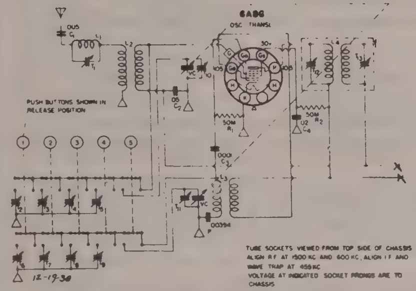


TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN R.F. AT 1500 KC AND 600 KC., ALIGN I.F. AT 455 KC.
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS

CHASSIS - IDENTIFICATION NUMBER 110.258-1

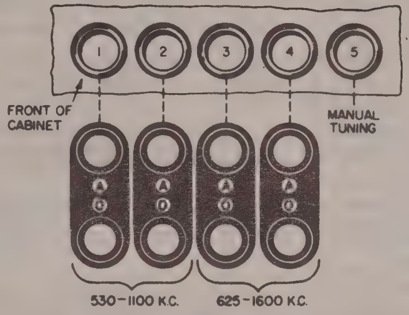


IF PEAK 455 KC



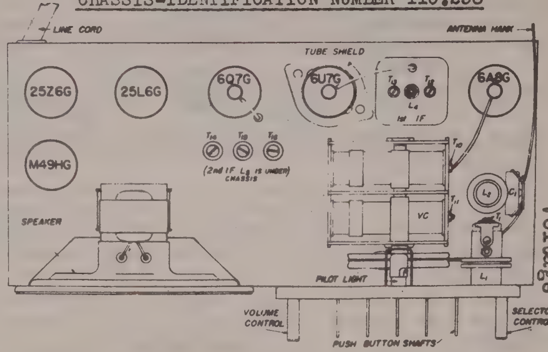
TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN R.F. AT 1500 KC AND 600 KC, ALIGN I.F. AND WAVE TRAP AT 455 KC
VOLTAGE AT INDICATED SOCKET PRONGS ARE TO CHASSIS

FOR SILVERTONE CHASSIS 110.258



AUTOMATIC TUNING ADJUSTMENTS

CHASSIS-IDENTIFICATION NUMBER 110.258



POWER SUPPLY:
All models available . . . . 105-125 volts, 50-60 cycle or DC, 45 watts

POWER OUTPUT:

Type	Beam Power
Undistorted	1.0
Maximum	2.4

LOUD SPEAKER:

Type	Dynamic
Size	5"
Field Resistance	450 ohms

APRIL 26, 1939

MODELS See Below
Alignment,Tuner

SEARS. ROEBUCK & CO.

MODELS 7250 CHASSIS 110.258-1;7251 CHASSIS 110.988; 7227,7243 CHASSIS 110.258 6327 CHASSIS 110.990.

AUTOMATIC TUNING CONTROL ADJUSTMENT

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

Read the entire procedure through very carefully before attempting to set the push buttons.

1. Make a list of the stations and their frequencies (kilocycles) that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles); that is, the station of the lowest frequency will be controlled by button No. 1, the station of the next higher frequency by button No. 2, etc.

2. Refer to the diagram underneath the cabinet and see which set of adjustment screws will have a tuning range that includes the frequency of the first station you wish to adjust. The frequency ranges of the adjustment screws are divided into two groups, one group covering from 530 to 1100 kc, the other covering from 625 to 1600 kc.

3. From the same diagram, after finding where the proper pair of adjustment screws are located, trace the dotted line connecting these screws to one of the push buttons. This is the button which, after the adjustments are completed, will tune in the station.

4. Push this button "IN".

5. Turn the volume control knob on full (to extreme right) and adjust screw marked "O" until the desired station is heard. If when making this adjustment, a number of stations can be brought in as the screw is turned and it is doubtful which station is the correct one, press button No. 5 (Manual Tuning) "IN" and turn the station selector knob to the number on the dial that corresponds to the frequency of the station. Listening to the program being broadcast will identify the station when adjusting screw "O".

6. Adjust the screw marked "A" for maximum volume, retarding the volume control and readjusting if necessary. This completes the adjustments for this particular station.

7. Cut out the station name from the list supplied and glue into face of button.

8. Insert celluloid disc.

9. Proceed in the same manner to adjust the tuning screws for the other stations on your list.

MODELS 7250 CHASSIS 110.258-1; 7251 CHASSIS 110.988; 7227,7243 CHASSIS 110.258

ALIGNMENT PROCEDURE

Output meter connections . . . . Across primary output transformer

Output meter reading to indicate 0.050 watt
for Weston type 571 output meter on 15 volt scale . . . . 9 volts

Average sensitivity in mv. for 0.050 watt . . . . See chart below

Dummy antenna valve in series with generator output . . . . 100 mmfds.

Connection of generator ground . . . . To chassis

MODEL 7807 CHASSIS 113.414

AUTOMATIC TUNING CONTROL ADJUSTMENT

Tune the receiver dial to any desired station, choose the push button which you wish to control this station. Unscrew the push button one full turn, then depress the button as far as it will go, release the button and turn until tight. The chosen station may always be received by depressing this button.

Remove call letter disc of station from list supplied and insert in button.

Insert celluloid disc.

In a like manner select a station for each of the other buttons and make necessary adjustments for each station.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil

Output meter reading to indicate 500 milliwatts . . . . 1.2 volts

Generator ground lead connection. . . . . Receiver chassis

Dummy antenna value in series with generator output . . . . See chart below

Connection of generator output lead. . . . . See chart below

Generator modulation. . . . . 30%, 400 cycles

Position of volume control . . . . Fully clockwise

Position of tone control. . . . . Clockwise

Position of Dial Pointer with variable fully closed . . . .Over first heavy line below 550 kc

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROX. MICROVOLTS
Open	465 kc.	.1 Mfd.	6SA7 Grid	T2, T1	I.F.Output I.F.Input	100
Open	1750 kc.	.0002 Mfd.	External Aerial Terminal	C20	Oscillator	75
1400 kc.	1400 kc.	.0002 Mfd.	External Aerial Terminal	C19	Translator	50
600 kc. (Rock)	600 kc.	.0002 Mfd.	External Aerial Terminal	C3	Padder	50

Where indicated by the word "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Generator modulation . . . . App. 30% @ 400 cycles

Position of volume control . . . . Fully clockwise

NOTE:- In the following table Ⓐ refers to Model 7250 Chassis 110.258-1; Ⓑ refers to Model 7251 Chassis 110.988 and Ⓒ refers to Models 7227,7243 Chassis 110,258

PUSH BUTTON SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	Ⓐ GENERATOR CONNECTION	Ⓑ GENERATOR CONNECTION	Ⓒ GENERATOR CONNECTION	Ⓐ TRIMMERS ADJUSTED	Ⓑ TRIMMERS ADJUSTED	Ⓒ TRIMMERS ADJUSTED	TRIMMER FUNCTION	Ⓐ APPROXIMATE MICROVOLTS	Ⓑ APPROXIMATE MICROVOLTS	Ⓒ APPROXIMATE MICROVOLTS
Manual "IN"	**	455 kc	6K7G, Grid	12K7GT, Grid	6U7G, Grid	T15*,T14,T16, T15,T 14,T16,	T14*,T15,T16, T14,T15,T16,	T15*,T14,T16 T15,T14,T16	I.F.	8000	5000	4000
"	**	455 kc	6A8G, Grid	12A8GT, Grid	6A8G, Grid	T 12,T 13	T12,T11	T12,T13	I.F.	90	75	58
"Ⓒ ONLY —	550 kc	455 kc			Ant.			T1	wave trap			***
"	1500 kc	1500 kc	***	***	Ant.	T11,T10	T10,T9	T11,T10	Osc., R.F.			23

IMPORTANT ALIGNMENT NOTES

It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

** Short oscillator section of variable condenser. Second I.F. alignment must be done twice to secure flat top tuning.

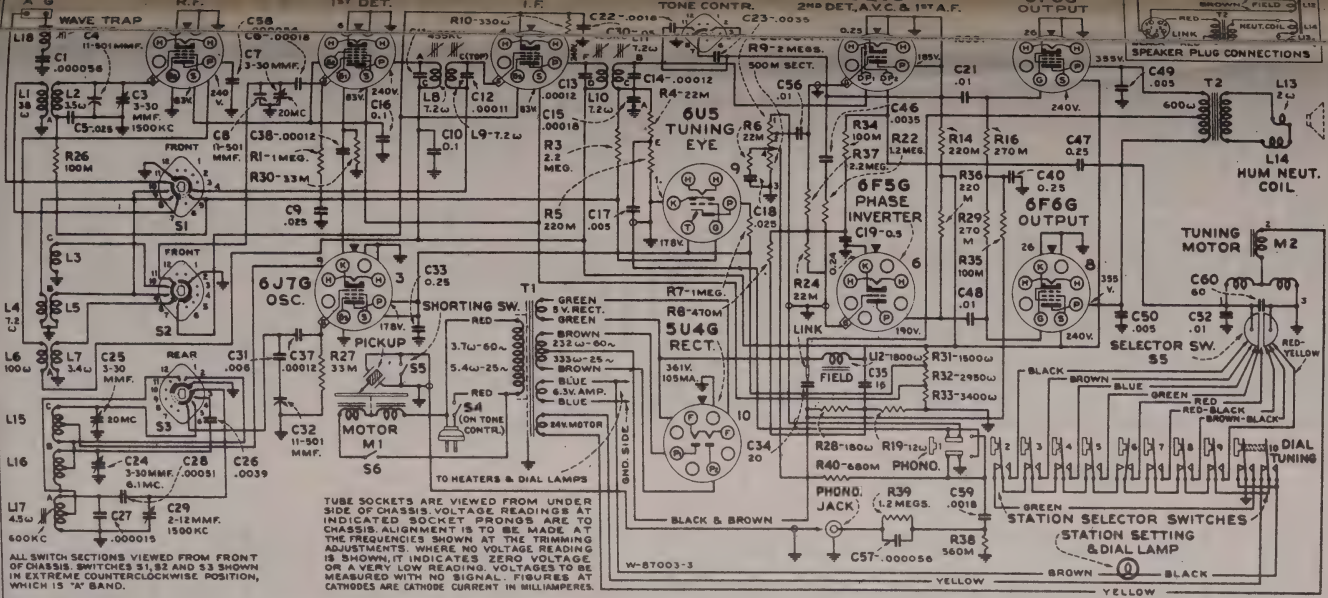
***Connect generator output to a separate radiating loop and pickup 1500 KC signal on receiver.

**** Adjust trimmer for minimum output with large signal input.

* First time is misaligned by loosening

SEARS, ROEBUCK & CO.

MODEL 7228,Ch.126.206
Schematic,Voltage
Dial Drive



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

ALL SWITCH SECTIONS VIEWED FROM FRONT OF CHASSIS. SWITCHES S1, S2 AND S3 SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS "A" BAND.

POWER OUTPUT:

Type	Push-Pull Pentode
Undistorted	10 watts
Maximum	12 watts

INTERMEDIATE FREQUENCY .... 455 kc

LOUDSPEAKER:

Type	Electrodynamic
Size	12 inches
V.C. Impedance	2.25 ohms at 400 cycles
Field Coil Resistance	1,800 ohms
App. Field Coil Voltage Drop	120 volts

Loudspeaker:

Centering of the loudspeaker voice-coil is done in the usual manner with three, narrow-paper or celluloid feelers, after first removing the front dust-cover by gently cutting it away. A dust-cover should be cemented back in place upon completion of the adjustment.

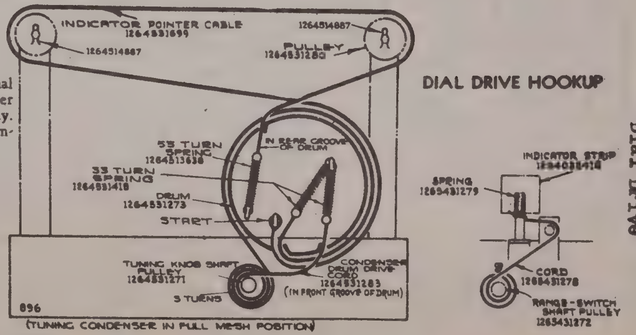
PHONOGRAPH:

Type	Automatic—Manual
Record Capacity	Eight 10-inch or Seven 12-inch
Turntable Speed	78 R.P.M., adjustable
Type of Pickup	Crystal
Pickup Impedance	100,000 ohms at 1,000 cycles

POWER SUPPLY RATINGS AVAILABLE

	Radio Only	Total
105-125 volts, 60 cycles	120 watts	150 watts
105-125 volts, 50-60 cycles	120 watts	150 watts
105-125 volts, 25 cycles	120 watts	150 watts

Dial Lamps (Three), Phonograph Compartment Lamp (One)	6.3 volts, 0.25 ampere
Pilot Lamp (One)	6.3 volts, 0.15 ampere


INDICATOR POINTER CABLE 1264531699
1264514887
1264514887
PULLEY 1264531280
55 TURN SPRING 1264513638
IN REAR GROOVE OF DRUM
33 TURN SPRING 1264531418
DRUM 1264531273
START
TUNING KNOB SHAFT PULLEY 1264531271
3 TURNS
CONDENSER DRUM DRIVE CORD 1264531283 (IN FRONT GROOVE OF DRUM)
896
INDICATOR STRIP
SPRING 1265431279
CORD 1265431278
RANGE-SWITCH SHAFT PULLEY 1265431272

DIAL DRIVE HOOKUP

(TUNING CONDENSER IN FULL MESH POSITION)

DECEMBER 20, 1938

MODEL 7228
Record Changer

SEARS, ROEBUCK & CO.
Automatic Record Changer

Adjustments, otes

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record. — The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17". Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D".

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife. — The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn scre locknut "F" to give .055—.061 inch separation. Screw must not be depressed during this adjustment. Afte ting screw "F" adjust screw "G" so that when its depressed flush with top of record shelf, the vertical sp between the knife, in its lowest rotational position, an shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf rev during the change cycle to allow the lower record to onto the turntable. Both posts are rotated simultaneous a gear and rack coupled to the main lever "15," and necessary that adjustments be such that the record is rel from both shelves at the same instant. To adjust, place inch record on the turntable, rotate mechanism into cyc the point where tone arm is at maximum distance out from turntable; lift record upward until it is in contact both separating knives, then loosen screws "H" and record shelves so that the curved inner edges of the sh are uniformly spaced at least 1/16 inch from record Tighten the blunt nose screw "H," run mechanism thr cycle several times to check action, then tighten cone poi screw "H".

If record shelves or knives are bent, or not perfe horizontal, improper operation and jamming of mecha will occur.

J. Tone Arm Rest Support (not shown).—When changer is out-of-cycle, the front lower edge of the pic head should be 5/16 inch above surface of motor bo This may be adjusted by bending the tone arm sup bracket, which is associated with the tone arm mounting b in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip stop pin "K" in relation to the main lever "15" governs point at which the roller enters the cam. By bending pin support either toward or away from trip pawl bea stud, the roller can be made to enter the cam later or earl respectively. This adjustment should be made so that roller definitely clears the cam outer guide as well as nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should applied to cam, main gear, spindle pinion gear, and gears record posts.

Light machine oil should be used in the tone arm verti bearing, record post bearings, and all other bearings various levers on underside of motor board.

The felt washer between the turntable and spindle beari should be soaked in light engine oil whenever the turnta is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rub mounting of tone arm base, rubber bumper, or flexi coupling of drive motor.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of t changer is generally exhibited in a specific mode of impro operation. The following relations between effects on ope tion and the usual mis-adjustments will enable ready adju ment in most cases.

1. For any irregularity of operation, the adjustment of t main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 in records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record b correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch " friction by means of screw "B". Also, see that leve "7" and "12" are free to move without touching eac other.
5. Pickup strikes lower record of stack or drags across to record on turntable—Adjust lift cable per adjustme "C".
6. Needle does not track after landing—Friction clutc "5" adjustment "B" may be too tight; bind in ton arm vertical bearing; levers "7" and "12" fouled; pickup output cable twisted.
7. Cycle commences before record is complete—Record defective, or adjustment "B" of friction clutch "5" too tight.
8. Wow in record reproduction—Record is defective flexible coupling between motor and changer mech anism not correctly assembled; or instrument is no being operated at normal room temperature (65° F)
9. Record knives strike edge of records—Records warped record edges are rough; or knife adjustments "F" an "G" are incorrect.
10. Record not released properly—Adjust record shelf as semblies in respect to shaft by means of adjustmen "H".
11. Needle lands in 10 inch position on 12 inch record o misses record when playing both types mixed—Increase tension of pickup locating lever spring "34"

MODEL 7228
Alignment, Trimmers
Socket

SEARS. ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELI NARY:

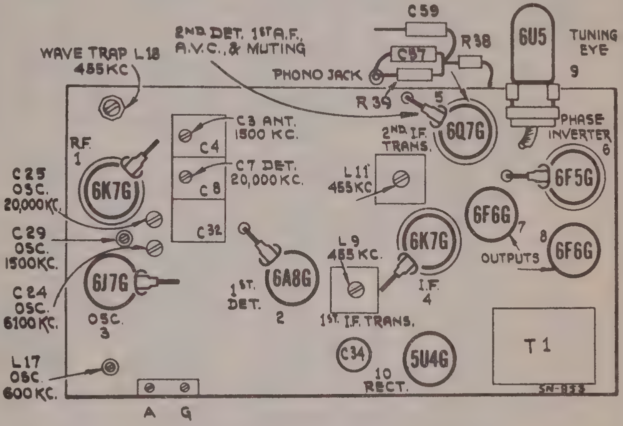
Output eter connections.......... Across speaker voice coil
Output eter reading to indicate 1.0 watt output.......... 1.5 volts
Approx ate average sensitivity in microvolts for 1.0 watt output.......... See chart below
Dummy ntenna value to be inserted in series with generator output.......... See chart below
Connec n of generator output lead.......... See chart below
Connec n of generator ground lead.......... To chassis
Generat modulation.......... 30%, 400 cycles
Position f Volume Control.......... Fully clockwise
Position f Tone Control.......... Fully clockwise

Calibr on Scale on Variable Condenser Drive Drum.—e tuning dial is fastened in the cabinet and annot used for reference during alignment when hassis i ut of cabinet; therefore, a calibration scale s attach to the rear of the drum which is mounted n the f t shaft of the gang condenser. The setting f the g g condenser is read on this scale, which is alibrate n degrees. The correct setting of the gang n degre for each alignment frequency, is given in he align nt table.

As the rst step in r-f alignment, check the position f the d m. The 0° mark on the drum scale must e vertic and directly over the center of the gang-ondense shaft when the plates are fully meshed. The urface the drum must be flush with the end of he gang ondenser shaft. The drum is held to the haft by neans of two set screws, which must be ightened ecurely when the drum is in the correct osition.

Pointe for Calibration Scale.—Improvise a pointer or the ibration scale by fastening a piece of wire the ga -condenser frame. and bend the wire so that points o the "0°" mark on the calibration scale hen the lates are fully closed.

Dial - dicator Adjustment. — After fastening the hassis i the cabinet, attach the dial pointer to the rive ca with variable condenser fully closed and ointer last calibration mark at 540 kc end of roadcas "A" band.



LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

Wave-I nd Swit Positi n	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"A	Low End	455 kc	.001 mfd.	6K7-G I-F Grid	L10, L11	2nd I-F Trans.	7,600
"A	Low End	455 kc	.001 mfd.	6A8-G Grid	L8, L9	1st I-F Trans.	130
"A	Low End	455 kc	.0002 mfd.	Ant.	L18	Wave Trap †	——
"C	20 mc (146°)	20 mc	300 ohms	Ant.	C25	Osc. *	——
"C	20 mc (146°) (rock)	20 mc	300 ohms	Ant.	C7	Det. **	50
"B	6.1 mc (139°)	6.1 mc	300 ohms	Ant.	C24	Osc. *	30
"A	1,500 kc (150.5°)	1,500 kc	.0002 mfd.	Ant.	C29, C3	Osc., Ant.	—
"A	600 kc (31°) (rock)	600 kc	.0002 mfd.	Ant.	L17	Osc.	3
"A	1,500 kc (150.5°)	1,500 kc	.0002 mfd.	Ant.	C29, C3	Osc., Ant.	5

IMPORTANT ALIGNMENT NOTES

† djust wave-trap for minimum output.

* se minimum capacity peak if two peaks can be obtained.

** se maximum capacity peak if two peaks can be obtained.

W re indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two hile k ing this adjustment.

Ea step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from e gen ator at its lowest possible value to prevent the a-v-c action of the set from interfering with accurate alignment.

A ustment locations are shown on the top and bottom parts location views of chassis.

O y the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for gnme t in any other band. Grid cap leads should remain in place during alignment.

V es shown under, "Microvolts," are only approximate.

MODEL 7228
Chassis Wiring,
Tuner Notes

SEARS, ROEBUCK & CO.

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact (push-button adjuster pin), and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken.

Adjustment of Selector Disc:

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the beveled operating-end at the left (viewed from rear).

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-inch from the body of the contacts.

Muting Circuit:

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Lubrication:

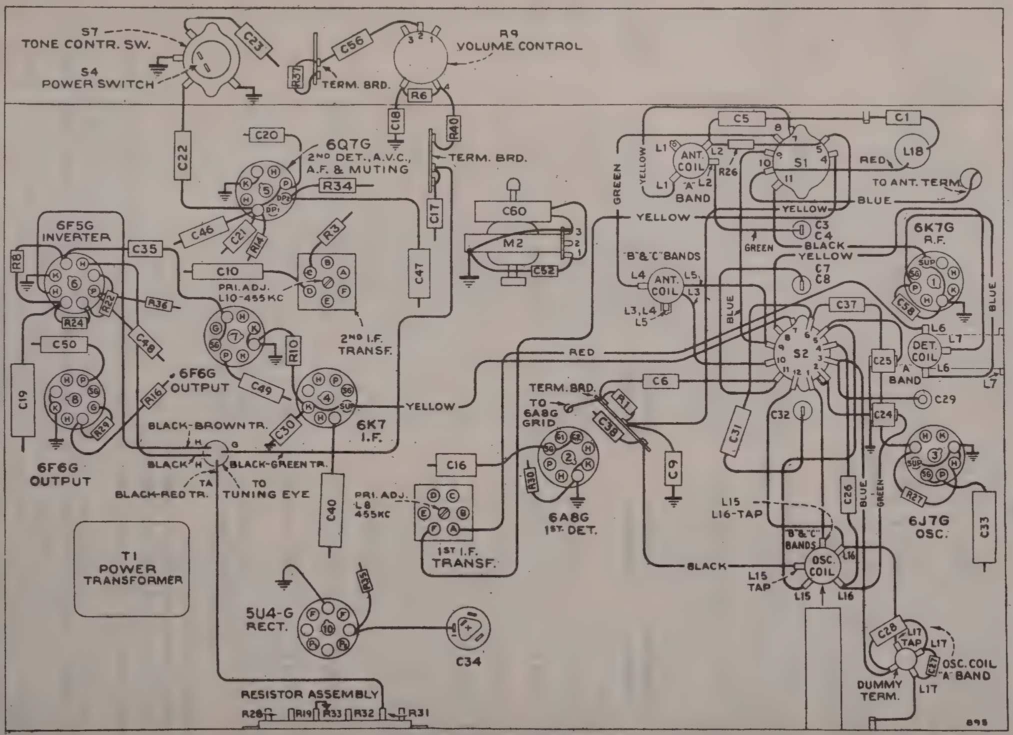
Motor bearings and **gear bearings**; use light machine oil.

Gear faces, dial-indicator pulleys and rails; use petroleum jelly.

Selector disc; apply *thin* film of petroleum jelly.

Tuning Motor Replacement:

Replacements for the tuning motor (No. 1264532434, 25 cycle, and No. 1264532095, 50-60 cycle) are supplied with a spiral thrust spring on the motor shaft. This spring should be removed (with a pair of long-nose pliers) before installing the motor in the chassis.



BOTTOM VIEW—REAR OF CHASSIS

General Information and Service Hints

Eliminating Whistle at 910 KC:

A whistle due to a beat between the second harmonic (910 kc) of the 455 kc I-F, and a 910 kc signal may be experienced. In localities where the 910 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I-F frequency of the receiver.

Determine at what point between 880 and 940 kc the whistle will be least objectionable. Dividing this frequency by two will give the new I-F frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 930 kc would not be objectionable, the I-F should be re-aligned at 930/2 or 465 kc. Try to select the new I-F frequency as close as possible to 455 kc.

having a frequency difference equal to the I-F frequency (455 kc) of the receiver. This will be evidenced by a whistle appearing when the receiver is tuned to either of the stations. It may be further localized by tuning the receiver to each of these stations and then stopping the oscillator, in each case, by grounding the oscillator stator section of the variable tuning condenser C32 (rear section) to chassis. If the whistle, in each case, still persists, it is being caused by the beat between these two stations and may be corrected by shifting the I-F frequency of the receiver to a frequency other than the difference frequency of the two local or strong signals (stations),

The I-F amplifier should not be shifted to a frequency higher than 470 kc

Align the I-F at the new frequency and then re-align the rest of the receiver as described under "ALIGNMENT PROCEDURE."

Unpacking:

Remove bracket "A" securing the pickup and needle mechanism, by removing screw "B." Also remove the red bolts "C" and "D," the paper coverings on the record posts and pickup, and the cardboard strip in the rear of the chassis. The instruction booklet and call-letter markers and covers will be found in an envelope in the record well. The knobs are in an envelope in the

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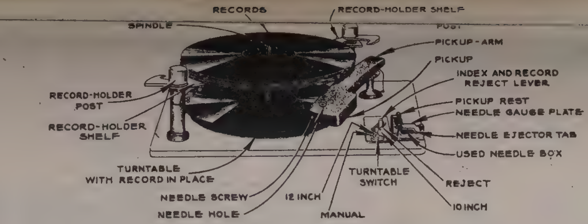
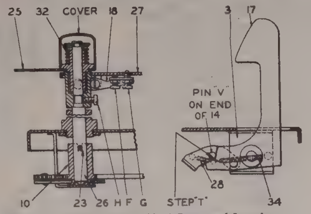
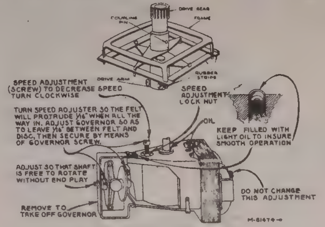


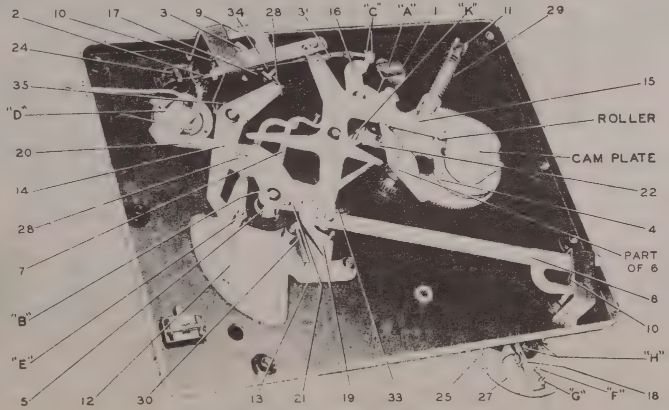
Top View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies


DRIVE GEAR
COUPLING PIN
FRAME
RUBBER STRIPS
DRIVE ARM
SPEED ADJUSTMENT (SCREW) TO DECREASE SPEED TURN CLOCKWISE
SPEED ADJUSTMENT LOCK NUT
TURN SPEED ADJUSTER SO THE FELT WILL PROTRUDE 1/16" WHEN ALL THE WAY IN. ADJUST GOVERNOR SO AS TO LEAVE 1/16" BETWEEN FELT AND DISC, THEN SECURE BY MEANS OF GOVERNOR SCREW.
OIL
KEEP FILLED WITH LIGHT OIL TO INSURE SMOOTH OPERATION
ADJUST SO THAT SHAFT IS FREE TO ROTATE WITHOUT END PLAY
REMOVE TO TAKE OFF GOVERNOR
DO NOT CHANGE THIS ADJUSTMENT
M-81474-0

Motor Data and Coupling



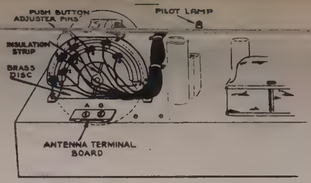
Bottom View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

Adjustments for Electric Tuning

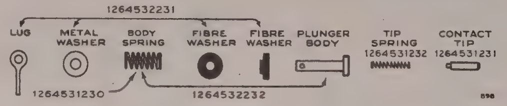
order from low to high frequencies.

2. Turn band switch to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.
4. Manually tune in the first station on the list, using the "Tuning Eye" for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1 to the insulating line on the disc at rear of gang. When the pin is correctly centered on the insulating line, the central dial lamp will go out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

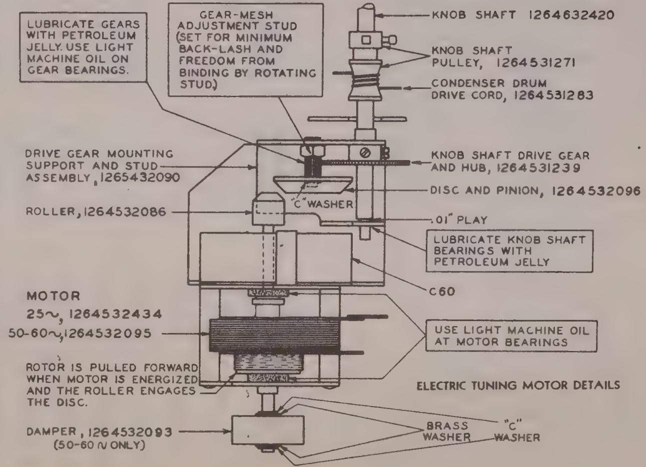


Station Button	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	Brown
No. 3	Blue
No. 4	Green
No. 5	Red
No. 6	Red-black
No. 7	Brown-black
No. 8	Red-yellow

STATION SETTING PINS



COMPONENT PARTS OF STATION SETTING CONTACT


LUBRICATE GEARS WITH PETROLEUM JELLY. USE LIGHT MACHINE OIL ON GEAR BEARINGS.
GEAR-MESH ADJUSTMENT STUD (SET FOR MINIMUM BACK-LASH AND FREEDOM FROM BINDING BY ROTATING STUD)
KNOB SHAFT 1264632420
KNOB SHAFT PULLEY, 1264531271
CONDENSER DRUM DRIVE CORD, 1264531283
DRIVE GEAR MOUNTING SUPPORT AND STUD ASSEMBLY, 1265432090
KNOB SHAFT DRIVE GEAR AND HUB, 1264531239
DISC AND PINION, 1264532096
"C" WASHER
ROLLER, 1264532086
.01" PLAY
LUBRICATE KNOB SHAFT BEARINGS WITH PETROLEUM JELLY
C60
MOTOR
25~, 1264532434
50-60~, 1264532095
USE LIGHT MACHINE OIL AT MOTOR BEARINGS
ROTOR IS PULLED FORWARD WHEN MOTOR IS ENERGIZED AND THE ROLLER ENGAGES THE DISC.
DAMPER, 1264532093 (50-60 ~ ONLY)
BRASS WASHER
"C" WASHER

ELECTRIC TUNING MOTOR DETAILS

MODEL 7230
Alignment,Socket
Trimmers

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections.. Across speaker oice c
Output meter reading to indicate 1.0 watt output.. 1.5 vo
Approximate average sensitivity in microvolts for 1.0 watt output........................... See c rt bel
Dummy antenna value to be inserted in series with generator output.......................... See c rt bel
Connection of generator output lead.. See c rt bel
Connection of generator ground lead.. chas
Generator modulation.. 30%,) cyc
Position of Volume Control.. Fully ockw
Position of Tone Control.. Fully ockw
Position of Dial Pointer with variable tuning condenser fully closed.......................... To fa on l
calibration mark at 540 kc end of "Broadca " ba

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Appr imat Mic volts
Broadcast	Low End	455 kc	0.001 mfd.	6K7-G I-F Grid	L12, L13	2nd I-F Transformer	3, 0
Broadcast	Low End	455 kc	0.001 mfd.	6K8 Grid	L10, L11	1st I-F Transformer	
Broadcast	Low End	455 kc	0.0002 mfd.	Ant.	C1	Wave-Trap†	—
Short Wave	15.2 mc	15.2 mc	300 ohms	Ant.	C3	Osc.*	—
Short Wave	15.2 mc (Rock)	15.2 mc	300 ohms	Ant.	C34	Ant.**	2
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C6	Osc.	—
Broadcast	600 kc (Rock)	600 kc	0.0002 mfd.	Ant.	L9	Osc.	1
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C6	Osc.	1

IMPORTANT ALIGNMENT NOTES

† Adjust wave-trap for minimum output.

* Use minimum capacity peak if two peaks can be obtained.

** Use maximum capacity peak if two peaks can be obtained.

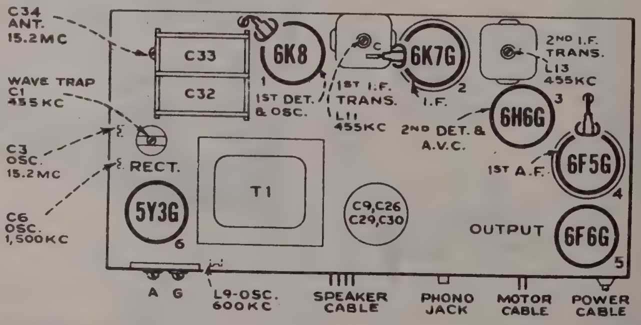
Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree tw while making this adjustment.

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output f t generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy us f alignment in any other band. Grid cap leads should remain in place during alignment.

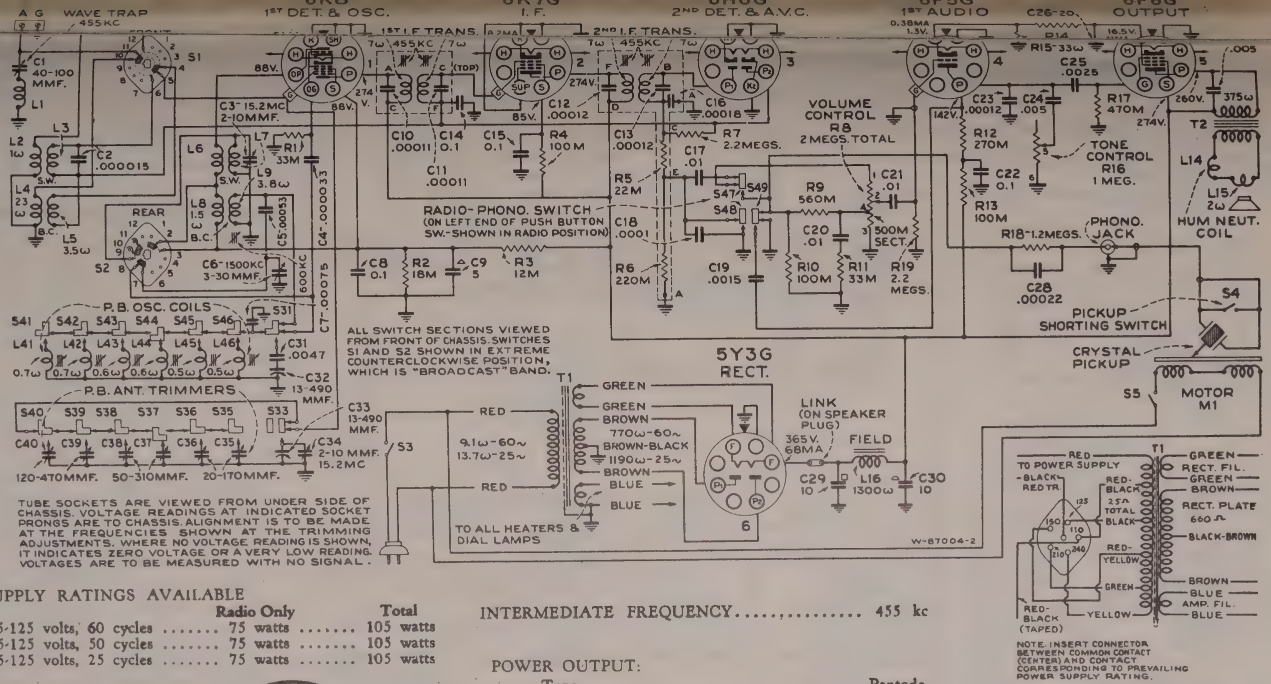
Values shown under "Microvolts" are only approximate.



LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

MODEL 7230,Ch.126.208
Schematic,Voltage
Dial Drive

SEARS. ROEBUCK & CO.



ALL SWITCH SECTIONS VIEWED FROM FRONT OF CHASSIS. SWITCHES S1 AND S2 SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS "BROADCAST" BAND.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL.

NOTE. INSERT CONNECTOR BETWEEN COMMON CONTACT (CENTER) AND CONTACT CORRESPONDING TO PREVAILING POWER SUPPLY RATING.

Connections for 100-130, 140-160, and 200-250 volt, 50-60 cycle power transformer No. 1261031446.

POWER SUPPLY RATINGS AVAILABLE

		Radio Only	Total
"A-6"	105-125 volts, 60 cycles	75 watts	105 watts
"A-5"	105-125 volts, 50 cycles	75 watts	105 watts
"B"	105-125 volts, 25 cycles	75 watts	105 watts

INTERMEDIATE FREQUENCY................ 455 kc

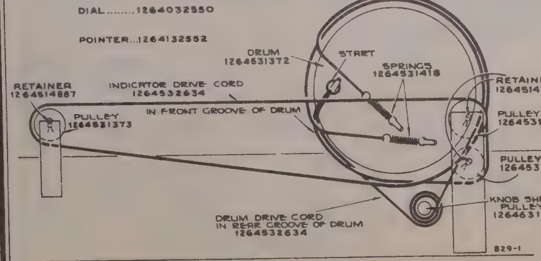
POWER OUTPUT:

Type	Pentode
Undistorted	2.5 watts
Maximum	4.5 watts

LOUDSPEAKER:

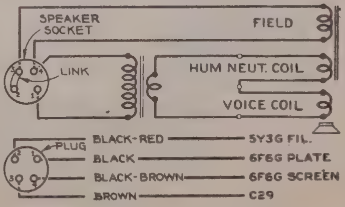
Type	Electrodynamic
Size	12 inches
Voice Coil Impedance	2.2 ohms at 400 cycles
Field Coil Resistance	1,300 ohms
App. Field Coil Voltage Drop	90 volts

Dial Lamps (Two).............. 6.3 volts, 0.25 ampere



DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

DIAL DRIVE HOOKUP

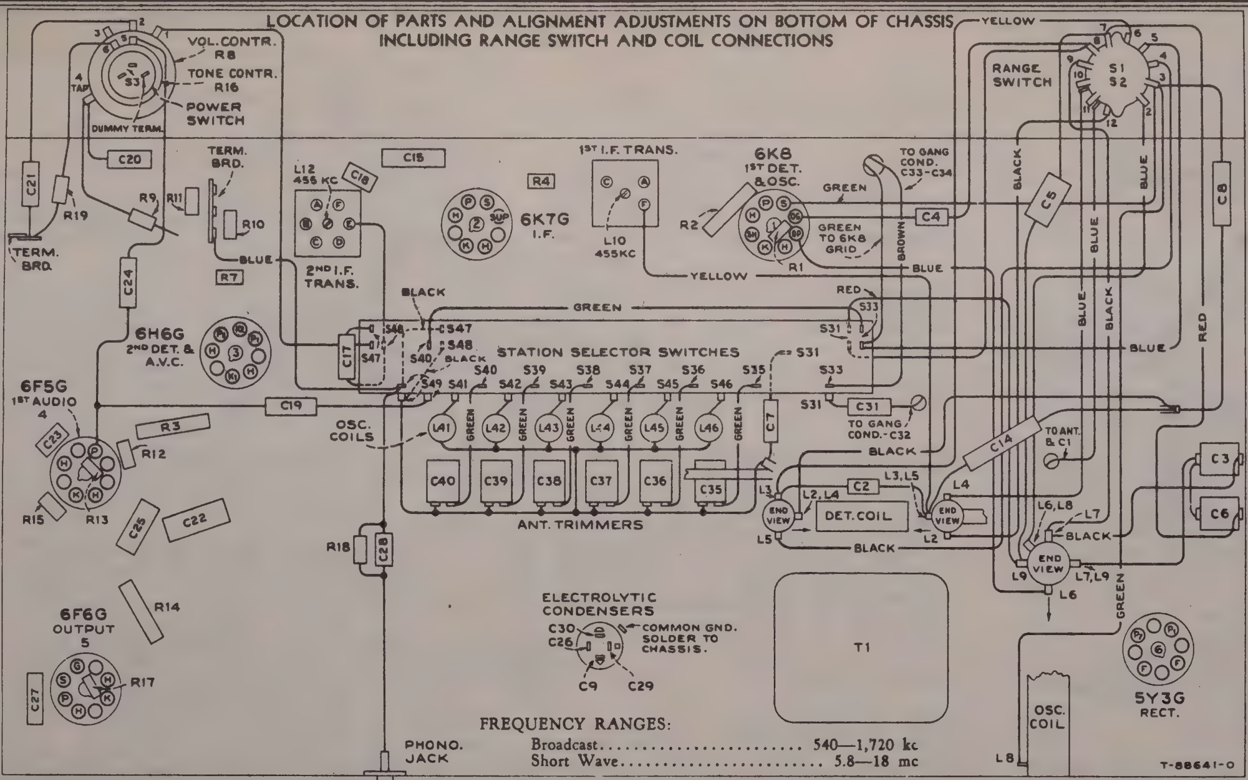


SPEAKER PLUG CONNECTIONS

DECEMBER 20, 1938

MODEL 7230
Chassis Wiring
Tuner, Terminal Board

SEARS, ROEBUCK & CO.



LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON BOTTOM OF CHASSIS INCLUDING RANGE SWITCH AND COIL CONNECTIONS

FREQUENCY RANGES:

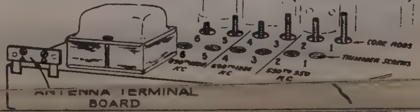
Broadcast........................ 540—1,720 kc
Short Wave........................ 5.8—18 mc

Adjustments for Push Button Tuning

Each of the six station push buttons connects to a separate magnetite-core oscillator coil and a separate antenna trimmer, both of which must be adjusted to select the desired station when this button is depressed. Use an insulated screw-driver or alignment tool, allowing at least five minutes warm-up period before making adjustments. The regular antenna should be used for the preliminary adjustments. Proceed as follows:

1. Make a list of the six desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning (rear) push button, and manually tune in the first station on the list.
3. Push in station-button No. 1, and adjust No. 1 oscillator core (L41) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.
4. Adjust No. 1 antenna trimmer (C40) for maximum output on this station.
5. Adjust for each of the remaining five stations in the same manner.
6. Make a final critical adjustment of the oscillator cores, using one or two feet of wire as an antenna to ensure sharp peaking.
(NOTE: Clockwise adjustment of the oscillator cores [illegible] quencies.)

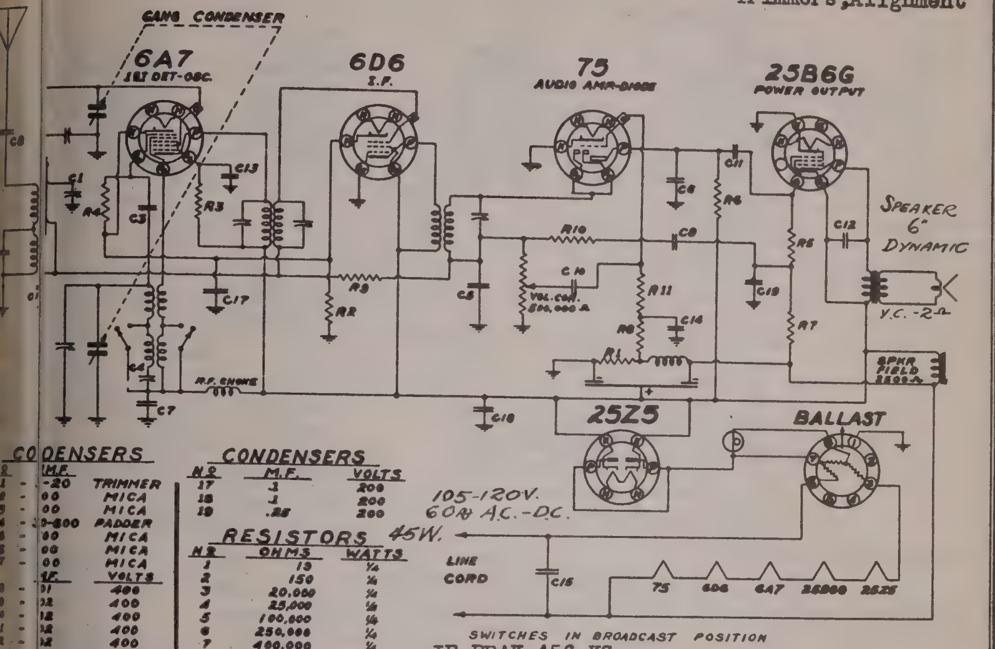
Six Push-button Tuning Ranges........... 550—1,500 kc
Two stations between approximately 550— 950 kc (Buttons 1 and 2)
Two stations between approximately 690—1,225 kc (Buttons 3 and 4)
Two stations between approximately 890—1,500 kc (Buttons 5 and 6)



ANTENNA TERMINAL BOARD

SEARS. ROEBUCK & CO.

MODEL 7231,Ch.105.6H
Schematic,Socket
Trimmers,Alignment



CO DENSERS

№	M.F.	
	-20	TRIMMER
	00	MICA
	00	MICA
	0-800	PADDER
	00	MICA
	00	MICA
	00	MICA
	F.	VOLTS
	01	400
	02	400
	12	400
	02	400
	02	400
	05	200
	05	200
	05	400
	1	200

CONDENSERS

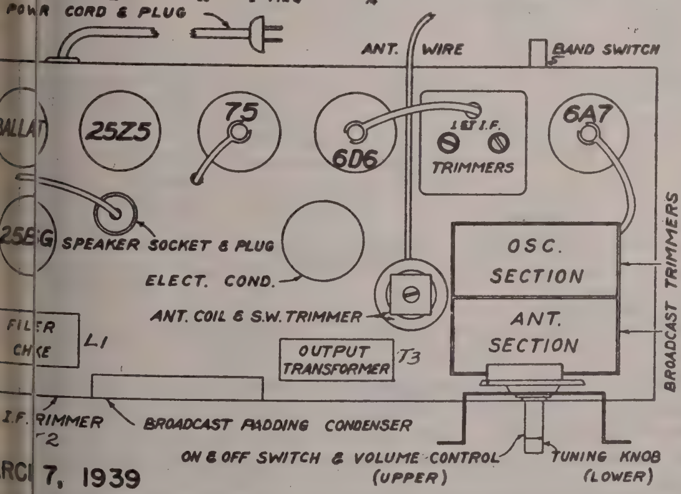
№	M.F.	VOLTS
17	.1	200
18	.1	200
19	.25	200

RESISTORS

№	OHMS	WATTS
1	13	¼
2	150	¼
3	20,000	½
4	25,000	¼
5	100,000	¼
6	250,000	¼
7	400,000	¼
8	500,000	¼
9	1 MEG	½
10	1 MEG	¼
11	1 MEG	¼

IF PEAK 456 KC

POWER OUTPUT:
Type............ Pentode
Undistorted........1 watt
Maximum..........1½ watts



FREQUENCY RANGES :
535 to 1750 KC
5600 to 18100 KC

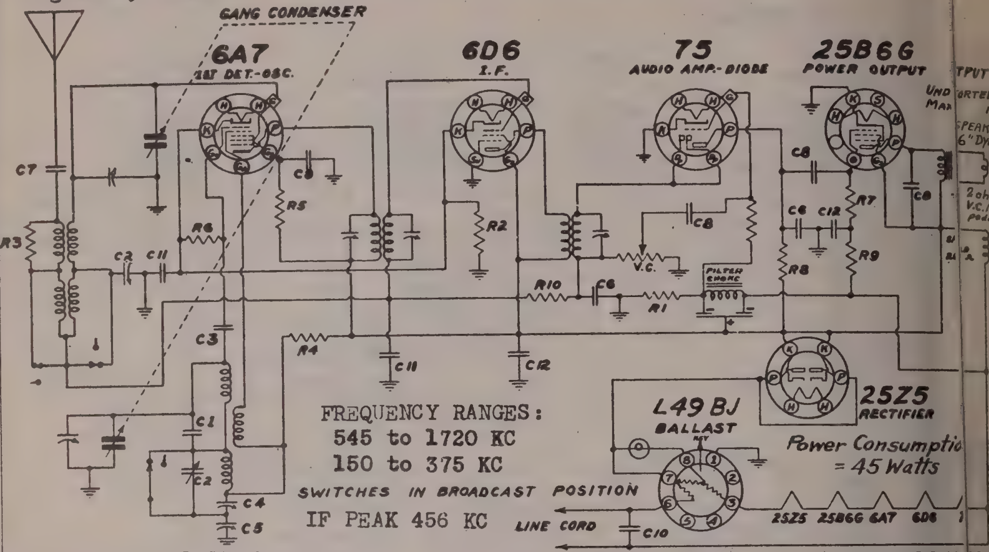
IF ALIGNMENT - Generator at 456 KC, connected to the control grid of the 6A7 tube, thru a .05 MFD condenser. Adjust IF trimmers to peak, they are located; two in transformer can above chassis, and other on front apron of chassis, is the left hand section.

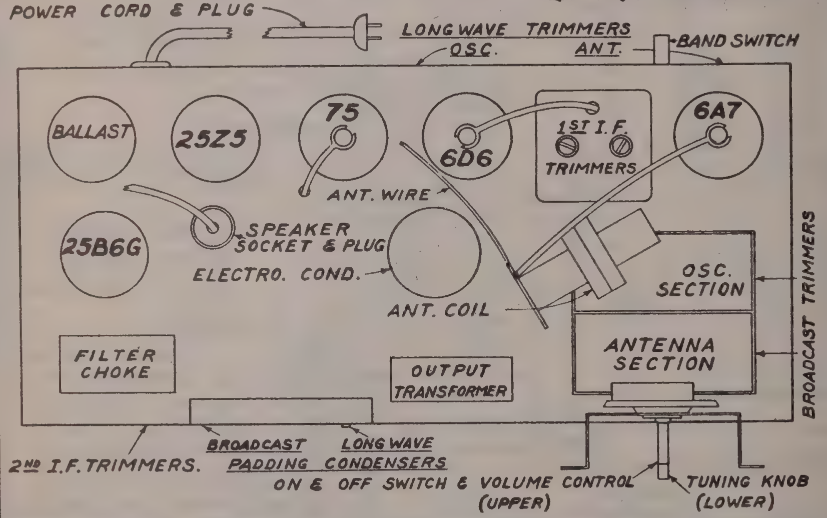
RC 7, 1939

ADC ST BAND ALIGNMENT - Generator at 1400 KC, connected to antenna lead of
eiv r thru 100 MMFD condenser. Dial at 1400 KC, adjust rear gang condenser
mme (OSC) to peak, then front section of gang condenser to peak.
era or at 600 KC, receiver dial at approximately 600 KC, while rocking the
iab condenser across signal adjust oscillator padder to maximum peak.
RTW VE BAND - Generator at 600 KC, rotate condenser from high frequency end
il enerator signal is heard, then peak trimmer on antenna coil. No other
rtw ve band adjustments required on this receiver. Repeat all adjustments.

MODEL 7232,Ch.105.6L
Schematic,Socket
Alignment,Trimmers

SEARS, ROEBUCK & CO.





CONDENSERS

No.	M.M.F.
C1	10
C2	30-100
C3	100
C4	100-200
C5	300-600
C6	500
	M.F.
C7	.01
C8	.02
C9	.05
C10	.05
C11	.1
C12	.25

RESISTORS

No.	OHMS
R1	18
R2	* 300
R3	8,000
R4	15,000
R5	20,000
R6	25,000
R7	100,000
R8	250,000
R9	400,000
R10	1,000,000

V.C. - ½ MEG. VOLUM
* TOLERANCE ± 10

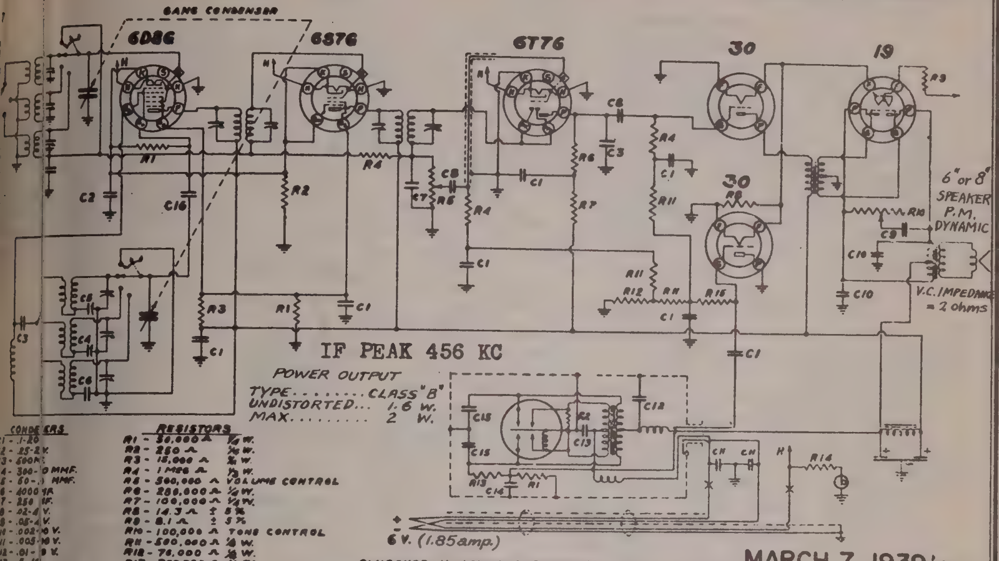
MARCH 7, 1

IF ALIGNMENT - Generator at 456 KC, and connected to the control grid of th 6A7 thru a .05 MFD condenser. Align the three IF trimmers to maximum peak. three trimmers are located as follows : two are located in the IF can on th top of the chassis, the third is located on the front apron of the chassis is the left hand section.

BROADCAST - Generator at 1400 KC, connected to the antenna thru a 100 MMFD enser. Dial set at 1400 KC, peak rear trimmer of gang condenser (OSC), then front trimmer. Shift generator and dial to 600 KC, while rocking gang conde peak the oscillator padding condenser for maximum resonance.

LONG WAVE - Generator at 375 KC, peak oscillator trimmer, gang condenser co letely open. Generator at 325 KC, peak the antenna trimmer, mounted on long antenna coil, after signal has been found by rotation condenser from high f end of dial. Pad the oscillator condenser at 160 KC while rocking condenser

MODEL 7233,Ch.105.6PU
Schematic,Socket
Alignment,Trimmers



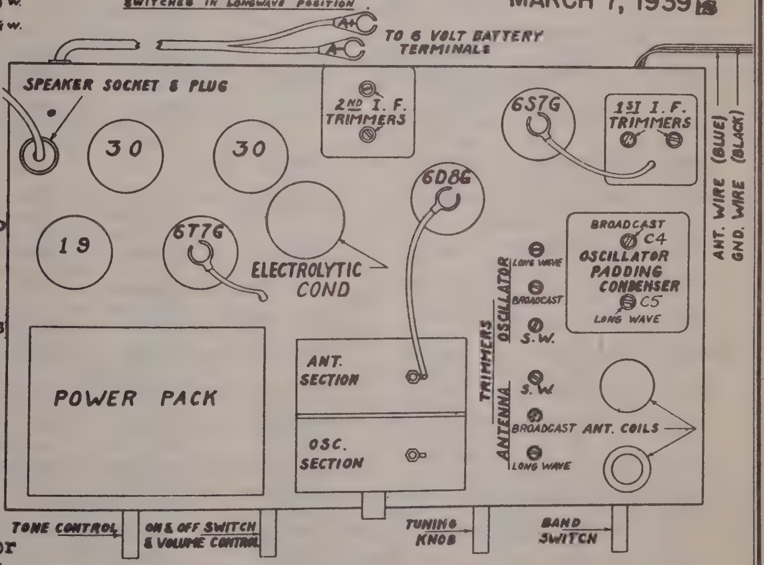
IF PEAK 456 KC

POWER OUTPUT
TYPE........CLASS "B"
UNDISTORTED... 1.6 W.
MAX.......... 2 W.

MARCH 7, 1939

CONDE ERS
1 - .1-20
2 - .25-2 V.
3 - 500M
4 - 300- 0 MMF.
5 - 50-. MMF.
6 - 4000 F.
7 - 250 F.
8 - .02-4 V.
9 - .05-4 V.
10 - .002- 0 V.
11 - .005- 0 V.
12 - .01- V.
13 - .5-1
14 - .05- V.
15 - .01-1 V.
16 - 100 F.

RESISTORS
R1 - 50,000 Ω ¼ W.
R2 - 250 Ω ⅛ W.
R3 - 15,000 Ω ¼ W.
R4 - 1 MEG Ω ½ W.
R5 - 500,000 Ω VOLUME CONTROL
R6 - 250,000 Ω ¼ W.
R7 - 100,000 Ω ¼ W.
R8 - 14.3 Ω ± 5%
R9 - 8.1 Ω ± 5%
R10 - 100,000 Ω TONE CONTROL
R11 - 500,000 Ω ¼ W.
R12 - 75,000 Ω ¼ W.
R13 - 200,000 Ω ¼ W.
R14 - 70 Ω ± 10%
R15 - 600,000 Ω ¼ W.



EQUE CY RANGES :
535 to 1730 KC
150 to 380 KC
5.6 to 18.1 MC

ALI NMENT-Generator 456 KC, connected to ntro grid of 6D8G ru a .05 MFD condser,then peak the trasformer trimmers r ma imum response.

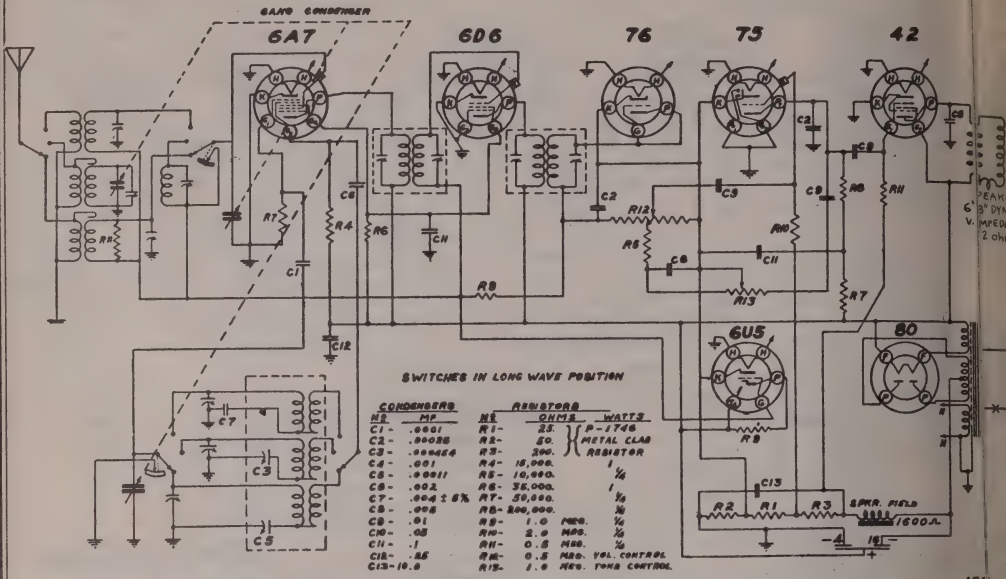
ROAD AST BAND - Genator at 1730 KC, the ng c ndenser out of sh, eak oscillator imme. Dial and Genator at 1400 KC,peak tenn and pre-selector imme s. Generator and al a 600 KC, while oki variable condenser across signal,peak the oscillator padder to maximum.

ORTW VE BAND - Generator to 18.1 MC, variable condenser at minimum, peak the . o cillator trimmer. Generator and dial at 16 MC, peak antenna trimmer. No ovis ons for low frequency padding have been made in this band. Check response 6 M .

NGWA E BAND - Set gang condenser.to minimum and generator to 380 KC, peak the ngwa e oscillator trimmer, then shift the generator signal to 325 KC, peak the tenn trimmer. Next set the generator to 160 KC, — then peak the longwave illa tor padding condenser to maximum response while rocking variable condenser

MODEL 7234,Ch.105.7MU
Schematic,Socket
Alignment,Trimmers

SEARS, ROEBUCK & CO.



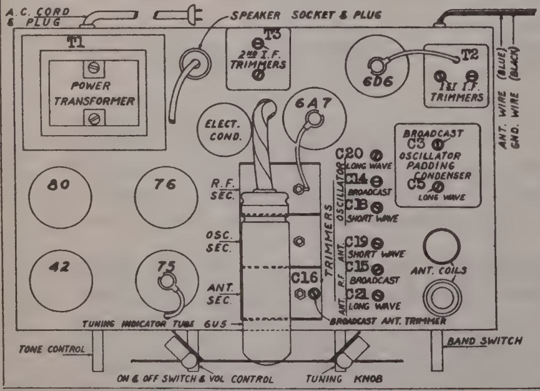
SWITCHES IN LONG WAVE POSITION

CONDENSERS NO.	MF	RESISTORS NO.	OHMS	WATTS
C1-	.0001	R1-	25.	P-1746 METAL CLAD RESISTOR
C2-	.00025	R2-	50.	
C3-	.000454	R3-	200.	
C4-	.001	R4-	15,000.	1
C5-	.00011	R5-	10,000.	¼
C6-	.002	R6-	35,000.	1
C7-	.004 ± 5%	R7-	50,000.	½
C8-	.005	R8-	200,000.	½
C9-	.01	R9-	1.0 MEG.	½
C10-	.05	R10-	2.0 MEG.	½
C11-	.1	R11-	0.5 MEG.	½
C12-	.25	R12-	0.5 MEG. VOL. CONTROL	
C13-	10.0	R13-	1.0 MEG. TONE CONTROL	

INTERMEDIATE FREQUENCY: 456kc

SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMA MICROVOL
"AM"	Fully closed	456 kc	.1 mfd	6A7 Grid	T 3 T2	IF Output IF Input	45
"AM"	Fully open	1730 kc	.0002 mfd	Ant. Lead	C14	Oscillator	
"AM"	1400 kc	1400 kc	.0002 mfd	Ant. Lead	C15 C16	Preselector Antenna	10
"AM"	600 kc (rock)	600 kc	.0002 mfd	Ant. Lead	C3	Padder	8
"SW"	Fully open	18.1 mc	400 ohms	Ant. Lead	C18	Oscillator	
"SW"	16 mc	16 mc	400 ohms	Ant. Lead	C19	Antenna	16
"LW"	Fully open	380 kc	.0002 mfd	Ant. Lead	C20	Oscillator	
"LW"	920 meters	325 kc	.0002 mfd	Ant. Lead	C 21	Antenna	8
"LW"	1875 meters (rock)	160 kc	.0002 mfd	Ant. Lead	C5	Padder	15

POWER SUPPLY:............................. Tapped-105-125-150-230 volts, 60 cycles; 56 wat



FREQUENCY RANGES:
Band "AM".................. 535 kc-1730
Band "LW".................. 150 kc-380
Band "SW".................. 5.6 mc-18.1

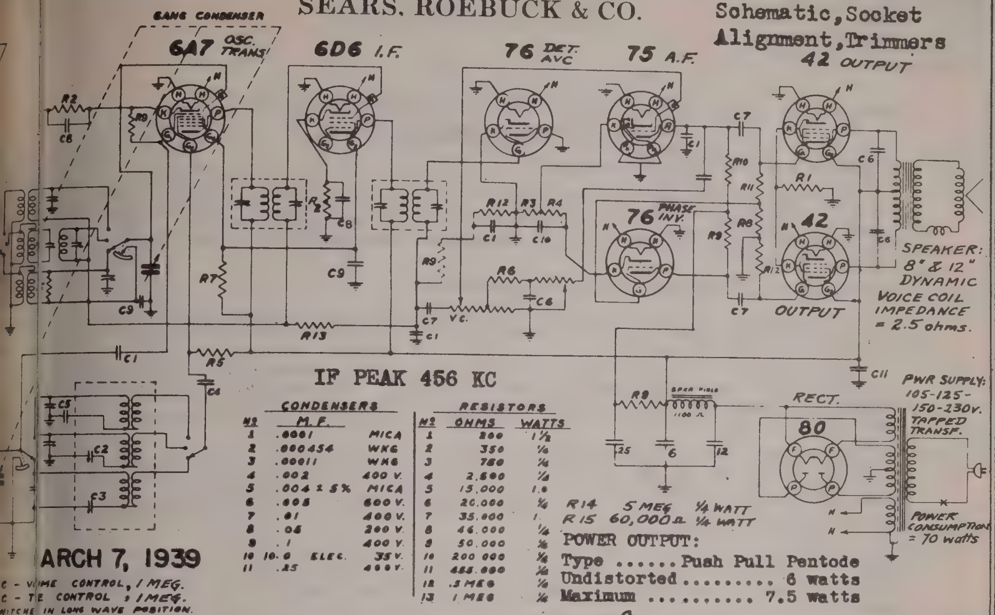
POWER OUTPUT:
Type....... .... Pent
Undistorted .... 2.5 wa
Maximum.......................... 3.5 wa

UNIVERSAL TRANSFORMER is used. Remo 2 screws and a shield on top of pow transformer exposes terminal plate pin connector. Inserting pin into c marked with voltage at which set is be used, permits operation on 105, 150 or 230 volts. For use on AC ONL

MARCH 7, 1

SEARS, ROEBUCK & CO.

MODEL 7235,Ch.105.8KU
Schematic,Socket
Alignment,Trimmers



IF PEAK 456 KC

CONDENSERS		
No	M.F.	
1	.0001	MICA
2	.000454	WKG
3	.00011	WKG
4	.002	400 V.
5	.004 ± 5%	MICA
6	.005	600 V.
7	.01	400 V.
8	.05	200 V.
9	.1	400 V.
10	10.0 ELEC.	35 V.
11	.25	400 V.

RESISTORS		
No	OHMS	WATTS
1	200	1½
2	350	¼
3	750	¼
4	2,500	¼
5	15,000	1.0
6	20,000	¼
7	35,000	1.
8	46,000	¼
9	50,000	¼
10	200 000	¼
11	455,000	¼
12	.5 MEG	¼
13	1 MEG	¼

R14 5 MEG ¼ WATT
R15 60,000 Ω ¼ WATT

POWER OUTPUT:
Type ......Push Pull Pentode
Undistorted.......... 6 watts
Maximum .... 7.5 watts

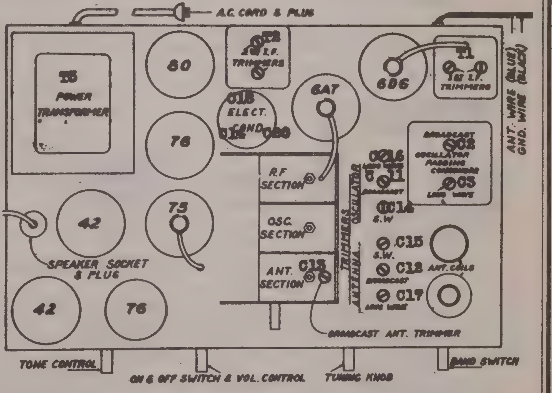
ARCH 7, 1939

C - V IME CONTROL, 1 MEG.
C - T E CONTROL ; 1 MEG.
ITCHE IN LONG WAVE POSITION.

F. AL NMENT With the wave switch in the Broadcast Band nd th gang condenser set at minimum. Adjust the st os lator to 456 KC and connect the output to e gri of the first detector tube (6A7) through a 5 or . mfd. condenser. The ground on the test osciltor ca be connected to the chassis ground. Align l four .F. trimmers to peak or maximum reading on e out ut meter.

ROAD AST BAND LIGN ENT Connect the output of the signal generator to the antenna lead (blue) roug a .0002 mfd. mica condenser. Set the gang nder r to minimum and the oscillator to 1730 KC nd a ust the "oscillator trimmer" to receive this gnal. lake no other adjustments at this frequency. nen s the generator to 1400 KC and tune in this gnal y rotating the gang to 1400 on the dial. Adst the preselector" and "antenna" trimmer to maxum s nal. Set the signal generator to 600 KC and ne in e signal on the receiver. **Note:** approximate- the me sensitivity should be noted at this point was t 1400 KC. The signal strength may somenes improved by padding the circuits. This is ne b slowly increasing or decreasing the oscilla- pad ing condenser and, at the same time, conuous tuning back and forth across the signal th th receiver until the maximum reading is obned n the output meter. This adjustment may em little complicated but is the easiest way to just e oscillator to the preselector of the R.F. secn. R rn to 1400 KC and again go over the adjustnts this frequency to be certain that they were t pu slightly out of alignment when adjustment s m le at 600 K.C.

ORT WAVE BAND IGN ENT The short wave band is adusted by setting the generator to 18,100 KC d w the gang at minimum, adjust the "short ve cillator trimmer" to receive the signal. Set ge rator at 16,000 KC, tune in the signal and just e "short wave antenna" trimmer to give xim n output. As there is no variable low freency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.



LONG WAVE BAND ALIGNMENT The long wave band is adjusted by connecting the output of the signal generator through a .0002 Mfd. mica condenser to the blue antenna lead. Then set the gang to minimum and the generator to 380 KC and adjust the long wave oscillator trimmer to receive this signal. Then set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set generator to 160 KC and pad the circuits to maximum output. Owing to the nature of tthe long wave band, the trimmer and padding condensers react upon each other to quite a degree; consequently, several re-adjustments at the trimming and padding positions are required before the circuits are adjusted properly.

MODEL 7235
MODEL 7236
MODEL 7425
Tuner Data

SEARS, ROEBUCK & CO.

MODEL 7235 (CHASSIS 105.8KU); MODEL 7236 (CHASSIS 105.8TU)

THE AUTOMATIC TUNING DIAL

CHOOSING THE STATIONS TO BE USED

The telephone dial has 10 buttons located in a ring within the dial scale. Make a list of 10 of your favorite stations which are tuned in regularly. Shown in Fig.1A is the approximate frequency range that each button will cover. NOTE: If 2 stations happen to fall within the range of one button, one station will necessarily have to be tuned in with the selector knob.

PROCEDURE FOR ADJUSTING THE TELEPHONE DIAL BUTTONS

(1) Choose one of the stations out of the list of stations selected and by means of the station selector very carefully tune in this station, noting at the same time the exact pointer location on the dial.

(2) Now select the proper button for the first station chosen by referring to Fig. 1A and noting the button into whose range the station falls. For example, station WGN with a frequency of 720 KC comes under the button whose frequency ranges from 670-755 KC. Usually the button nearest the tuning point or the bottom of the dial will be the proper button.

(3) Loosen the button by unscrewing it (not the dial) ½ turn to the left. Now press the button in all the way and rock the dial back and forth a trifle until a click is heard Do not release the button now but set the pointer to its former location and with the dial in this position, being careful not to move it, proceed to tighten the button by turning it in the opposite direction (to the right). Make sure the button is very securely tightened as it may get out of adjustment.

(4) From the station call sheet supplied remove the proper station disc and insert into the push button so that the wording is horizontal when the button is at the bottom, and then insert a clear celluloid insert. Follow this same procedure for the remaining buttons.

(5) If for any reason it is necessary to remove a station call letter disc, the use of a pen knife or any sharp pointed instrument will facilitate the removal.

MODEL 7425 CHASSIS 107.375

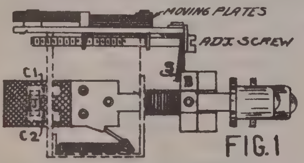


FIG.1

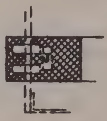


FIG.2

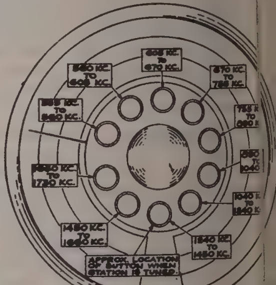


Fig. 1A

MECHANICAL ACTION OF THE PERM-A-MATIC TUNER

Fig. 1 shows one of the buttons depressed for a station. The trimmer panel assembly (for the antenna circuit) is designed with spring fingers "S" that make contact with cross bar "B" completing the ground circuit of the R.F. Trimmer.

When making the original set-up, the adjusting screw may indicate two positions for resonance. This is due to the possibility of the small amount of play in the screw thread and is of no concern as long as it is set to the exact resonance point.

The jumper contact "J" connects C1 contact to C2 contact with the button "IN". This completes the oscillator circuit for that particular button.

Fig. 2 shows the jumper position with the button "OUT".

Fig. 3 shows the manual OFF-ON button in the "OUT" position.

The "L" shaped sliding contact is the common cathode return circuit and alternates the bias on the 6K8 for manual tuning or on the 6A7 for push button tuning.

Fig. 4 shows the iron core movement within the oscillator coil. Its position is held stationary by the small spring wire across the coil form. The position of this spring must be such that no spring action is apparent from the end of the adjustment stud due to pressure with a screwdriver. Otherwise, when the screwdriver is removed, the core will shift out of position.

The button is held down by action of the latch bar and is released when another key raises the latch bar on its way down.

If it is necessary to replace a coil, mount it in line with the other coils and cement it in place.

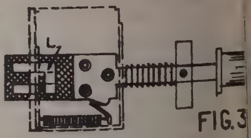


FIG.3

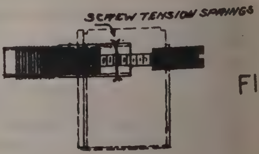
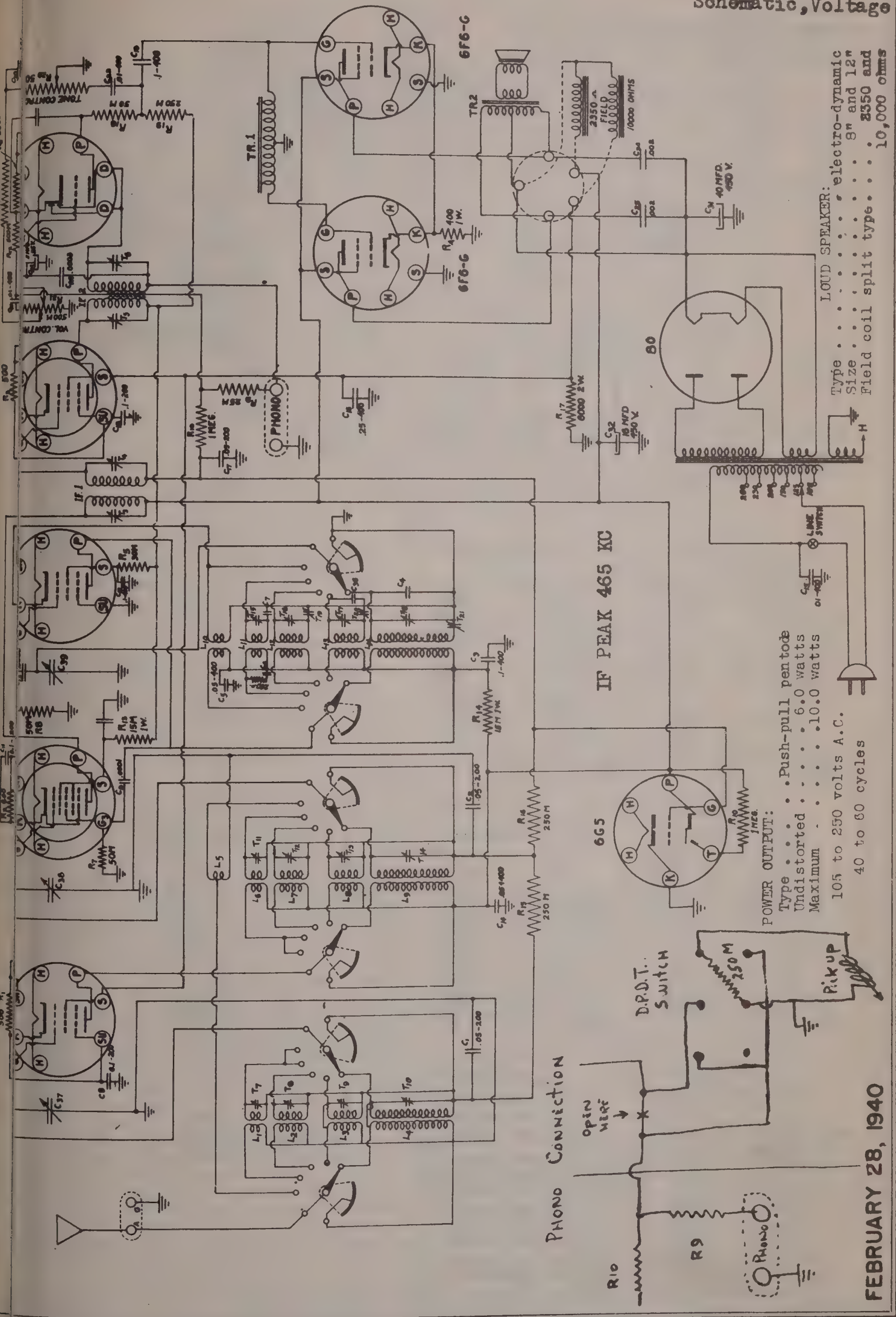


FIG.

SEARS. ROEBUCK & CO.

MODELS 7237,7239
Ch.104.709
Schematic,Voltage



LOUD SPEAKER:
Type . . . . electro-dynamic
Size . . . . 8" and 12"
Field coil split type . . . 2350 and 10,000 ohms

POWER OUTPUT:
Type . . . . . .Push-pull pentode
Undistorted . . . . . 6.0 watts
Maximum . . . . . .10.0 watts

105 to 250 volts A.C.
40 to 60 cycles

FEBRUARY 28, 1940

MODELS 7237,7239
Voltage,Socket
Trimmers,Coils
Voltage Connections
Alignment Notes

SEARS, ROEBUCK & CO.

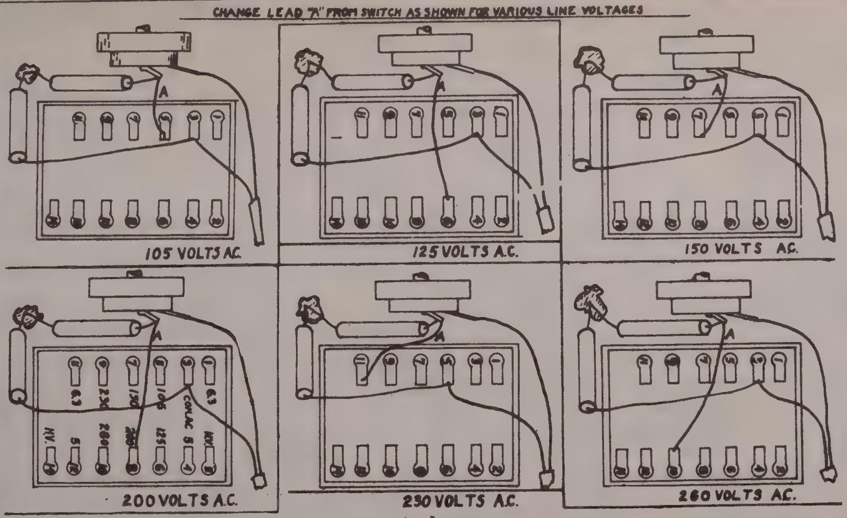


Fig. 1

All Voltages taken from ground with line voltage 115 volts.

TUBE	POSITION	PLATE	SCREEN GRID	CATHODE	FILAMENT
6K7-G	1st. R.F.	250 V.	115 V.	2 V.	6 V.
6L7	Mixer	245 V.	172 V.	5.5 V.	6 V.
6J7-G	Oscillator	135 V.	155 V.	-	6 V.
6K7	I.F.	245 V.	115 V.	3.5 V.	6 V.
6Q7-G	Diode Det.	60 V.	-	1 V.	6 V.
6F6-G 6F6-G	P.P. Audio P.P. Audio	325 V. 325 V.	250 V. 250 V.	19 V. 19 V.	6 V. 6 V.

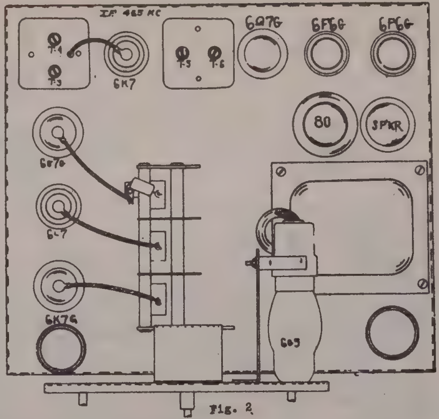
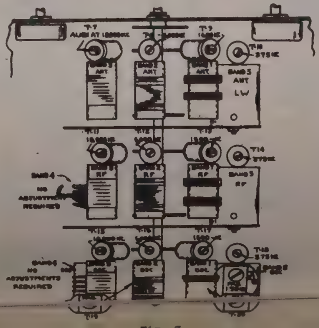


Fig. 2

ALIGNMENT FREQUENCIES:
Band 1 . . . . 1600 KC & 600
Band 2 . . . . 6 MC
Band 3 . . . . 18 MC
Band 4 . . . . no adjustment
Band 5 . . . . .375 KC

FREQUENCY RANGES:
Band 1 . . . . 540-1750 KC
Band 2 . . . . 1.75-6.0 MC
Band 3 . . . . 6.0-18.0 MC
Band 4 . . . . .15.0-40 MC
Band 5 . . . . . 750-2100 meters (longwave)


BAND 4 NO ADJUSTMENTS REQUIRED
BAND 4 NO ADJUSTMENTS REQUIRED

IMPORTANT ALIGNMENT NOTES

It is assumed that if an alignment procedure becomes necessary that the serviceman has an oscillator capable of accurately covering the range of the receiver and that a meter output indicator is used.

The I.F. stages are aligned in the usual manner by feeding a 465 KC signal into the grid of the 6L7 tube.

Follow Fig. 2 and Fig. 3 showing trimmer locations and alignment frequency.

Always adjust the oscillator first in any particular band.

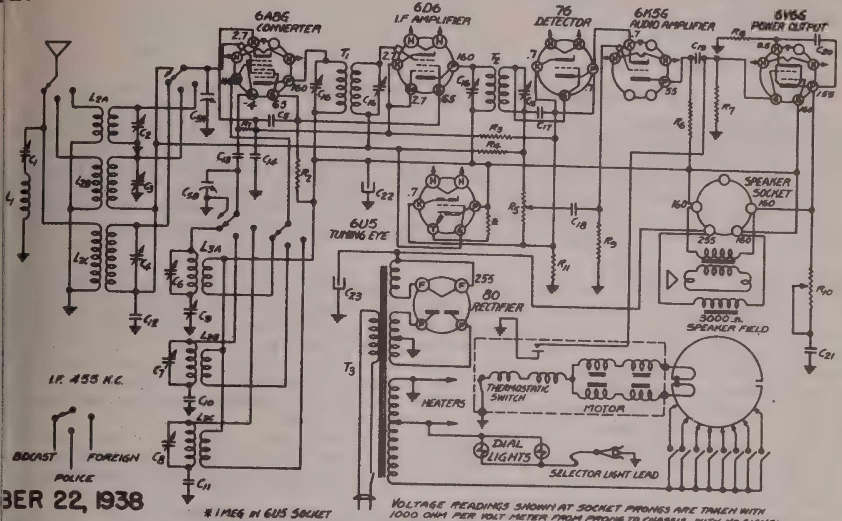
Use as low an output as possible from the test oscillator in making the various adjustments.

After trimming at the high frequency end of the dial and adjusting the padding condenser at the other end, always recheck the

chema ic,Voltage
ocket Trimmers
ligm nt

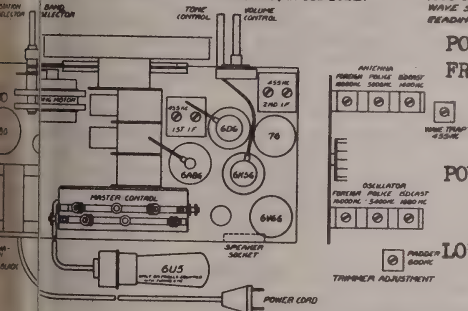
SEARS, ROEBUCK & CO.

MODELS 7241,7241A
Ch. 109.246



OVEMBER 22, 1938

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TAKEN WITH 1000 OHM PER VOLT METER FROM PRONG TO CHASSIS, WITH NO SIGNAL, WAVE SWITCH IN BROADCAST POSITION ON 117 VOLT LINE. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



POWER SUPPLY: 115 volts,60 cycles,45 watts
FREQUENCY RANGES: 540 to 1650 KC
1650 to 5400 KC
5250 to 16000 KC

POWER OUTPUT: Undistorted = 0.75 watts
Maximum = 1.4 watts

LOUD SPEAKER: Type, Dynamic
Size, 8-inch
Field Resistance =3000 ohms

ALIGNMENT PROCEDURE

onnect an output meter across the speaker voice coil. The volume control should be set a ew degrees back of the maximum volume position. Use a weak signal from the generator. S ong signals tend to cause improper adjustments.

I Connect the generator ground to the receiver chassis. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 KC signal to the grid of the 6D6 IF amplifier tube and aline the 2nd IF transformer. Repeat for the 1st IF transformer, applying the signal to the grid of the 6A8G tube. (See tube layout diagram for location of trimmers.).

R Using a 250 mmf. condenser as a "dummy" antenna, turn the wave switch all the way to the left, apply 455 KC signal to the antenna and adjust the wave trap trimmer for minimum response. Turn the tuning condenser to minimum capacity, set the generator at 1680 KC and adjust the Broadcast Oscillator trimmer for top frequency. Set the generator at 1400 KC and aline the Broadcast Antenna trimmer. Set the generator at 600 KC, tune the receiver to the signal and adjust the padder. The tuning condenser must be rocked back and forth through the signal while varying the padder in order to assure perfect alignment.

A 400 ohm resistor must be used as a "dummy" antenna for proper alignment of the two short wave bands. Set the wave switch in the center position, adjust the oscillator top frequency to 5400 KC, then aline the antenna trimmer at about 5000 KC.
Turn the Wave Switch to the extreme right hand position, adjust the oscillator top frequency to 16000 KC and aline the antenna at 15000KC. In order to be sure that the top end of the last band is set properly it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna trimmer should be screwed down tight then unscrewed to the first peak. This procedure should be followed in order that the oscillator and antenna circuits will be set in the correct relation to each other. It is best to rock the tuning condenser back and forth through the signal while making these adjustments at high frequencies.

MODELS 7241,7241A
Ch.109.246
MODELS 7242,7242A
Ch.109.190
Automatic Tuner Data

SEARS, ROEBUCK & CO.

ELECTRIC AUTOMATIC TUNING INSTRUCTIONS

ELECTRIC AUTOMATIC TUNING

The tuning unit consists of three parts. (1) The MASTER SELECTOR. This includes the SELECTC DRUM, and the SELECTOR PINS. These parts are located on the back of the variable condenser together with their associated brackets and wiring. (2) MOTOR and DRIVE. This assembly cons ts of an induction motor having a mechanical clutch with magnetic throw out, a train of gears operating directly onto the manual tuning shaft. (3) PUSH BUTTON ASSEMBLY. These buttons ar located on the front of the chassis and extend through the escutcheon below the dial.

SETTING UP THE MASTER SELECTOR

List eight local or strong stations according to frequency. Setting up weak or distant stat ns is not recommended. Call the station nearest the left hand end of the dial(nearest 1600 KC. the No. 1 Station. Number the other stations similarly going from left to right across the al. On the back of the receiver will be found the SELECTOR DRUM and the eight CONTACT PINS whic determine the point at which the tuner will stop when the buttons are pressed. Figure 1 sho the general layout and relation of the drum and contacts. Figure 2 shows one of the contact ins in detail. Figure 3 shows the arrangement of the contact pins, each pin being numbered according to the system suggested for numbering the stations.

On the SELECTOR DRUM are two pairs of CONTACT RIBBONS. Note that there is a paint dot on th edge of the drum directly opposite the break in the ribbons on the upper half of the drum. is is for locating the approximate position at which a given CONTACT PIN should be set in orde to have the DRUM stop for a particular station.

IT IS IMPORTANT THAT THE FOLLOWING STEPS BE FOLLOWED EXACTLY AS OUTLINED:

(1) Turn the wave switch to the "Broadcast" position. Turn the receiver ON and let it run f at least ten minutes to allow the tubes to reach their final operating temperature.

(2) Using the MANUAL STATION SELECTOR, tune in the No. 1 station, that is the one nearest t 1600 KC. end of the dial. Watch the tuning tube closely, making certain that the station is tuned in perfectly.

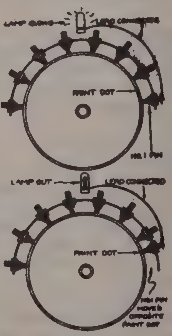
(3) Attach the SELECTOR LIGHT lead to the No. 1 pin. This lead has a spring clip at the end d will be found clipped to a ground post at the top of the selector bracket. Unless the pin he-pens to be set exactly the DIAL LIGHTS will glow when the lead is touched to the pin.

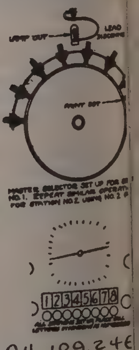
(4) Observe the position of the paint dot on the edge of the DRUM. Grasp the No. 1 pin firmly and slide it toward the paint dot. When the PIN is directly opposite the paint dot the lights will go out indicating that the pin is properly set. To insure the greatest accuracy slide the pin back and forth across the break in the ribbons, leaving it set half way between the points where the lights go out.

(5) Using similar procedure set up the other seven stations, in each case using the pin bearing the same number as the station being set up.

(6) Locate the CALL LETTERS of your stations on the printed sheets supplied with the receiver and insert them in the proper pockets above the buttons.

(7) The only operations necessary to tune in any of the eight stations set up as outlined above are: Turn the receiver ON, allow an interval of time for the tubes to heat and press the button for the station desired HOLDING THE BUTTON DOWN UNTIL THE POINTER STOPS MOVING. Then adjust the tone and volume.




LAMP OUT
LEAD DISCONNE
PAINT DOT
MASTER SELECTOR SET UP FOR ST
NO. 1. REPEAT SIMILAR OPERATI
FOR STATION NO. 2 USING NO. 2 P
1 2 3 4 5 6 7 8

CH. 109.246

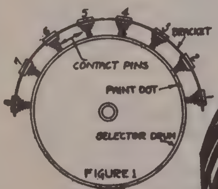


FIGURE 1

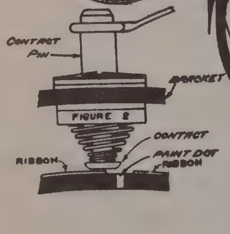


FIGURE 2

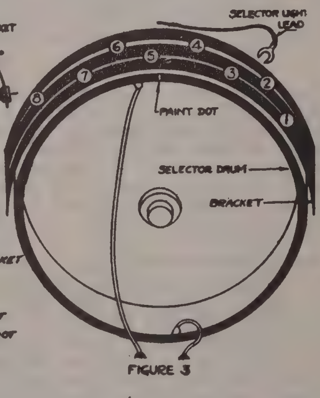
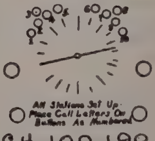


FIGURE 3

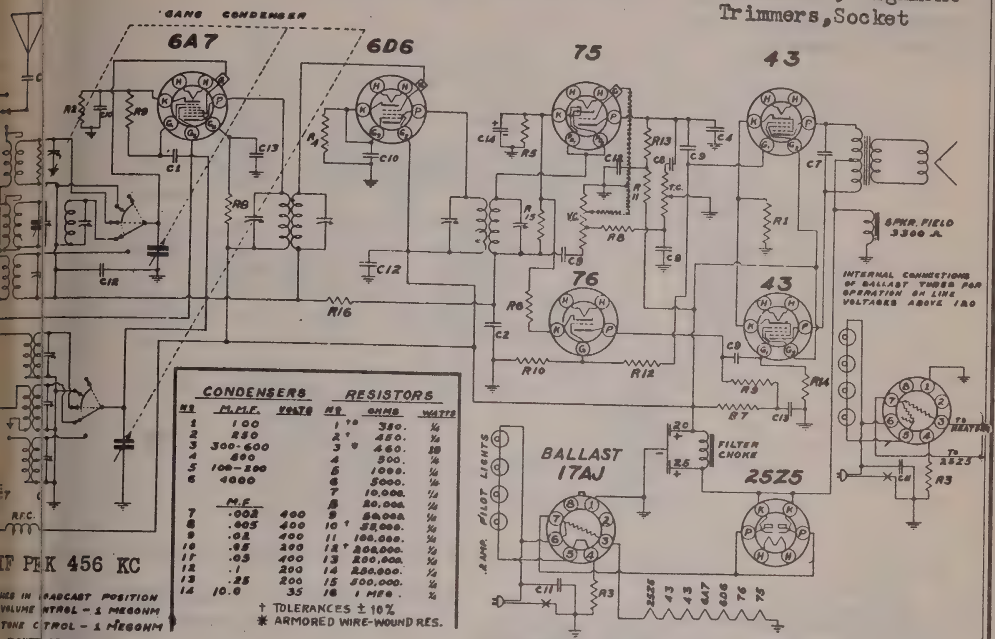

All Stations Set Up. Place Call Letters On Buttons As Numbered

CH 109.190

Note that in Ch
109.190, ten co
pins are provide

SEARS, ROEBUCK & CO.

MODEL 7236,Ch.105.8TU
Schematic,Alignment
Trimmers,Socket



CONDENSERS No.	M.M.F.	VOLTS	RESISTORS No.	OHMS	WATTS
1	100		1 †*	350.	¼
2	250		2 †	450.	½
3	300-600		3 *	460.	10
4	500		4	500.	¼
5	100-200		5	1000.	¼
6	4000		6	5000.	¼
			7	10,000.	¼
	M.F.		8	20,000.	¼
7	.002	400	9	50,000.	½
8	.005	400	10 †	55,000.	½
9	.02	400	11	100,000.	½
10	.05	200	12 †	200,000.	½
11	.05	400	13	200,000.	½
12	.1	200	14	250,000.	½
13	.25	200	15	500,000.	½
14	10.0	35	16	1 MEG.	½

† TOLERANCES ± 10%
✱ ARMORED WIRE-WOUND RES.

IF PE K 456 KC

ES IN OADCAST POSITION
VOLUME NTROL - 1 MEGOHM
TONE C TROL - 1 MEGOHM

POWE SUPPLY:.................................105-125 volts, 60 cycles, AC or DC, 70 watts

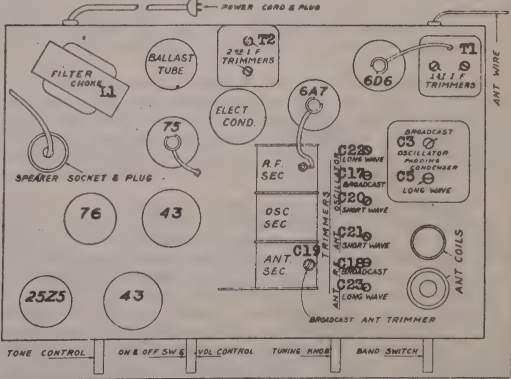
WAVEBAND SWITH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	456 kc	.1 mfd	6A7 Grid	T2 T1	IF Output IF Input	45
"AM"	Fully open	1730 kc	.0002 mfd	Ant. Lead	C 17	Oscillator	
"AM"	1400 kc	1400 kc	.0002 mfd	Ant. Lead	C18 C19	Preselector Antenna	10
"AM"	600 kc(rock)	600 kc	.0002 mfd	Ant. Lead	C3	Padder	8
"SW"	Fully open	18.1 mc	400 ohm	Ant. Lead	C20	Oscillator	
"SW"	16 mc	16 mc	400 ohm	Ant. Lead	C21	Antenna	16
"LW"	Fully open	380 kc	.0002 mfd	Ant. Lead	C22	Oscillator	
"LW"	920 meters	325 kc	.0002 mfd	Ant. Lead	C 23	Antenna	8
"LW"	1875 meters (rock)	160 kc	.0002 mfd	Ant. Lead	C5	Padder	15

For PUSH-BUTTON TUNER, see Index

REQUE Y RANGES:
B d "AM"................. 535 kc-1750 kc
B d "LW"...................150 kc-375 kc
B d "SW"...................5.6 mc-18.1 mc

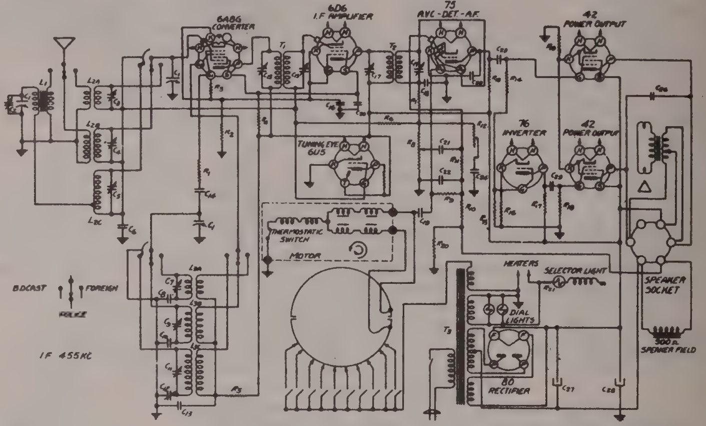
WER TPUT:
Ty e................... Push Pull Pentode
Ur istorted..................... 1.8 watts
M imum.........................2.5 watts

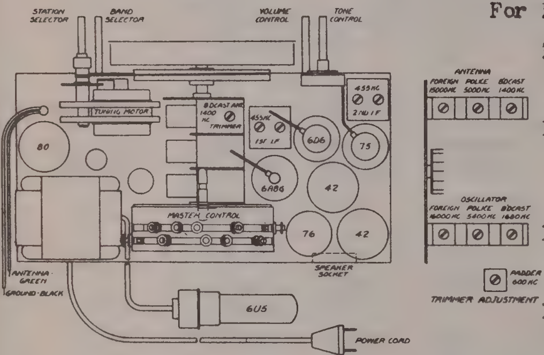
UD S AKER:
Ty e............................. Dynamic
Si e .... 8 and 12 inch
Fi ld coil resistance......... 3000 ohms
V ce coil impedance............ 2.5 ohms



MODELS 7242,7242A
Ch.109.190
Schematic,Socket
Alignment,Trimmers

SEARS. ROEBUCK & CO.





For ELECTRIC AUTOMATIC TUNING, see Ind

POWER SUPPLY: 105-125 volts, 60 cy
80 watts

FREQUENCY RANGES: 540 to 1650 KC
1650 to 5400 KC
5250 to 16000 KC

POWER OUTPUT: Undistorted = 3 watt
Maximum = 5 watt

LOUD SPEAKER: Type, Dynamic
Size, 8-inch
Field Resistance=900

JAN. 5, 1939

ALIGNMENT PROCEDURE

Connect an output meter across the speaker voice coil. The volume control should be set a few degrees back of the maximum volume position. Use a weak signal from the generator. Strong signals tend to cause improper adjustments.

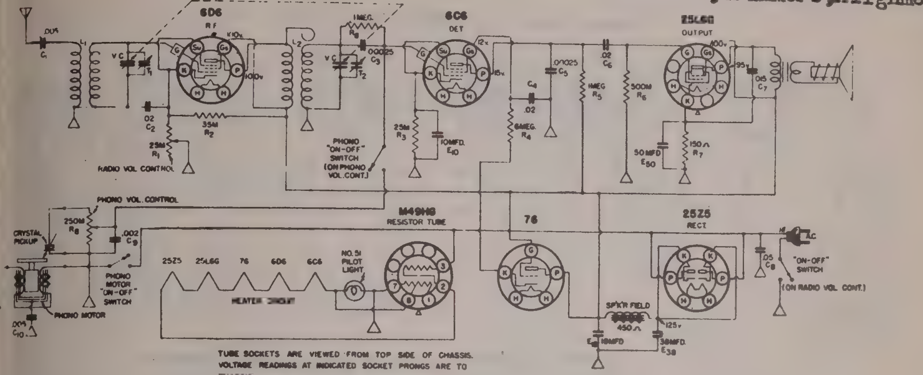
IF. Connect the generator ground to the receiver chassis. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 KC signal to the grid of the 6D6 IF amplifier tube and aline the 2nd IF transformer. Repeat for the 1st IF transformer, applyin the signal to the grid of the 6A8G tube. (See tube layout diagram for location of trimmers.)

RF. Using a 200 mmf condenser as a "dummy" antenna, Turn the wave switch to the "Broadcast" position and the tuning condenser to minimum capacity. Feed a 1680 KC signal to the antenna and adjust the broadcast oscillator trimmer for top frequency. Set the generator at about 1400 KC and adjust the broadcast antenna and RF trimmers. Set the generator for 600 KC., tur the receiver to the signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder to assure perfect alignment.

A 400 ohm resistor must be used as a dummy antenna for proper alignment of the short wa bands. Set the wave switch in the center position, adjust the oscillator top frequency to 54 KC., Then align the antenna trimmer at about 5000 KC. With the wave switch in the extreme right hand position adjust the oscillator top frequency of the high frequency band to 16000 and align the antenna at about 15000 KC. In order to be sure that the top end of the last ba is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna trimmer should be screwed down tight then unscrewed to the first pe This procedure should be followed in order that the oscillator and antenna circuits will be in the correct relation to each other. It is best to rock the tuning condenser back and fort through the signal while making these adjustments at high frequencies.

SEARS, ROEBUCK & CO.

MODEL 7244,Ch.110.907
Schematic,Voltage
Socket,Trimmers,Alignment



TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGN R.F. AND ANTENNA AT 1500 KC.

POWE SUPPLY:

ll models available .... 105-125 volts, 60 cycle A.C. .... 40 watts

FREQ NCY RANGE:

roadcast .... 530-1730 KC

POWE OUTPUT:

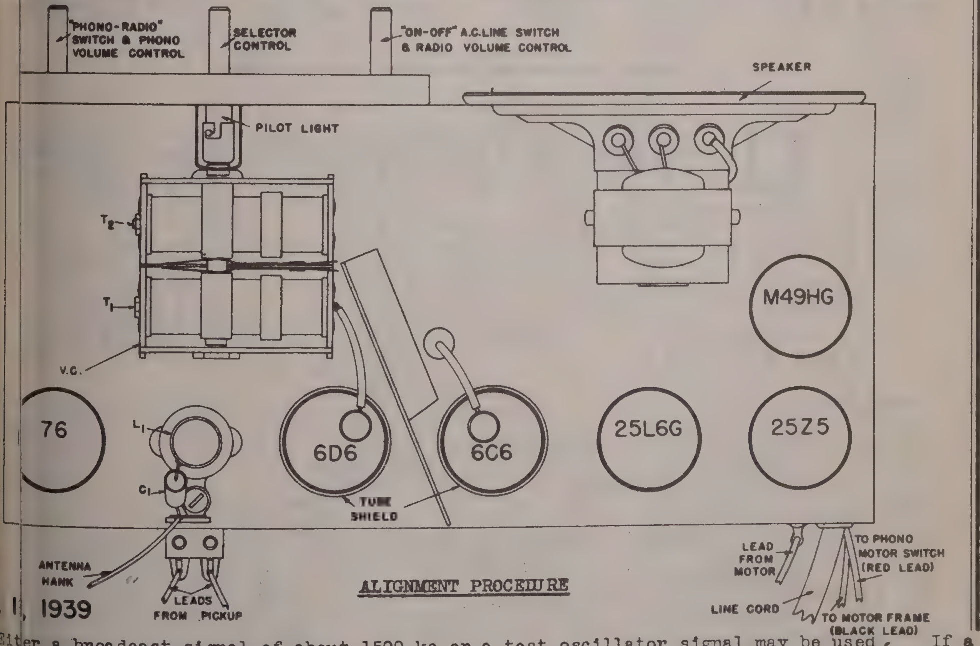
ype .... Beam Power
ndistorted .... 1.25 watts
aximum .... 1.75 watts

ALIGNMENT FREQUENCY

1500 KC

LOUD SPEAKER:

Type .... Dynamic
Size .... 5"
Field Resistance .... 450 Ohms


"PHONO-RADIO" SWITCH & PHONO VOLUME CONTROL
SELECTOR CONTROL
"ON-OFF" A.C.LINE SWITCH & RADIO VOLUME CONTROL
SPEAKER
PILOT LIGHT
T2
T1
V.C.
M49HG
76
L1
6D6
6C6
25L6G
25Z5
C1
TUBE SHIELD
ANTENNA HANK
LEADS FROM PICKUP
LEAD FROM MOTOR
TO PHONO MOTOR SWITCH (RED LEAD)
LINE CORD
TO MOTOR FRAME (BLACK LEAD)

ALIGNMENT PROCEDURE

Eiter a broadcast signal of about 1500 kc or a test oscillator signal may be used. If a dcas signal is used, the antenna of the receiver should be extended as in a normal installa- . I a test oscillator signal is used, a wire should be connected to the test oscillator out and un parallel to but insulated from the receiver's antenna wire. The generator ground necti n should be connected to ground.

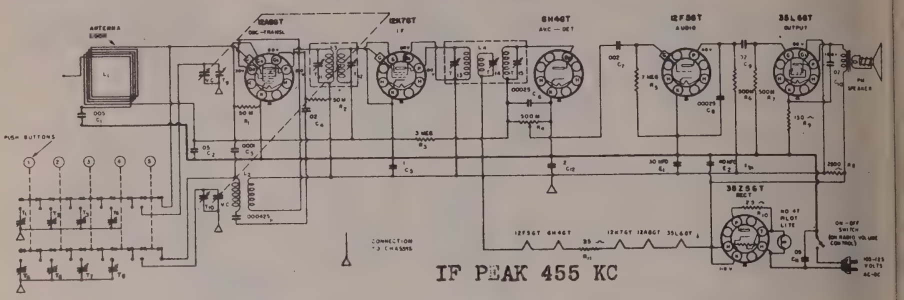
Tur in the 1500 kc signal and adjust the trimmers for maximum loud speaker response. This be the most accurately if the Volume Control setting is reduced to give a low volume level. locaion of this trimmer is shown in the tube socket location diagram.

MODELS 7251,Ch.110.988
7246,7251,Ch.110.988-1A,-2
Schematics,Socket,Trimmers

SEARS, ROEBUCK & CO.

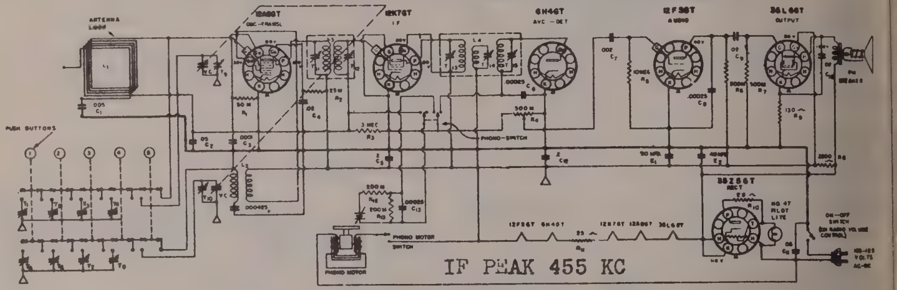
FOR ALIGNMENT SEE I

WIRING DIAGRAM FOR SILVERTONE CHASSIS NO. 988



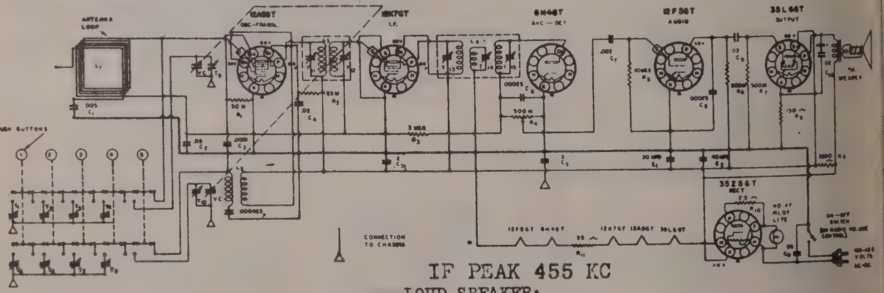
IF PEAK 455 KC

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.988-1A



IF PEAK 455 KC

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.988-2

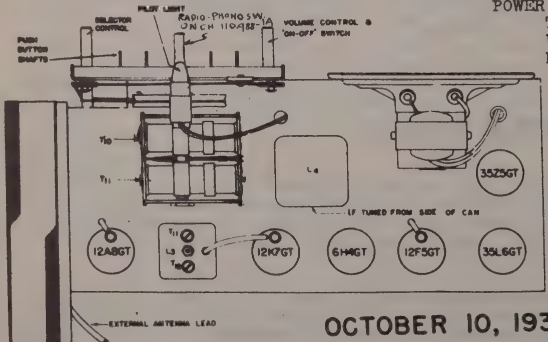


IF PEAK 455 KC

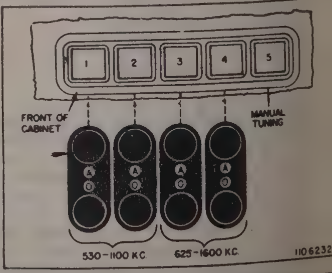
LOUD SPEAKER:
Type.....................................Dynar
Size.....................................
Field....................................P.

POWER SUPPLY:
All models available
110-125 volts, 25-60 cycle AC or DC, 30 watts

POWER OUTPUT:
Type...............................Beam Powe
Undistorted........................1.
Maximum............................1.



OCTOBER 10, 1939



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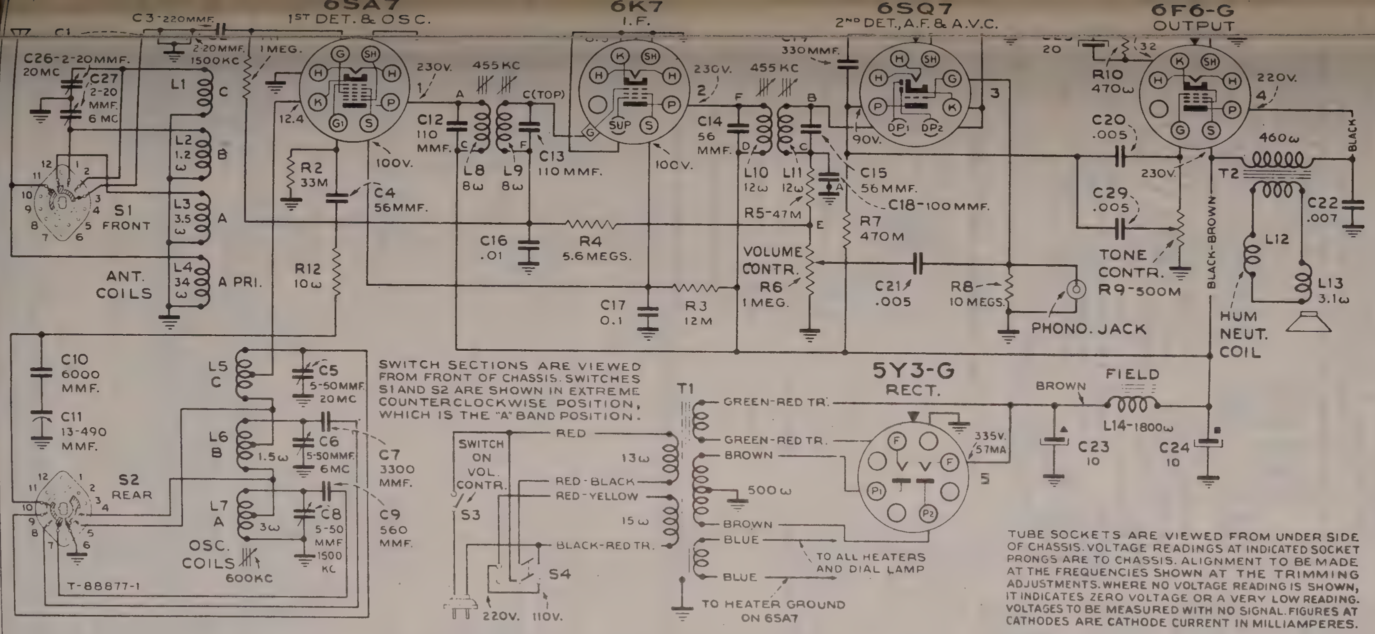
SEARS, ROEBUCK & CO.

MODEL 7300 (Export)
Ch.126.216
Schematic, Voltage
Phono.Connections



SWITCH SECTIONS ARE VIEWED FROM FRONT OF CHASSIS. SWITCHES S1 AND S2 ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS THE "A" BAND POSITION.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

LOUDSPEAKER:

Type	6-inch Electrodynamic
Voice Coil Impedance	3.4 ohm at 400 cycles
Field Coil Resistance	1,800 ohms
App. Field Coil Voltage Drop	100 volts

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

POWER OUTPUT:

Type	Pentode
Undistorted	1.5 watts
Maximum	3.3 watts

POWER SUPPLY RATING AVAILABLE:

105-125 volts, 25 cycles, 70 watts
105-125/200-250 volts, 50-60 cycles, 70 watts

Dial Lamp......... Mazda 44, 6.3 volts, 0.25 amp.

FREQUENCY RANGES:

(A) Standard Broadcast	540-1,720 kc	(550-174 m)
(B) Medium Wave	2.3-7.0 mc	(130-42.8 m)
(C) Short Wave	7.0-22.0 mc	(42.0-13.6 m)

INTERMEDIATE FREQUENCY................ 455 kc

ALIGNMENT FREQUENCIES:

Band "A"	600 kc (osc.)	1,500 kc (ant., osc.)
Band "B"		6 mc (osc., ant.)
Band "C"		20 mc (osc., ant.)

Record Player:

A jack is provided on the rear of chassis for connection to a No. 6227 Silvertone Record Player which is supplied only in 100-125 volts, 25, 50 or 60 cycle rating. If receiver is to be used on 220 volts, it will be necessary to connect the Record Player power cord to the 110V. primary section of the Power Transformer as shown in Figure 5.

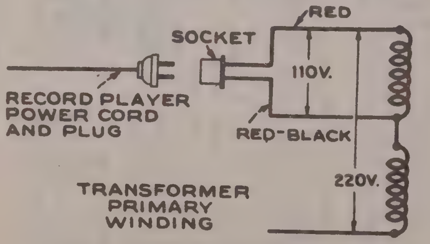

RED
SOCKET
110V.
RECORD PLAYER POWER CORD AND PLUG
RED-BLACK
220V.
TRANSFORMER PRIMARY WINDING

FIG. 5. RECORD PLAYER CONNECTIONS (220 V. — 110 V.)

AUGUST 7, 1939

MODEL 7300
Chassis Wiring, Socket Trimmers, Dial, Notes

SEARS, ROEBUCK & CO.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45° mark on the drum scale (see "Dial Drive Drawing") must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅜-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

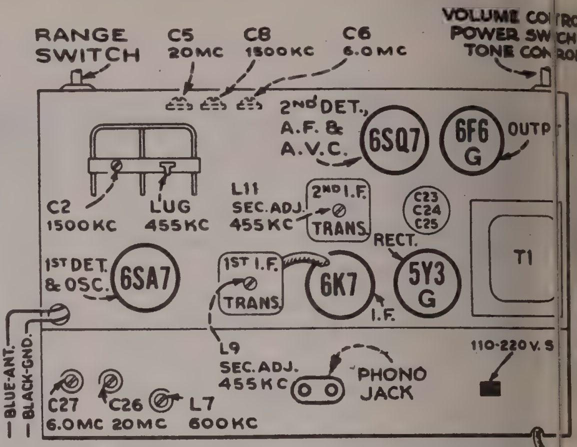


FIG. 1. TUBE, TRIMMER AND PARTS LOCATION

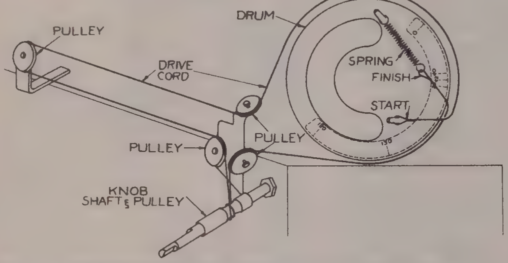


FIG. 2. CONDENSER AND INDICATOR DRIVE CORD

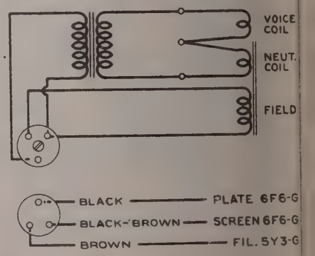


FIG. 3. SPEAKER AND CABLE CONNECTIO

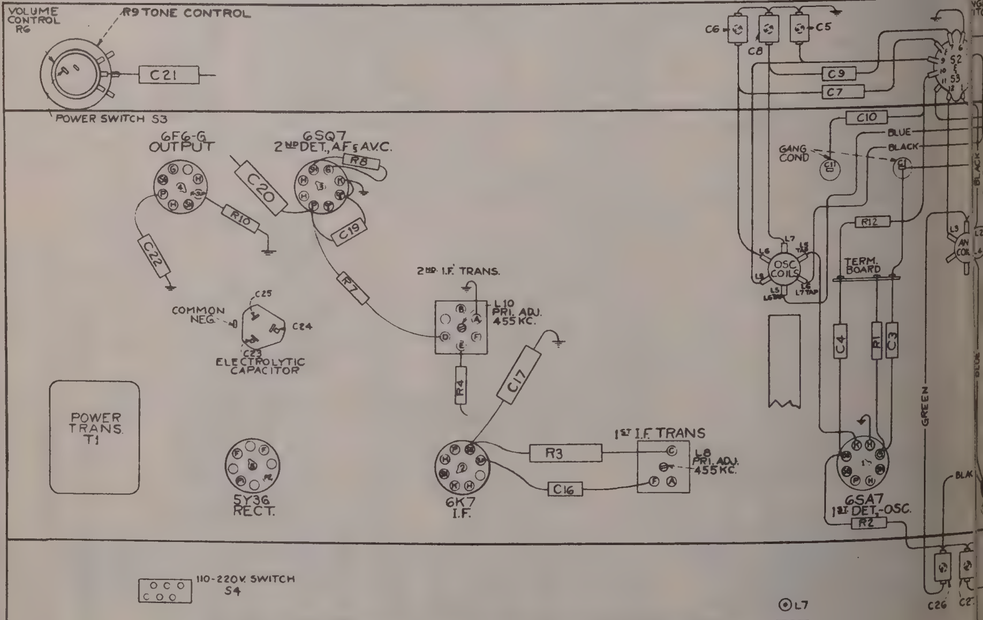


FIG. 4. TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

RELI NARY:

utput meter connections.......... Across speaker voice coil
utput meter reading to indicate 1.0 watt output.......... 1.6 volts
pprox ate average sensitivity in microvolts for 1.0 watt output.......... See chart below
ummy antenna value to be inserted in series with generator output.......... See chart below
onnec n of generator output lead.......... See chart below
onnec n of generator ground lead.......... To chassis
enera modulation.......... 30%, 400 cycles
sition of Volume Control.......... Fully Clockwise
sition of Tone Control.......... Fully Clockwise

Wav Band Sw ch Pos on	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"	Low End	455 kc	.001 mfd.	6K7 I-F Grid	L10, L11	2nd I-F Trans.	3,500
"	Low End	455 kc	.001 mfd.	Tuning Condenser Stator (osc.)	L8, L9	1st I-F Trans.	85
"	600 kc (33°) (rock)	600 kc	.0002 mfd.	Ant.	L7	Osc.	15
"	1,500 kc (152.4°)	1,500 kc	.0002 mfd.	Ant.	C8, C2	Osc., Ant.	——
"	20 mc (155.4°)	20 mc	300 ohms	Ant.	C5	Osc.*	——
"	20 mc (155.4°) (rock)	20 mc	300 ohms	Ant.	C26	Ant.	95
"	6.0 mc (149°)	6.0 mc	300 ohms	Ant.	C6	Osc.*	15
"	6.0 mc (149°)	6.0 mc	300 ohms	Ant.	C27	Ant.	——
"	1,500 kc (150.5°)	1,500 kc	.0002 mfd.	Ant.	C29, C3	Osc., Ant.	15

IMPORTANT ALIGNMENT NOTES

*U minimum capacity peak if two peaks can be obtained.

W re indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two hil. m king this adjustment.

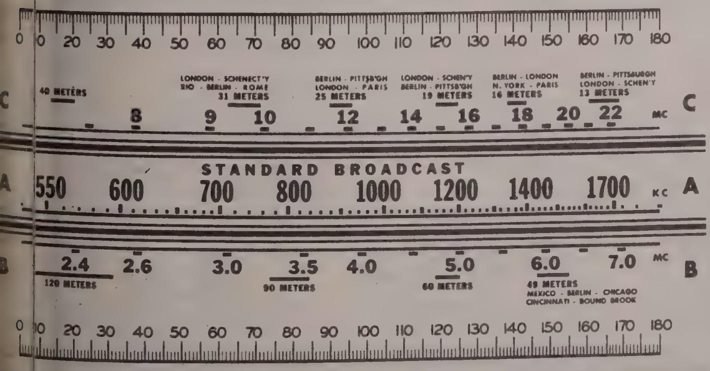
Ea step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from e ger ator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

A ustment locations are shown on the top and bottom parts location views of chassis.

O the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for ignme in any other band. Grid cap leads should remain in place during alignment.

N .—Oscillator tracks 455 kc above signal on all bands.

V es shown under, "Microvolts," are only approximate.


0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180
C
40 METERS
LONDON · SCHENECT'Y RIO · BERLIN · ROME 31 METERS
BERLIN · PITTSB'GH LONDON · PARIS 25 METERS
LONDON · SCHEN'Y BERLIN · PITTSB'GH 19 METERS
BERLIN · LONDON N. YORK · PARIS 16 METERS
BERLIN · PITTSBURGH LONDON · SCHEN'Y 13 METERS
8 9 10 12 14 16 18 20 22 MC
C
STANDARD BROADCAST
A
550 600 700 800 1000 1200 1400 1700 KC
A
B
2.4 2.6 3.0 3.5 4.0 5.0 6.0 7.0 MC
120 METERS
90 METERS
60 METERS
49 METERS MEXICO · BERLIN · CHICAGO CINCINNATI · BOUND BROOK
B
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

Calibration Scale

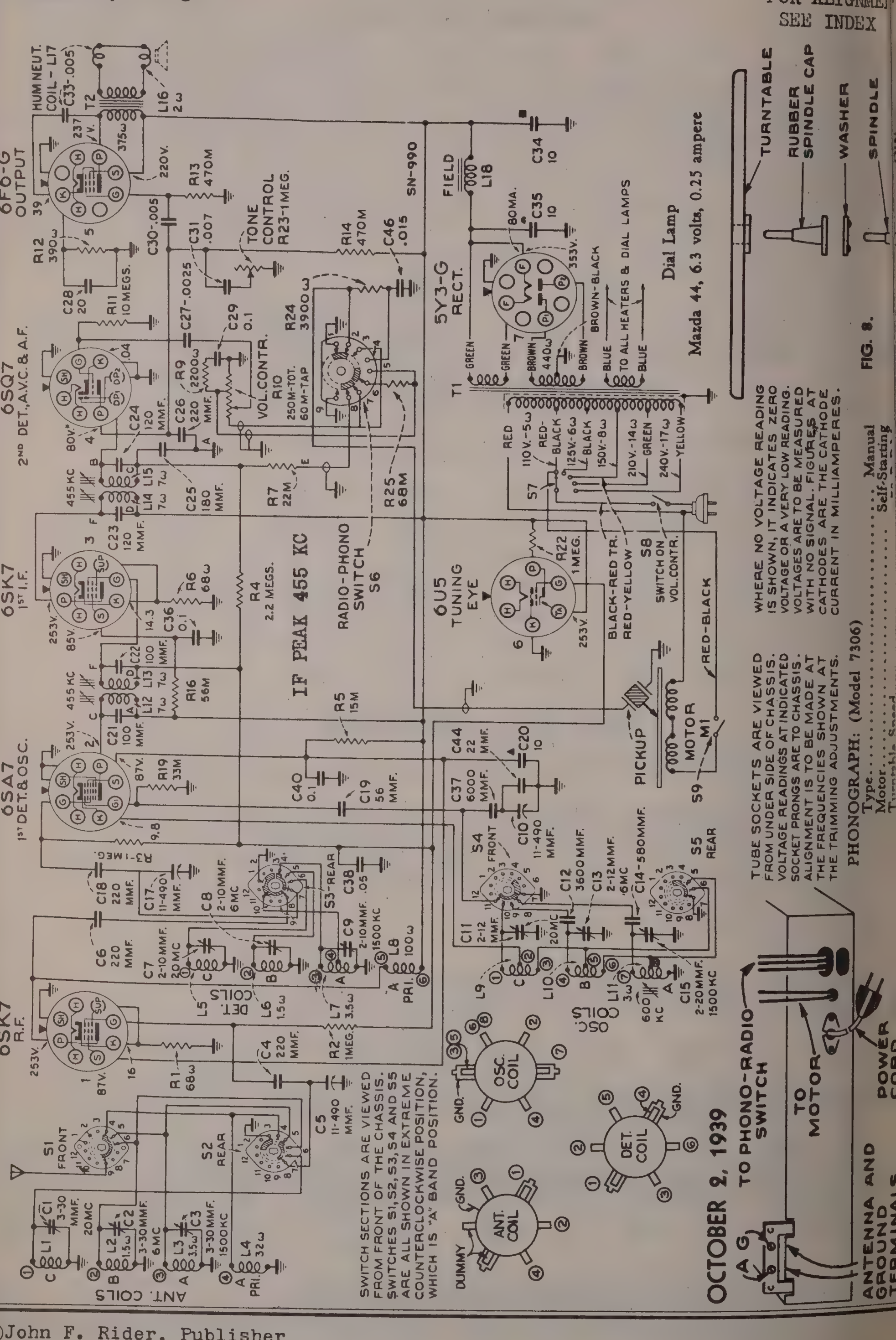
Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

MODEL 7306(Export)
Ch.126.218
Schematic,Voltage

SEARS, ROEBUCK & CO.

FOR ALIGNME
SEE INDEX



Dial Lamp

Mazda 44, 6.3 volts, 0.25 ampere

SWITCH SECTIONS ARE VIEWED FROM FRONT OF THE CHASSIS. SWITCHES S1,S2,S3,S4 AND S5 ARE ALL SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS "A" BAND POSITION.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS.

WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE THE CATHODE CURRENT IN MILLIAMPERES.

PHONOGRAPH: (Model 7306)

Type.......................... Manual
Motor.......................... Self-Starting
Turntable Speed

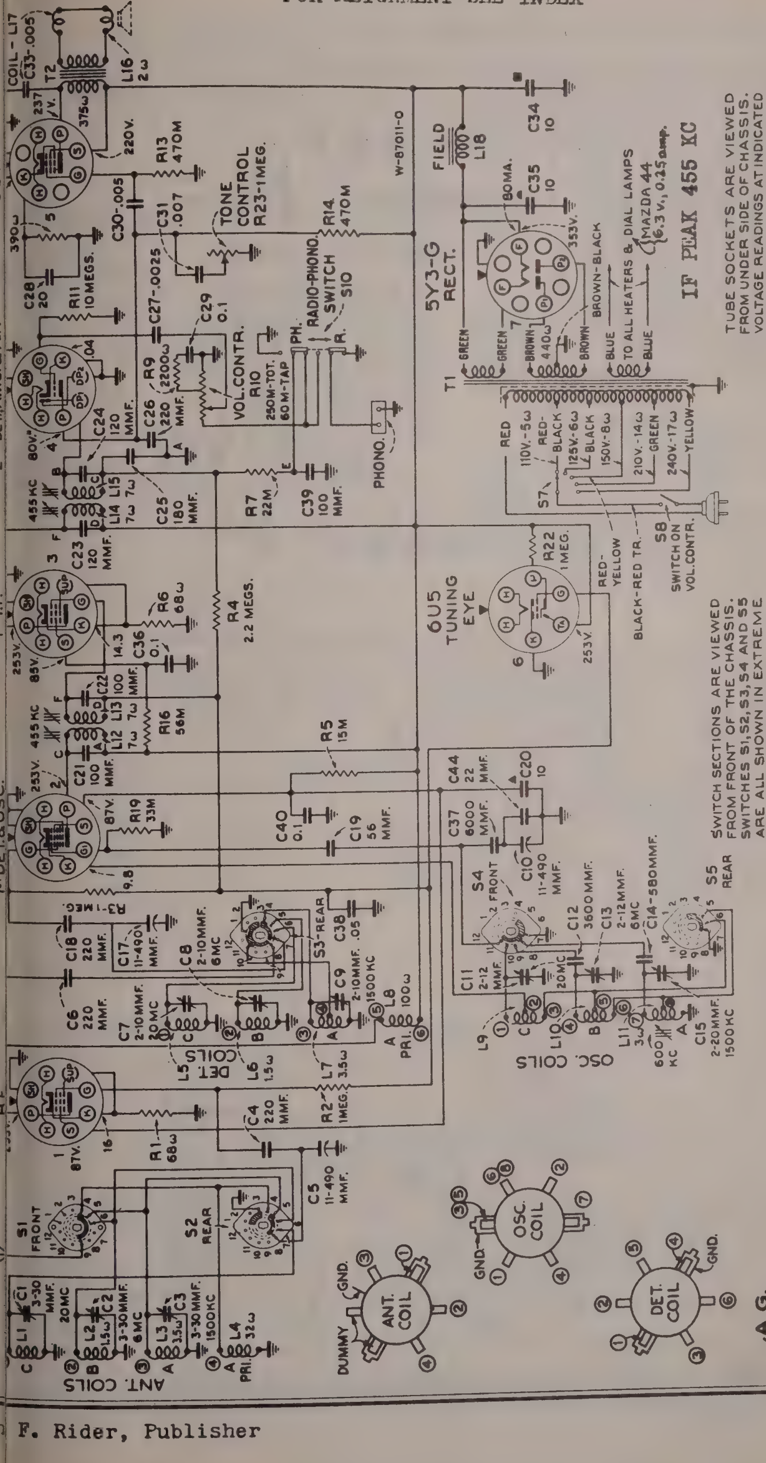
FIG. 8.

OCTOBER 2, 1939

SEARS, ROEBUCK & CO.

MODELS 7305,Ch.126.217,
7307,Ch.126.220 (Export)
Schematic,Voltage

FOR ALIGNMENT SEE INDEX



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE THE CATHODE CURRENT IN MILLIAMPERES.

IF PEAK 455 KC

OCTOBER 2, 1939

SWITCH SECTIONS ARE VIEWED FROM FRONT OF THE CHASSIS. SWITCHES S1,S2,S3,S4 AND S5 ARE ALL SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS "A" BAND POSITION.

Record Player:

A jack is provided on the rear of the chassis in Models 7305 and 7307 for connection to a No. 6227 Silvertone Record Player which is supplied only in 100-125 volts, 25, 50 or 60 cycle rating. If receiver is to be used on 220 volts, it will be necessary to connect the Record Player power cord to the 110 V. primary section of the power transformer as shown in Figure 9.

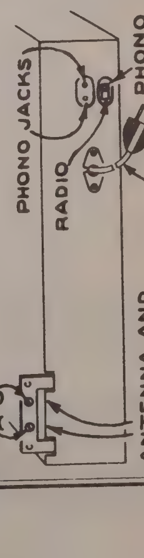


FIG. 6. REAR OF CHASSIS (Models 7305-7307)

MODELS 7305,7306,7307
Chassis Wiring,Socket
Trimmers,Notes

SEARS, ROEBUCK & CO.

Loudspeaker:

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cente in place upon completion of the adjustment.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

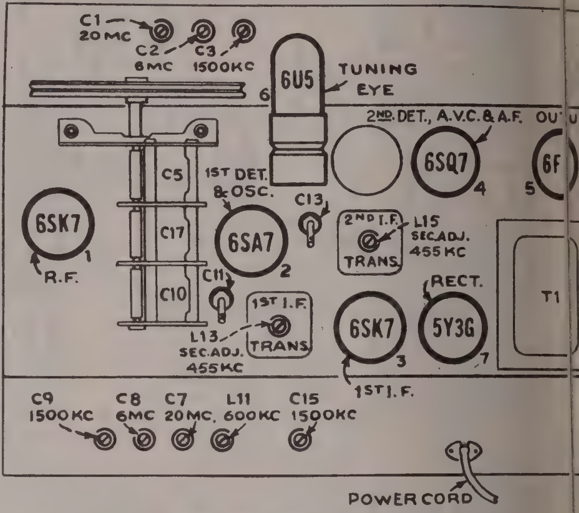


FIG. 1. TUBE, TRIMMER AND PARTS LOCATION

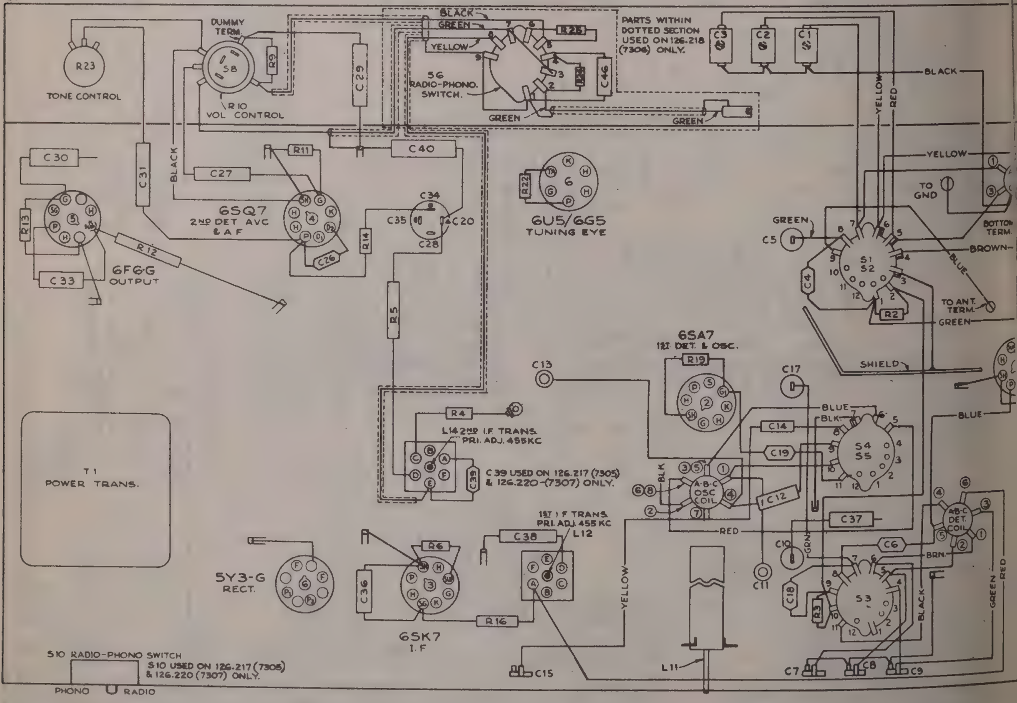


FIG. 2. TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

SEARS, ROEBUCK & CO.

MODELS 7305,7306,7307
Alignment

N del 7305 (126.217) and Model 7307 (126.220) are the same except for the size of speaker. Model 7305 having a 6-inch and N del 7307 a 12-inch electrodynamic speaker.

N del 7306 (126.218) has an 8-inch electrodynamic speaker and is supplied as a radio-phonograph combination.

POWI SUPPLY RATING:

lodels 7305 and 7307	100-130, 140-160, 195-250 volts, 40 to 60 cycles, 75 watts
lodel 7306	100-130, 140-160, 195-250 volts, 40 to 60 cycles, 75 watts
Phono Motor	20 watts
Total	95 watts

CHAS IS FEATURES:

No. R-F Stages (all bands)	One
No. I-F Stages	One
Tuning Eye	
Line Noise Electrostatic Transformer Shield	

Aural-Compensated Volume Control
Magnetite-Core Adjusted I-F Transformers and Band "A" Low-Frequency Oscillator Tracking
Jack and Switch for Phonograph Attachment on Models 7305 and 7307

IREQ ENCY RANGES:

(A) Standard Broadcast	540-1,720 kc	(550-174 m)
(B) Medium Wave	2.3-7.0 mc	(130-42.8 m)
(C) Short Wave	7.0-22.0 mc	(42.0-13.6 m)

ALIGNMENT FREQUENCIES:

Band "A"	600 kc (osc.) 1,500 kc (osc., det., ant.)
Band "B"	6 mc (osc., det., ant.)
Band "C"	20 mc (osc., det., ant.)

INTE MEDIATE FREQUENCY ... 455 kc

POWER OUTPUT:

Type	Pentode
Undistorted	2.5 watts
Maximum	4.5 watts

LOUI PEAKER:

	Model 7305	Model 7306	Model 7307
Type—Electrodynamic	6-inch	8-inch	12-inch
Voice Coil Impedance at 400 Cycles	3.4 ohms	2.2 ohms	2.2 ohms
Field Coil Resistance	1,800 ohms	1,060 ohms	1,060 ohms
Approx. Field Coil Voltage Drop	130 volts	130 volts	130 volts

ALIGNMENT PROCEDURE

PREL MINARY:

Outpu meter connections	Across speaker voice coil
Outpu meter reading to indicate 1.0 watt output	1.6 volts
Appro mate average sensitivity in microvolts for 1.0 watt output	See chart below
Dumm antenna value to be inserted in series with generator output	See chart below
Conne ion of generator output lead	See chart below
Conne ion of generator ground lead	To chassis
Gener or modulation	30%, 400 cycles
Positic of Volume Control	Fully clockwise
Positic of Tone Control	Fully clockwise

Wav Band Sw ch Po ion	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"	Low End	455 kc	.001 mfd.	6SK7 I-F Grid	L14, L15	2nd I-F Trans.	4,600
"	Low End	455 kc	.001 mfd.	Tuning Condenser Stator (osc.)	L12, L13	1st I-F Trans.	85
"	600 kc (148°) (rock)	600 kc	.0002 mfd.	Ant.	L11	Osc.	2.8
"	1,500 kc (28°)	1,500 kc	.0002 mfd.	Ant.	C15, C9, C3	Osc., Det., Ant.	2.1
"	6.0 mc (31°)	6.0 mc	300 ohms	Ant.	C13*, C8, C2	Osc.,* Det., Ant.	2.1
"	20 mc (23°)	20 mc	300 ohms	Ant.	C11*, C7, C1	Osc.,* Det., Ant.	4.2

IMPORTANT ALIGNMENT NOTES

*le minimum capacity peak if two peaks can be obtained.

here indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while aking this adjustment.

ch step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the g herator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

djustment locations are shown on the top and bottom parts location views of chassis.

nly the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for align ent in any other band.

ote.—Oscillator tracks 455 kc above signal on all bands.

alues shown under, "Microvolts," are only approximate.

MODELS 7305,7306,7307
MODELS 7310,7312

SEARS. ROEBUCK & CO.

Phonograph Data

NOTE:-ILLUSTRATIONS MARKED WITH✱APPLY ALSO TO MODELS 7310,7312.

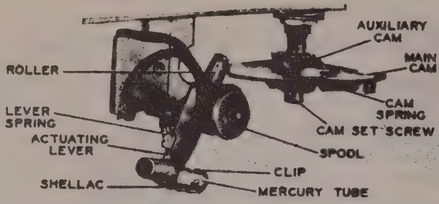


FIG. 4. MERCURY SWITCH MECHANISM (Model 7306) Viewed from front—shown with pickup in rest position

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1⅞ inches from the center line of the turntable shaft.

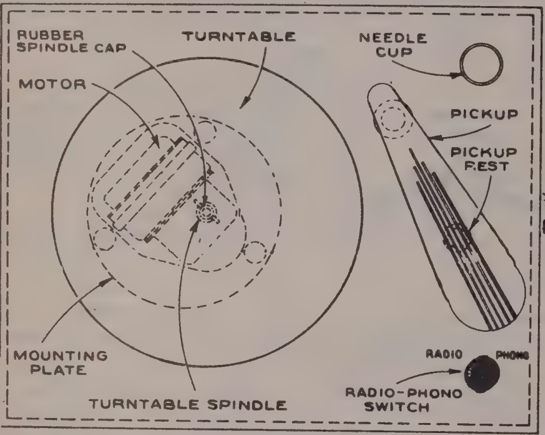
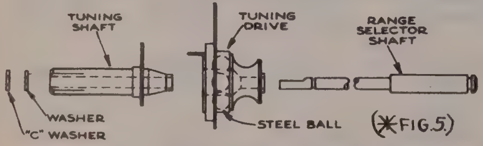
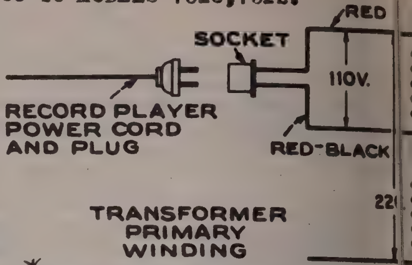


FIG. 3. PHONOGRAPH MOTOR BOARD AND OPERATING CONTROLS (Model 7306)

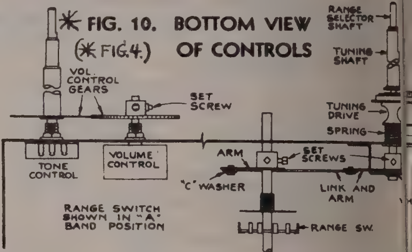


(✱FIG.5)

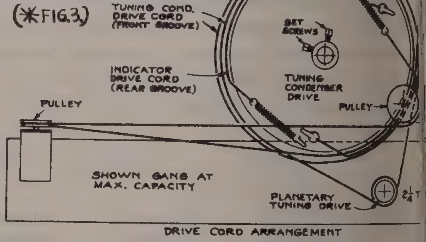
✱FIG. 7. PLANETARY TUNING DRIVE ASS'Y


RED
SOCKET
110V.
RECORD PLAYER POWER CORD AND PLUG
RED-BLACK
22
TRANSFORMER PRIMARY WINDING

✱FIG. 9. RECORD PLAYER CONNECTION (220V—110V)
(✱FIG.8)



✱ FIG. 10. BOTTOM VIEW OF CONTROLS
(✱FIG.4.)


TUNING COND. DRIVE CORD (FRONT GROOVE)
PULLEY
SET SCREWS
INDICATOR DRIVE CORD (REAR GROOVE)
TUNING CONDENSER DRIVE
PULLEY
PULLEY
SHOWN GANG AT MAX. CAPACITY
PLANETARY TUNING DRIVE
2¼ T
DRIVE CORD ARRANGEMENT

✱
FIG. 11. CONDENSER AND INDICATOR DRIVE CORDS
(✱FIG.3.)

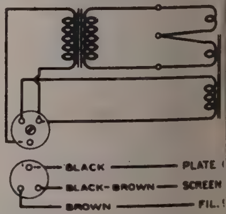
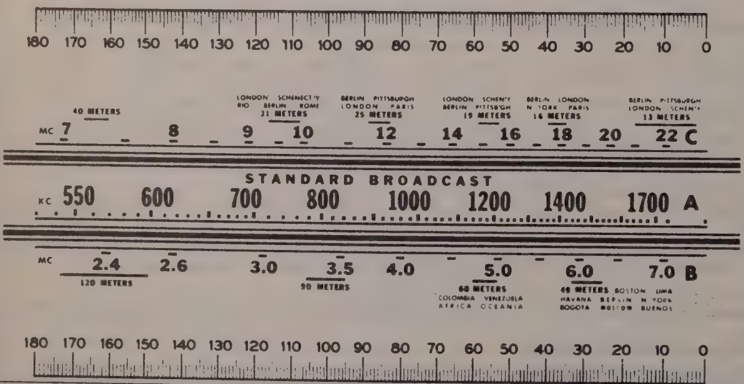


FIG. 12. ⟶
SPEAKER AND CABLE CONNECTIONS


180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
40 METERS
LONDON SCHENECT'Y RIO BERLIN ROME
31 METERS
BERLIN PITTSBURGH LONDON PARIS
25 METERS
LONDON SCHEN'Y BERLIN PITTSB'GH
19 METERS
BERLIN LONDON N YORK PARIS
16 METERS
BERLIN PITTSBURGH LONDON SCHEN'Y
13 METERS
MC 7 8 9 10 12 14 16 18 20 22 C
STANDARD BROADCAST
KC 550 600 700 800 1000 1200 1400 1700 A
MC 2.4 2.6 3.0 3.5 4.0 5.0 6.0 7.0 B
120 METERS
90 METERS
60 METERS
COLOMBIA VENEZUELA AFRICA OCEANIA
49 METERS BOSTON LIMA HAVANA BERLIN N YORK BOGOTA MOSCOW BUENOS
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

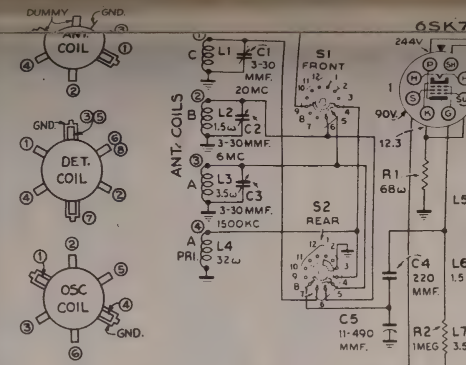
✱ Calibration Scale

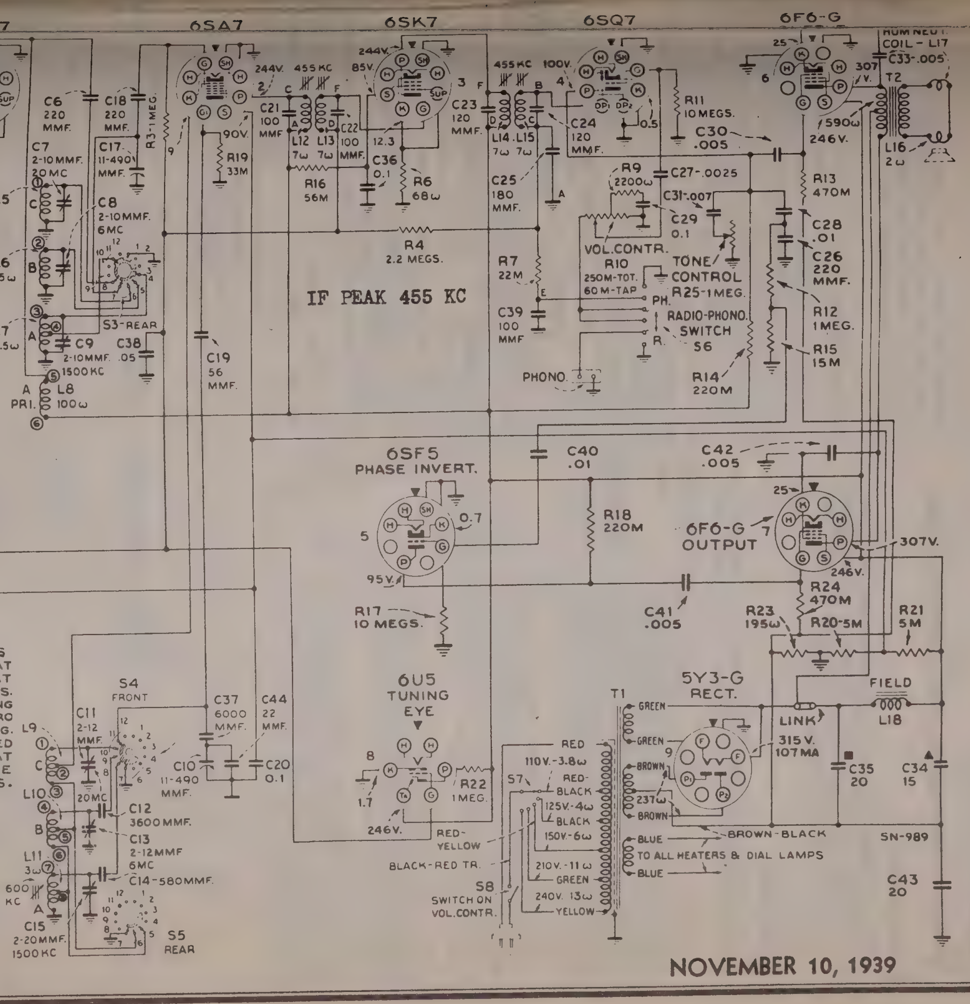
Reduced Reproduction of Rec
Dial, and Corresponding 0-1
Calibration Scales

The corresponding position of th
indicator for any setting of the ca
tion scale can be determined by dr
a line from this point on the b
calibration scale to the same poi
the top calibration scale. For exa
32° on the calibration scale corre
to approximately 7.9 mc on "C"
and 600 kc on "A" band, etc. Re
structions under "Alignment Proced

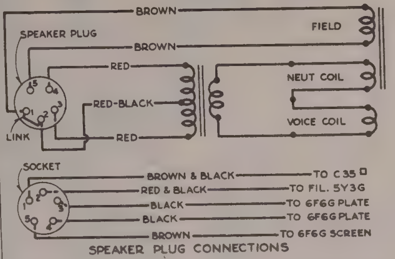
SEARS, ROEBUCK & CO.

MODELS 7310,Ch.126.219
7312,Ch.126.221(Export)
Schematic,Voltage





NOVEMBER 10, 1939



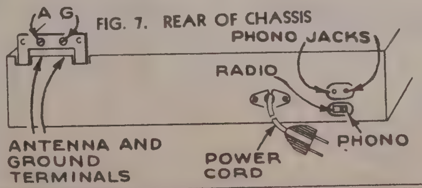
SPEAKER PLUG CONNECTIONS

FIG. 6. SPEAKER AND CABLE CONNECTIONS

SWITCH SECTIONS ARE VIEWED FROM FRONT OF THE CHASSIS. SWITCHES S1,S2,S3,S4 AND S5 ARE ALL SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS "A" BAND POSITION.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE THE CATHODE CURRENT IN MILLIAMPERES.

FIG. 7. REAR OF CHASSIS



MODELS 7310,7312
Chassis Wiring,Socket
Trimmers,Dial Data

SEARS, ROEBUCK & CO.

General Information and Service Hints

Loudspeaker:

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

Tuning Dial:

The tuning shaft is connected through a cord drive to a drum on the condenser shaft. This same cord drives the dial indicator by passing over a pulley on the chassis. shows the complete cord drive assembly and the corr ber of turns which the cord should be wrapped aro drive shaft and condenser drum.

Record Player:

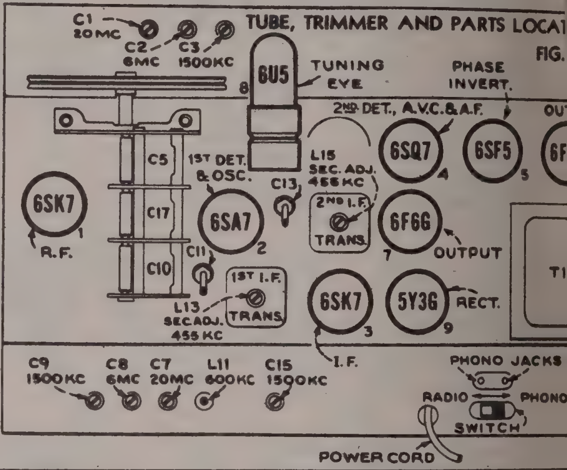
A jack is provided on the rear of the chassis for co to a No. 6227 Silvertone Record Player which is only in 100-125 volts, 25, 50 or 60 cycle rating. If is to be used on 220 volts, it will be necessary to con Record Player power cord to the 110 V. primary se the power transformer as shown in Figure 8.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.


TUBE, TRIMMER AND PARTS LOCAT
FIG.

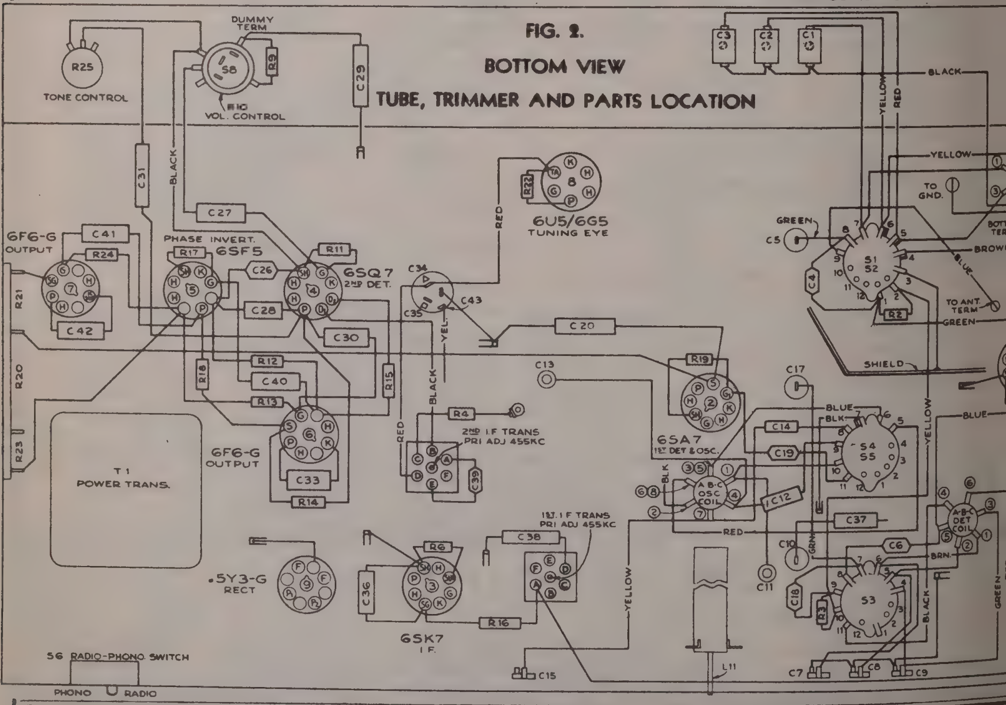


FIG. 2.
BOTTOM VIEW
TUBE, TRIMMER AND PARTS LOCATION

SEARS ROEBUCK & CO.

DSI AKER:	Model 7310	Model 7312
T e—Electrodynamic	8-inch	12-inch
V ce Coil Impedance at 400 Cycles	2.2 ohms	2.2 ohms
F d Coil Resistance	1,060 ohms	1,060 ohms
A roximate Field Coil Voltage Drop	70 volts	70 volts

Not —The above models are identical except for the size of speaker. Model 7310 has an 8-inch and Model 7312 a ch ectrodynamic speaker.

VEF OUTPUT:

T pe	Push-Pull
U distorted	10.5 watts
M ximum	11.5 watts

ERI EDIATE FREQUENCY .... 455 kc

VEF SUPPLY RATING:

100-130, 140-160, 195-250 volts,
40 to 60 cycles, 95 watts

FREQUENCY RANGES:

(A) Standard Broadcast	540-1,720 kc	(550-174 m)
(B) Medium Wave	2.3-7.0 mc	(130-42.8 m)
(C) Short Wave	7.0-22.0 mc	(42.0-13.6 m)

ALIGNMENT FREQUENCIES:

Band "A"	600 kc (osc.) 1,500 kc (osc., det., ant.)
Band "B"	6 mc (osc., det., ant.)
Band "C"	20 mc (osc., det., ant.)

ALIGNMENT PROCEDURE

IMI ARY:

it m er connections	Across speaker voice coil
it m er reading to indicate 1.0 watt output	1.48 volts
oxim e average sensitivity in microvolts for 1.0 watt output	See chart below
my a enna value to be inserted in series with generator output	See chart below
ectic of generator output lead	See chart below
ectic of generator ground lead	To chassis
rator modulation	30%, 400 cycles
on c Volume Control	Fully clockwise
on c Tone Control	Fully clockwise

LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

e-Ba witch sitior	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
A"	Low End	455 kc	.001 mfd.	6SK7 I-F Grid	L14, L15	2nd I-F Trans.	5,000
A"	Low End	455 kc	.001 mfd.	Tuning Condenser Stator (osc.)	L12, L13	1st I-F Trans.	100
A"	1,500 kc (28°)	1,500 kc	.0002 mfd.	Ant.	C15, C9, C3	Osc., Det., Ant.	2
A"	600 kc (148°) (rock)	600 kc	.0002 mfd.	Ant.	L11	Osc.	2
B"	6.0 mc (31°)	6.0 mc	300 ohms	Ant.	C13,* C8, C2	Osc.,* Det., Ant.	2
C"	20 mc (23°)	20 mc	300 ohms	Ant.	C11,* C7, C1	Osc.,* Det., Ant.	2.5

IMPORTANT ALIGNMENT NOTES

Use inimum capacity peaks if two peaks can be obtained.

Whe indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two mak g this adjustment.

Each tep of the alignment should be repeated in its original order for greater accuracy. Always keep the output from ener or at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adju ment locations are shown on the top and bottom parts location views of chassis.

Only he dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for nent n any other band.

Note—Oscillator tracks 455 kc above signal on all bands.

Valu shown under, "Microvolts," are only approximate.

MODEL 7807,Ch.113,414
Schematic,Voltage
Chassis,Socket
Trimmers

SEARS. ROEBUCK & CO.

POWER SUPPLY:
105 - 120 Volts, 50-60 Cycle A.C. . . . 55 Watts

LOUD SPEAKER:

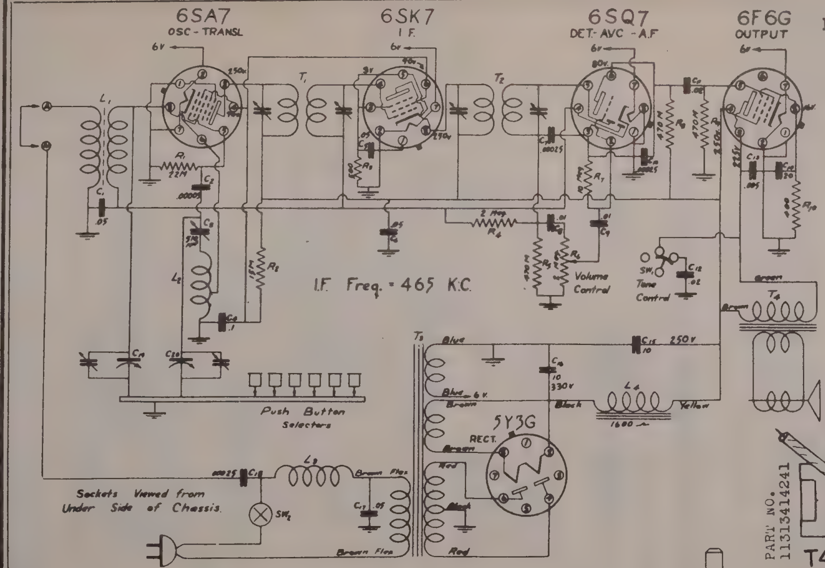
Type.	Dynamic
Size.	6 inch
Field resistance.	1600 ohms

POWER OUTPUT:

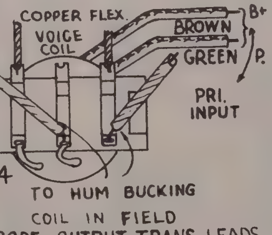
Type	Single Pentode
Undistorted.	2.1 Watts
Maximum.	3.9 Watts

FREQUENCY RANGE:
Broadcast. . . . . 540-1750 KD

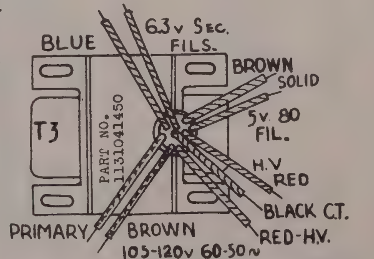
INTERMEDIATE FREQUENCY. . . . . 465 KC



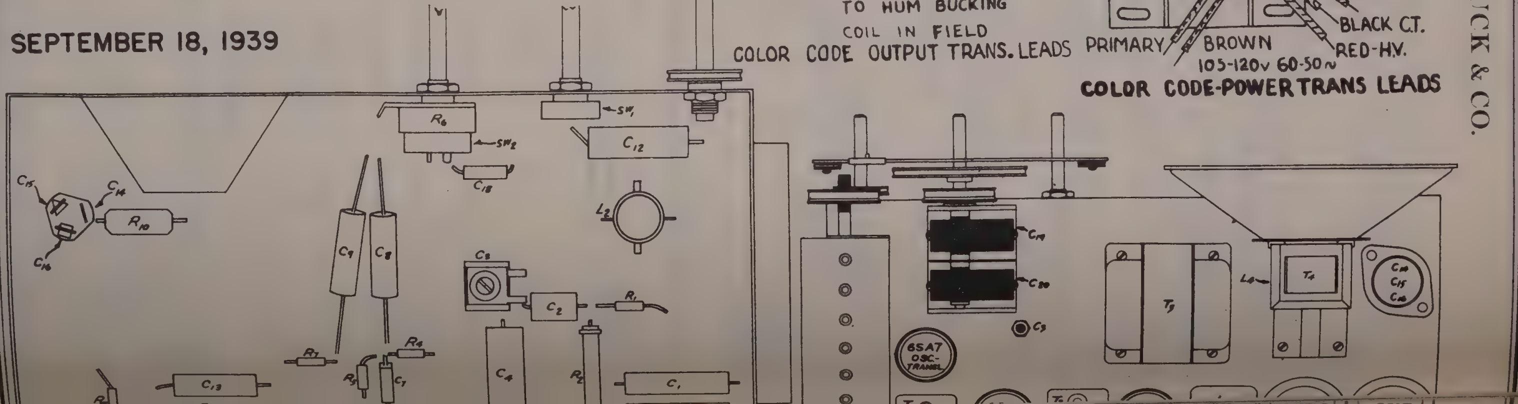
SEPTEMBER 18, 1939



COLOR CODE OUTPUT TRANS. LEADS



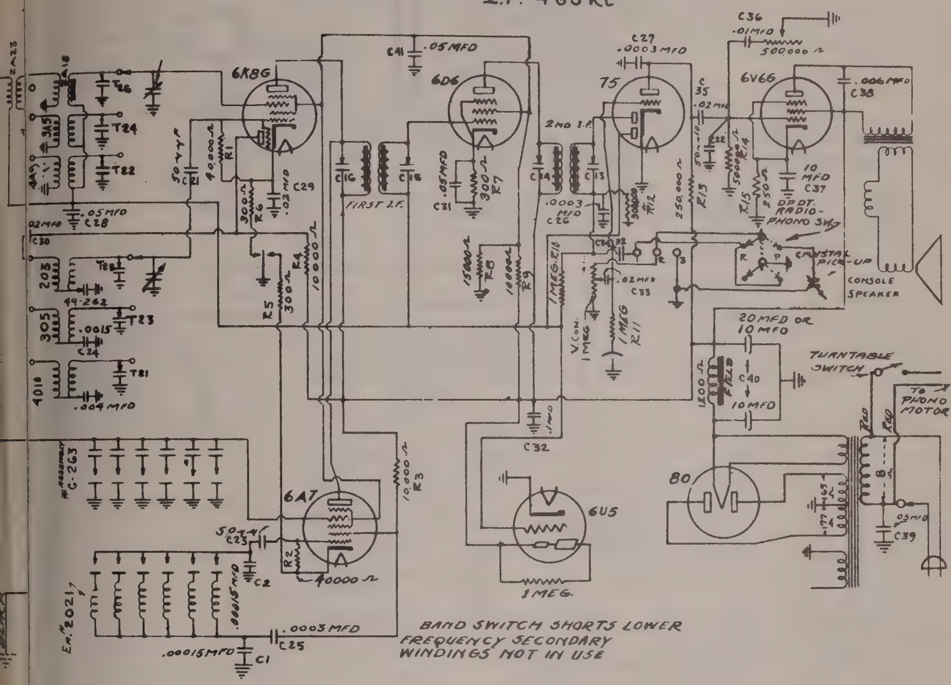
COLOR CODE-POWER TRANS LEADS



SEARS, ROEBUCK & CO.

MODEL 7245
Ch.107.375
Schematic,Voltage
Socket,Trimmers

I.F. 465 kc



BAND SWITCH SHORTS LOWER FREQUENCY SECONDARY WINDINGS NOT IN USE

BES D FUNCTIONS:

6	Manual tuning 1st Detector
6	Automatic tuning 1st Detector
6	I-F Amplifier
7	2nd Detector, AVC, 1st AVC.
6U5	Tuning Eye
6V6G.	Power Output
80.	Rectifier
Dial Lamps (2).	6.3 Volts .15 Amps.

WER PLY RATINGS AVAILABLE AND CONSUMPTION:

	RADIO ONLY	TOTAL
10-125 Volts, 60 Cycles.	60 Watts	90 Watts
10-125 Volts, 50 Cycles.	60 Watts	90 Watts
10-125 Volts, 25 Cycles.	60 Watts	90 Watts

WER TPUT:

Te.	Single Pentode
Uistorted	4.5 Watts
Mimum	6.5 Watts

DUDSPKER:

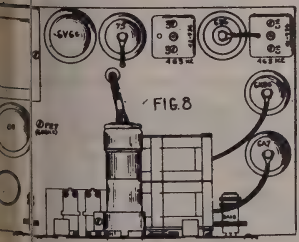
Te.	Electrodynamic
Se.	12 inches
V. Impedance.	4.5 at 400 cycles
Fld Coil Resistance	1200 ohms
A. Field Coil Voltage Drop.	90 volts

PHONOGRAPH:

Type.	Automatic-Manual
Record Capacity	Eight 10" or Seven 12"
Speed 78 R.P.M.	Constant
Type of Pickup.	Crystal
Pickup Impedance.	100,000 ohms at 1,000 Cy

FREQUENCY RANGES:

Standard Broadcast.	540-1720 kc.
Medium Wave	2.2- 7.5 mc.
Short Wave.	7 - 22 mc.



SOCKET VOLTAGE READINGS

TUBE	FUNCTION	CATHODE	SCREEN GRID	PLATE	OSC. PLATE
6K8G	Mixer	3	95	225	135 V.
6D6	I.F.	3	95	225	-
75	Det AVC	-	-	45	-
6V6G	Output	12	235	225	-
6A7	Push B.	3	95	-	135 V.

Voltages taken from ground with line voltage at 117 V.A.C.
Drop across speaker field 90 V.

MODEL 7245
Alignment, Trimmers
Tuner Data

SEARS, ROEBUCK & CO.

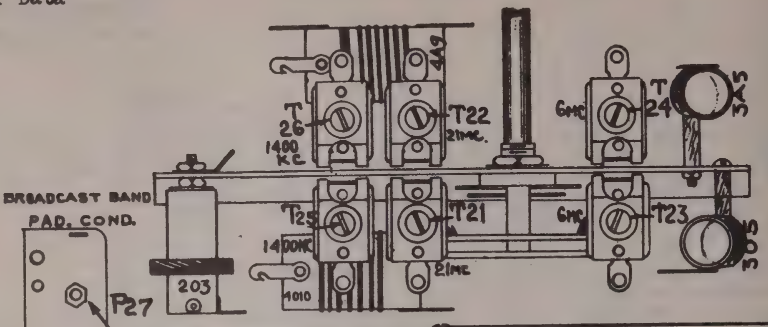
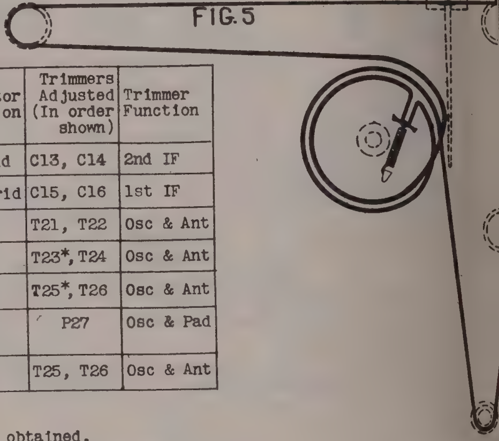


FIG. 9

FIG. 5



DIAL DRIVE HOOKUP

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function
Broadcast	Low End	465 KC	.001 Mfd.	6D6 Grid	C13, C14	2nd IF
Broadcast	Low End	465 KC	.001 Mfd.	6K8G Grid	C15, C16	1st IF
Shortwave	21 MC	21 MC	300 Ohms	Ant.	T21, T22	Osc & Ant
Med. Wave	6 MC	6 MC	300 Ohms	Ant.	T23*, T24	Osc & Ant
Broadcast	1400 KC	1400 KC	.0002 Mfd.	Ant.	T25*, T26	Osc & Ant
Broadcast	600 KC (Rock)	600 KC	.0002 Mfd.	Ant.	P27	Osc & Pad
Broadcast	1400 KC	1400 KC	.0002 Mfd.	Ant.	T25, T26	Osc & Ant

IMPORTANT ALIGNMENT NOTES

*Use minimum capacity peak if two peaks can be obtained.
Where indicated by the word "Rock", the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set from interfering with accurate alignment.
Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band. Grid cap leads should remain in place during alignment.

SET-UP INSTRUCTIONS FOR PERMA-MATIC AUTOMATIC TUNER

NOTE: DO NOT ATTEMPT ANY ADJUSTMENTS UNTIL THE SET HAS BEEN TURNED ON AT LEAST 20 MINUTES

(1) Remove the push-button escutcheon by removing a screw at each end of the plate.

(2) Depress any one of the selector buttons. The correct adjustment screws are always to the RIGHT of the depressed button. Tune in the desired station by turning the black slotted stud (numbered 1 on the illustration below). This varies the iron core position within the oscillator coil.

(3) Adjust the screw with slotted head for maximum electric eye deflection. This adjustment is numbered 2 in illustration and always the one directly above the station selector adjustment mentioned in above paragraph. If electric eye overlaps on strong stations, adjust for maximum overlap. When making the two adjustments it is possible to obtain a strong deflection of the tuning eye apparently for a station and yet no station is present. THIS IS A NORMAL CONDITION and just means that the two adjustments are not close enough in relation to each other and can be corrected by varying the two adjustment screws.

THERE IS NO FREQUENCY DISCRIMINATION BETWEEN BUTTONS. ANY ONE OF SELECTORS WILL TUNE THE ENTIRE BROADCAST BAND (1600-540 KC).

NOTICE: DO NOT FORCE ANY ADJUSTMENTS if they tighten up in the course of adjustment, either the maximum or minimum has been reached and the adjustment should be made by opposite rotation.

It will be found easier to adjust if the low frequency statio
started on the right side and progress toward high frequency
tions to left, IN THF SAME ORDER AS THE TUNING DIAL.

However, the above procedure is not absolutely necessary if
should be some preference for arranging stations otherwise.

AFTER ALL ADJUSTMENTS HAVE BEEN MADE -- GO OVER EACH ADJUSTM
SECOND TIME TO MAKE CERTAIN THEY ARE CORRECT AND TO COMPENSA
SUBSEQUENT ADJUSTMENTS.

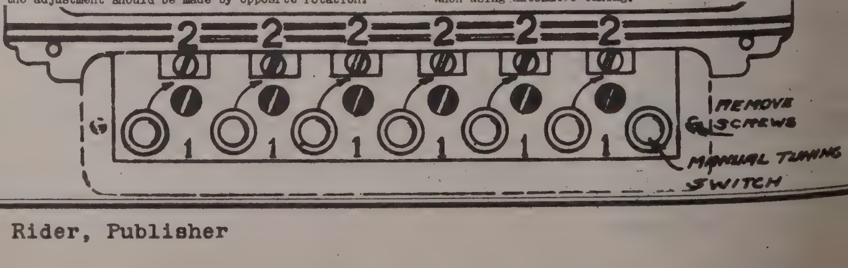
It is a big help to tune the desired station in on main dial
making adjustments, in order that the station can be quickly
nized by switching from manual back to button being adjusted

It is not necessary to lock any of the adjustments as they a
automatically locked.

Push out necessary station letter indicator from tab sheet,
back, and press into place above the correct button.

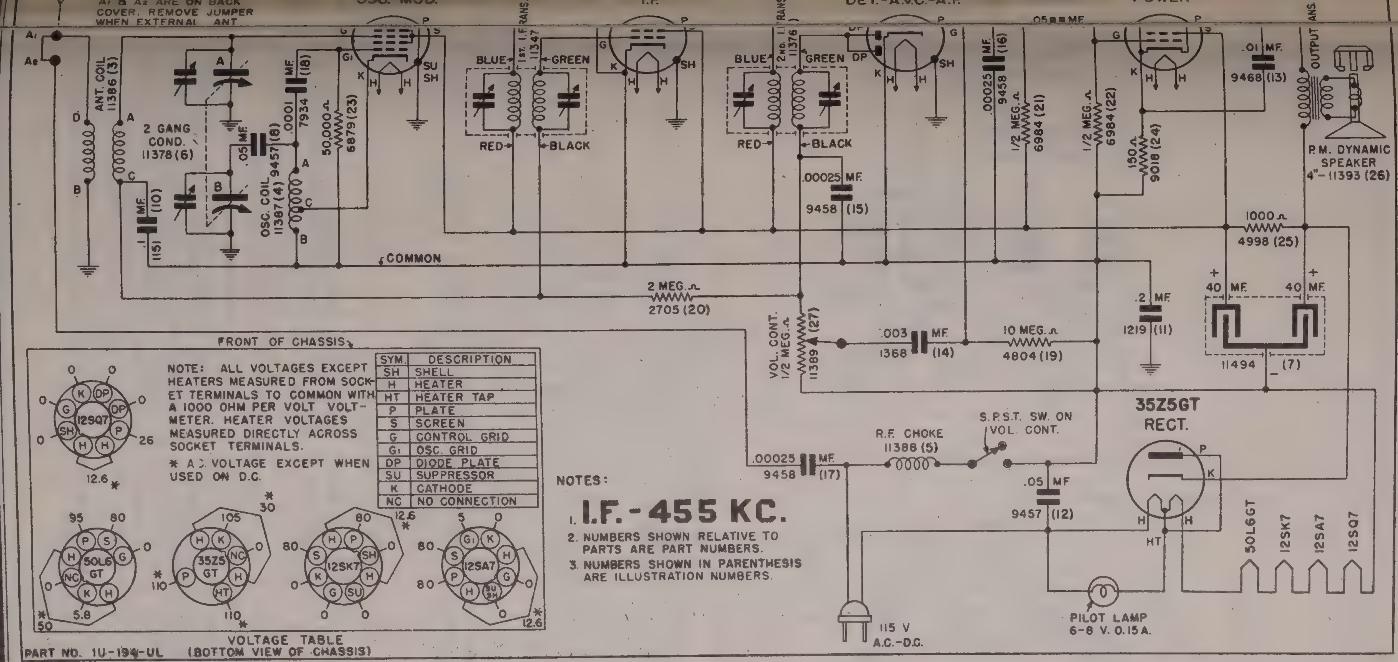
NOTICE: Turning station selector screw clock-wise lowers th
frequency.

Best results will be had when band switch is in broadcast po
when using automatic tuning.



SENTINEL RADIO CORP.

MODEL 1U-194UL
Schematic,Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO COMMON WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. VOLTAGE EXCEPT WHEN USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
G1	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTES:

1. **I.F. - 455 KC.**
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

Part No.			Description	List Price
1	11347	Coil	1st I.F. Transformer	$0.90
2	11376	Coil	2nd I.F. Transformer	.80
3	11386	Coil	Antenna	.50
4	11387	Coil	Oscillator	.45
5	11388	Coil	Antenna Line Choke	.25
6	11378	Condenser	Tuning Two Gang	1.75
7	11494	Condenser	Tubular Dry Electrolytic 40-40 Mfd.	1.10
8	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
9	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
10	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
11	1219	Condenser	Tubular .2 Mfd. 400 Volt	.27
12	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
13	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
14	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
15	9458	Condenser	Mica .00025 Mfd.	.21
16	9458	Condenser	Mica .00025 Mfd.	.21
17	9458	Condenser	Mica .00025 Mfd.	.21
18	7934	Condenser	Mica .0001 Mfd.	.21
19	4804	Resistor	Carbon 10 Megohm 1/3 Watt	.19
20	2705	Resistor	Carbon 2 Megohm 1/3 Watt	.19
21	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
22	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
23	6879	Resistor	Carbon 50,000 Ohm 1/3 Watt	.19
24	9018	Resistor	Carbon 150 Ohm 1/3 Watt	.19
25	4998	Resistor	Carbon 1000 Ohm 1 Watt	.21
26	11393	Speaker	P.M. Dynamic 4 in.	2.50
27	11389	Volume Control	With Switch	.80

MISCELLANEOUS PARTS

			Description	List Price
	11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
	11381	Dial Scale	Calibrated Scale	.30
	8184	Dial Cord	12 in. of 18 lb. Dial Drive Cord	.10
	11379	Dial Shaft	Dial Drive Shaft	.12
	11725	Dial Pointer	For Dial-Bronze	.15
	11384	Dial Pointer	For Dial	.15
	11391	Dial Crystal	For Dial	.22
	10207	Knob	Ivory	.08
	11733	Knob	Walnut	.10

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

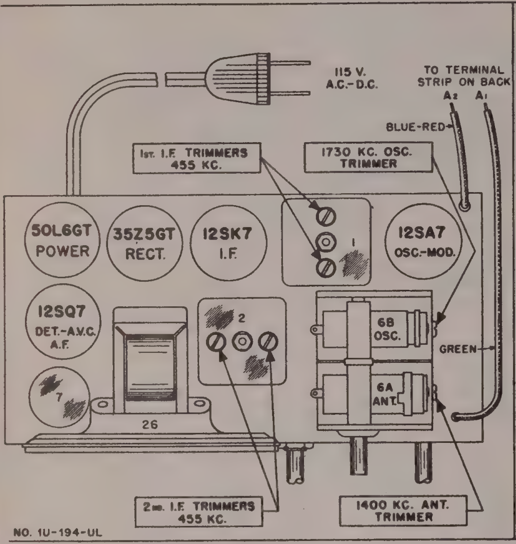
WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

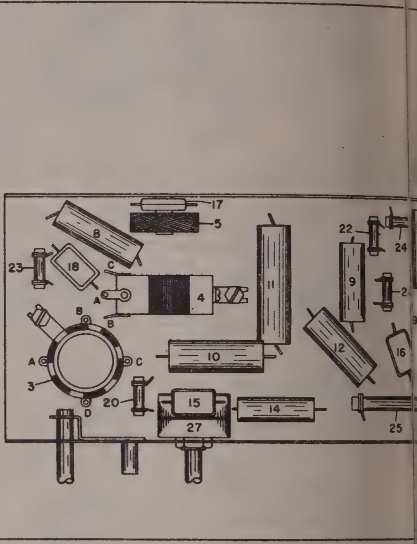
W. 3M 1-40 PART NO. 1U-194UL

SENTINEL RADIO CORP.

SENTINEL MODEL 1U-194UL

5 tube A. C. - D. C. Operated Superheterodyne Receiver.





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis through .01 Mfd. condenser—if too much hum is encountered, leave unconnected.

		TEST OSCILLATOR			
	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
	I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube	Adjust the second I. F. transformer trimmers for maximum output then adjust each of the first I. F. trimmers for maximum output
1	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver "A1" post	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	Receiver "A1" post	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

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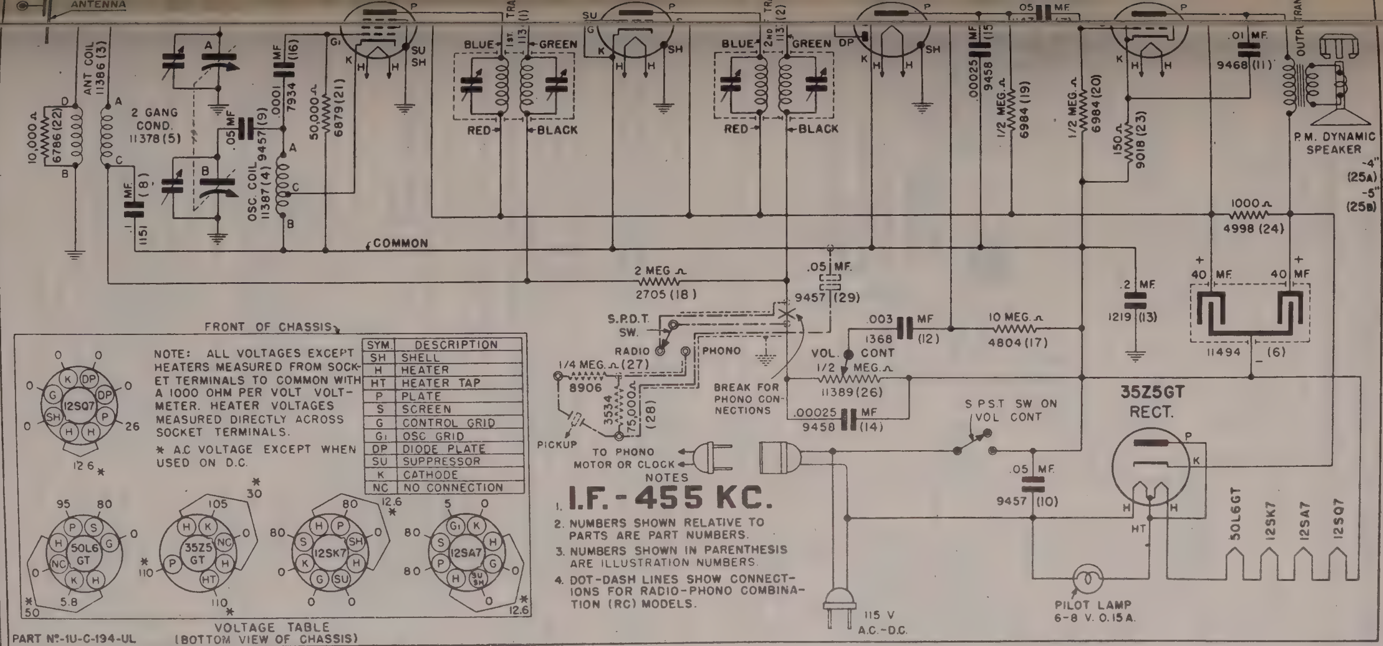
SENTINEL RADIO CORP.

MODEL 1U-C-194UL,RC-1U-194UL
Schematic,Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO COMMON WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C VOLTAGE EXCEPT WHEN USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
G1	OSC GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. DOT-DASH LINES SHOW CONNECTIONS FOR RADIO-PHONO COMBINATION (RC) MODELS.

PARTS LIST

	Part No.		Description	List Price
1	11347	Coil	1st I. F. Transformer	$ .90
2	11376	Coil	2nd I. F. Transformer	.80
3	11386	Coil	Antenna	.50
4	11387	Coil	Oscillator	.45
5	11378	Condenser	Tuning Two Gang	1.75
6	11494	Condenser	Dry Electric 40-40 Mfd.	1.10
7	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
8	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
10	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
11	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
12	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
13	1219	Condenser	Tubular .2 Mfd. 400 Volt	.27
14	9458	Condenser	Mica .00025 Mfd.	.21
15	9458	Condenser	Mica .00025 Mfd.	.21
16	7934	Condenser	Mica .0001 Mfd.	.21
17	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
13	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
19	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
20	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
21	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
22	6786	Resistor	Carbon 10,000 Ohm ⅓ Watt	.19
23	9018	Resistor	Carbon 150 Ohm ⅓ Watt	.19
24	4998	Resistor	Carbon 1000 Ohm 1 Watt	.21
25A	11393	Speaker	P. M. Dynamic 4 in.	2.50
25B	11364	Speaker	P. M. Dynamic 5 in.	2.90
26	11389	Volume Control	With S.P.S.T. Switch	.80
27	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
28	3534	Resistor	Carbon 75,000 Ohm ⅓ Watt	.19
29	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
	10573	Switch	"Off-On" Motor Switch	.65
	2434	Switch	"Radio-Phono" Switch	.70

MISCELLANEOUS PARTS

Part No.		Description	List Price
11843	Back	Metal Cabinet Back	.25
11403	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11846	Clock	115 Volt 60 Cycle	3.75
11847	Clock	115 Volt 50 Cycle	4.00
11851	Clock Face	Clock Face Only	.25
11852	Clock Hand	Black Hour Hand	.20
11853	Clock Hand	Black Minute Hand	.15
11854	Clock Hand	Red Second Hand	.15
11381	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord	.10
11379	Dial Shaft	Dial Drive Shaft	.12
11725	Dial Pointer	For Dial-Bronze	.15
11384	Dial Pointer	For Dial	.15
11391	Dial Crystal	For Dial and Clock	.22
11841	Knob	Tuning-Ivory for Clock Model	.10
11733	Knob	For Phono-Radio Motor Switches	.10
11371	Escutcheon	For Dial with Crystal Used wih Phono Model	.75
11899	Receptacle	A.C. Receptacle and Plug for Phono Motor and Clock	.50
11912	Phono Motor	115 Volt 50 Cycle with 8 in. Turntable	4.50
11913	Phono Motor	115 Volt 60 Cycle with 8 in. Turntable	4.25
11907	Pickup	Crystal Pickup and Arm	4.25

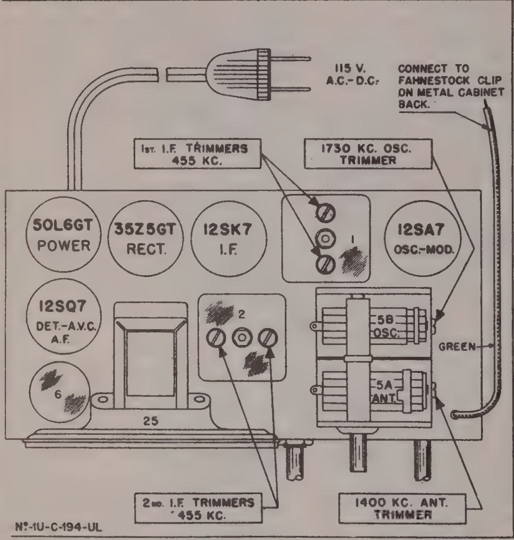
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

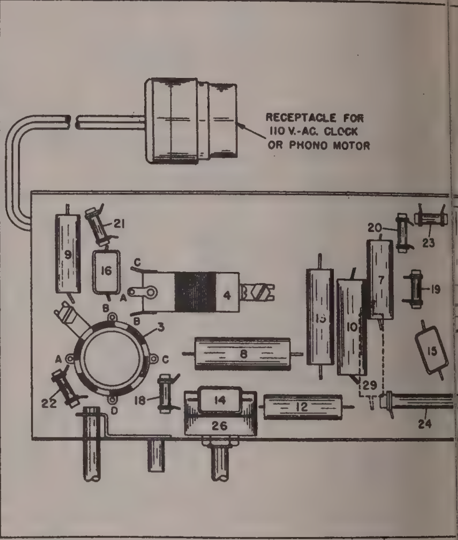
W. 3M 1-40 PART NO. 1U-C-194UL RC-1U-194UL

SENTINEL MODEL 1U-C-194UL & RC-1U-194UL

5 tube A. C. - D. C. Operated Superheterodyne Receiver



N°-1U-C-194-UL



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

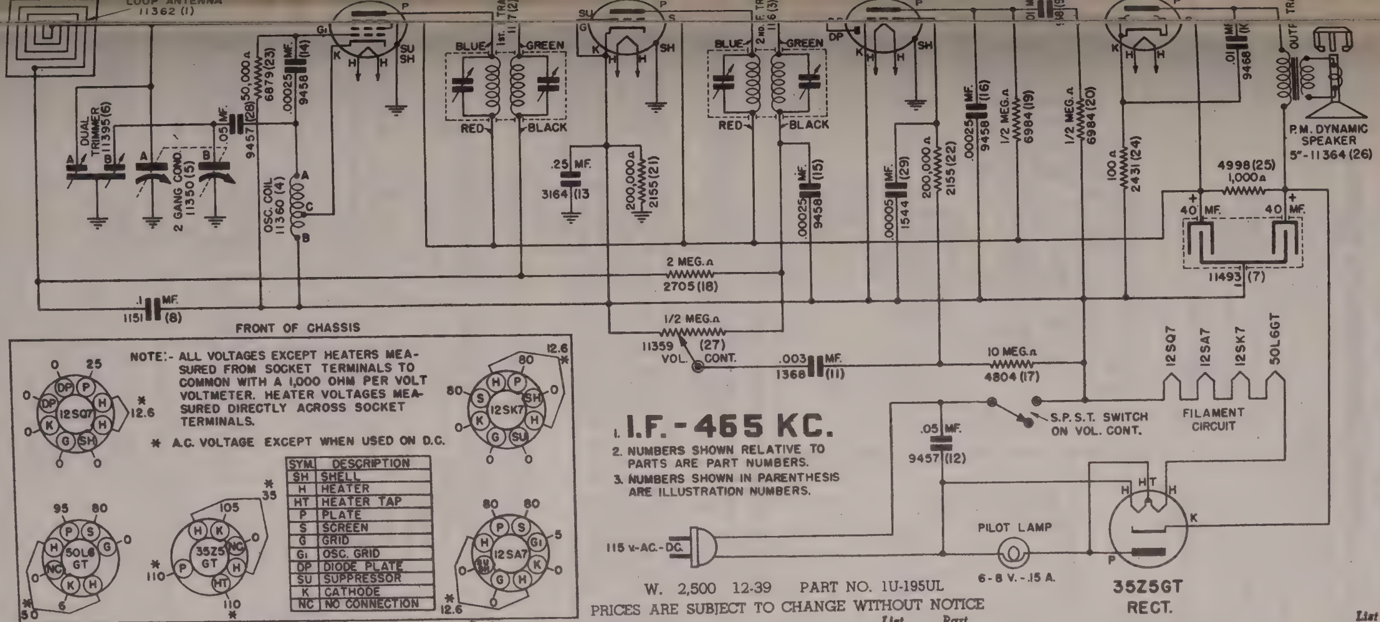
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis through .01 Mfd. condenser—if too much hum is encountered, leave unconnected.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube	Adjust the second I. F. transformer trimmers for maximum output then adjust each of the first I. F. trimmers for maximum output
1 Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	To Metal Cabinet Back	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	To Metal Cabinet Back	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

MODEL 1U-195UL
Schematic,Voltage

SENTINEL RADIO CORP.



NOTE:- ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO COMMON WITH A 1,000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. VOLTAGE EXCEPT WHEN USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	GRID
G1	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

1. I.F. - 465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

W. 2,500 12-39 PART NO. 1U-195UL
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

PART NO. 1U-195-UL

Part No.			Description	List Price
1	11362	Antenna	Loop	$ .65
2	11347	Coil	1st I. F. Transformer	.90
3	11376	Coil	2nd I. F. Transformer	.80
4	11360	Coil	Oscillator	.50
5	11350	Condenser	Tuning Two Gang (Pushbutton Mech. Tuner Unit)	3.75
6	11395	Condenser	Dual Trimmer 2-90 Mmf.	.30
7	11493	Condenser	Tubular Dry Electrolytic 40-40 Mfd. 150 Volts	1.00
8	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
10	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
11	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
12	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
13	3164	Condenser	Tubular .25 Mfd. 400 Volt	.26
14	9458	Condenser	Mica .00025 Mfd.	.21
15	9458	Condenser	Mica .00025 Mfd.	.21
16	9458	Condenser	Mica .00025 Mfd.	.21
17	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
18	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
19	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
20	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
21	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19
22	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19
23	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
24	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
25	4998	Resistor	Carbon 1,000 Ohm 1 Watt	.21
26	11364	Speaker	P. M. Dynamic 5 in.	3.00
27	11359	Volume Control	With S. P. S. T. Switch	.80
28	9457	Condenser	.05 Mfd. 400 Volt	.18
29	1544	Condenser	.00005 Mfd. Mica	.21

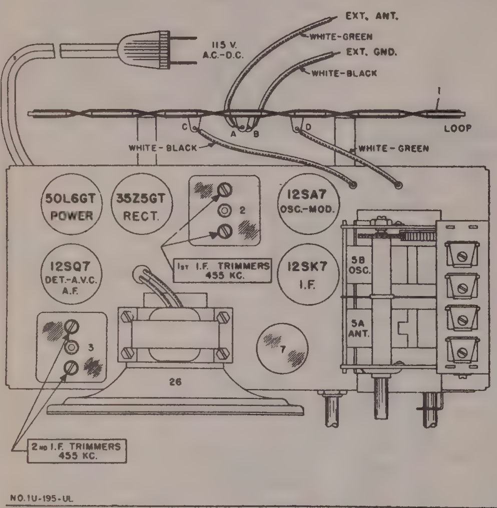
MISCELLANEOUS PARTS

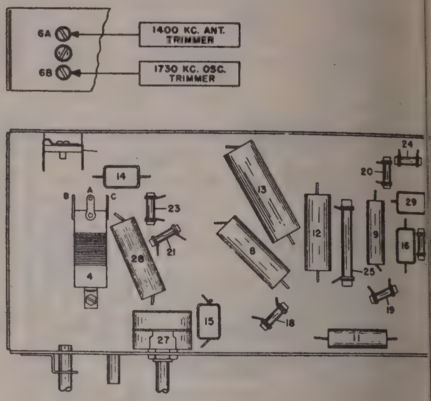
Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11354	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord	.10
11352	Dial Shaft	Dial Drive Shaft	.12
11513	Dial Pointer	For Dial-Bronze	.15
10659	Dial Pointer	For Dial	.16
11357	Dial Crystal	For Dial Used with Bakelite Cabinet Only	.27
11371	Escutcheon	For Dial Used with Wood Cabinet Only	.75
11200	Escutcheon	For Pushbutton Used with Wood Cabinet Only	.35
11733	Knob	Bakelite Tuning for Wood Cabinet	.10
11734	Knob	Bakelite Pushbutton for Wood Cabinet	.10
11729	Knob	Walnut Bakelite Tuning for Walnut Plastic Cabinet	.10
11731	Knob	Walnut Bakelite Pushbutton for Walnut Plastic Cabinet	.10
11730	Knob	Onyx Bakelite Tuning for Onyx Cabinet	.12
11732	Knob	Onyx Bakelite Pushbutton for Onyx Cabinet	.12
	Cabinet	Walnut Plastic	2.00
	Cabinet	Onyx Plastic	4.25

SENTINEL RADIO CORP

SENTINEL MODEL 1U-195UL

5 tube A. C. - D. C. Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS IT WILL BE IN WHEN THE SET IS IN THE CABINET AND THE BACK ATTACHED.

When adjusting 1720 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop.

Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

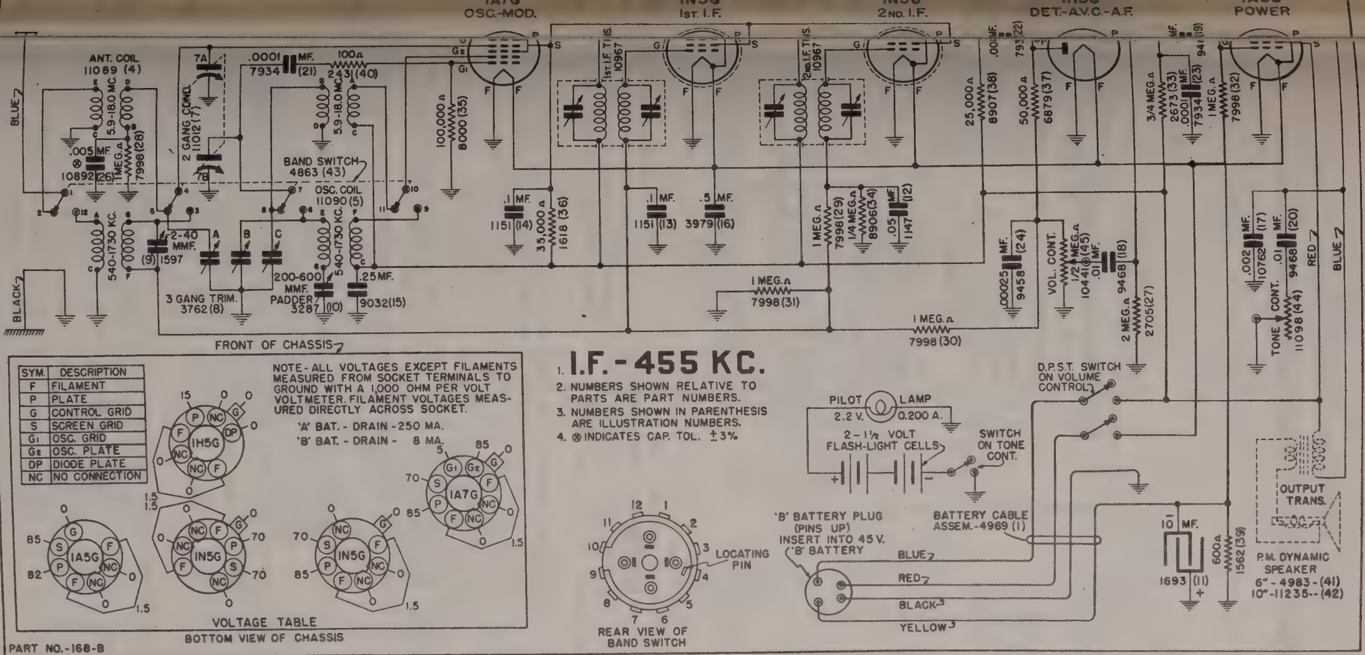
(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

DO NOT ATTACH LOW SIDE OF TEST OSCILLATOR TO RECEIVER—LEAVE UNCONNECTED.

	TEST OSCILLATOR			
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube DO NOT REMOVE CAP	Adjust the second I. F. transformer trimmers for maximum out put—then adjust each of the first I.F. trimmers for maximum output.
1 Exactly 1730 K. C.	Exactly 1730 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 168B
Schematic, Voltage



SYM.	DESCRIPTION
F	FILAMENT
P	PLATE
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

NOTE - ALL VOLTAGES EXCEPT FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER. FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET.

'A' BAT. - DRAIN - 250 MA.
'B' BAT. - DRAIN - 8 MA.

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAP. TOL. ±3%

PARTS LIST

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Illus. No.	Part No.		Description	List Price
1 (a)	4969	Cable	Battery With 4 Prong Plug	$ .35
1 (b)	11159	Cable	Battery with 2-3 Prong "B" and 1-2 Prong "A" Plugs	.55
2	10967	Coil	1st I. F. Transformer	1.10
3	10967	Coil	2nd I. F. Transformer	1.10
4	11089	Coil	Antenna	.65
5	11090	Coil	Oscillator	.60
7	11012	Condenser	Tuning Two Gang	1.75
8	3762	Condenser	Trimmer Three Gang 2-40 Mmf. Ea.	.47
9	1597	Condenser	Trimmer (2-40 Mmf.)	.21
10	3287	Condenser	Padder 200-600 Mmf.	.45
11	1693	Condenser	Dry Electrolytic 10 Mfd. 25 Volt	.75
12	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
13	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
14	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
15	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
16	3979	Condenser	Tubular .5 Mfd. 200 Volt	.40
17	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19
18	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
19	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
20	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
21	7934	Condenser	Mica Moulded .0001 Mfd	.21
22	7934	Condenser	Mica Moulded .0001 Mfd	.21
23	7934	Condenser	Mica Moulded .0001 Mfd	.21
24	9458	Condenser	Mica Moulded .00025 Mfd	.21
26	10892	Condenser	Mica Moulded .005 Mfd. + 3%	.30
27	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
28	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
29	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
30	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
31	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
32	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
33	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
34	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
35	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
36	1618	Resistor	Carbon 35,000 Ohm ⅓ Watt	.19
37	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
38	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
39	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
40	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
41	4983	Speaker	P. M. Dynamic 6 in.	4.25
42	11235	Speaker	P. M. Dynamic 10 in.	7.50
43	4863	Switch	Wave Band	.60
44	11098	Tone Control	With Dial Light Switch	.80
45	10441	Volume Control	With Off-On Switch	.95

MISCELLANEOUS PARTS

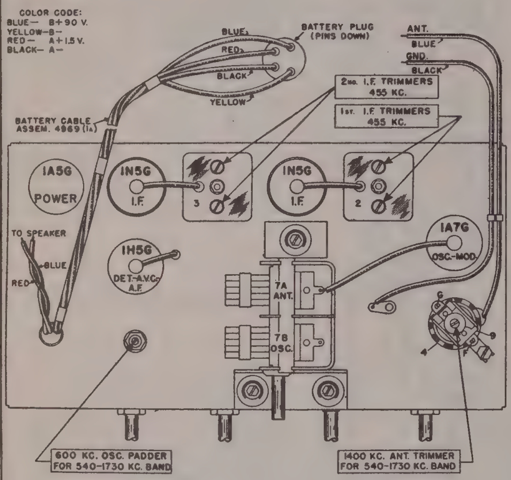
Illus. No.	Part No.		Description	List Price
	8184	Cord	Dial Drive Cord	.10
	11094	Dial Scale	Calibrated Dial Scale Only	.45
	11107	Dial Indicator	On-Off Indicator Assembly	.20
	10777	Dial Pointer	For Dial	.16
	11102	Escutcheon	For Dial-Uses Four Metal Clips for Mounting	1.00
	11267	Escutcheon	For Dial-Uses Wood Screws for Mounting	1.00
	4958	Knob	Marked "Tuning"	.12
	4959	Knob	Marked "Off-Volume"	.12
	4589	Spring	Cord Tension	.04
	4960	Knob	Marked "Tone"	.12
	4961	Knob	Marked "Band Switch"	.12
	3487	Plug	3 Prong "B"	.10
	10351	Plug	2 Prong "A"	.10
	4978	Plug	4 Prong "AB"	.10

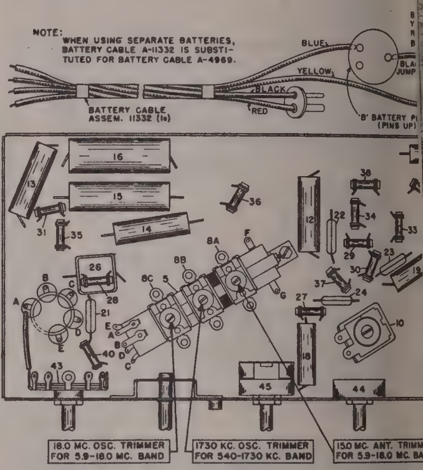
MODEL 168B
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

TWO BAND—FIVE TUBE

1½ Volt—Battery Operated Superheterodyne Receiver




NOTE:
WHEN USING SEPARATE BATTERIES, BATTERY CABLE A-11332 IS SUBSTITUTED FOR BATTERY CABLE A-4969.
BLUE
YELLOW
BLACK
RED
BATTERY CABLE ASSEM. 11332 (1B)
'B' BATTERY P
(PINS UP)
16
15
13
14
31
35
36
12
22
34
33
38
26
28
21
8A
8B
8C
5
F
G
29
30
23
37
24
27
10
A
B
C
D
E
40
43
18
45
44
18.0 MC. OSC. TRIMMER FOR 5.9-18.0 MC. BAND
1730 KC. OSC. TRIMMER FOR 540-1730 KC. BAND
15.0 MC. ANT. TRIMM
FOR 5.9-18.0 MC. BA

ALIGNMENT PROCEDURE

o . Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

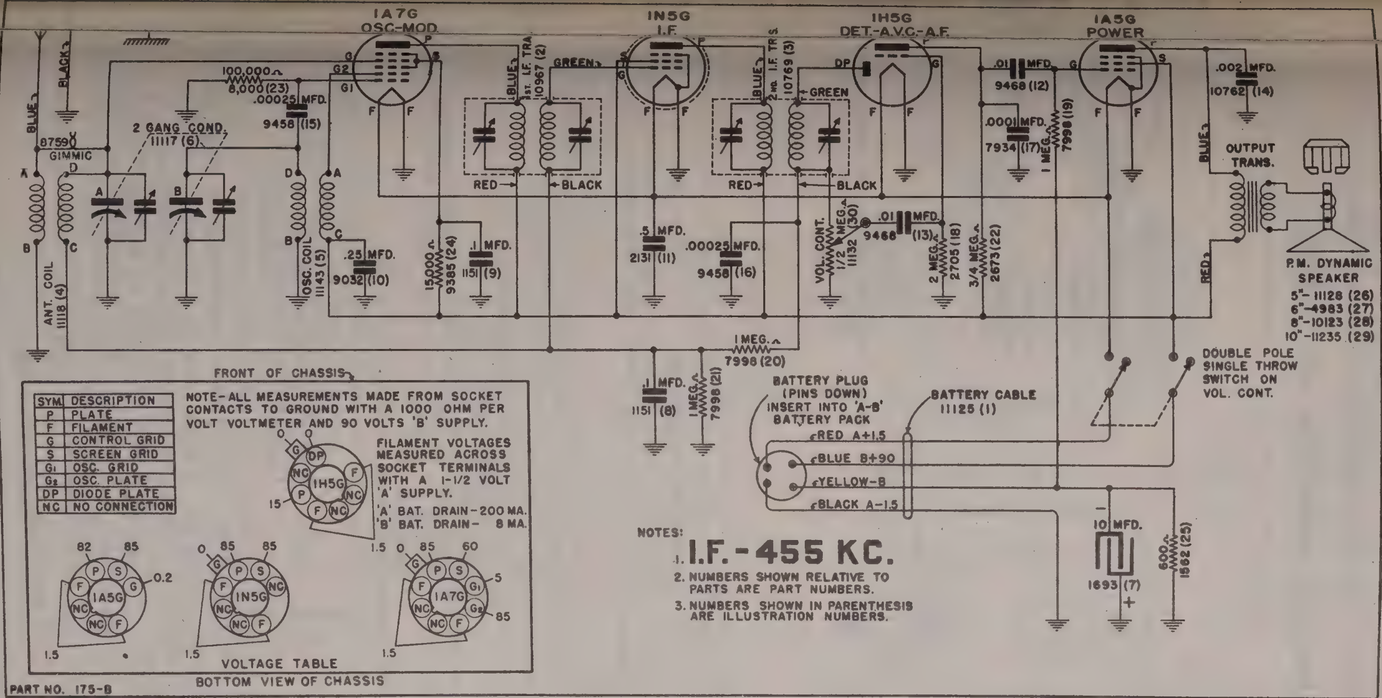
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locatio of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. Alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High Side to grid cap of 1A7G tube. Do not remove cap.	Adjust each of the second I.F. transforme trimmers for maximum output—then adjus each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer fo maximum output.
	2 Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 60 K.C. oscillator padder for maximum output.
5.9 to 18 M.C. Band	1 Exactly 18 M.C.	Exactly 18 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back of trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Exactly 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	While rocking gang condenser adjust 1 M.C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 175B
Schematic,Voltage



PARTS LIST

Illus. No.	Part No.		Description	List Price
1(a)	11125	Cable	Battery (With 4 Prong Plug)	$ .25
1(b)	11332	Cable	Battery (With 2-3 Prong and 1-2 Prong Plug)	.37
2	10967	Coil	1st I. F. Transformer	1.10
3	10769	Coil	2nd I. F. Transformer	1.10
4	11118	Coil	Antenna	.55
5	11143	Coil	Oscillator	.45
6	11117	Condenser	Tuning (2 Gang)	2.00
7	1693	Condenser	Tubular Dry Elec. 10 Mfd. 25 V. D. C.	.75
8	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
11	2131	Condenser	Tubular .5 Mfd. 200 Volt	.55
12	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17

No. Illus.	No. Part		Description	Price List
13	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
14	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19
15	9458	Condenser	Mica .00025 Mfd	.21
16	9458	Condenser	Mica .00025 Mfd	.21
17	7934	Condenser	Mica .0001 Mfd	.21
18	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
19	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
20	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
21	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
22	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
23	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
24	9385	Resistor	Carbon 15,000 Ohm ⅓ Watt	.19
25	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
26	11128	Speaker	P. M. Dynamic 5 in.	4.00
27	4983	Speaker	P. M. Dynamic 6 in.	4.25
29	11235	Speaker	P. M. Dynamic 10 in.	7.50
30	11132	Volume Control with "off-on" Switch		.95

Part No.		Description	List Price
		MISCELLANEOUS PARTS	
11108	Bulb	2 Cell 2.2 Volt White Bead Type	.07
11121	Dial Scale	Calibrated Dial Scale	.40
8184	Dial Cord	24 in. of 18 lb. Cord	.10
11119	Dial Shaft		.15
11127	Dial Indicator	"Off-On" Switch	.15
11626	Dial Pointer		.30
11627	Dial Crystal	For Dial	.30
11140	Dial Escutcheon	For Cabinet	1.25
4978	Plug	4 Prong Battery Plug	.06
10207	Knob	Antique Ivory Tuning Control	.10
11145	Knob	Walnut Tuning Control	.10

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

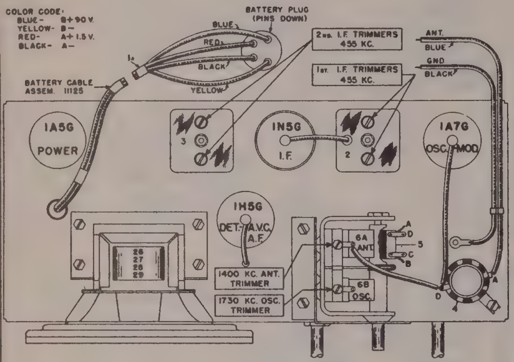
W. 4M 9-39 PART NO. 175B

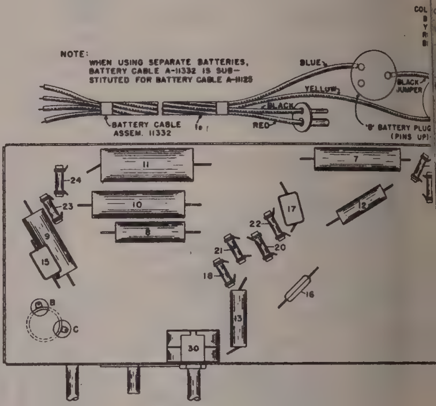
MODEL 175B
Socket,Trimmers
Chassis,Alignment

SENTINEL RADIO CORP.

4 TUBE — 1½ VOLT BATTERY OPERATED

SUPERHETERODYNE RECEIVER




NOTE:
WHEN USING SEPARATE BATTERIES, BATTERY CABLE A-11332 IS SUBSTITUTED FOR BATTERY CABLE A-11125
BLUE
YELLOW
BLACK
RED
BLACK JUMPER
BATTERY CABLE ASSEM. 11332
1a
'B' BATTERY PLUG (PINS UP)
11
7
24
23
10
8
9
15
17
22
20
21
18
12
16
13
30
B
C

NO. 175-B

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

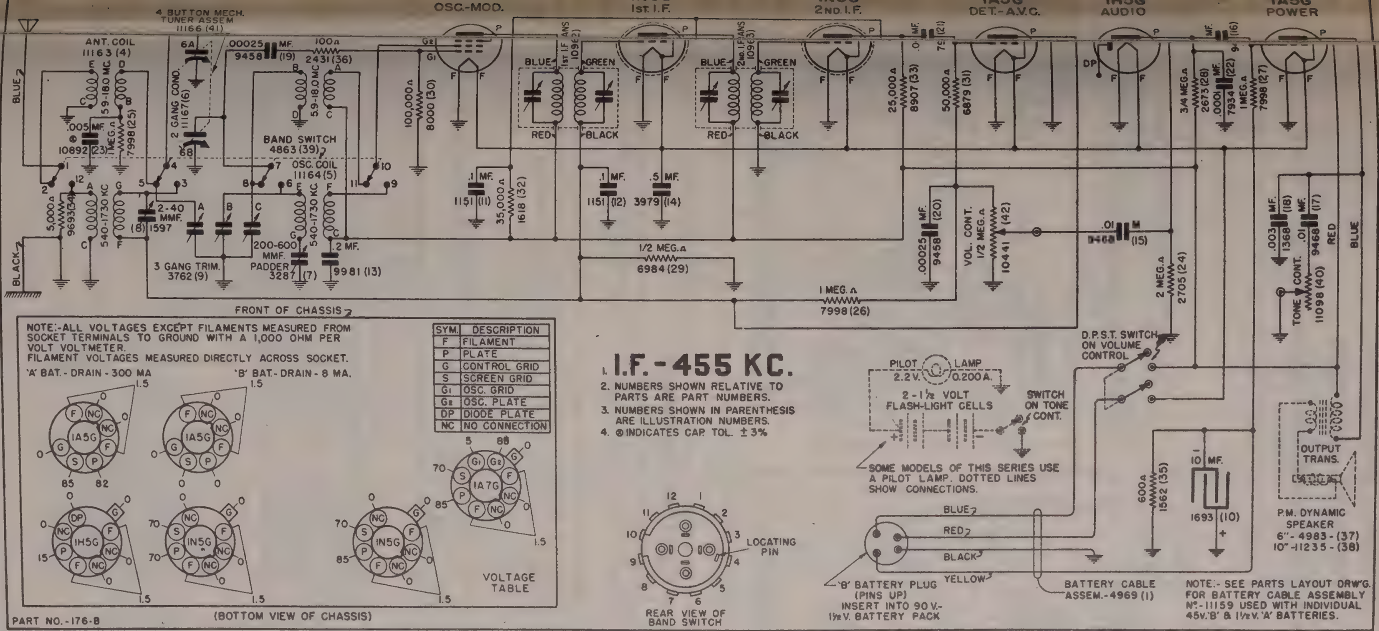
(c) Have ground lead of test oscillator attached to chassis.

	TEST OSCILLATOR			
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below:**
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7G tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1 Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL MODEL 175B

SENTINEL RADIO CORP.

MODEL 176B
Schematic, Voltage



NOTE:-ALL VOLTAGES EXCEPT FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER.
FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET.
'A' BAT.-DRAIN-300 MA
'B' BAT.-DRAIN-8 MA.

SYM.	DESCRIPTION
F	FILAMENT
P	PLATE
G	CONTROL GRID
S	SCREEN GRID
G_1	OSC. GRID
G_2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAP. TOL. ± 3%

NOTE:- SEE PARTS LAYOUT DRW'G. FOR BATTERY CABLE ASSEMBLY Nº-11159 USED WITH INDIVIDUAL 45 V. 'B' & 1½ V. 'A' BATTERIES.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1A	4969	Cable	Battery with Four Prong Plug	$ .35
1B	11159	Cable	Battery with 2-3 Prong "B" and 1-2 Prong "A" Plugs	.55
2	10967	Coil	1st I. F. Transformer	1.10
3	10967	Coil	2nd I. F. Transformer	1.10
4	11163	Coil	Antenna	.70
5	11164	Coil	Oscillator	.60
6	11167	Condenser	Two Gang with Four Button Mechanical Tuner Assembly	3.00
7	3287	Condenser	Padder 200-600 Mmf	.45
8	1597	Condenser	Trimmer	.21
9	3762	Condenser	Trimmer Three Gang	.47
10	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt D.C. Wkg	.75
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
13	9981	Condenser	Tubular .2 Mfd. 200 Volt	.29
14	3979	Condenser	Tubular .5 Mfd. 200 Volt	.40
15	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
16	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
17	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
18	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
19	9458	Condenser	Mica .00025 Mfd.	.21
20	9458	Condenser	Mica .00025 Mfd.	.21

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Illus. No.	Part No.		Description	List Price
21	7934	Condenser	Mica .0001 Mfd.	.21
22	7934	Condenser	Mica .0001 Mfd.	.21
23	10892	Condenser	Mica .005 Mfd. ± 3%	.30
24	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
25	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
26	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
27	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
28	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
30	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
31	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
32	1618	Resistor	Carbon 35,000 Ohm ⅓ Watt	.19
33	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
34	9693	Resistor	Carbon 5,000 Ohm ⅓ Watt	.19
35	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
36	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
37	4983	Speaker	P. M. Dynamic 6"	4.25
38	11235	Speaker	P. M. Dynamic 10"	7.50
39	4863	Switch	Wave	.60
40	11098	Tone Control	With Dial Light Switch	.80
41	11166	Tuner Unit	Complete with Four Button Mech. Assem. Two Gang Condenser and Mechanical Drive Assembly	3.95
42	10441	Volume Control	With D. P. S. T. "On-Off" Switch	.95

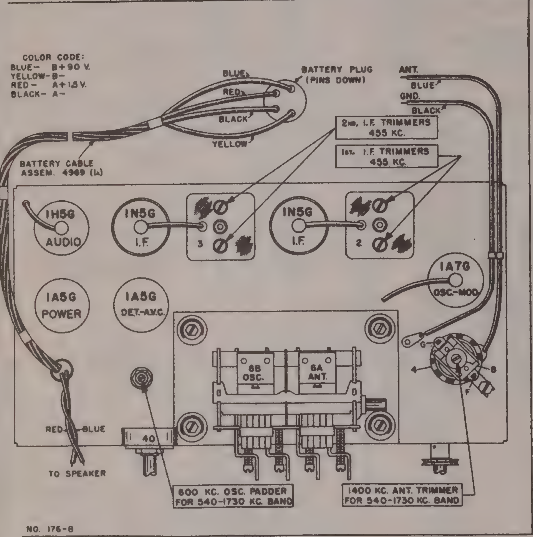
WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

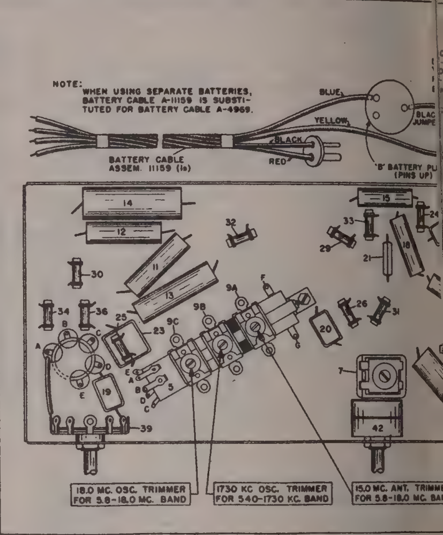
MISCELLANEOUS PARTS

Illus. No.	Part No.		Description	List Price
	8184	Cord	12" of 18 lb. Drive Cord	.10
	11189	Dial Scale	Calibrated Scale Only	.55
	11173	Dial Assembly	Complete Drive Mechanism Less Scale	.75
	11193	Dial Pointer	For Dial	.16
	11198	Escutcheon	For Dial with Mtg. Screw Holes in Corners	1.25
	11199	Escutcheon	For Dial with Mtg. Screw Holes away from Corners	1.25
	11200	Escutcheon	Pushbutton Used with 11198 Dial Escutcheon	.35
	11201	Escutcheon	Pushbutton Used with 11199 Dial Escutcheon	.35
	4958	Knob	Marked "Tuning"	.12
	4959	Knob	Marked "Off-Volume"	.12
	4960	Knob	Marked "Tone"	.12
	4961	Knob	Marked "Band Switch"	.12
	3487	Plug	3 Prong "B"	.10
	10351	Plug	2 Prong "A"	.10
	4978	Plug	4 Prong "AB"	.10
	11197	Dial Spring	Gear Drive Shaft Tension	.16
	4589	Dial Spring	Cord Tension	.04
	11185	Dial Shaft	Gear Drive Shaft Assembly	.35

4M W. 12-39 PART NO. 176B

SENTINEL MODEL 176B
TWO BAND—SIX TUBE
1½ Volt—Battery Operated Superheterodyne Receiver




NOTE:
WHEN USING SEPARATE BATTERIES, BATTERY CABLE A-11159 IS SUBSTITUTED FOR BATTERY CABLE A-4969.
BLUE
YELLOW
BLACK
RED
BLAC JUMPE
'B' BATTERY PL (PINS UP)
BATTERY CABLE ASSEM. 11159 (I)
14
12
15
32
33
24
29
21
18
30
11
13
F
9A
9B
9C
26
31
34
36
25
23
20
G
B
C
A
D
E
19
E
A
B
D
C
5
7
42
39
18.0 MC. OSC. TRIMMER FOR 5.8-18.0 MC. BAND
1730 KC OSC. TRIMMER FOR 540-1730 KC. BAND
15.0 MC. ANT. TRIMME FOR 5.8-18.0 MC. BA

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

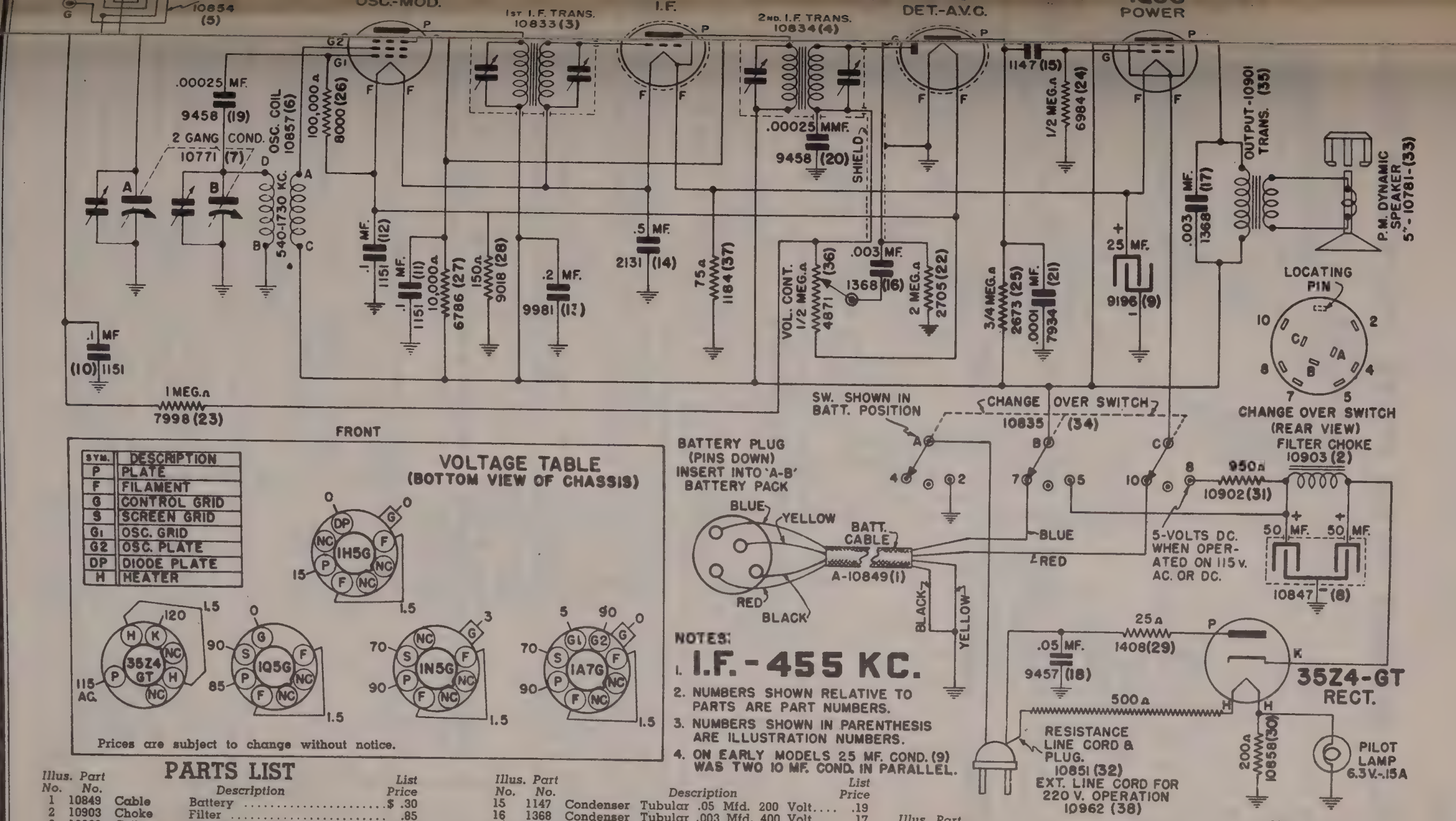
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. Alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High Side to grid cap of 1A7G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.8 to 18 M.C. Band	1 Exactly 18 M.C.	Exactly 18 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 180XL
Schematic ,Voltage



SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
H	HEATER

NOTES:

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ON EARLY MODELS 25 MF. COND. (9) WAS TWO 10 MF. COND. IN PARALLEL.

Prices are subject to change without notice.

PARTS LIST

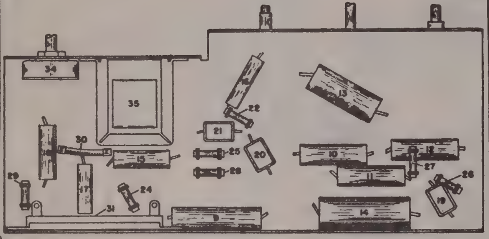
Illus. No.	Part No.		Description	List Price
1	10849	Cable	Battery	$ .30
2	10903	Choke	Filter	.85
3	10833	Coil	1st I.F. Transformer	1.45
4	10834	Coil	2nd I. F. Transformer	1.45
5	10854	Loop	Antenna Complete with Frame	1.75
6	10857	Coil	Oscillator	.60
7	10771	Condenser	Tuning Two Gang	1.65
8	10847	Condenser	Tubular Dry Electrolytic 50-50 Mfd. 150 Volts	1.10
9	9196	Condenser	Tubular Dry Electrolytic 25 Mfd. 25 Volt	.94
10	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
13	9981	Condenser	Tubular .2 Mfd. 200 Volt	.29
14	2131	Condenser	Tubular .5 Mfd. 200 Volt	.55
15	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
16	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
17	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
18	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
19	9458	Condenser	Mica Moulded .00025 Mfd.	.21
20	9458	Condenser	Mica Moulded .00025 Mfd.	.21
21	7934	Condenser	Mica Moulded .0001 Mfd.	.21
22	2705	Resistor	Carbon 2 Megohm 1/3 Watt	.19
23	7998	Resistor	Carbon 1 Megohm 1/3 Watt	.19
24	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
25	2673	Resistor	Carbon 750,000 Ohm 1/3 Watt	.19
26	8000	Resistor	Carbon 100,000 Ohm 1/3 Watt	.19
27	6786	Resistor	Carbon 10,000 Ohm 1/3 Watt	.19
28	9018	Resistor	Carbon 150 Ohm 1/3 Watt	.19
29	1408	Resistor	Flexible 25 Ohm 1 Watt	.19
30	10858	Resistor	Wire Wound Flexible 200 Ohm 2 Watt	.22
31	10902	Resistor	Wire Wound Flexible 950 Ohm 9½ Watts	.65
32	10851	Resistor	Line Cord & Plug	.90
33	10781	Speaker	P.M. DYNAMIC 5" Less Transformer	3.25
34	10835	Switch	Voltage Selector	.60
35	10901	Transformer	Output	.90
36	4871	Volume Control		.80
37	1184	Resistor	Wire Wound Flexible 75 Ohm 1 Watt	.19
38	10962	Resistor	Extension Line Cord 220 Volt	1.50

MODEL 180XL
Socket,Trimmers
Alignment,Chassis

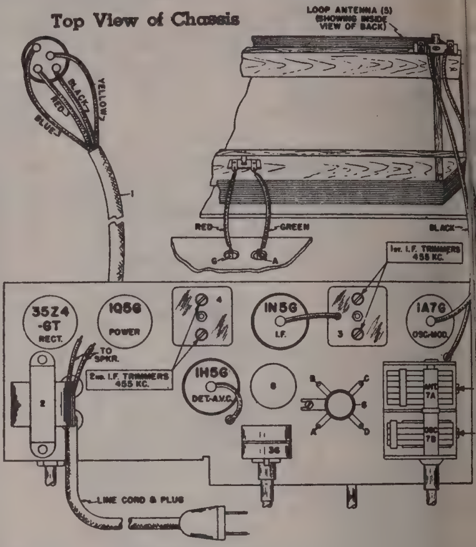
SENTINEL RADIO CORP.

PORTABLE – BATTERY OR 110 VOLTS, DC-AC 50-60 CYCLE

Bottom View of Chassis



Top View of Chassis



ALIGNMENT PROCEDURE

Follow procedure carefully and in the order given—read tabulations from left to right. If more than one adjustment is requir any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity stop (comp in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibrati dial needle does not point exactly to last line move needle to correct position.

Use an accurately calibrated test oscillator with some type of output measuring device.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERY-PACK IN THE SAME APPROXIMATE POSITIC THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

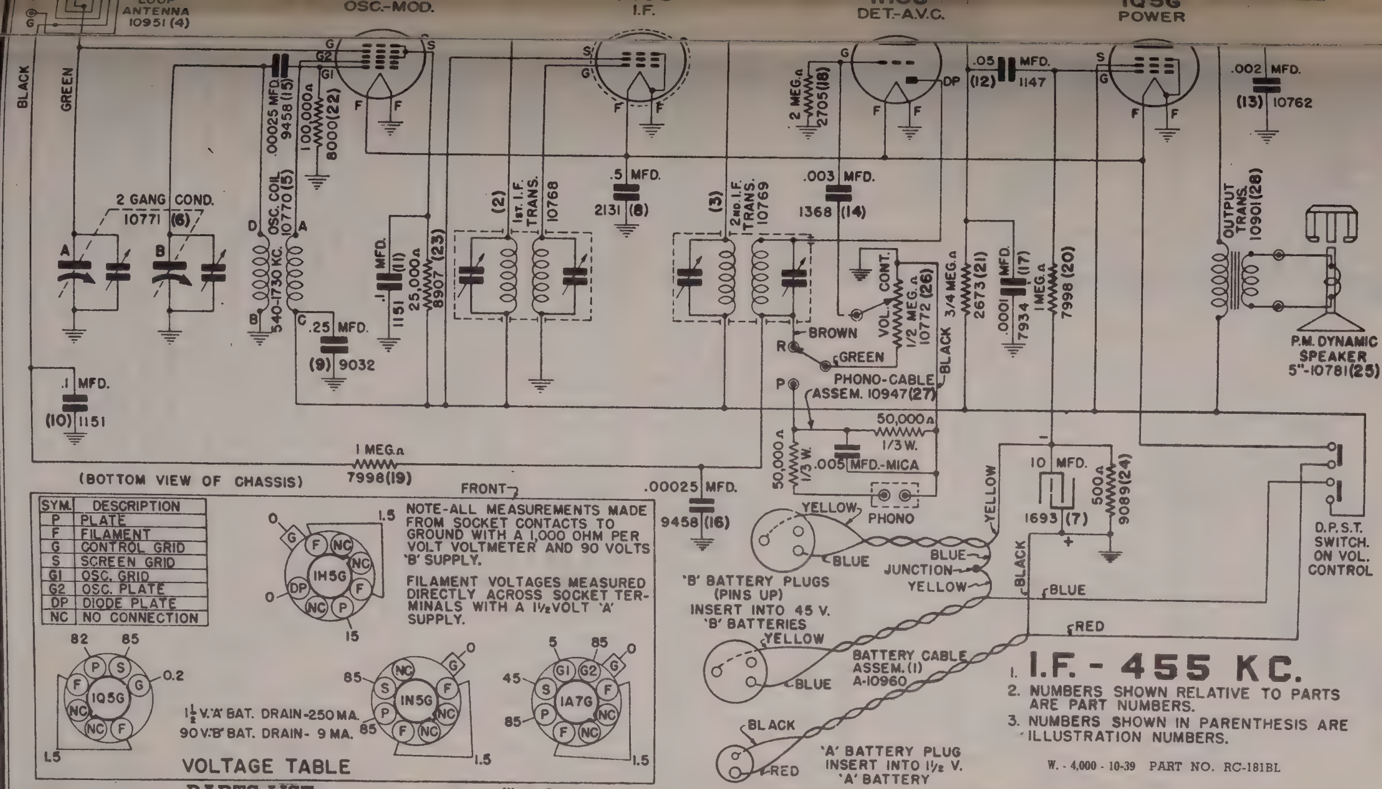
When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on l of cabinet back.

Couple test oscillator to receiver loop by:
a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillat
b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

		TEST OSCILLATOR		
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP	Adjust the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1730 K. C.	Exactly 1730 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output.

MODEL 181BL
Schematic,Voltage

SENTINEL RADIO CORP.



SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

NOTE-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER AND 90 VOLTS 'B' SUPPLY.

FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS WITH A 1½ VOLT 'A' SUPPLY.

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

W. - 4,000 - 10-39 PART NO. RC-181BL

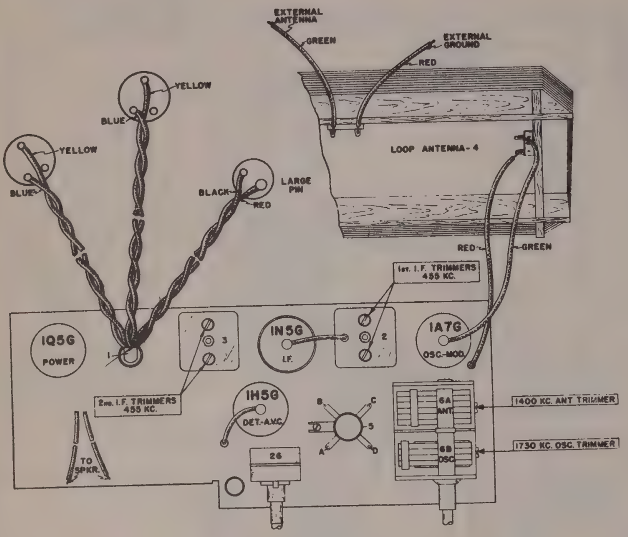
PARTS LIST

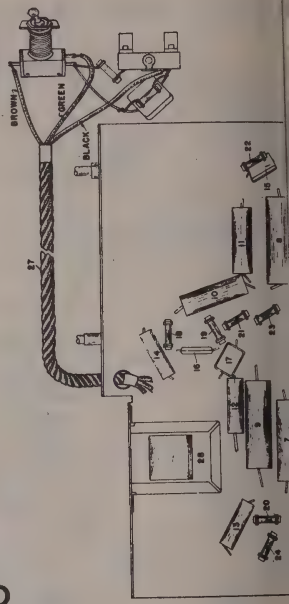
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Illus. No.	Part No.		Description	List Price
1	10960	Cable	Battery, 6 Conductor Complete with Plugs	$ .55
2	10768	Coil	1st I.F. Transformer	1.05
3	10769	Coil	2nd I.F. Transformer	1.10
4	10951	Loop	Antenna Complete with Frame	1.75
5	10770	Coil	Oscillator	.65
6	10771	Condenser	Tuning Two Gang	1.65
7	1693	Condenser	Tubular Dry Elec. 10 Mfd. 25 Volt D. C.	.75
8	2131	Condenser	Tubular .5 Mfd. 200 Volt	.55
9	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
10	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
13	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19
14	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
15	9458	Condenser	Mica .00025 Mfd	.21
16	9458	Condenser	Mica .00025 Mfd	.21
17	7934	Condenser	Mica .0001 Mfd	.21
18	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
19	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
20	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
21	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
22	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
23	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
24	9089	Resistor	Carbon 500 Ohm ⅓ Watt	.19
25	10781	Speaker	P. M. Dynamic 5 in	3.25
26	10772	Volume Control	With D.P.S.T. Switch	.95
27	10947	Cable	For Phono Motor Complete with No. 2434 Switch	.90
28	10901	Transformer	Output	.90
		MISCELLANEOUS PARTS		
	10920	Dial Scale	Calibrated Dial Scale	.35
	3814	Dial Drive Cord		.15
	10777	Dial Pointer		.16
	10853	Dial Escutcheon	For Cabinet	.65
	4958	Knob	Marked "Tuning"	.12
	4959	Knob	Marked "Off-Volume"	.12
	10954	Phono Motor	Spring Wound Complete with Turntable	5.50
	10955	Pickup	Crystal-Dark Brown Finish	5.25

MODEL 181BL
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.





SENTINEL MODEL 181BL

4 TUBE — 1½ VOLT BATTERY OPERATED

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is r on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (compl mesh) at which point the dial needle must be exactly even with the last line at the low frequency end dial calibration. If dial needle does not point exactly to last line move to correct position.

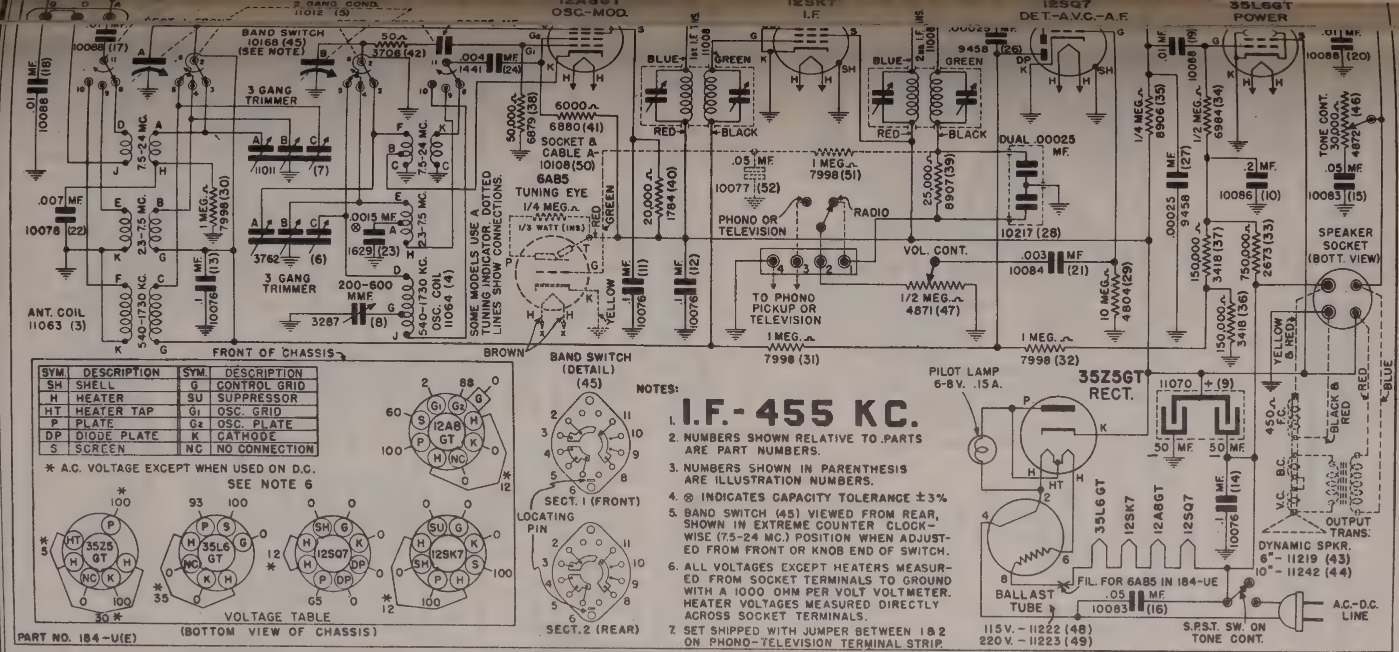
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

	Set receiver dial to:	TEST OSCILLATOR Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
	I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7G tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODELS 184U,184UE
Schematic,Voltage



SYM.	DESCRIPTION	SYM.	DESCRIPTION
SH	SHELL	G	CONTROL GRID
H	HEATER	SU	SUPPRESSOR
HT	HEATER TAP	G₁	OSC. GRID
P	PLATE	G₂	OSC. PLATE
DP	DIODE PLATE	K	CATHODE
S	SCREEN	NC	NO CONNECTION

* A.C. VOLTAGE EXCEPT WHEN USED ON D.C. SEE NOTE 6

NOTES:

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%
5. BAND SWITCH (45) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER CLOCKWISE (7.5-24 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
6. ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
7. SET SHIPPED WITH JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11008	Coil	1st I.F. Transformer	$1.25
2	11008	Coil	2nd I.F. Transformer	1.25
3	11063	Coil	Antenna	.85
4	11064	Coil	Oscillator	.75
5	11012	Condenser	Tuning Two Gang	1.75
6	3762	Condenser	Trimmer Three Gang	.47
7	11011	Condenser	Trimmer Three Gang	.50
8	3287	Condenser	Padder 200-600 Mmf.	.45
9	11070	Condenser	Dry Electrolytic Condenser 50-50 Mfd.	.75
10	10086	Condenser	Tubular .2 Mfd. 200 Volt	.20
11	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
12	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
13	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
14	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
15	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
16	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
17	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
18	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
19	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
20	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
21	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
22	10078	Condenser	Tubular .007 Mfd. 200 Volt	.19
23	1629	Condenser	Mica .015 Mfd. ± 3%	.21
24	1441	Condenser	Mica .004 Mfd.	.21
25	9458	Condenser	Mica .00025 Mfd.	.21
26	9458	Condenser	Mica .00025 Mfd.	.21
27	9458	Condenser	Mica .00025 Mfd.	.21
28	10217	Condenser	Mica .00025 Mfd.	.21
29	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
30	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
31	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
32	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
33	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
34	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
35	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
36	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
37	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
38	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
39	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
40	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
41	6880	Resistor	Carbon 6,000 Ohm ⅓ Watt	.19
42	3706	Resistor	Carbon 50 Ohm ⅓ Watt	.19
43	11219	Speaker	Electro-Dynamic 6 in.	4.00
44	11242	Speaker	Electro-Dynamic 10 in.	6.00
45	10168	Switch	Band Selector	1.30
46	4872	Tone Control	With On-Off Switch	.80
47	4871	Volume Control		.80
48	11222	Ballast Tube	115 Volt	.60
49	11223	Ballast Tube	220 Volt	1.00
50	10108	Socket & Cable	6AB5 Tuning Eye Cable & Socket Assembly	.65
51	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
52	10077	Condenser	Tubular .05 Mfd. 200 Volt	.19

MISCELLANEOUS PARTS

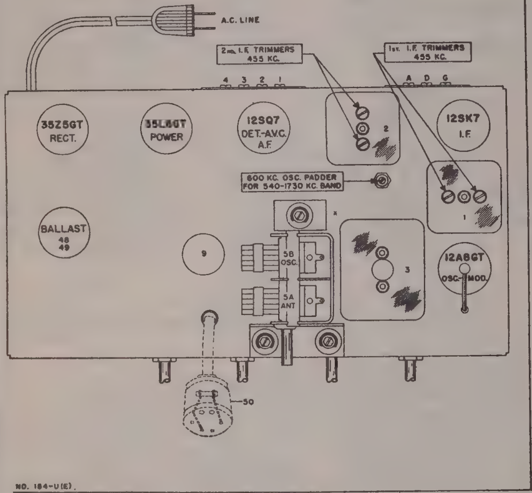
	11304	Bulb	6-8 Volt .150 Amp. Type No. 47 Bayonet Base	.10
	11246	Band Indicator	For Dial	.12
	8184	Dial Cord	24 in. of 18 Lb. Drive Cord	.15
	11021	Dial Scale	Calibrated Scale	.55
	11017	Dial Shaft	Drive Shaft	.11
	11025	Dial Pointer	Dial Indicator	.16
	11693	Dial Spring	Cord Tension Spring	.04
	11198	Escutcheon	For Dial with Mtg. Screw Holes in Corners	1.25
	11199	Escutcheon	For Dial with Mtg. Screw Holes Away From Corners	1.25
	10030	Knob	Marked "Tuning"	.12
	10032	Knob	Marked "Volume"	.12
	10068	Knob	Marked "Off-On-Tone"	.12
	10069	Knob	Marked "Band Switch"	.12

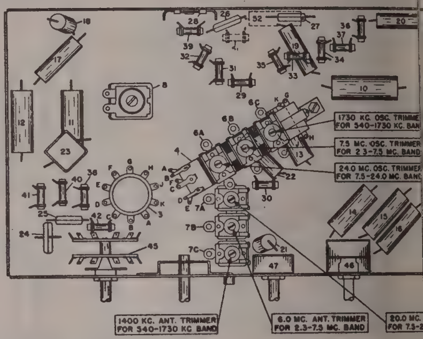
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

3M W. 12-39 Part No. 184U-184UE

SENTINEL MODEL 184U and 184UE—THREE BAND—FIVE and SIX TUBE

A. C. Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

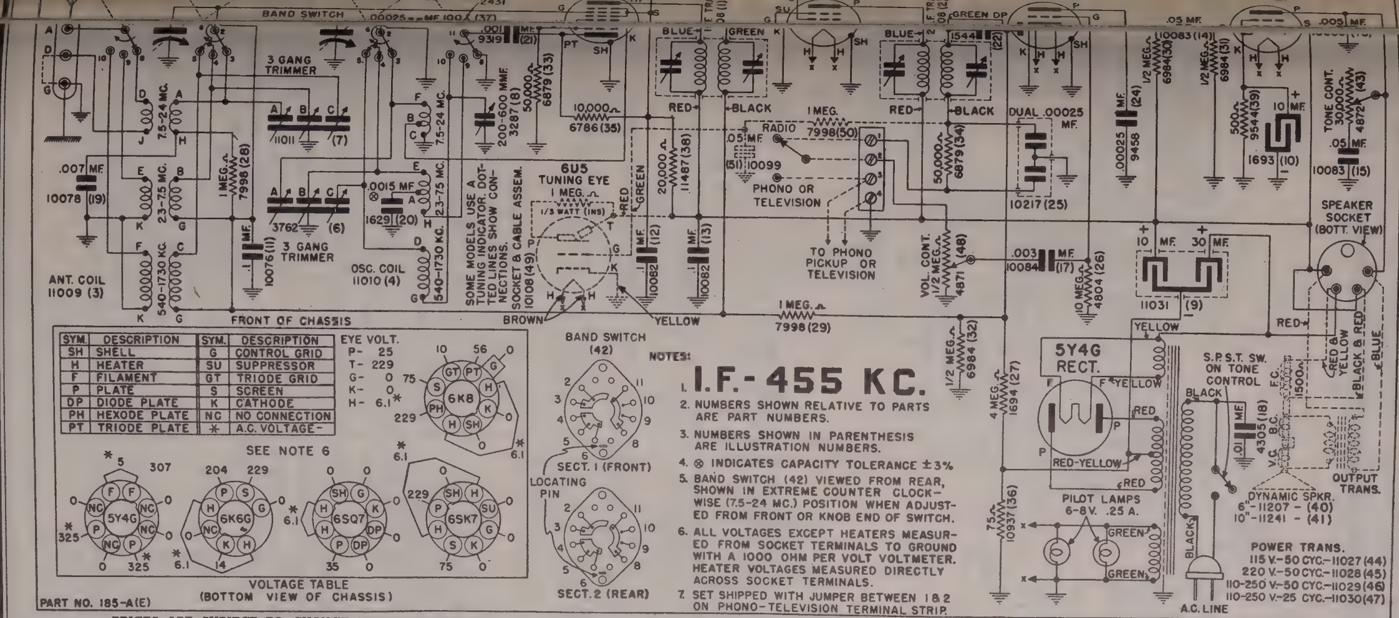
Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locatio of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator: consisting of:	Attach output of test oscillator to:	
I.F. ALIGNMENT use any band position	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 12A8GT Do not remove cap	Adjust each of the second I.F. transforme trimmers for maximum output—then ac just each of the first I.F. transforme trimmers for maximum output.
1730 TO 540 K.C. BAND	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer fo maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 14 K.C. antenna trimmer for maximum outpu
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 6 K.C. oscillator padder for maximum outpu
2.3 TO 7.5 M.C. BAND	1 Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer fo maximum output.
	2 Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust M.C. antenna trimmer for maximum outpu
7.5 TO 24 M.C. BAND	1 Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer fo maximum output—be sure to use prope peak. If more than one peak is noticed back off trimmer to minimum capacity then screw down trimmer (add capacity until the second peak—which is the prope one to use is tuned in.
	2 Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 2 M.C. antenna trimmer for maximum outpu


BAND SWITCH
3 GANG TRIMMER
ANT. COIL 11009 (3)
OSC. COIL 11010 (4)
7.5-24 MC.
23-75 MC.
540-1730 KC.
FRONT OF CHASSIS
6U5 TUNING EYE
SOME MODELS USE A TUNING INDICATOR. DOTTED LINES SHOW CONNECTIONS.
SOCKET & CABLE ASSEM. 10108 (49)
RADIO
PHONO OR TELEVISION
TO PHONO PICKUP OR TELEVISION
VOL. CONT.
TONE CONT.
SPEAKER SOCKET (BOTT. VIEW)
5Y4G RECT.
PILOT LAMPS 6-8V. .25 A.
S.P.S.T. SW. ON TONE CONTROL
OUTPUT TRANS.
DYNAMIC SPKR. 6"-11207 - (40) 10"-11241 - (41)
POWER TRANS.
115 V.-50 CYC.-11027 (44)
220 V.-50 CYC.-11028 (45)
110-250 V.-50 CYC.-11029 (46)
110-250 V.-25 CYC.-11030 (47)
A.C. LINE
BAND SWITCH (42)
SECT. 1 (FRONT)
SECT. 2 (REAR)
LOCATING PIN
SEE NOTE 6
EYE VOLT. P- 25 T- 229 G- 0 K- 0 H- 6.1*
VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)
PART NO. 185-A(E)

SYM.	DESCRIPTION	SYM.	DESCRIPTION
SH	SHELL	G	CONTROL GRID
H	HEATER	SU	SUPPRESSOR
F	FILAMENT	GT	TRIODE GRID
P	PLATE	S	SCREEN
DP	DIODE PLATE	K	CATHODE
PH	HEXODE PLATE	NC	NO CONNECTION
PT	TRIODE PLATE	*	A.C. VOLTAGE-

NOTES:

1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%
5. BAND SWITCH (42) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER CLOCKWISE (7.5-24 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
6. ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
7. SET SHIPPED WITH JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

W. - 4,000 - 10-39 PART NO. 185A

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11008	Coil	1st I.F. Transformer	$1.25
2	11008	Coil	2nd I.F. Transformer	1.25
3	11009	Coil	Antenna	.85
4	11010	Coil	Oscillator	.75
5	11012	Condenser	Tuning Two Gang	1.75
6	3762	Condenser	Trimmer Three Gang	.47
7	11011	Condenser	Trimmer Three Gang	.50
8	3287	Condenser	Padder 200-600 Mmf.	.45
9	11031	Condenser	Dry Electrolytic 10-30 Mfd. 450 Volts	1.25
10	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt D.C.	.75
11	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
12	10082	Condenser	Tubular .1 Mfd. 400 Volt	.20
13	10082	Condenser	Tubular .1 Mfd. 400 Volt	.20
14	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
15	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
16	10080	Condenser	Tubular .005 Mfd. 400 Volt	.17
17	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
18	4305	Condenser	Tubular .01 Mfd. 220 Volt	.30
19	10078	Condenser	Tubular .007 Mfd. 200 Volt	.19
20	1629	Condenser	Mica .0015 Mfd.	.21
21	9319	Condenser	Mica .001 Mfd.	.21
22	1544	Condenser	Mica .00005 Mfd.	.21
23	9458	Condenser	Mica .00025 Mfd.	.21
24	9458	Condenser	Mica .00025 Mfd.	.21
25	10217	Condenser	Mica Dual .00025 Mfd.	.21
26	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
27	1694	Resistor	Carbon 4 Megohm ⅓ Watt	.19
28	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
29	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
30	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
31	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
32	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
33	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
34	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
35	6786	Resistor	Carbon 10,000 Ohm ⅓ Watt	.19
36	10937	Resistor	Carbon 75 Ohm ⅓ Watt	.19
37	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
38	11487	Resistor	Carbon 20,000 Ohm 1½ Watt	.22
39	9544	Resistor	Carbon 500 Ohm 1 Watt	.22
40	11207	Speaker	Electro Dynamic 6 in.	4.25
41	11241	Speaker	Electro Dynamic 10 in.	6.00
42	10168	Switch	Wave	1.30
43	4872	Tone Control	With On-Off Switch	.80
44	11027	Transformer	Power 115 Volt 50 Cycle	3.25
45	11028	Transformer	Power 220 Volt 50 Cycle	4.10
46	11029	Transformer	Power 110-250 Volt 50 Cycle	6.50
48	4871	Volume Control		.80
49	10108	Socket & Cable	Tuning Eye Assembly (6U5 Tube)	.65
50	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
51	10077	Condenser	Tubular .05 Mfd. 200 Volt	.19

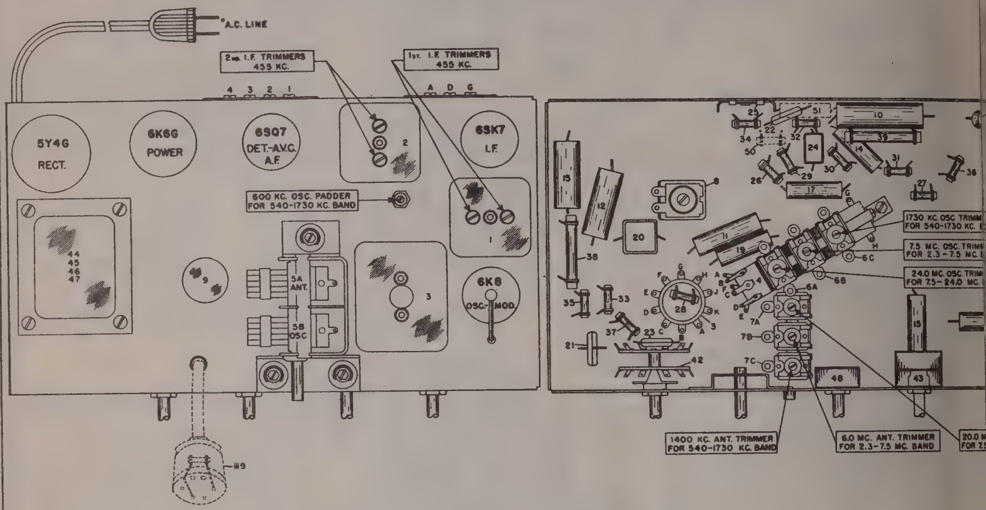
MISCELLANEOUS PARTS

Illus. No.	Part No.		Description	List Price
	10292	Bulb	6-8 Volt .250 Ampere Type C-3¼ No. 44	.10
	11022	Dial Scale	Calibrated Scale	.60
	11246	Dial Indicator	Band Indicator	.12
	8184	Dial Cord	Dial Drive Cord 24 in. of 18 Lb.	.15
	11017	Dial Shaft	Dial Drive Shaft	.11
	11025	Dial Pointer	For Dial	.16
	11198	Escutcheon	For Dial with Mtg. Screw Holes In Corners	1.25
	11199	Escutcheon	For Dial with Mtg. Screw Holes Away From Corners	1.25
	4958	Knob	Marked "Tuning"	.12
	10906	Knob	Marked "Volume"	.12
	11566	Knob	Marked "Off-Tone"	.12
	4961	Knob	Marked "Band Switch"	.12
	8117	Shaft Clamp	"C" Retainer Washer for Drive Shaft	.02
	10578	Strip	Antenna and Ground Post	.15

SENTINEL RADIO CORP.

SENTINEL MODEL 185A and 185AE—THREE BAND—FIVE and SIX TUB

A. C. Operated Superheterodyne Receiver


A.C. LINE
2nd I.F. TRIMMERS 455 KC.
1st I.F. TRIMMERS 455 KC.
4 3 2 1
A D G
5Y4G RECT.
6K6G POWER
6SQ7 DET.-A.V.C. A.F.
6SK7 I.F.
6K8 OSC.-MOD.
600 KC. OSC. PADDER FOR 540-1730 KC. BAND
44 45 46 47
9
5A ANT.
5B OSC
2
1
3
#9
1730 KC. OSC TRIMM FOR 540-1730 KC.
7.5 MC. OSC. TRIM FOR 2.3-7.5 MC.
24.0 MC. OSC. TRIM FOR 7.5-24.0 MC.
1400 KC. ANT. TRIMMER FOR 540-1730 KC. BAND
6.0 MC. ANT. TRIMMER FOR 2.3-7.5 MC. BAND
20.0 FOR 7.5
10
11
12
13
14
15
17
19
20
21
22
23
24
25
26
27
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35
36
37
38
39
42
43
48
50
51
6A
6B
6C
7A
7B
7C

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibra incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one ba make the adjustment marked (1) first, (2) next, (3) third.

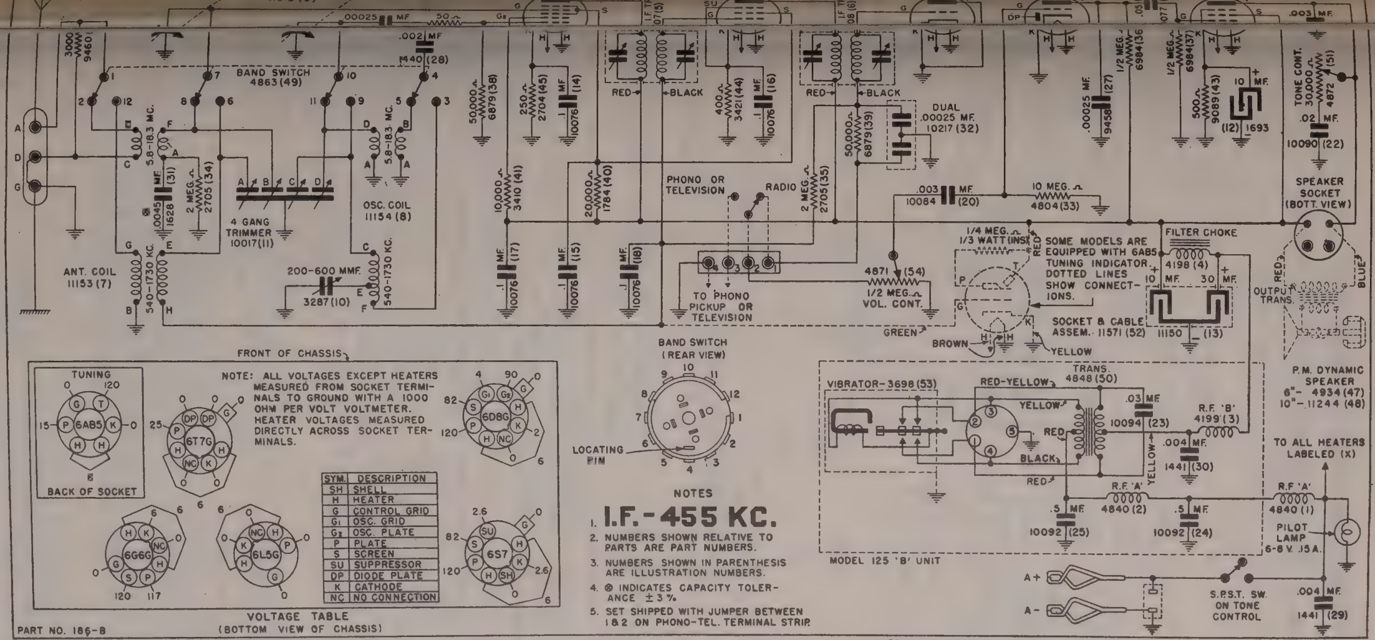
Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If needle does not point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for lo of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator: consisting of:	Attach output of test oscillator to:	
I.F. ALIGNMENT use any band position	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap	Adjust each of the second I.F. transfo trimmers for maximum output—then just each of the first I.F. transfo trimmers for maximum output.
1730 TO 540 K.C. BAND	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimme maximum output.
	2 Exactly 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjus K.C antenna trimmer for maximum o
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adju K.C. oscillator padder for maximum o
2.3 TO 7.5 M.C. BAND	1 Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimme maximum output.
	2 Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adj M.C. antenna trimmer for maximum
7.5 TO 24 M.C. BAND	1 Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimme maximum output—be sure to use peak. If more than one peak is back off trimmer to minimum cap then screw down trimmer (add cap until the second peak—which is the one to use is tuned in.
	2 Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adj M.C. antenna trimmer for maximum



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
G	CONTROL GRID
G_1	OSC. GRID
G_2	OSC. PLATE
P	PLATE
S	SCREEN
SU	SUPPRESSOR
DP	DIODE PLATE
K	CATHODE
NC	NO CONNECTION

NOTES

1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%.
5. SET SHIPPED WITH JUMPER BETWEEN 1 & 2 ON PHONO-TEL. TERMINAL STRIP.

PARTS LIST

Part No.			Description	List Price
1	4840	Choke	R. F. "A"	$ .18
2	4840	Choke	R. F. "A"	.18
3	4199	Choke	R. F. "B"	.40
4	4198	Choke	Filter	.95
5	11007	Coil	1st I. F. Transformer	1.25
6	11008	Coil	2nd I. F. Transformer	1.25
7	11153	Coil	Antenna	.70
8	11154	Coil	Oscillator	.60
9	11012	Condenser	Tuning (Two Gang)	1.75
10	3287	Condenser	Padder 340-460 Mmf.	.45
11	10017	Condenser	Trimmer Four Gang	.55
12	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt	.75
13	11150	Condenser	Dry Electrolytic 1-10 & 30 Mfd.	1.00
14	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
15	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
16	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
17	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
18	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
19	10077	Condenser	Tubular .05 Mfd. 200 Volt	.19
20	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
21	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
22	10090	Condenser	Tubular .02 Mfd. 400 Volt	.19
23	10094	Condenser	Tubular .03 Mfd. 800 Volt	.22
24	10092	Condenser	Tubular .5 Mfd. 100 Volt	.25
25	10092	Condenser	Tubular .5 Mfd. 100 Volt	.25
26	9458	Condenser	Mica .00025 Mfd.	.21
27	9458	Condenser	Mica .00025 Mfd.	.21
28	1440	Condenser	Mica .002 Mfd.	.21
29	1441	Condenser	Mica .004 Mfd.	.21
30	1441	Condenser	Mica .004 Mfd.	.21
31	1628	Condenser	Mica .0045 Mfd. ± 3%	.24
32	10217	Condenser	Dual Mica .00025 Mfd.	.21
33	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
34	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
35	2705	Resistor*	Carbon 2 Megohm ⅓ Watt	.19
36	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
37	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
38	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
39	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
40	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
41	3410	Resistor	Carbon 10,000 Ohm ⅓ Watt	.19
42	9460	Resistor	Carbon 3,000 Ohm ⅓ Watt	.19
43	9089	Resistor	Carbon 500 Ohm ⅓ Watt	.19
44	3421	Resistor	Carbon 400 Ohm ⅓ Watt	.19
45	2704	Resistor	Carbon 250 Ohm ⅓ Watt	.19
46	3706	Resistor	Carbon 50 Ohm ⅓ Watt	.19
47	4934	Speaker	P. M. Dynamic 6 in.	5.00
48	11244	Speaker	P. M. Dynamic 10 in.	6.50
49	4863	Switch	Band	.60
50	4848	Transformer	Power	2.25
51	4872	Tone Control	With S. P. S. T. Switch	.80
52	11571	Teleye Socket Cable Assembly	Used with 6AB5 Tube	.65
53	3698	Vibrator		3,50
54	4871	Volume Control		.80

MISCELLANEOUS PARTS

		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
8184	Cord	Dial Drive Cord	.10
11156	Dial Scale	Calibrated Scale Only	.60
11017	Dial Shaft	Drive Shaft	.11
11025	Dial Pointer	For Dial	.16
11198	Escutcheon	For Dial—with Mounting Screw Holes in Corners	1.25
11199	Escutcheon	For Dial—with Mounting Screw Holes away from Corners	1.25
4958	Knob	Marked "Tuning"	.12
10906	Knob	Marked "Volume"	.12
11566	Knob	Marked "Off-On Tone"	.12
4961	Knob	Marked "Band Switch"	.12
4589	Spring	Cord Tension	.04
10578	Strip	Antenna Marked "G. D. A."	.15

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

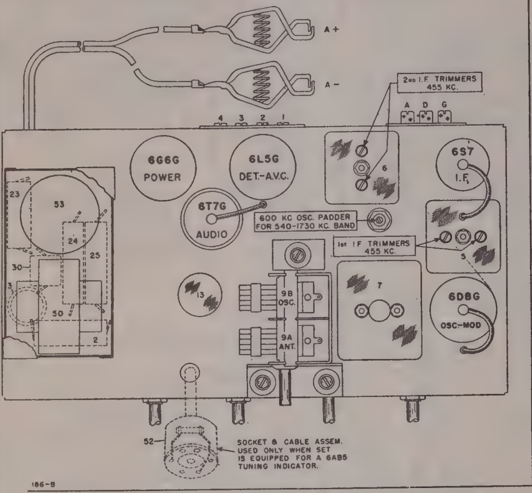
W. 5M 10-39

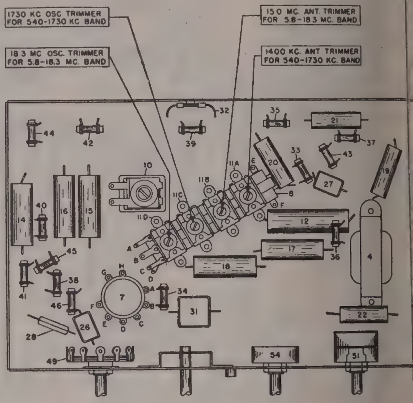
MODELS 186B,186BE
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

TWO BAND—FIVE and SIX TUBE

6 Volt Battery Operated Superheterodyne Receiver


A+
A−
4 3 2 1
2ND I.F. TRIMMERS 455 KC.
A D G
6G6G POWER
6L5G DET.-A.V.C.
6S7 I.F.
6T7G AUDIO
600 KC OSC. PADDER FOR 540-1730 KC. BAND
1st I F TRIMMERS 455 KC.
9B OSC.
9A ANT.
6D8G OSC-MOD
53
24
25
30
50
13
7
6
5
2
3
23
22
52
SOCKET & CABLE ASSEM. USED ONLY WHEN SET IS EQUIPPED FOR A 6AB5 TUNING INDICATOR.
186-B


1730 KC OSC TRIMMER FOR 540-1730 KC BAND
18.3 MC OSC. TRIMMER FOR 5.8-18.3 MC. BAND
15.0 MC. ANT. TRIMMER FOR 5.8-18.3 MC. BAND
1400 KC. ANT TRIMMER FOR 540-1730 KC. BAND
44
42
32
39
35
21
37
43
33
20
27
19
10
40
16
15
14
11A
11B
11C
11D
E
F
8
12
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36
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45
38
41
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51

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration inc
For alignment procedure read tabluations from left to right. If more than one adjustment is required on any one band, make the a
ment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle doe point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for lo of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6D8G tube. Do not remove cap.	Adjust each of the second I.F. trans trimmers for maximum output—then each of the first I.F. transformer tri for maximum output.
1730 to 540 K. C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	Adjust 1730 K. C. oscillator trimm maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adjus K.C. antenna trimmer for maximum o
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adju K.C. oscillator padder for maximum o
5.8 to 18.3 M. C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	Adjust 18.3 M.C. oscillator trimm maximum output—be sure to use peak. If more than one peak is n back off trimmer to minimum ca then screw down trimmer (add ca until the second peak—which is the one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	While rocking gang condenser adju M.C. antenna trimmer for maximum o

Television Connections:—The audio amplifier and loud speaker of this receiver can be used to amplify the sound output of a tel receiver not equipped with an audio amplifier and speaker—just connect the sound channel output of the television receiver (from the detector) to the No. 3 and No. 4 terminals on back of receiver and attach a single pole double throw switch.

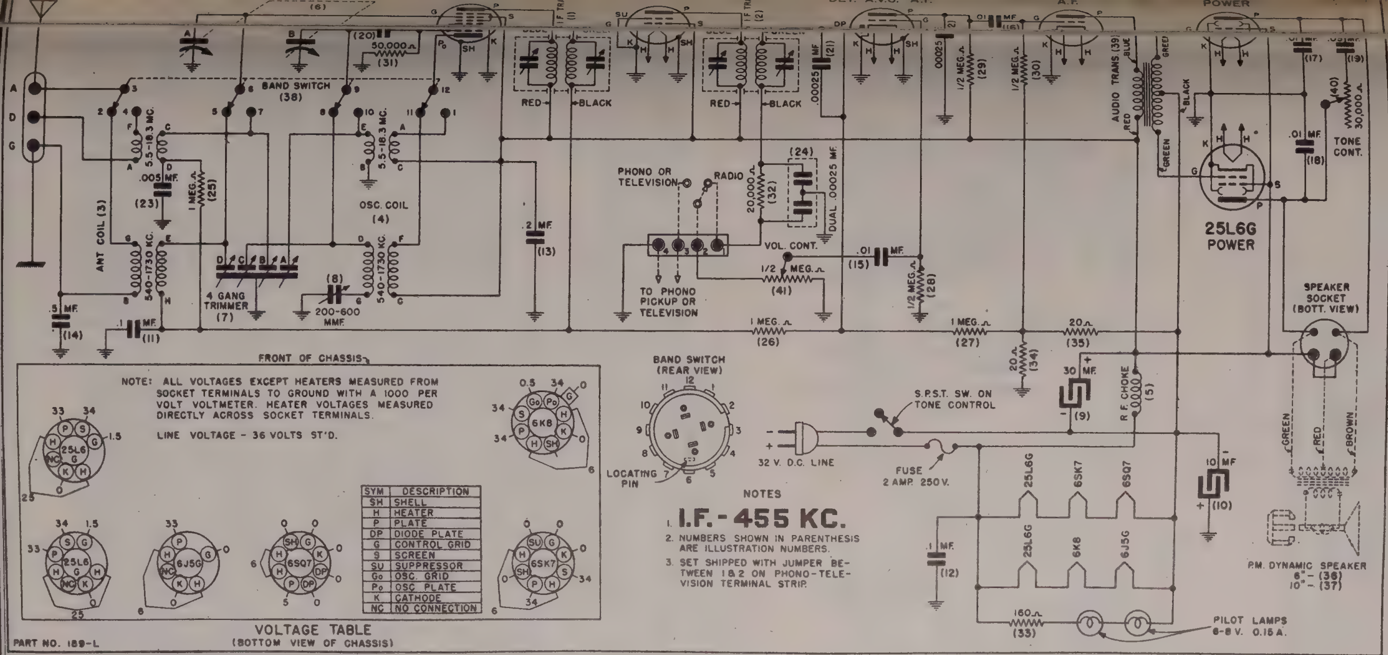
Phonograph Connections:—Phonograph records may be electrically reproduced through the receiver loud speaker by connecting th of the phonograph pickup to the No. 3 and No. 4 terminals and using either an electrical or hand wound spring operated phonograph The pickup should be of the high impedance type and a single pole double throw switch must be connected as shown in diagram. To op place switch in phono position—set pickup needle on record and adjust radio volume control to desired amount of volume.

When shipped from factory a jumper wire is attached to terminals 1 and 2. If receiver is not to be used for phono or television tion, leave the jumper wire in this position. When receiver is used for either phono or television sound operation, remove jumper wir

SENTINEL MODELS 186B and 186BE

SENTINEL RADIO CORP.

MODEL 189L
Schematic,Voltage



NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
3. SET SHIPPED WITH JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

LINE VOLTAGE - 36 VOLTS ST'D.

SYM	DESCRIPTION
SH	SHELL
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
S	SCREEN
SU	SUPPRESSOR
Go	OSC. GRID
Po	OSC. PLATE
K	CATHODE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PART NO. 189-L

PARTS LIST

Part No.			Description	List Price
1	11008	Coil	1st I.F. Transformer	$1.25
2	11008	Coil	2nd I.F. Transformer	1.25
3	11072	Coil	Antenna	.75
4	11074	Coil	Oscillator	.60
5	4199	Coil	R.F. "B" Choke	.40
6	11012	Condenser	Tuning Two Gang	1.75
7	10017	Condenser	Trimmer Four Gang	.55
8	3287	Condenser	Padder 340-460 Mmf.	.45
9	11080	Condenser	Tubular Dry Electrolytic 30 Mfd. 50 Volt	.60
10	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt	.75
11	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
12	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
13	10086	Condenser	Tubular .2 Mfd. 200 Volt	.20
14	10099	Condenser	Tubular .5 Mfd. 200 Volt	.25
15	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
16	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
17	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
18	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
19	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
20	9458	Condenser	Mica .00025 Mfd.	.21
21	9458	Condenser	Mica .00025 Mfd.	.21
22	9458	Condenser	Mica .00025 Mfd.	.21
23	10892	Condenser	Mica .005 Mfd. ± 3%	.30
24	10217	Condenser	Mica Dual .00025 Mfd.	.21
25	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
26	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
27	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
28	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
30	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
31	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
32	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
33	11081	Resistor	Wire Wound 160 Ohm 3.6 Watt	.55
34	11082	Resistor	Wire Wound Flexible 20 Ohm ½ Watt	.19
35	11082	Resistor	Wire Wound Flexible 20 Ohm ½ Watt	.19
36	11216	Speaker	Dynamic, P.M. 6 in.	5.50
37	11245	Speaker	Dynamic, P.M. 10 in.	7.50
38	4853	Switch	Wave	.60
39	10142	Transformer	Audio	2.00
40	4872	Tone Control	With S.P.S.T. A.C. Switch	.80
41	4871	Volume Control		.80

MISCELLANEOUS PARTS

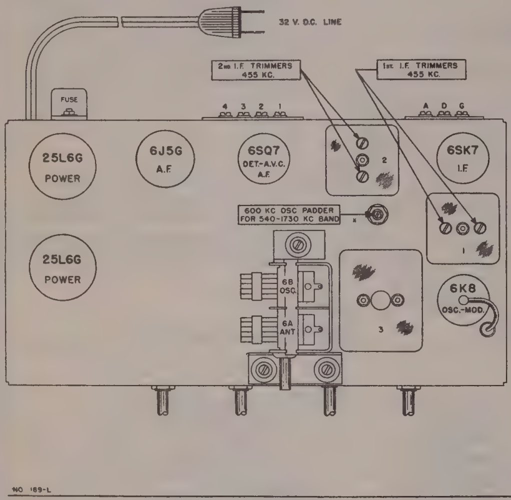
Part No.			Description	List Price
	3856	Block	Fuse Mtg. Block	.15
	11304	Bulb	6-8 Volt .150 Ampere Light No. 47 Bayonet Base	.10
	3857	Cover	For Fuse Block	.10
	11017	Dial Shaft	Drive Shaft	.11
	8184	Dial Cord	3 Ft. of 18 Lb. Drive Cord	.20
	11693	Dial Spring	Cord Tension Spring	.04
	11076	Dial Scale	Calibrated Scale	.60
	11025	Dial Pointer		.16
	11198	Escutcheon	For Dial with Mtg. Screw Holes in Corners	1.25
	11199	Escutcheon	For Dial with Mtg. Screw Holes Away From Corners	1.25
	8215	Fuse	2 Ampere	.10
	10030	Knob	Marked "Tuning"	.12
	10032	Knob	Marked "Volume"	.12
	10068	Knob	Marked "Tone"-On-Off"	.12
	10069	Knob	Marked "Band Switch"	.12
	10578	Strip	3 Post Antenna & Ground Strip	.15
	11005	Strip	4 Post Phono & Television Strip	.10

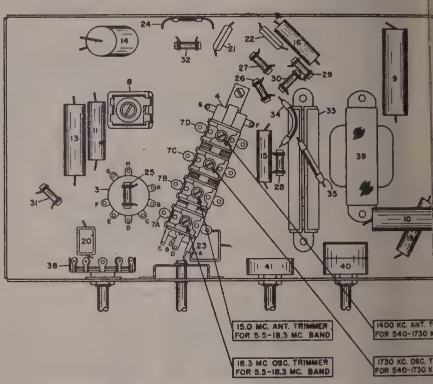
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

W. 4M 1-40 PART NO. 189L

SENTINEL MODEL 189L
TWO BAND—SIX TUBE
32 Volt Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect For alignment procedure read tabluations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at whic point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does no point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to "G" Post.

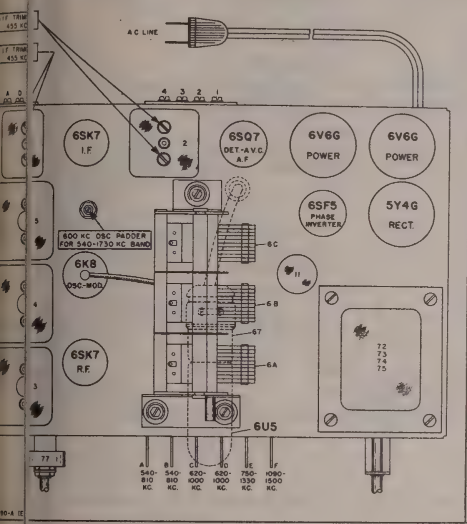
Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locatio of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap.	Adjust each of the second I.F. transforme trimmers for maximum output—then adjus each of the first I.F. transformer trimmer for maximum output.
1730 to 540 K. C. Band	**1** Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	Adjust 1730 K. C. oscillator trimmer fo maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adjust 140 K.C. antenna trimmer for maximum outpu
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adjust 6(K.C. oscillator padder for maximum outpu
5.5 to 18.3 M. C. Band	**1** Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	Adjust 18.3 M.C. oscillator trimmer fo maximum output—be sure to use prope peak. If more than one peak is notice back off trimmer to minimum capacity then screw down trimmer (add capacity until the second peak—which is the prope one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	While rocking gang condenser adjust M.C. antenna trimmer for maximum outpu

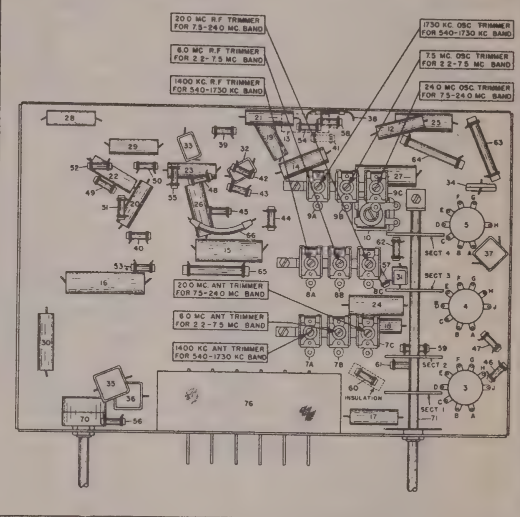
Television Connections:—The audio amplifier and loud speaker of this receiver can be used to amplify the sound output of a television receiver not equipped with an audio amplifier and speaker—just connect the sound channel output of the television receiver (from the second detector) to the No. 3 and No. 4 terminals on back of receiver and attach a single pole double throw switch.

Phonograph Connections:—Phonograph records may be electrically reproduced through the receiver loud speaker by connecting the leads of the phonograph pickup to the No. 3 and No. 4 terminals and using either an electrical or hand wound spring operated phonograph motor. The pickup should be of the high impedance type and a single pole double throw switch must be connected as shown in diagram. To operate—place switch in phono position—set pickup needle on record and adjust radio volume control to desired amount of volume.

When shipped from factory a jumper wire is attached to terminals 1 and 2. If receiver is not to be used for phono or television operation, leave the jumper wire in this position. When receiver is used for either phono or television sound operation, remove jumper wire.

SENTINEL MODEL 190A and 190AE—THREE BAND—EIGHT and NINE TUBE AC Operated Superheterodyne Receiver




20.0 MC R.F TRIMMER FOR 7.5-24.0 MC. BAND
6.0 MC R.F TRIMMER FOR 2.2-7.5 MC BAND
1400 KC. R.F TRIMMER FOR 540-1730 KC BAND
1730 KC. OSC TRIMMER FOR 540-1730 KC BAND
7.5 MC. OSC TRIMMER FOR 2.2-7.5 MC BAND
24.0 MC OSC. TRIMMER FOR 7.5-24.0 MC BAND
20.0 MC. ANT TRIMMER FOR 7.5-24.0 MC BAND
6.0 MC ANT TRIMMER FOR 2.2-7.5 MC BAND
1400 KC ANT TRIMMER FOR 540-1730 KC BAND
INSULATION
SECT 1
SECT 2
SECT 3
SECT 4
9A 9B 9C 10
8A 8B 8C
7A 7B 7C
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 70 71 76
3 4 5
A B C D E F G H J

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration ncorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, nake the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

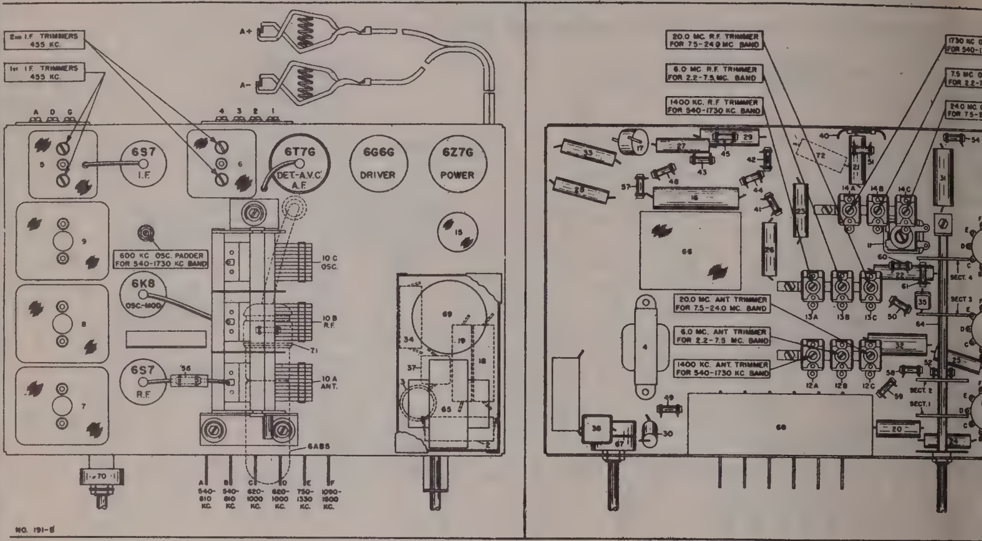
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator: consisting of:	Attach output of test oscillator to:	
. ALIGNMENT use any band position		Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap	Adjust each of the second I.F. transforme trimmers for maximum output—then adjust each of the first I.F. transforme trimmers for maximum output.
1730 TO 540 K.C. BAND	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and R.F. trimmers for maximum output
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.2 TO 7.5 M.C. BAND	1	Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2	Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna and R.F. trimmers for maximum output
7.5 TO 24 M.C. BAND	1	Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmers for maximum output

MODELS 191B,191BE
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

SENTINEL MODEL 191B and 191BE—THREE BAND—SIX and SEVEN TUBE

6 Volt Battery Operated Superheterodyne Receiver


2nd I.F. TRIMMERS 455 KC.
1st I.F. TRIMMERS 455 KC.
A+
A-
A D G
4 3 2 1
6S7 I.F.
6T7G DET.-A.V.C. A.F.
6G6G DRIVER
6Z7G POWER
600 KC OSC. PADDER FOR 540-1730 KC BAND
6K8 OSC.-MOD.
6S7 R.F.
10 C OSC.
10 B R.F.
10 A ANT.
6A85
A 540-810 KC.
B 540-810 KC.
C 620-1000 KC.
D 620-1000 KC.
E 750-1330 KC.
F 1090-1500 KC.
NO. 191-6
20.0 MC. R.F. TRIMMER FOR 7.5-24.0 MC BAND
6.0 MC R.F. TRIMMER FOR 2.2-7.5 MC. BAND
1400 KC. R.F. TRIMMER FOR 540-1730 KC. BAND
20.0 MC. ANT TRIMMER FOR 7.5-24.0 MC. BAND
6.0 MC. ANT TRIMMER FOR 2.2-7.5 MC. BAND
1400 KC. ANT. TRIMMER FOR 540-1730 KC BAND
14 A
14 B
14 C
13 A
13 B
13 C
12 A
12 B
12 C
SECT. 4
SECT. 3
SECT. 2
SECT. 1

ALIGNMENT PROCEDURE

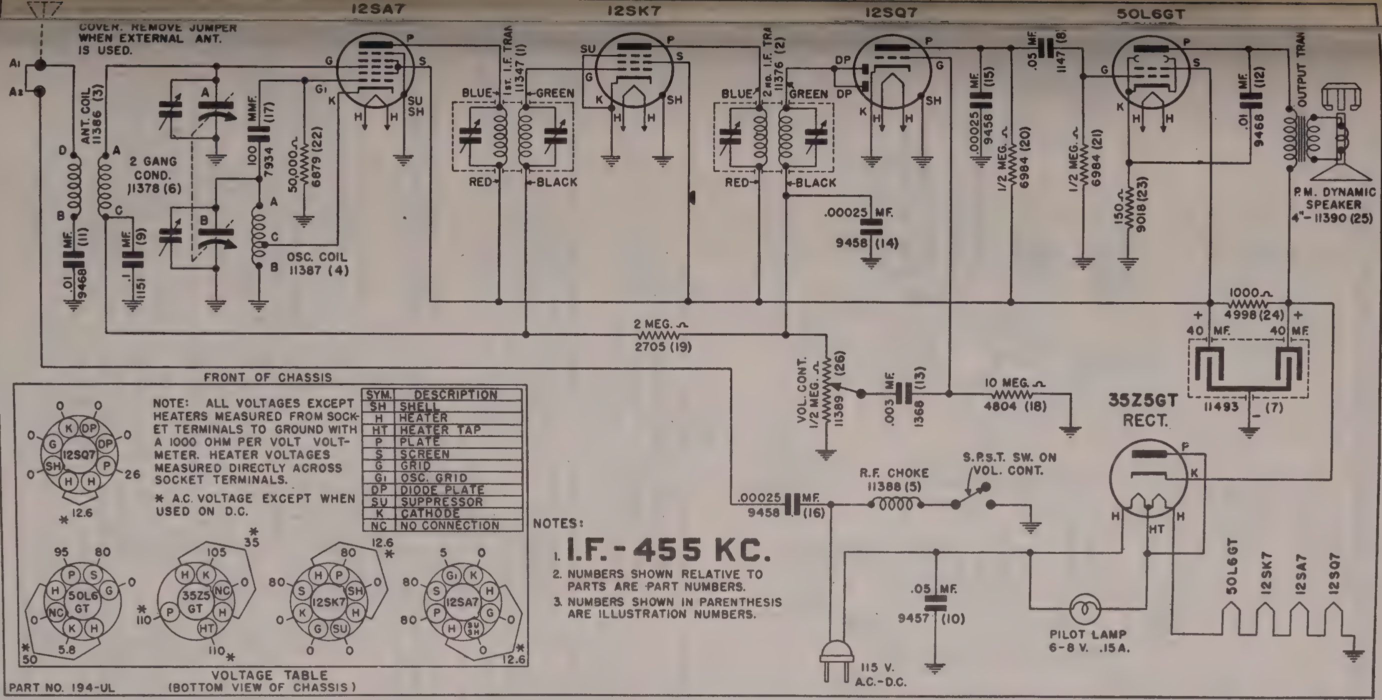
Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator: consisting of:	Attach output of test oscillator to:	
I.F. ALIGNMENT use any band position		Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 TO 540 K.C. BAND	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and R.F. trimmers for maximum output
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.2 TO 7.5 M.C. BAND	1	Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2	Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna and R.F. trimmers for maximum output
7.5 TO 24 M.C. BAND	1	Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmers for maximum output

SENTINEL RADIO CORP.

MODEL 194UL
Schematic, Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. VOLTAGE EXCEPT WHEN USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	GRID
G1	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTES:

1. **I.F.-455 KC.**
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

	Part No.		Description	List Price
1	11347	Coil	1st I. F. Transformer	$ .90
2	11376	Coil	2nd I. F. Transformer	.80
3	11386	Coil	Antenna	.50
4	11387	Coil	Oscillator	.45
5	11388	Coil	Antenna Line Choke	.25
6	11378	Condenser	Tuning Two Gang	1.75
7	11493	Condenser	Tubular Dry Elec. 40 Mfd.-40 Mfd.	1.00
8	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
11	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
12	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
13	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
14	9458	Condenser	Mica .00025 Mfd.	.21
15	9458	Condenser	Mica .00025 Mfd.	.21
16	9458	Condenser	Mica .00025 Mfd.	.21
17	7934	Condenser	Mica .0001 Mfd.	.21
18	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
19	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
20	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
21	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
22	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
23	9018	Resistor	Carbon 150 Ohm ⅓ Watt	.19
24	4998	Resistor	Carbon 1000 Ohm 1 Watt	.21
25	11390	Speaker	P. M. Dynamic 4 in.	2.70
26	11389	Volume Control	With S.P.S.T. Switch	.80

MISCELLANEOUS PARTS

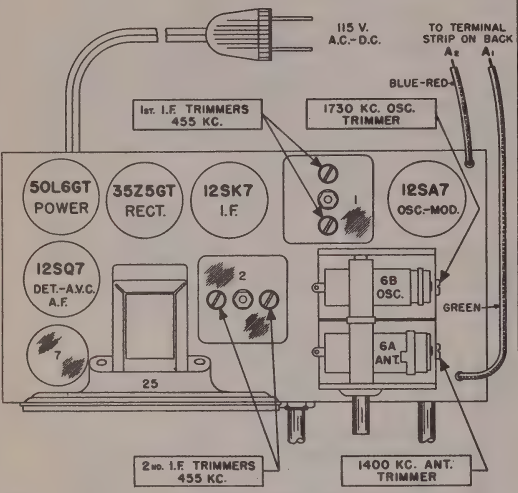
Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11381	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord	.10
11379	Dial Shaft	Dial Drive Shaft	.12
11725	Dial Pointer	For Dial-Bronze	.15
11384	Dial Pointer	For Dial	.15
11391	Dial Crystal	For Dial	.22
11563	Knob	Bakelite Tuning for Walnut Plastic Cabinet	.10
10207	Knob	Bakelite Push Button for Ivory Plastic Cabinet	.08
	Cabinet	Walnut Plastic	1.80
	Cabinet	Ivory Plastic	2.15

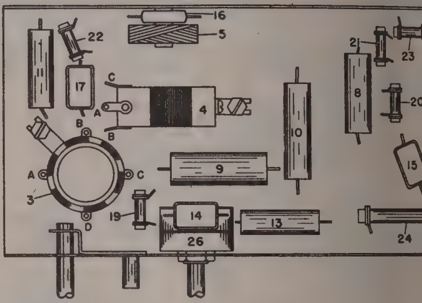
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.   W. 4,000 10-39

MODEL 194UL
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

5 tube A. C. - D. C. Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

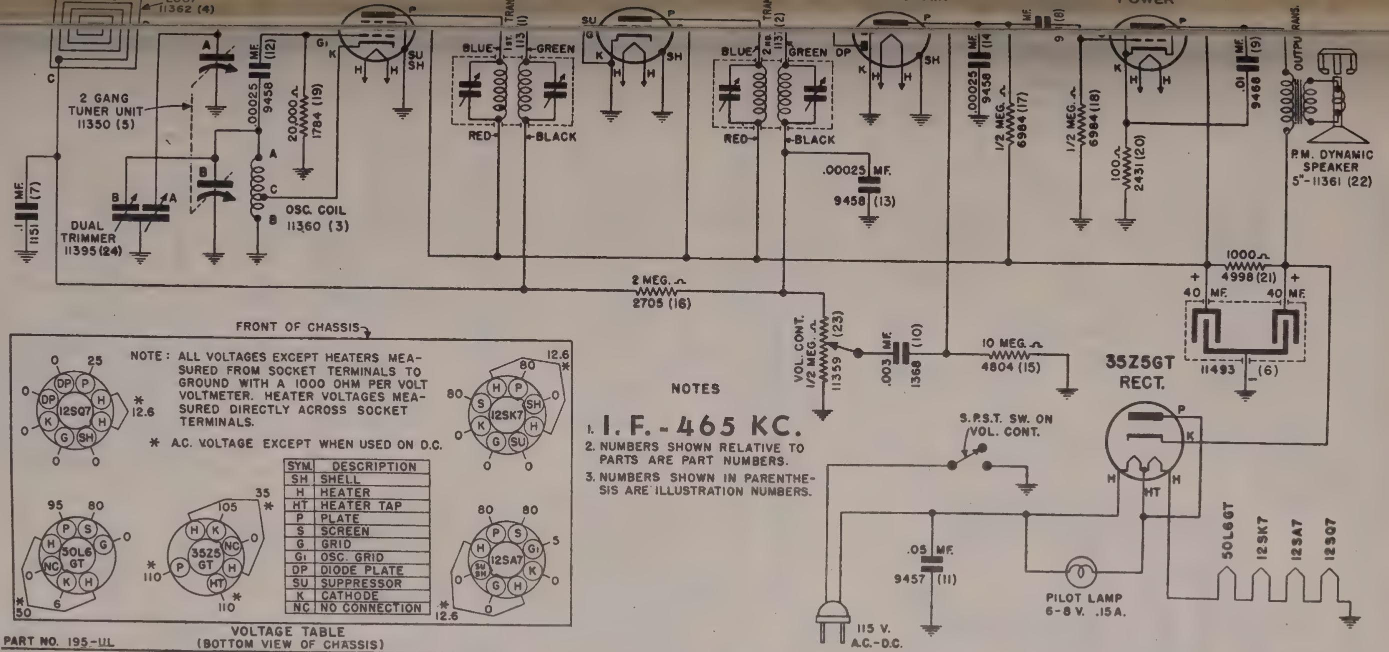
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to gang condenser frame.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmer for maximum output then adjust each of the first I. F. trimmers for maximum output
1 Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver "A1" post	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	Receiver "A1" post	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 195UL
Schematic, Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. VOLTAGE EXCEPT WHEN USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	GRID
G1	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTES

1. I. F. - 465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

Part No.			Description	List Price
1	11347	Coil	1st I. F. Transformer	.90
2	11376	Coil	2nd I. F. Transformer	.80
3	11360	Coil	Oscillator	.50
4	11362	Antenna	Loop	.65
5	11350	Condenser	Tuning (Two Gang) Push Button Mech. Tuner Unit	3.75
6	11493	Condenser	Tubular Dry Elec. 40-40 Mfd.	1.00
7	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
8	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
9	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
10	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
11	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
12	9458	Condenser	Mica .00025 Mfd.	.21
13	9458	Condenser	Mica .00025 Mfd.	.21
14	9458	Condenser	Mica .00025 Mfd.	.21
15	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
16	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
17	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
18	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
19	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
20	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
21	4998	Resistor	Carbon 1,000 Ohm ⅓ Watt	.19
22	11361	Speaker	P. M. Dynamic 5 in.	2.70
23	11359	Volume Control	With S.P.S.T Switch	.80
24	11395	Condenser	Dual Trimmer 2-40 Mmf.	.30
25	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19

MISCELLANEOUS PARTS

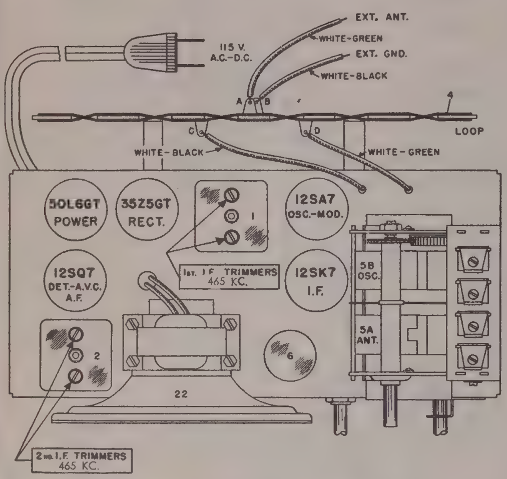
Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11354	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord	.10
11352	Dial Shaft	Dial Drive Shaft	.12
11513	Dial Pointer	For Dial-Bronze	.15
10659	Dial Pointer	For Dial	.16
11357	Dial Crystal	For Dial Used With Bakelite Cabinet Only	.27
11371	Escutcheon	For Dial Used With Wood Cabinet Only	.75
11200	Escutcheon	For Pushbutton Used With Wood Cabt. Only	.35
10208	Knob	Bakelite Tuning for Wood Cabinet	.12
11372	Knob	Bakelite Push Button for Wood Cabinet	.10
11563	Knob	Bakelite Tuning for Walnut Plastic Cabinet	.10
11595	Knob	Bakelite Push Button for Plastic Cabinet	.10
11564	Knob	Bakelite Tuning for Onyx Cabinet	.10
11596	Knob	Bakelite Push Button for Onyx Cabinet	.10
	Cabinet	Walnut Plastic	2.00
	Cabinet	Onyx Plastic	4.25

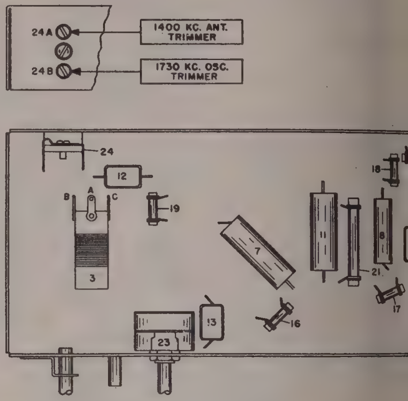
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. W4M 9-39

MODEL 195UL
Socket, Trimmers
Alignment, Chassis

SENTINEL RADIO CORP.

5 tube A. C. - D. C. Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely i mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS IT WILL BE IN WHEN THE SET IS IN THE CABINET AND THE BACK ATTACHED.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop.

Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

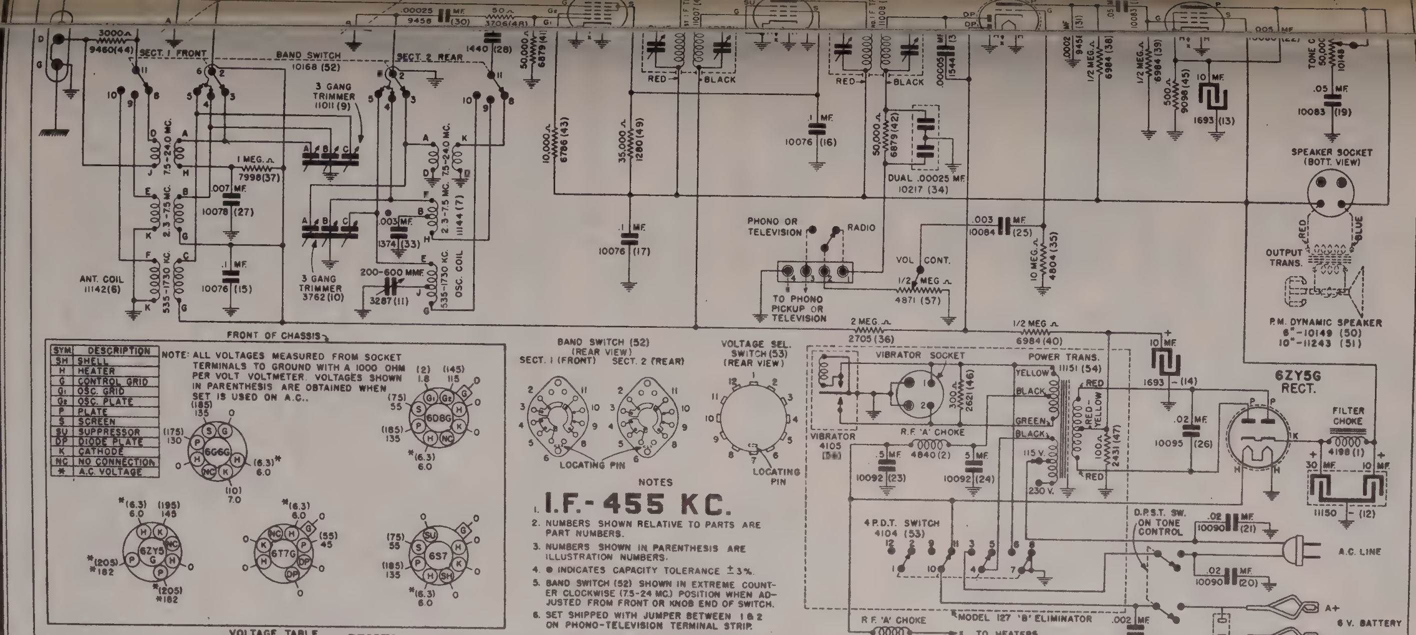
(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

DO NOT ATTACH LOW SIDE OF TEST OSCILLATOR TO RECEIVER—LEAVE UNCONNECTED.

		TEST OSCILLATOR			
	Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
	I. F. Any point where no interfering signal is received	465 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube DO NOT REMOVE CAP	Adjust the second I. F. transformer trimmers for maximum output—then adjust each of the first I.F. trimmers for maximum output.
1	Exactly 1730 K. C.	Exactly 1730 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 197X
Schematic,Voltage



SYM	DESCRIPTION
SH	SHELL
H	HEATER
G	CONTROL GRID
G_1	OSC. GRID
G_2	OSC. PLATE
P	PLATE
S	SCREEN
SU	SUPPRESSOR
DP	DIODE PLATE
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTE: ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. VOLTAGES SHOWN IN PARENTHESIS ARE OBTAINED WHEN SET IS USED ON A.C..

NOTES

1. **I.F.- 455 KC.**
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ● INDICATES CAPACITY TOLERANCE ± 3%.
5. BAND SWITCH (52) SHOWN IN EXTREME COUNTER CLOCKWISE (7.5-24 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
6. SET SHIPPED WITH JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

PART NO. 197-X

VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

W. 3M 12-39 PART NO. 197-X

Part No.			Description	List Price
1	4198	Choke	Audio Filter	$ .95
2	4840	Choke	R. F. "A"	.18
3	4840	Choke	R. F. "A"	.18
4	11007	Coil	1st I. F. Transformer	1.25
5	11008	Coil	2nd I. F. Transformer	1.25
6	11142	Coil	Antenna	.75
7	11144	Coil	Oscillator	.65
8	11012	Condenser	Tuning Two Gang	1.75
9	11011	Condenser	Trimmer Three Gang	.50
10	3762	Condenser	Trimmer Three Gang	.47
11	3287	Condenser	Padder 340-460 Mmf.	.45
12	11150	Condenser	Dry Electrolytic 10-30 Mfd. 250 Volt	1.00
13	1693	Condenser	Dry Electrolytic 10 Mfd. 25 Volt	.75
14	1693	Condenser	Dry Electrolytic 10 Mfd. 25 Volt	.75
15	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
16	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
17	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
18	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
19	10083	Condenser	Tubular .05 Mfd. 400 Volt	.19
20	10090	Condenser	Tubular .02 Mfd. 400 Volt	.19
21	10090	Condenser	Tubular .02 Mfd 400 Volt	.19
22	10080	Condenser	Tubular .005 Mfd. 400 Volt	.17
23	10092	Condenser	Tubular .5 Mfd 100 Volt	.25
24	10092	Condenser	Tubular .5 Mfd. 100 Volt	.25
25	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
26	10095	Condenser	Tubular .02 Mfd. 1000 Volt	.20
27	10078	Condenser	Tubular .007 Mfd. 200 Volt	.19
28	1440	Condenser	Mica .002 Mfd	.21
29	1440	Condenser	Mica .002 Mfd	.21
30	9458	Condenser	Mica .00025 Mfd	.21
31	9458	Condenser	Mica .00025 Mfd	.21
32	1544	Condenser	Mica .00005 Mfd	.21
33	1374	Condenser	Mica .003 Mfd. ± 3%	.24
34	10217	Condenser	Mica Dual .00025 Mfd	.21
35	4804	Resistor	Carbon 10 Megohm 1/3 Watt	.19
36	2705	Resistor	Carbon 2 Megohm 1/3 Watt	.19
37	7998	Resistor	Carbon 1 Megohm 1/3 Watt	.19
38	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
39	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
40	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
41	6879	Resistor	Carbon 50,000 Ohm 1/3 Watt	.19
42	6879	Resistor	Carbon 50,000 Ohm 1/3 Watt	.19
43	6786	Resistor	Carbon 10,000 Ohm 1/3 Watt	.19
44	9460	Resistor	Carbon 3,000 Ohm 1/3 Watt	.19
45	9089	Resistor	Carbon 500 Ohm 1/3 Watt	.19
46	2621	Resistor	Carbon 300 Ohm 1/3 Watt	.19
47	2431	Resistor	Carbon 100 Ohm 1/3 Watt	.19
48	3706	Resistor	Carbon 50 Ohm 1/3 Watt	.19
49	1280	Resistor	Carbon 35,000 Ohm 1/2 Watt	.19
50	10149	Speaker	P M. Dynamic 6 in.	5 00
51	11243	Speaker	P. M. Dynamic 10 in.	7.00
52	10168	Switch	Wave Band	1.30
53	4104	Switch	Voltage Selector	.75
54	11151	Transformer	Power, 6 Volt - 115-230 Volt 50-60 Cycle	3.00
55	10148	Tone Control	With On-Off Switch	.90
56	4105	Vibrator		3.50
57	4871	Volume Control		.80

MISCELLANEOUS PARTS

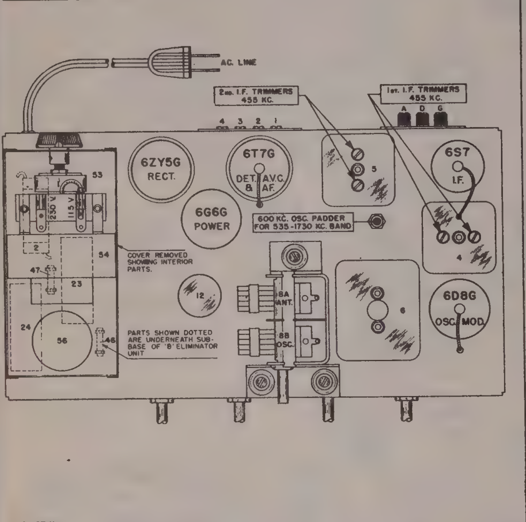
		Description	List
11304	Bulb	6-8 Volt .150 Amp. Dial Light No. 47 Bayonet Base	.10
2262	Clamp	Battery Clamp	.17
11017	Dial Shaft	Drive Shaft	.11
8184	Dial Cord	24 in. of 18 lb. Drive Cord	.15
11693	Dial Spring	Cord Tension Spring	.04
11022	Dial Scale	Calibrated Scale	.60
11025	Dial Pointer	Indicator Needle	.16
11246	Dial Indicator	Band Indicator	.12
11198	Escutcheon	For Dial with Crystal (Mtg. Screw Holes in Corners)	1.25
11199	Escutcheon	For Dial with Crystal (with Mtg. Holes Away from Corners)	1.25
10030	Knob	Marked "Tuning"	.12
10032	Knob	Marked "Volume"	.12
10068	Knob	Marked "Tone-On-Off"	.12
10069	Knob	Marked "Band Switch"	.12

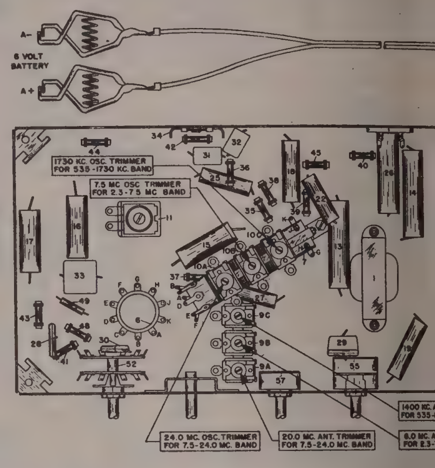
SENTINEL RADIO CORP.

SENTINEL MODEL 197X

TWO BAND—FIVE TUBE

115 Volt A. C. or 6 Volt Battery Operated Superheterodyne Receiver


AC. LINE
2nd. I.F. TRIMMERS 455 KC.
1st. I.F. TRIMMERS 455 KC.
A D G
4 3 2 1
6ZY5G RECT.
6T7G DET. A.V.C. B. A.F.
6S7 I.F.
6G6G POWER
600 KC. OSC. PADDER FOR 535-1730 KC. BAND
6D8G OSC. MOD.
8A ANT.
8B OSC.
COVER REMOVED SHOWING INTERIOR PARTS.
PARTS SHOWN DOTTED ARE UNDERNEATH SUB-BASE OF 'B' ELIMINATOR UNIT
230 V
115 V
53
54
2
47
23
24
56
46
12
5
4
6
NO-197-X


A-
6 VOLT BATTERY
A+
1730 KC. OSC. TRIMMER FOR 535-1730 KC. BAND
7.5 MC OSC TRIMMER FOR 2.3-7.5 MC BAND
24.0 MC. OSC. TRIMMER FOR 7.5-24.0 MC. BAND
20.0 MC. ANT. TRIMMER FOR 7.5-24.0 MC. BAND
1400 KC. A
FOR 535-
6.0 MC. A
FOR 2.3-

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locatio of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator: consisting of:	Attach output of test oscillator to:	
I.F. ALIGNMENT use any band position		Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6D8G tube. Do not remove cap	Adjust each of the second I.F. transforme trimmers for maximum output—then adjust each of the first I.F. transforme trimmers for maximum output.
1730 TO 540 K.C. BAND	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer fo maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 140 K.C. antenna trimmer for maximum outpu
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 60 K.C. oscillator padder for maximum outpu
2.3 TO 7.5 M.C. BAND	1	Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer fo maximum output.
	2	Approx. 6. M.C.	Approx. 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust M.C. antenna trimmer for maximum outpu
7.5 TO 24 M.C. BAND	1	Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed back off trimmer to minimum capacity then screw down trimmer (add capacity until the second peak—which is the proper one to use is tuned in.
	2	Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust M.C. antenna trimmer for maximum output

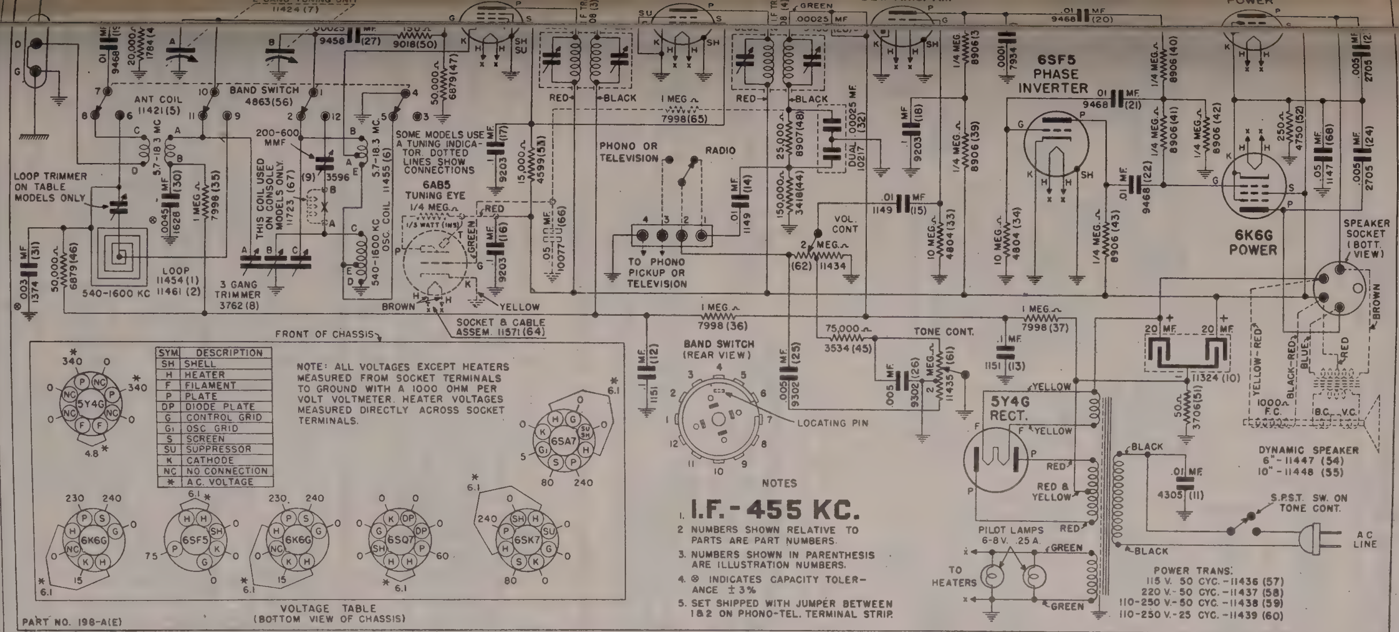
THIS RECEIVER CAN BE OPERATED WITH A SIX VOLT STORAGE BATTERY OF FROM 115 TO 230 VOLT 50 TO 60 CYCLE CURRENT.

FOR AC OPERATION obtain from the Electric Supply Company the voltage and current rating of the local Electric Service and — — — remove top cover from power unit and insert metal tipped lead into proper terminal socket that will be found underneath top cover of power unit. Place voltage selector switch knob in "115—230" positon and plug set power cord plug into house lighting outlet.

FOR SIX VOLT BATTERY OPERATION attach battery cable leads to six volt storage battery and place voltage selector switch knob to "6 V."

SENTINEL RADIO CORP

MODELS 198A,198AE Schematic,Voltage


6SF5 PHASE INVERTER
6K6G POWER
6AB5 TUNING EYE
5Y4G RECT.
ANT COIL 11421(5)
BAND SWITCH 4863(56)
LOOP 11454 (1) 11461 (2)
540-1600 KC
LOOP TRIMMER ON TABLE MODELS ONLY
3 GANG TRIMMER 3762 (8)
THIS COIL USED ON CONSOLE MODELS ONLY 11723 (67)
OSC. COIL 11455 (6)
SOME MODELS USE A TUNING INDICATOR. DOTTED LINES SHOW CONNECTIONS
SOCKET & CABLE ASSEM. 11571(64)
PHONO OR TELEVISION
RADIO
TO PHONO PICKUP OR TELEVISION
VOL. CONT
TONE CONT.
SPEAKER SOCKET (BOTT. VIEW)
DYNAMIC SPEAKER 6"-11447 (54) 10"-11448 (55)
S.P.S.T. SW. ON TONE CONT.
AC LINE
PILOT LAMPS 6-8V. .25 A.
TO HEATERS
POWER TRANS.
115 V. 50 CYC. -11436 (57)
220 V.-50 CYC. -11437 (58)
110-250 V.-50 CYC. -11438 (59)
110-250 V.-25 CYC. -11439 (60)
FRONT OF CHASSIS
BAND SWITCH (REAR VIEW)
LOCATING PIN
VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)
PART NO. 198-A(E)

SYM	DESCRIPTION
SH	SHELL
H	HEATER
F	FILAMENT
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
G1	OSC. GRID
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

NOTES

1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%
5. SET SHIPPED WITH JUMPER BETWEEN 1&2 ON PHONO-TEL. TERMINAL STRIP.

W. 4M 11-39 PART NO. 198AL-E

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Illus. No.	Part No.		Description	List Price
1	11454	Antenna	Loop (For Table Model)	$2.00
2	11461	Antenna	Loop (For Console Model)	3.50
3	11008	Coil	1st I.F. Transformer	1.25
4	11008	Coil	2nd I.F. Transformer	1.25
5	11421	Coil	Antenna—Short Wave	1.25
6	11455	Coil	Oscillator Two Band	1.35
7	11424	Condenser	Tuning—Two Gang—With Push Button Mech.	4.00
8	3762	Condenser	Trimmer Three Gang	.47
9	3596	Condenser	Padding 340-460 Mmf	.44
10	11324	Condenser	Dry Electrolytic 20 Mfd. - 20 Mfd. 450 Volt D.C Wkg	1.25
11	4305	Condenser	Tubular (Shielded) .01 Mfd. 200 V.	.30
12	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
13	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
14	1149	Condenser	Tubular .01 Mfd. 200 Volt	.17
15	1149	Condenser	Tubular .01 Mfd. 200 Volt	.17
16	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
17	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
18	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
19	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
20	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
21	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
22	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
23	2075	Condenser	Tubular .005 Mfd. 600 Volt	.18
24	2075	Condenser	Tubular .005 Mfd. 600 Volt	.18
25	9302	Condenser	Mica .005 Mfd	.55
26	9302	Condenser	Mica .005 Mfd	.55
27	9458	Condenser	Mica .00025 Mfd	.21
28	9458	Condenser	Mica .00025 Mfd	.21
29	7934	Condenser	Mica .0001	.21
30	1628	Condenser	Mica .0045 Mfd. ± 3%	.24
31	1374	Condenser	Mica .003 Mfd. ± 3%	.24
32	10217	Condenser	Mica Dual .00025 Mfd	.21
33	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
34	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
35	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
36	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
37	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
38	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
39	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
40	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
41	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
42	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
43	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
44	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
45	3534	Resistor	Carbon 75,000 Ohm ⅓ Watt	.19
46	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
47	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
48	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
49	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
50	9018	Resistor	Carbon 150 Ohm ⅓ Watt	.19
51	3706	Resistor	Carbon 50 Ohm ⅓ Watt	.19
52	4750	Resistor	Carbon 250 Ohm 1 Watt	.22
53	4599	Resistor	Carbon 15,000 Ohm 1½ Watt	.22
54	11447	Speaker	Electro-Dynamic 6 in	4.50
55	11448	Speaker	Electro-Dynamic 10 in	7.00
56	4863	Switch	Band Selector	.60
57	11436	Transformer	Power 115 Volt 50 Cycle	3.50
58	11437	Transformer	Power 220 Volt 50 Cycle	4.25
59	11438	Transformer	Power 110-250 Volt 50 Cycle	6.75
60	11439	Transformer	Power 110-250 Volt 25 Cycle	8.75
61	11435	Tone Control	With S.P.S.T. Switch	.90
62	11434	Volume Control		.70
64	11571	Cable Assembly	Tuning Eye Cable & Socket Assembly	.65
65	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
66	10077	Condenser	Tubular .05 Mfd. 400 Volt	.19
67	11723	Coil	Oscillator Series (Console Only)	.80
68	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19

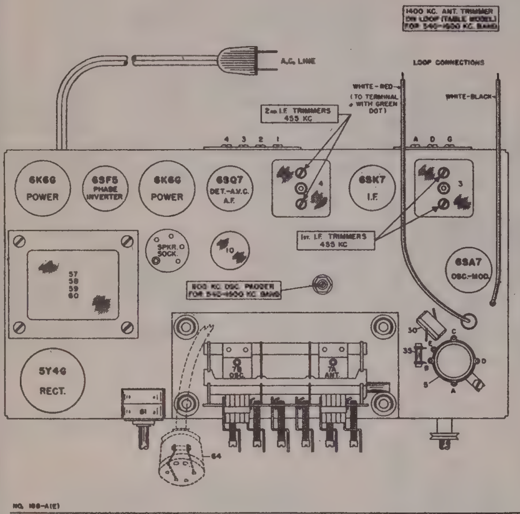
MISCELLANEOUS PARTS

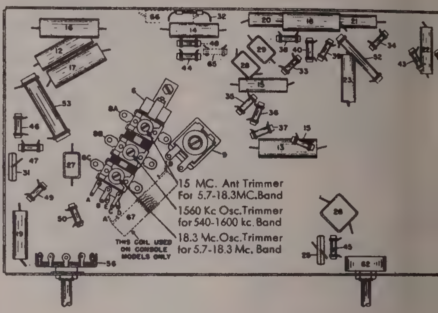
Part No.		Description	List Price
10292	Bulb	Pilot Lamp 6-8 Volt .25 Amp. Type No. 44	.10
11176	Dial Pointer		.10
11426	Dial Assembly	Drive Assembly Less Scale & Gear	2.00
11185	Dial Gear	Drive Shaft with Rubber Sleeve	.35
8184	Dial Cord	12 in. of 18 Lb. Drive Cord	.10
11197	Dial Spring	Drive Shaft Tension Spring	.16
11430	Dial Scale	Calibrated Scale	.40
11450	Escutcheon	For Dial	1.25
11449	Escutcheon	For Dial	1.50
11452	Escutcheon	Push Button Used with No. 11450 Dial Escutcheon	.35
11451	Escutcheon	Push Button Used with No. 11449 Dial Escutcheon	.35
10030	Knob	Marked "Tuning"	.12
10068	Knob	Marked "Off-On Tone"	.12
10069	Knob	Marked "Band Switch"	.12
10032	Knob	Marked "Volume"	.12
11202	Knob	Push Button	.08

MODELS 198A,198AE
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

TWO BAND—SEVEN and EIGHT TUBE
A. C. Operated Superheterodyne Receiver

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9B
8C
67
A
A'
15 MC. Ant Trimmer For 5.7-18.3MC.Band
1560 Kc Osc.Trimmer for 540-1600 kc. Band
18.3 Mc.Osc.Trimmer for 5.7-18.3 Mc. Band
THIS COIL USED ON CONSOLE MODELS ONLY
19
56
26
25
45
62

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 or 1560 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop.

Couple test oscillator to receiver loop by:

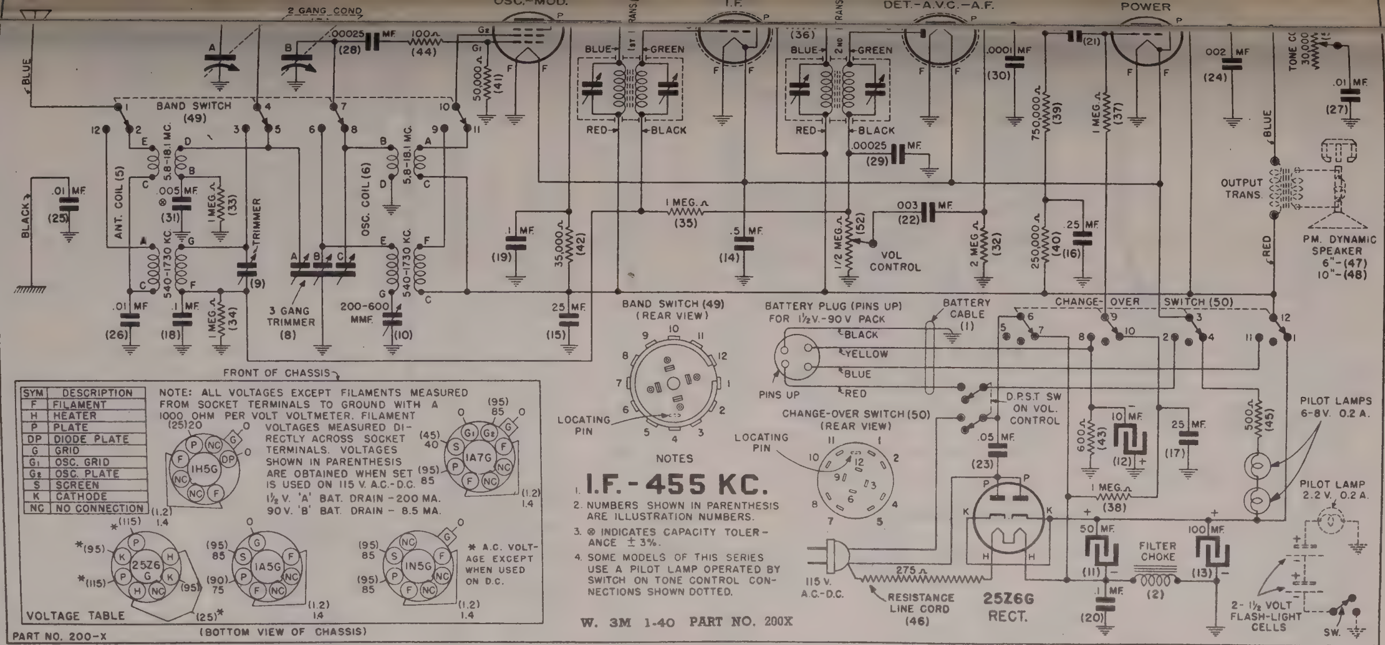
(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locati of trimmers mentioned below:
		Adjust test Oscillator frequency to	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6SA7 tube. Do not remove cap.	Adjust each of the second I.F. transform trimmers for maximum output—then adju each of the first I.F. transformer trimme for maximum output.
1560 to 540 K.C. Band	1 Exactly 1500 K.C.	Exactly 1560 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1530 K. C. oscillator trimmer f maximum output
	2 Approx. 1400 K.C. Table Model only.	Approx. 1400 K.C. Table Model Only	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 14 K.C. antenna trimmer for maximum outpu
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 6 K.C. oscillator padder for maximum outpu
5.7 to 18.3 M. C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	Use Small Loop to couple test oscillator to receiver loop	Adjust 18.3 M.C. oscillator trimmer f maximum output—be sure to use prope peak. If more than one peak is notice back off trimmer to minimum capacit then screw down trimmer (add capacity until the second peak—which is the prope one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M. C.	400 Ohm	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust M.C. antenna trimmer for maximum outp

SENTINEL RADIO CORP.

MODEL 200X
Schematic, Voltage



SYM	DESCRIPTION
F	FILAMENT
H	HEATER
P	PLATE
DP	DIODE PLATE
G	GRID
G_1	OSC. GRID
G_2	OSC. PLATE
S	SCREEN
K	CATHODE
NC	NO CONNECTION

NOTE: ALL VOLTAGES EXCEPT FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS. VOLTAGES SHOWN IN PARENTHESIS ARE OBTAINED WHEN SET IS USED ON 115 V. A.C.-D.C.

1½ V. 'A' BAT. DRAIN - 200 MA.
90 V. 'B' BAT. DRAIN - 8.5 MA.

NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
3. ⊗ INDICATES CAPACITY TOLERANCE ± 3%.
4. SOME MODELS OF THIS SERIES USE A PILOT LAMP OPERATED BY SWITCH ON TONE CONTROL CONNECTIONS SHOWN DOTTED.

W. 3M 1-40 PART NO. 200X

PARTS LIST

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Illus. No.	Part No.		Description	List Price
1	4969	Cable	Battery, Assembly with Four Prong Plug	$0.35
2	11501	Choke	Filter	1.75
3	11539	Coil	1st I.F. Transformer	1.50
4	10834	Coil	2nd I.F. Transformer	1.45
5	11089	Coil	Antenna	.65
6	11090	Coil	Oscillator	.60
7	11012	Condenser	Tuning Two Gang	1.75
8	3762	Condenser	Trimmer Three Gang	.47
9	1597	Condenser	Trimmers 3-35 Mmf.	.21
10	3287	Condenser	Padder 340-460 Mmf.	.45
11	11502	Condenser	Tubular Dry Electrolytic 50 Mfd. 150 Volt D. C.	1.10
12	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt D. C.	.75
13	11508	Condenser	Dry Electrolytic 100 Mfd. 150 Volt D. C.	1.10
14	2131	Condenser	Tubular .5 Mfd. 200 Volt	.55
15	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
16	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
17	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
18	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
19	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
20	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
21	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
22	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
23	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
24	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19
25	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
26	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
27	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
28	9458	Condenser	Mica .00025 Mfd.	.21
29	9458	Condenser	Mica .00025 Mfd.	.21
30	7934	Condenser	Mica .0001 Mfd.	.21
31	10892	Condenser	Mica .005 Mfd. ± 3%	.30
32	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
33	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
34	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
35	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
36	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
37	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
38	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
39	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
40	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
41	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
42	1618	Resistor	Carbon 35,000 Ohm ⅓ Watt	.19
43	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
44	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
45	11504	Resistor	Wire Wound (Vit. Enam.) 500 Ohm	.30
46	11505	Resist. Cord	115 Volt Line Cord	.90
47	4983	Speaker	P. M. Dynamic 6 in.	4.25
48	11235	Speaker	P. M. Dynamic 10 in.	7.50
49	4863	Switch	Wave Band	.60
50	11500	Switch	Change-Over	.80
51	11098	Tone Control	With Dial Light Switch	.80
52	10441	Volume Control	With On-Off Switch	.95

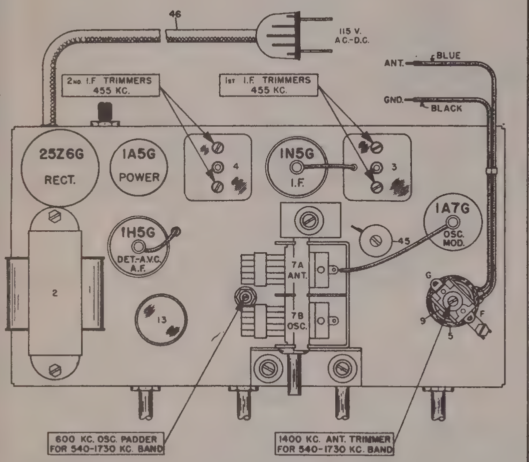
MISCELLANEOUS PARTS

Illus. No.	Part No.		Description	List Price
	8184	Dial Cord	24 in. of 18 Lb. Drive Cord	.15
	11017	Dial Shaft	Drive Shaft	.11
	11094	Dial Scale	Calibrated Scale	.45
	11107	Dial Indicator	On-Off Dial Indicator	.20
	4832	Dial Spring	Cord Tension Spring	.06
	10777	Dial Pointer		.10
	11267	Escutcheon	With Crystal for Dial (Uses Wood Screws for Mtg.)	1.00
	11102	Escutcheon	With Crystal for Dial (Uses Four Metal Clips for Mtg.)	1.00
	10030	Knob	Marked 'Tuning"	.12
	10069	Knob	Marked "Band Switch"	.12
	11871	Knob	Marked "Off-Volume"	.12
	10033	Knob	Marked 'Tone"	.12
	11506	Knob	For Voltage Selector Switch	.12
	10884	Plate	AC-DC—"Off-Batt." Indicator	.10
	4978	Plug	Four Prong Battery Plug	.10

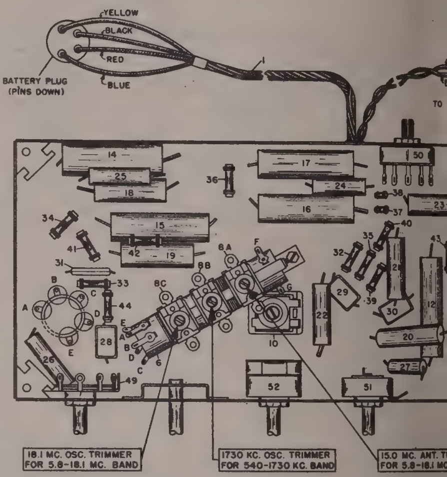
MODEL 200X
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

Five Tube - Two Band
Battery or 110 Volts, DC-AC 50-60 Cycles
Superheterodyne Receiver



NO. 200-X



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

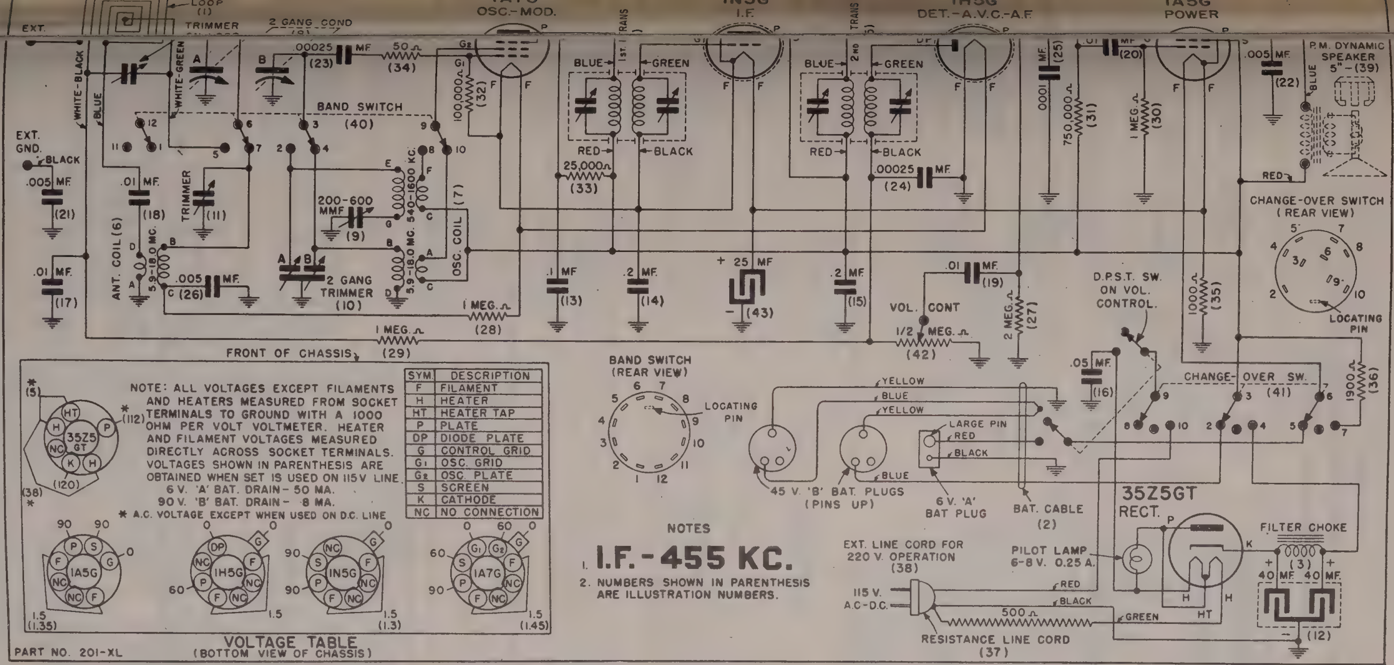
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. Alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High Side to grid cap of 1A7G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.8 to 18.1 M.C. Band	1 Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 201XL
Schematic, Voltage



NOTE: ALL VOLTAGES EXCEPT FILAMENTS AND HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS. VOLTAGES SHOWN IN PARENTHESIS ARE OBTAINED WHEN SET IS USED ON 115V LINE.
6 V. 'A' BAT. DRAIN - 50 MA.
90 V. 'B' BAT. DRAIN - 8 MA.
* A.C. VOLTAGE EXCEPT WHEN USED ON D.C. LINE

SYM.	DESCRIPTION
F	FILAMENT
H	HEATER
HT	HEATER TAP
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
G₁	OSC. GRID
G₂	OSC. PLATE
S	SCREEN
K	CATHODE
NC	NO CONNECTION

NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11677	Antenna	Loop	$1.10
2	11673	Cable	Battery With 2-3 Prong "B" Plugs and 1-2 Prong "A" Plug	.60
3	10832	Choke	Filter	.85
4	4791	Coil	1st I.F. Transformer	1.15
5	4792	Coil	2nd I.F. Transformer	1.15
6	11664	Coil	Antenna	.85
7	11665	Coil	Oscillator	.65
8	11660	Condenser	Tuning Two Gang	1.75
9	3287	Condenser	Padder 340-460 Mmf.	.45
10	11395	Condenser	Trimmer Dual 3-35 Mmf.	.30
11	1597	Condenser	Trimmer 3-45 Mmf.	.21
12	11493	Condenser	Dry Electrolytic 40-40 Mfd. 150 Volt D. C. Wkg.	1.00
13	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
15	10086	Condenser	Tubular .2 Mfd. 200 Volt	.20
16	10077	Condenser	Tubular .05 Mfd. 200 Volt	.19
17	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
18	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
19	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
20	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
21	10080	Condenser	Tubular .005 Mfd. 400 Volt	.17
22	10080	Condenser	Tubular .005 Mfd. 400 Volt	.17
23	9458	Condenser	Mica .00025 Mfd.	.21
24	9458	Condenser	Mica .00025 Mfd.	.21
25	7934	Condenser	Mica .0001 Mfd.	.21
26	9302	Condenser	Mica .005 Mfd. ± 3%	.55
27	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
28	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
29	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
30	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
31	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
32	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
33	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
34	3706	Resistor	Carbon 50 Ohm ⅓ Watt	.19
35	11694	Resistor	Wire Wound 1000 Ohm 1½ Watt	.30
36	11672	Resistor	Wire Wound 1900 Ohm	.75
37	10851	Resistor	Resistance Line Cord	.90
38	10962	Resistor	220 Volt Extension Resistance Line Cord	1.50
39	11680	Speaker	P. M. Dynamic 5 in.	3.75
40	11661	Switch	Wave	.90
41	11666	Switch	Change-Over	.80
42	10441	Volume Control	With D.P.S.T. Switch	.95
43	9196	Condenser	Dry Electrolytic 25 Mfd. 25 Volt	.50

MISCELLANEOUS PARTS

Part No.		Description	List Price
10292	Bulb	6-8 Volt .250 Ampere Type No. 44	.10
11667	Dial Frame	Frame Mechanism Less Scale	.85
11669	Dial Scale		.50
11648	Dial Indicator	"On-Off" Indicator	.20
8184	Dial Cord	14 in. of 18 Lb. Drive Cord	.10
10777	Dial Pointer	Indicator	.16
11519	Escutcheon	For Dial With Crystal	.75
10853	Escutcheon	For Dial With Crystal	.65
4958	Knob	Marked "Tuning"	.12
4959	Knob	Marked "Off-Volume"	.12
4961	Knob	Marked "Band Switch"	.12
11642	Plug	3 Prong "B" Battery	.10
11046	Plug	2 Prong "A" Battery	.08
10884	Plate	Marked "AC-DC"—"Off"—"Batt."	.10

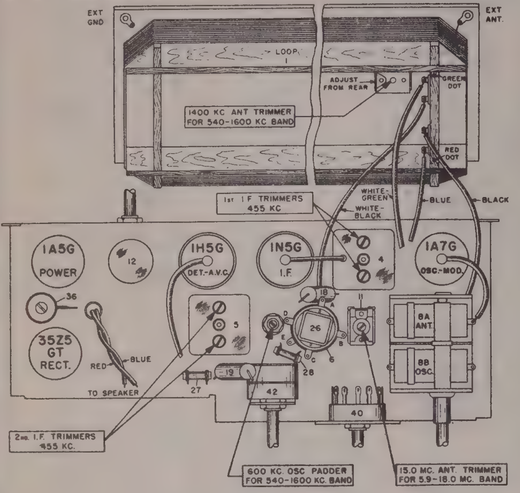
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

W. 3M 1-40 PART NO. 201XL

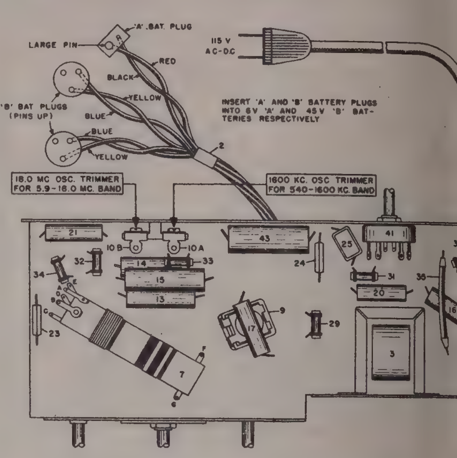
MODEL 201XL
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

Two Band
Battery or 110 Volts, DC-AC 50-60 Cycles
Superheterodyne Receiver



NO. 201-XL


'A' .BAT. PLUG
LARGE PIN
RED
BLACK
YELLOW
'B' BAT PLUGS (PINS UP)
BLUE
BLUE
YELLOW
115 V AC-DC
INSERT 'A' AND 'B' BATTERY PLUGS INTO 6V 'A' AND 45V 'B' BATTERIES RESPECTIVELY
2
18.0 MC OSC. TRIMMER FOR 5.9-18.0 MC. BAND
1600 KC. OSC TRIMMER FOR 540-1600 KC. BAND
21
10 B
10 A
43
25
41
32
33
14
34
15
13
24
31
20
36
16
23
9
17
29
3
7
6
F
A
B
C
D
E
G

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop.

Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

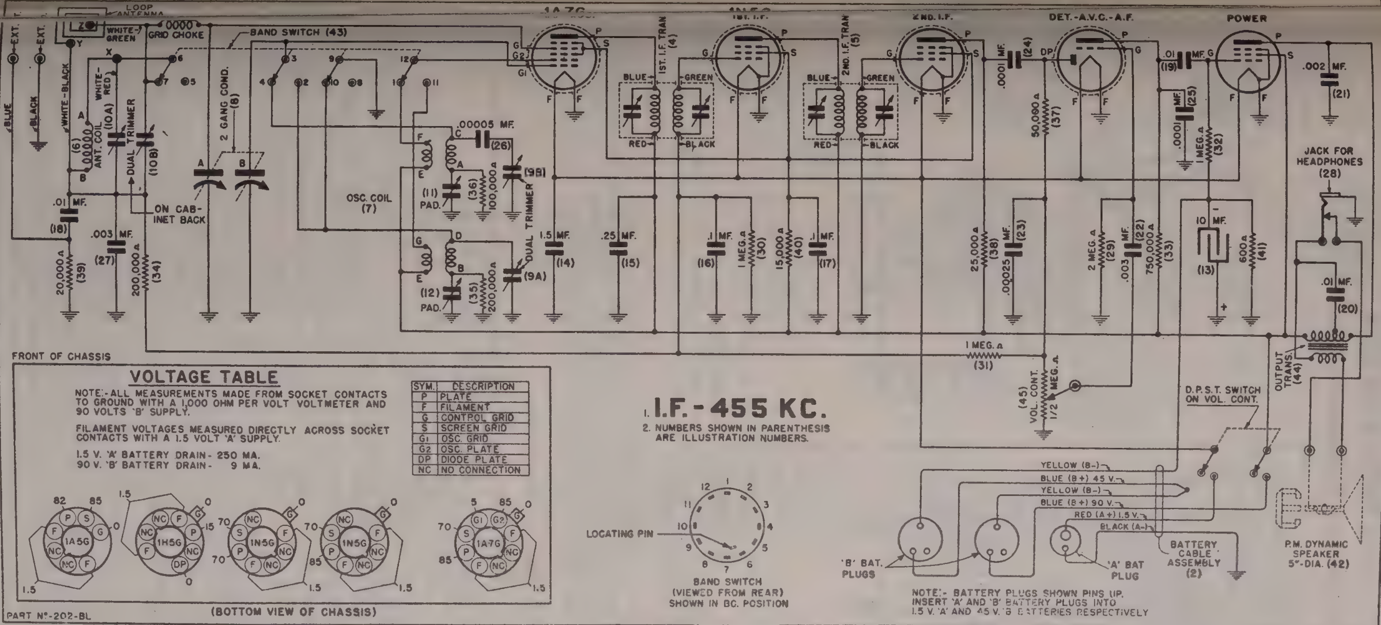
(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for locatio of trimmers mentioned below:
		Adjust test Oscillator frequency to	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 KC.	.02 Mfd. condenser	High side to grid cap of 1A7 G tube. Do not remove cap.	Adjust each of the second I.F. transforme trimmers for maximum output—then adjus each of the first I.F. transformer trimmers for maximum output.
1600 to 540 K.C. Band	1 Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1600 K. C. oscillator trimmer fo maximum output
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 140 K.C. antenna trimmer for maximum output
	3 Approx. 600 K.C.	Approx. 600 K.C	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 60 K.C. oscillator padder for maximum output
5.9 to 18 M.C. Band	1 Exactly 18 M. C.	Exactly 18 M. C.	400 Ohm carbon resistor	High side to "Ext. Ant." Lug. Low side to "Ext. GND" Lug	Adjust 18 M. C. oscillator trimmer fo maximum output—be sure to use prope peak. If more than one peak is noticed back off trimmer to minimum capacity then screw down trimmer (add capacity until the second peak—which is the prope one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to "Ext. Ant." Lug. Low side to "Ext. GND" Lug	While rocking gang condenser adjust 1 M.C. antenna trimmer for maximum outpu

SENTINEL RADIO CORP.

MODEL 202BL
Schematic,Voltage

NAME-WIRING DIAGRAM FOR MODEL 202-BL RECEIVER



VOLTAGE TABLE

NOTE:-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER AND 90 VOLTS 'B' SUPPLY.

FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET CONTACTS WITH A 1.5 VOLT 'A' SUPPLY.

1.5 V. 'A' BATTERY DRAIN- 250 MA.
90 V. 'B' BATTERY DRAIN- 9 MA.

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

(BOTTOM VIEW OF CHASSIS)

1. I.F.-455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

BAND SWITCH
(VIEWED FROM REAR)
SHOWN IN BC. POSITION

NOTE:- BATTERY PLUGS SHOWN PINS UP. INSERT 'A' AND 'B' BATTERY PLUGS INTO 1.5 V. 'A' AND 45 V. 'B' BATTERIES RESPECTIVELY

PARTS LIST

No.	Part		Description	Price List
1	11654	Antenna	Loop	$1.75
2	11644	Cable	For Battery with 2-3 prong "B" and 1-2 prong "A" plugs	.75
3	11606	Choke	Grid	.30
4	10967	Coil	1st I. F. Transformer	1.10
5	10967	Coil	2nd I. F. Transformer	1.10
6	11602	Coil	Antenna	.75
7	11603	Coil	Oscillator	.60
8	11252	Condenser	Tuning Two Gang	1.70
9A	11613	Condenser	Trimmer Dual 50-70 Mmf	.33
9B	11613	Condenser	Trimmer Dual 50-70 Mmf	.33
10A	11355	Condenser	Trimmer Dual	.30
10B	11655	Condenser	Trimmer Dual	.30
11	3287	Condenser	Padder 340-460 Mmf	.45
12	4067	Condenser	Padder 160-200 Mmf	.28
13	1693	Condenser	Dry Electrolytic 10 Mfd. 25 Volt	.75
14	11659	Condenser	Flat Type 1.5 Mfd. 100 Volt	.30
15	10089	Condenser	Tubular .25 Mfd. 200 Volt	.23
16	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
17	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
18	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
19	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
20	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
21	10079	Condenser	Tubular .002 Mfd. 400 Volt	.17
22	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
23	9458	Condenser	Mica .00025 Mfd.	.21
24	7934	Condenser	Mica .0001 Mfd.	.21
25	7934	Condenser	Mica .0001 Mfd.	.21
26	1544	Condenser	Mica .00005 Mfd.	.21
27	1374	Condenser	Mica .003 Mfd. ± 3%	.24
28	11646	Phono Jack		.50
29	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
30	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
31	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
32	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
33	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
34	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19
35	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19
36	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
37	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
38	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
39	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
40	9385	Resistor	Carbon 15,000 Ohm ⅓ Watt	.19
41	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
42	10781	Speaker	5" P.M. Dynamic Less Transformer	3.25
43	11632	Switch	Wave	.85
44	11601	Transformer	Output	.90
45	11631	Volume Control	With D.P.S.T. Switch	.80

MISCELLANEOUS PARTS

Part		Description	Price
11608	Dial Mechanism	Complete Dial Assembly	2.25
11610	Dial Scale	Calibrated Scale	.50
8184	Dial Cord	14" of 18 Lb. Drive Cord	.10
11693	Dial Spring	Cord Tension Spring	.04
10777	Dial Pointer	Dial Needle	.16
11648	Dial Indicator	On-Off Indicator	.20
10853	Escutcheon	For Dial with Crystal	.65
11519	Escutcheon	For Dial with Crystal	.75
4958	Knob	Marked "Tuning"	.12
4959	Knob	Marked "Off-Volume"	.12
4961	Knob	Marked "Band Switch"	.12
11642	Plug	3 Prong for "B" Battery	.10
10351	Plug	2 Prong for "A" Battery	.10

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

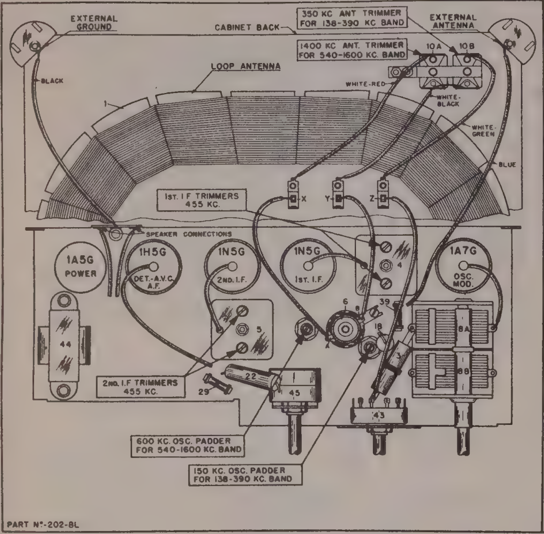
W. 3M 3-40 Part No. 202BL

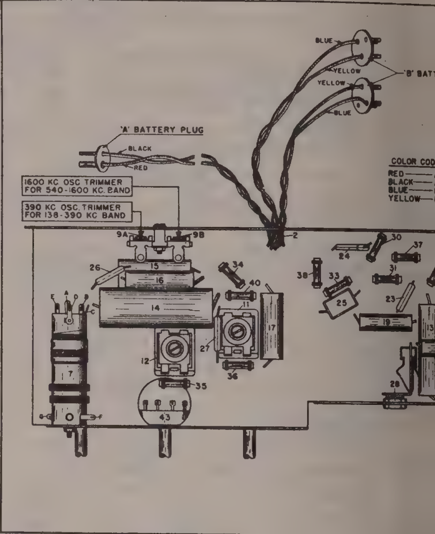
SENTINEL RADIO CORP.

SENTINEL MODEL 202BL

TWO BAND—FIVE TUBE

Battery Operated Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting trimmers, do not connect test oscillator to loop.

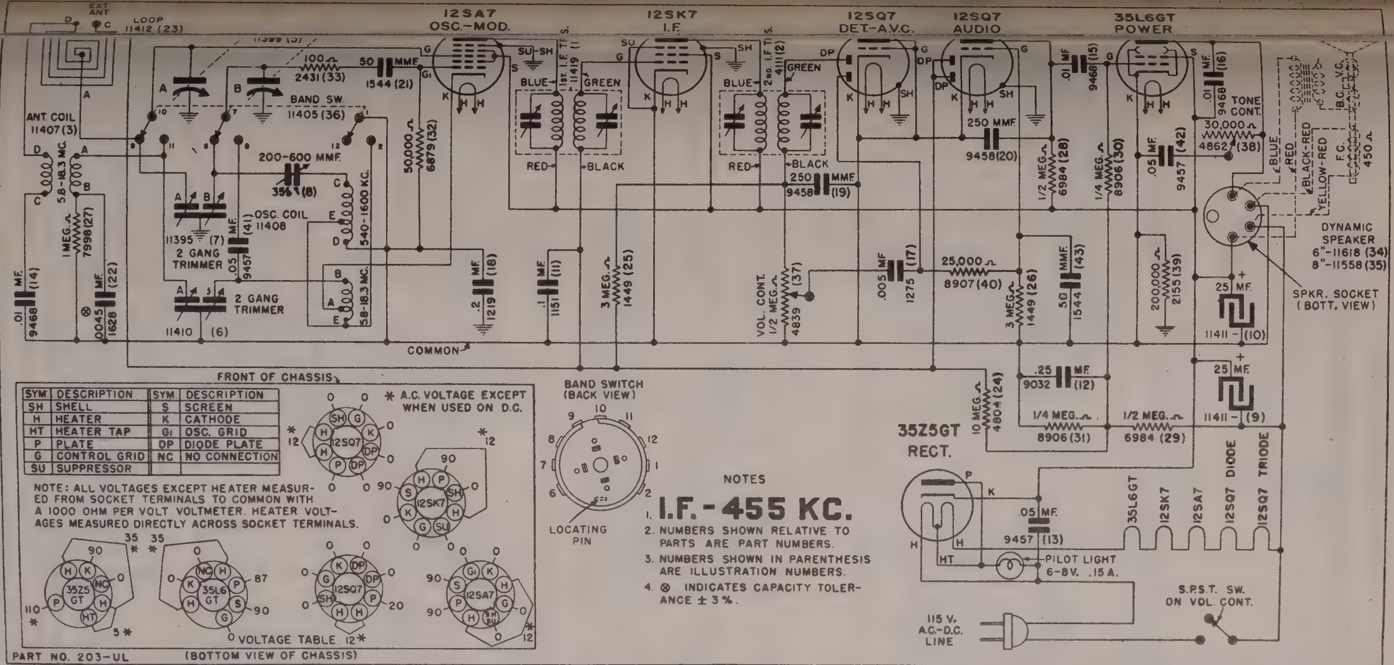
Couple test oscillator to receiver loop by:

(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

BE SURE TO ALIGN 138-390 K.C. BAND FIRST—ALWAYS REALIGN 1600-540 K.C. BAND AFTERWARDS.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for loc of trimmers mentioned below:
		Adjust test Oscillator frequency to	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 KC.	.02 Mfd. condenser	High side to grid of 1A7G Tube Do not remove cap.	Adjust each of the second I.F. transfo trimmers for maximum output—then ac each of the first I.F. transformer trimm for maximum output.
138 to 390 K. C. Band	1 Exactly 390 K.C.	Exactly 390 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 390 K.C. oscillator trimmer maximum output.
	2 Approx. 350 K.C.	Approx. 350 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 350 K.C. antenna trimmer f maximum output.
	3 Approx. 150 K.C.	Approx. 150 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust K.C. oscillator padder for maximun response.
1600 to 540 K.C. Band	1 Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1600 K. C. oscillator trimmer maximum output
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust K.C. antenna trimmer for maximum ou
	3 Approx. 600 K.C.	Approx. 600 K.C	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust K.C. oscillator padder for maximum ou



SYM.	DESCRIPTION	SYM.	DESCRIPTION
SH	SHELL	S	SCREEN
H	HEATER	K	CATHODE
HT	HEATER TAP	G1	OSC. GRID
P	PLATE	DP	DIODE PLATE
G	CONTROL GRID	NC	NO CONNECTION
SU	SUPPRESSOR		

NOTE: ALL VOLTAGES EXCEPT HEATER MEASURED FROM SOCKET TERMINALS TO COMMON WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

NOTES

1. **I.F. - 455 KC.**
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11419	Coil	1st I.F. Transformer	$1.25
2	4111	Coil	2nd I.F. Transformer	1.25
3	11407	Coil	Antenna	.65
4	11408	Coil	Oscillator	.65
5	11399	Condenser	Two Gang Tuner Unit (4 Button Mechanical)	3.75
6	11410	Condenser	Trimmer Two Gang	.30
7	11395	Condenser	Trimmer Dual	.30
8	3596	Condenser	Padding 200-600 Mmf.	.44
9	11411	Condenser	Dry Electrolytic 25 Mfd. 200 Volt	.60
10	11411	Condenser	Dry Electrolytic 25 Mfd. 200 Volt	.60
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
13	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
14	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
15	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
16	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
17	1275	Condenser	Tubular .005 Mfd. 400 Volt	.18
18	1219	Condenser	Tubular .2 Mfd. 400 Volt	.27
19	9458	Condenser	Mica .00025 Mfd.	.21
20	9458	Condenser	Mica .00025 Mfd.	.21
21	1544	Condenser	Mica .00005 Mfd.	.21
22	1628	Condenser	Mica .0045 Mfd. ± 3%	.24
23	11412	Antenna	Loop	.80
24	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
25	1449	Resistor	Carbon 3 Megohm ⅓ Watt	.19
26	1449	Resistor	Carbon 3 Megohm ⅓ Watt	.19
27	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
28	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
30	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
31	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
32	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
33	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
34	11618	Speaker	Electro-Dynamic 6 in.	4.25
35	11558	Speaker	Electro-Dynamic 8 in.	5.50
36	11405	Switch	Band	.65
37	4839	Volume Control	Withon-off Switch	.85
38	4862	Tone Control		.65
39	2155	Resistor	Carbon 200,000 Ohm ⅓ Watt	.19
40	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
41	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
42	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
43	1544	Condenser	Mica .00005 Mfd.	.21

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

MISCELLANEOUS PARTS

Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Mazda Type No. 47 Bayonet Base	.10
4398	Call Letters	Set of ⅜ in. Call Letters	.25
11547	Dial Scale	Calibrated Scale	.50
4761	Dial Shaft	Drive Shaft	.15
8184	Dial Cord	Drive Cord 12 in. of 18 lb. Drive Cord	.10
11193	Dial Pointer	For Dial	.16
11140	Escutcheon	For Dial—With Crystal	1.00
11139	Escutcheon	For Dial—With Crystal	1.00
11556	Escutcheon	For Pushbuttons	.40
11557	Escutcheon	For Pushbuttons	.40
4958	Knob	Marked "Tuning"	.12
4959	Knob	Marked "Off-Volume"	.12
4960	Knob	Marked "Tone"	.12
4961	Knob	Marked "Band Switch"	.12
11559	Knob	Pushbutton	.10

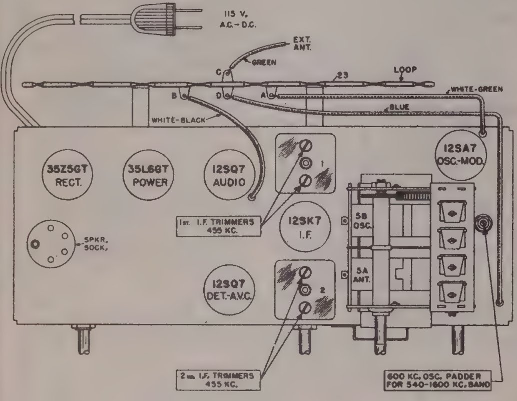
W. 4M 12-39 Part No. 203UL

MODEL 203UL
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

TWO BAND—SIX TUBE

A. C.—D. C. Operated Superheterodyne Receiver



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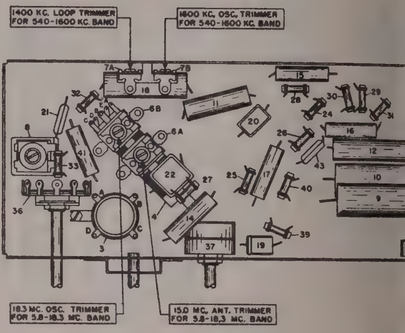


ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise receiver will be insensitive and the di calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is require on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of th dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN TH SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillat to loop.

Couple test oscillator to receiver loop by:

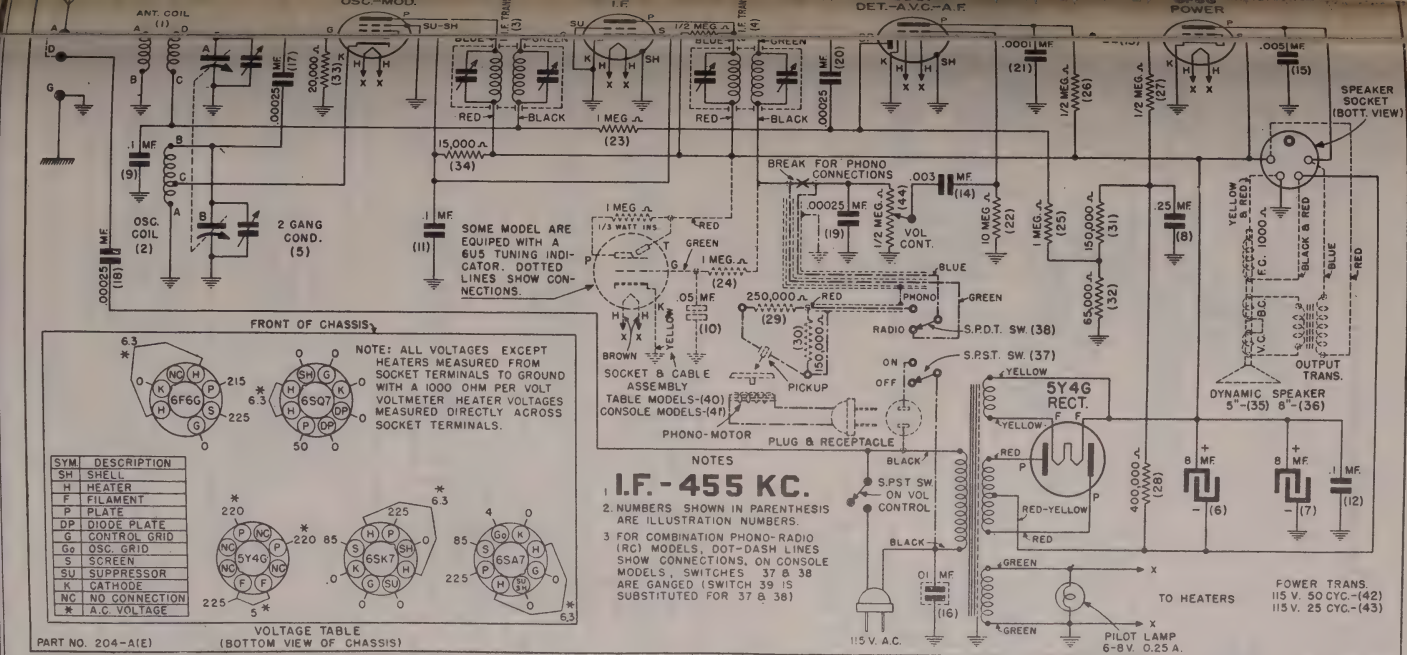
(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach acros output of test oscillator.

(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for l of trimmers mentioned below
		Adjust test Oscillator frequency to	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 KC.	.02 Mfd. condenser	High side to grid cap of 12SA7 tube. Do not remove cap.	Adjust each of the second I.F. trans trimmers for maximum output—then each of the first I.F. transformer tri for maximum output.
1600 to 540 K.C. Band	**1** Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1600 K. C. oscillator trimm maximum output
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adju K.C. antenna trimmer for maximum
	3 Approx. 600 K.C.	Approx. 600 K.C	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adju K.C. oscillator padder for maximum
5.8 to 18.3 M.C. Band	**1** Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Green Ant. Lead, Low side to frame of gang condenser	Adjust 18.3 M.C. oscillator trimm maximum output—be sure to use peak. If more than one peak is back off trimmer to minimum ca then screw down trimmer (add ca until the second peak—which is the one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Green Ant. Lead, Low side to frame of gang condenser	While rocking gang condenser adj M.C. antenna trimmer for maximum

SENTINEL RADIO CORP.

MODELS 204A,204AE
Schematic,Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
F	FILAMENT
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC. GRID
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTES

1 I.F. - 455 KC.

2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

3 FOR COMBINATION PHONO-RADIO (RC) MODELS, DOT-DASH LINES SHOW CONNECTIONS. ON CONSOLE MODELS, SWITCHES 37 & 38 ARE GANGED (SWITCH 39 IS SUBSTITUTED FOR 37 & 38)

PARTS LIST

Part No.			Description	List Price
1	11269	Coil	Antenna	$ .70
2	11271	Coil	Oscillator	.60
3	4404	Coil	1st I. F. Transformer	1.20
4	4404	Coil	2nd I. F. Transformer	1.20
5	11526	Condenser	Tuning (Two Gang)	2.00
6	10625	Condenser	Dry Electrolytic 8 Mfd.-350 Volt D. C. Wkg.	.55
7	10625	Condenser	Dry Electrolytic 8 Mfd.-350 Volt D. C. Wkg.	.55
8	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
11	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
12	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
13	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
14	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
15	2075	Condenser	Tubular .005 Mfd. 600 Volt	.18
16	4305	Condenser	Tubular .01 Mfd. 220 Volt (Shielded)	.30
17	9458	Condenser	.00025 Mfd. Mica	.21
18	9458	Condenser	.00025 Mfd. Mica	.21
19	9458	Condenser	.00025 Mfd. Mica	.21
20	9458	Condenser	.00025 Mfd. Mica	.21
21	7934	Condenser	.0001 Mfd. Mica	.21
22	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
23	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
24	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
25	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
26	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
27	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
28	3133	Resistor	Carbon 400,000 Ohm ⅓ Watt	.19
29	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
30	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
31	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
32	11599	Resistor	Carbon 65,000 Ohm ⅓ Watt	.19
33	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
34	4599	Resistor	Carbon 15,000 Ohm 1½ Watt	.22
35	11278	Speaker	Electro-Dynamic 5"	3.00
36	11537	Speaker	Electro-Dynamic 8"	5.00
37	10573	Switch	S.P.S.T. (On-Off) Used with Phono Model Having Tuning Eye	.65
38	2434	Switch	S.P.D.T. (Rad-Phono) Used with Phono Model Having Tuning Eye	.70
39	10472	Switch	Radio-Phono (Used with Phono Model without Tuning Eye	1.00
40	4516	Socket & Cable Assembly	For 6U5 Tuning Eye Incl. Socket and Resistor	.65
41	10108	Socket & Cable Assembly	For 6U5 Tuning Eye Incl. Socket and Resistor (Used with Phono Model)	.65
42	11272	Transformer	Power 115 Volt 50 Cycle	2.80
43	11273	Transformer	Power 115 Volt 25 Cycle	5.00
44	4839	Volume Control		.85
45	6984	Resistor	Carbon 500,000 Ohm—⅓ Watt	.19

MISCELLANEOUS PARTS

		Description	List Price
10292	Bulb	6-8 Volt .250 Amp. Type 3¼ No. 44	.10
11529	Dial Scale		.35
8184	Dial Cord	12" of 18 lb. Drive Cord	.10
11017	Dial Shaft	Dial Drive Shaft	.11
11489	Dial Pointer	Indicator Needle	.15
11140	Escutcheon	With Crystal for Dial	1.00
11339	Escutcheon	With Crystal for Dial	1.00
4519	Escutcheon	For Tuning Eye	.30
11796	Knob		.10
10473	Motor	Phono 110 Volt 60 Cycle less Turntable	7.00
10546	Motor	Phono 110 Volt 50 Cycle Less Turntable	7.50
10547	Motor	Phono 220 Volt 50 Cycle Less Turntable	8.00
10955	Pickup	Crystal Pickup and Arm	5.25
11797	Turntable	10" Velveteen Covered	1.50
11798	Turntable	12" Velveteen Covered	1.75

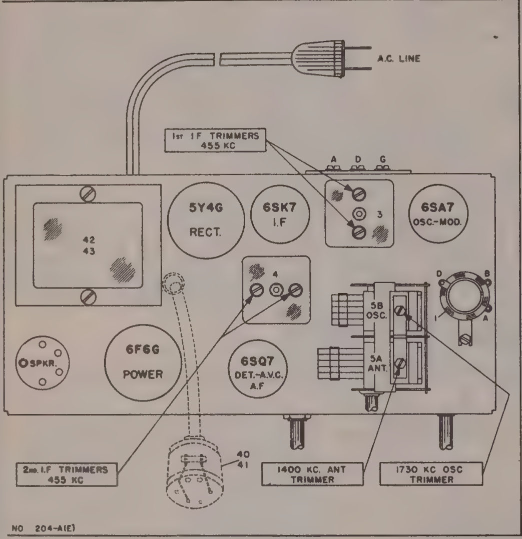
W. 4M PART NO. 204A

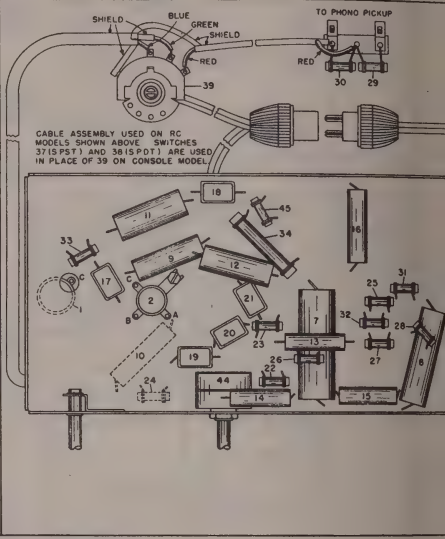
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

MODELS 204A,204AE
Socket,Trimmers
Alignment,Chassis

SENTINEL RADIO CORP.

5 and 6 tube A. C. Operated Superheterodyne Receiver




SHIELD
BLUE
GREEN
SHIELD
RED
39
TO PHONO PICKUP
RED
30
29
CABLE ASSEMBLY USED ON RC MODELS SHOWN ABOVE SWITCHES 37(S PST) AND 38(S PDT) ARE USED IN PLACE OF 39 ON CONSOLE MODEL.
18
11
45
34
16
33
9
12
17
C
2
C
1
B
A
21
25
31
32
7
28
20
23
13
27
8
10
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26
22
24
44
14
15

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

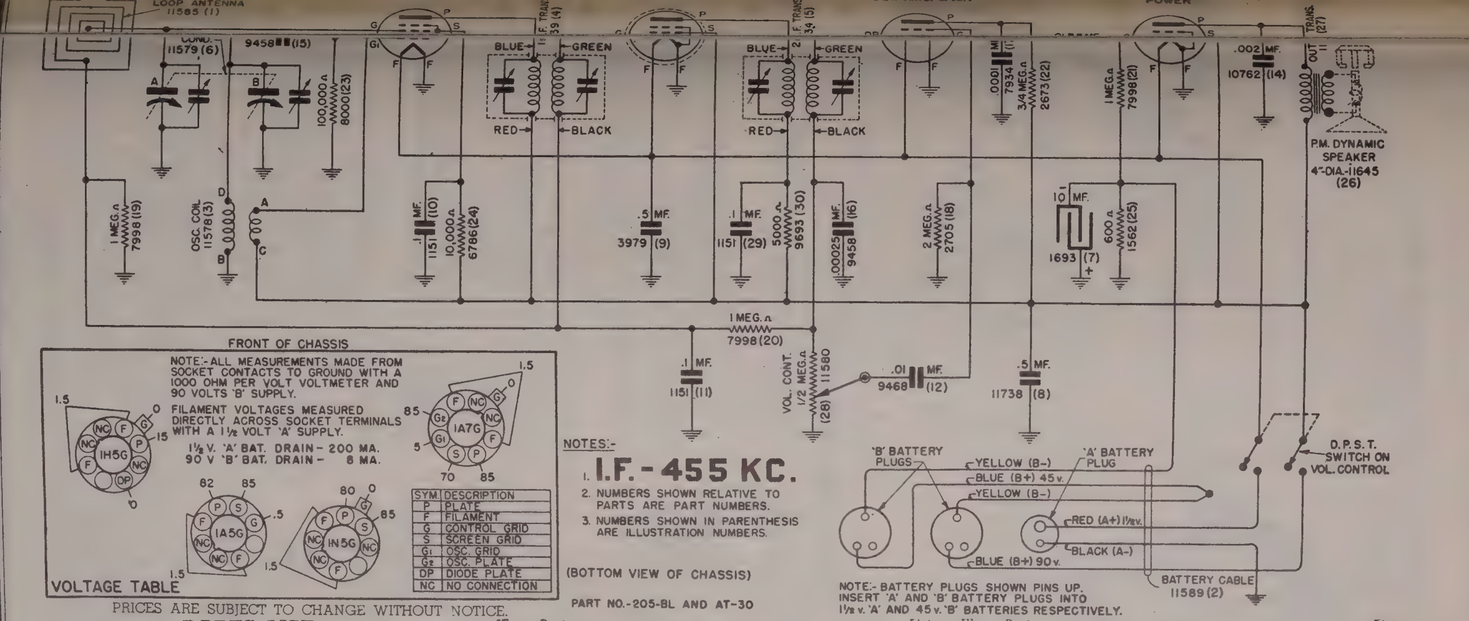
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to gang condenser frame.

		TEST OSCILLATOR			
	Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below:**
	I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 6SA7 tube DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmers for maximum output then adjust each of the first I. F. trimmers for maximum output
1	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver "A" post	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	Receiver "A" post	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

MODEL 205BL
Schematic, Voltage



NOTE:- ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 90 VOLTS 'B' SUPPLY.

FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS WITH A 1½ VOLT 'A' SUPPLY.

1½ V. 'A' BAT. DRAIN - 200 MA.
90 V 'B' BAT. DRAIN - 8 MA.

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G_1	OSC. GRID
G_2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

NOTES:-

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

(BOTTOM VIEW OF CHASSIS)

PART NO.-205-BL AND AT-30

NOTE:- BATTERY PLUGS SHOWN PINS UP. INSERT 'A' AND 'B' BATTERY PLUGS INTO 1½ v. 'A' AND 45 v. 'B' BATTERIES RESPECTIVELY.

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11585	Antenna Loop		$ .90
2	11589	Cable	Battery Complete with Plugs	.45
3	11578	Coil	Oscillator	.60
4	11539	Coil	1st I. F. Transformer	1.50
5	10834	Coil	2nd I. F. Transformer	1.45
6	11579	Condenser	Tuning Two Gang	1.95
7	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt	.75
8	11738	Condenser	Tubular .5 Mfd. 100 Volt +40%, —10%	.35
9	3979	Condenser	Tubular .5 Mfd. 200 Volt +40%, —10%	.40
10	1151	Condenser	Tubular .1 Mfd. 200 Volt +40%, —10%	.20
11	1151	Condenser	Tubular .1 Mfd. 200 Volt +40%, —10%	.20
12	9468	Condenser	Tubular .01 Mfd. 400 Volt +40%, —10%	.17
13	9468	Condenser	Tubular .01 Mfd. 400 Volt +40%, —10%	.17
14	10762	Condenser	Tubular .002 Mfd. 400 Volt +40%, —10%	.19
15	9458	Condenser	Mica .00025 Mfd. ±20%	.21
16	9458	Condenser	Mica .00025 Mfd. ±20%	.21
17	7934	Condenser	Mica .0001 Mfd. ±20%	.21
18	2705	Resistor	Carbon 2 Megohm ⅓ Watt ±20%	.19
19	7998	Resistor	Carbon 1 Megohm ⅓ Watt ±20%	.19
20	7998	Resistor	Carbon 1 Megohm ⅓ Watt ±20%	.19
21	7998	Resistor	Carbon 1 Megohm ⅓ Watt ±20%	.19
22	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt ±20%	.19
23	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt ±20%	.19
24	6786	Resistor	Carbon 10,000 Ohm ⅓ Watt ±10%	.19
25	1562	Resistor	Carbon 600 Ohm ⅓ Watt ±10%	.19
26	11645	Speaker	P. M. Dynamic 4 in.	2.50
27	11577	Transformer	Output	1.00
28	11580	Volume Control	With S.T.D.P. Switch	.85
29	1151	Condenser	Tubular .1 Mfd. 200 Volt ±40%	.20
30	9693	Resistor	Carbon 5000 Ohm ⅓ Watt	.19

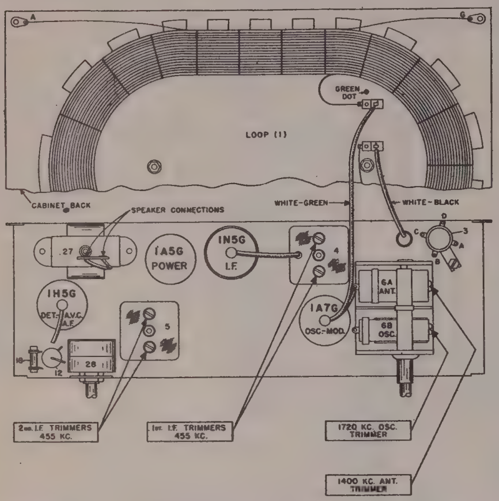
MISCELLANEOUS PARTS

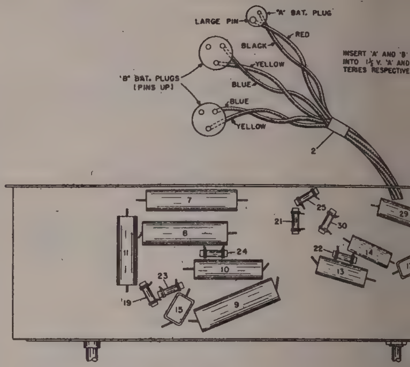
Part No.		Description	List Price
11642	Battery Plug	3 Prong "B"	.10
10351	Battery Plug	2 Prong "A"	.10
	Cabinet	Complete with No. 11622 Back and Loop	4.50
11622	Cabinet Back	Complete with Loop	1.50
3814	Dial Cord	18 in. of 30 lb. Cord	.15
11620	Dial Scale	Calibrated Scale	.35
11693	Dial Spring	Cord Tension Spring	.04
11696	Dial Pointer	White Lacquer Finish	.20
11583	Dial Crystal		.20
10787	Knob	Mottled Walnut Tenite	.08

MODEL 205BL
Socket, Trimmers
Alignment, Chassis

SENTINEL RADIO CORP.

4 tube 1½ Volt Portable Superheterodyne Receiver





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dia calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is require on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely i mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IN THE BACK OF CHASSI IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1720 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillato to loop.

Couple test oscillator to receiver loop by:

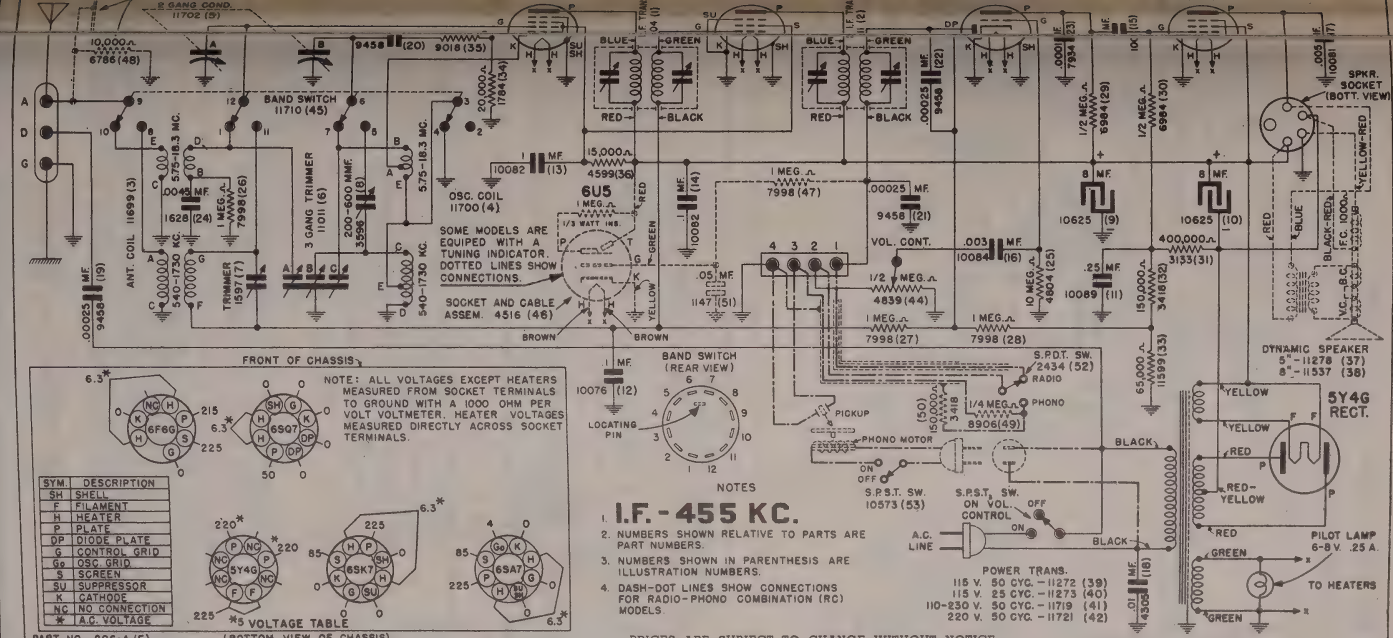
(a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach acros output of test oscillator.

(b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

		TEST OSCILLATOR			
	Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
	I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube DO NOT REMOVE CAP	Adjust the second I. F. transformer trimmers for maximum out put—then adjust each of the firs I.F. trimmers for maximum output.
1	Exactly 1720 K. C.	Exactly 1720 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1720 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trim mer for maximum output.

SENTINEL RADIO CORP.

MODELS 206A,206AE,RC206A
RC206AE
Schematic,Voltage



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

SYM.	DESCRIPTION
SH	SHELL
F	FILAMENT
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC. GRID
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. DASH-DOT LINES SHOW CONNECTIONS FOR RADIO-PHONO COMBINATION (RC) MODELS.

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

	Part No.		Description	List Price
1	4404	Coil	1st I.F. Transformer	$1.20
2	4111	Coil	2nd I.F. Transformer	1.25
3	11699	Coil	Antenna	.75
4	11700	Coil	Oscillator	.70
5	11702	Condenser	Tuning Two Gang	1.75
6	11011	Condenser	Trimmer Three Gang	.50
7	1597	Condenser	Trimmer 3-45 Mmf.	.21
8	3596	Condenser	Padder 340-460 Mmf.	.44
9	10625	Condenser	Dry Electrolytic 8 Mfd. 350 Volt	.55
10	10625	Condenser	Dry Electrolytic 8 Mfd. 350 Volt	.55
11	10089	Condenser	Tubular .25 Mfd. 200 Volt	.23
12	10076	Condenser	Tubular .1 Mfd. 200 Volt	.19
13	10082	Condenser	Tubular .1 Mfd. 400 Volt	.20
14	10082	Condenser	Tubular .1 Mfd. 400 Volt	.20
15	10088	Condenser	Tubular .01 Mfd. 400 Volt	.19
16	10084	Condenser	Tubular .003 Mfd. 400 Volt	.17
17	10081	Condenser	Tubular .005 Mfd. 600 Volt	.20
18	4305	Condenser	Tubular .01 Mfd. 220 Volt	.30
19	9458	Condenser	Mica .00025 Mfd.	.21
20	9458	Condenser	Mica .00025 Mfd.	.21
21	9458	Condenser	Mica .00025 Mfd.	.21
22	9458	Condenser	Mica .00025 Mfd.	.21
23	7934	Condenser	Mica .0001 Mfd.	.21
24	1628	Condenser	Mica .0045 Mfd. ± 3%	.24
25	4804	Resistor	Carbon 10 Megohm 1/3 Watt	.19
26	7998	Resistor	Carbon 10 Megohm 1/3 Watt	.19
27	7998	Resistor	Carbon 10 Megohm 1/3 Watt	.19
28	7998	Resistor	Carbon 10 Megohm 1/3 Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
30	6984	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
31	3133	Resistor	Carbon 400,000 Ohm 1/3 Watt	.19
32	3418	Resistor	Carbon 150,000 Ohm 1/3 Watt	.19
33	11599	Resistor	Carbon 65,000 Ohm 1/3 Watt	.19
34	1784	Resistor	Carbon 20,000 Ohm 1/3 Watt	.19
35	9018	Resistor	Carbon 150 Ohm 1/3 Watt	.19
36	4599	Resistor	Carbon 15,000 Ohm 1½ Watt	.22
37	11278	Speaker	5 in. Electro-Dynamic	3.00
38	11537	Speaker	8 in. Electro-Dynamic	5.00
39	11272	Transformer	Power 115 Volt 50 Cycle	2.80
40	11273	Transformer	Power 115 Volt 25 Cycle	5.00
41	11719	Transformer	Power 110 Volt—230 Volt 50 Cycle	5.50
42	11721	Transformer	Power 220 Volt 50 Cycle	4.75
44	4839	Volume Control	With S.P.S.T. Switch	.85
45	11710	Switch	Wave	.90
46	4516	Socket & Cable Assem.	For 6U5 Tuning Eye	.65
47	7998	Resistor	1 Megohm 1/3 Watt	.19
48	6786	Resistor	10,000 Ohm 1/3 Watt Used only on Console Model	.19
49	8906	Resistor	250,000 Ohm 1/3 Watt	.19
50	3418	Resistor	Carbon 150,000 Ohm 1/3 Watt	.19
51	1147	Condenser	.05 Mfd. 200 Volt	.19
52	2434	Switch	Phono S.P.D.T.	.70
53	10573	Switch	S T S.T "On-Off"	.65

MISCELLANEOUS PARTS

Part No.		Description	List Price
11926	Antenna Plate	Copper Plated—(Console Model Only)	1.00
10292	Bulb	6-8 Volt .250 Amp. Type 3¼ No. 44	.10
11707	Dial Scale		.60
8184	Dial Cord	12 in. of 18 lb. Drive Cord	.10
11017	Dial Shaft	Dial Drive Shaft	.11
11489	Dial Pointer	Indicator Needle	.15
11140	Escutcheon	With Crystal for Dial	1.00
11339	Escutcheon	With Crystal for Dial	1.00
4519	Escutcheon	For Tuning Eye	.30
11796	Knob		.10
11907	Pickup	Crystal Pickup and Arm	4.25
10030	Knob	Marked "Tuning" Used With Console Model	.12
10069	Knob	Marked "Band Switch" Used With Console Model	.12
11871	Knob	Marked "Off-Volume" Used With Console Model	.12
4958	Knob	Marked "Tuning" Used With Table Model	.12
4959	Knob	Marked "Off-Volume" Used With Table Model	.12
4961	Knob	Marked "Band Selector" Used With Table Model	.12

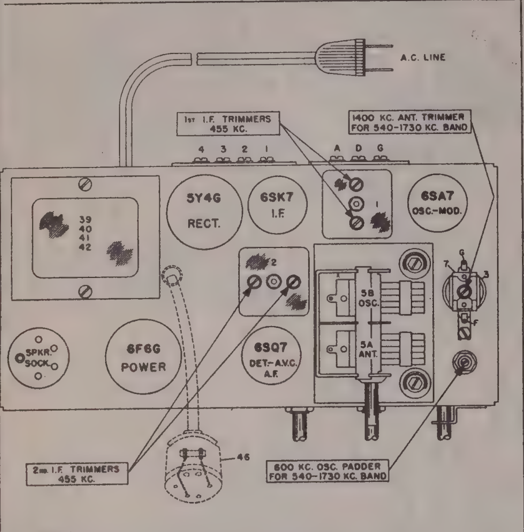
W. 3M 2-40 PART NO. 206A

MODELS 206A,206AE,RC206A
RC206AE
Socket,Trimmers,Chassis
Alignment

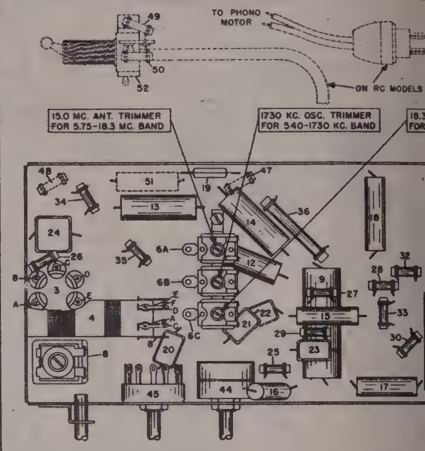
SENTINEL RADIO CORP.

TWO BAND—FIVE and SIX TUBE

A. C. Operated Superheterodyne Receiver


A.C. LINE
1st I.F. TRIMMERS 455 KC.
1400 KC. ANT. TRIMMER FOR 540-1730 KC. BAND
4 3 2 1
A D G
39 40 41 42
5Y4G RECT.
6SK7 I.F.
6SA7 OSC.-MOD.
1
2
SPKR. SOCK.
6F6G POWER
6SQ7 DET.-A.V.C. A.F.
5B OSC.
5A ANT.
7
G
3
F
46
2nd I.F. TRIMMERS 455 KC.
600 KC. OSC. PADDER FOR 540-1730 KC. BAND

NO. 206-A(E)



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration inco
For alignment procedure read tabluations from left to right. If more than one adjustment is required on any one band, make the ad
ment marked (1) first, (2) next, (3) third.

Before starting alignment:
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at
point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle doe
point exactly to last line move needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for lo of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6SA7 tube. Do not remove cap.	Adjust each of the second I.F. transf trimmers for maximum output—then each of the first I.F. transformer trin for maximum output.
1730 to 540 K. C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	Adjust 1730 K. C. oscillator trimme maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adjus K.C. antenna trimmer for maximum o
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver "A" antenna post	While rocking gang condenser adju K.C. oscillator padder for maximum o
5.75 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	Adjust 18.3 M.C. oscillator trimme maximum output—be sure to use peak. If more than one peak is n back off trimmer to minimum ca then screw down trimmer (add cap until the second peak—which is the one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm carbon resistor	Receiver "A" antenna post	While rocking gang condenser adju M.C. antenna trimmer for maximum o

Television Connections:—The audio amplifier and loud speaker of this receiver can be used to amplify the sound output of a telev
receiver not equipped with an audio amplifier and speaker—just connect the sound channel output of the television receiver (from the se
detector) to the No. 3 and No. 4 terminals on back of receiver and attach a single pole double throw switch.

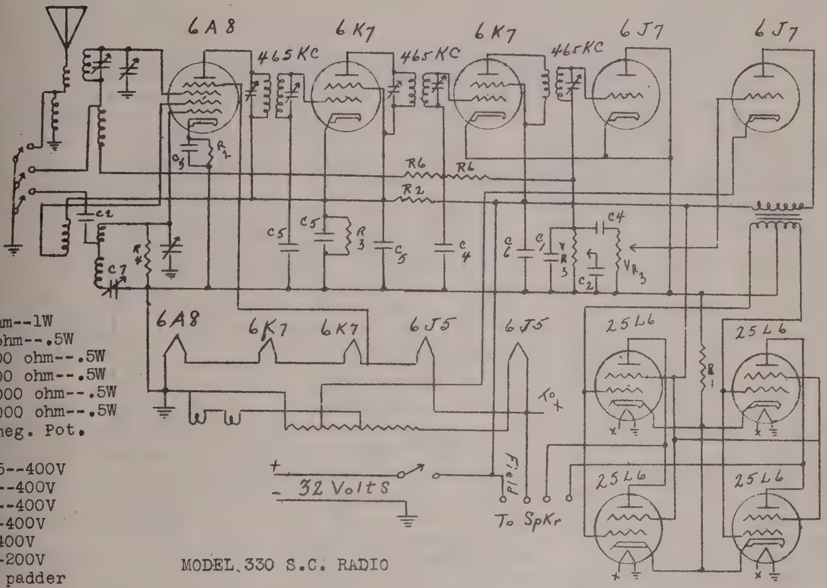
Phonograph Connections:—Phonograph records may be electrically reproduced through the receiver loud speaker by connecting the
of the phonograph pickup to the No. 3 and No. 4 terminals and using either an electrical or hand wound spring operated phonograph m
The pickup should be of the high impedance type and a single pole double throw switch must be connected as shown in diagram. To oper
place switch in phono position—set pickup needle on record and adjust radio volume control to desired amount of volume.

**When shipped from factory a jumper wire is attached to terminals 1 and 2. If receiver is not to be used for phono or television op
tion, leave the jumper wire in this position. When receiver is used for either phono or television sound operation, remove jumper wire.**

SENTINEL MODELS 206A, 206AE, RC206A, and RC206AE

SETCHELL CARLSON, INC.

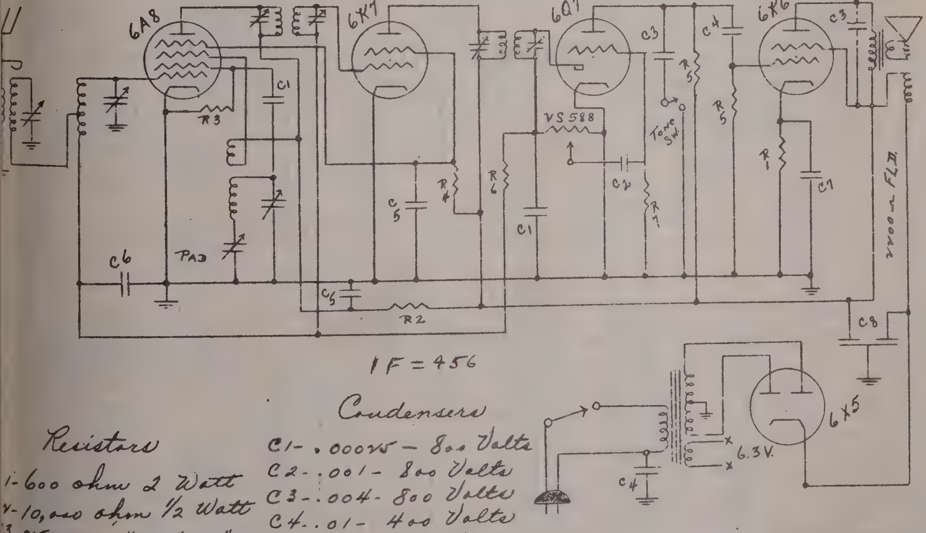
MODEL 330
MODEL 588
Schematics



1--75 ohm--1W
2--700 ohm--.5W
3--25,000 ohm--.5W
4--50,000 ohm--.5W
5--200,000 ohm--.5W
6--500,000 ohm--.5W
r3--.5 meg. Pot.

1--.0005--400V
2--.002--400V
3--.005--400V
4--.01--400V
5--.1--400V
6--.25--200V
7--Adj. padder

MODEL 330 S.C. RADIO



IF = 456

Condensers
C1-.00025-800 Volts
C2-.001-800 Volts
C3-.004-800 Volts
C4-.01-400 Volts
C5-.05-400 Volts
C6-.1-200 Volts
C7-10-25 Volts
C8-8X8-450 Volts

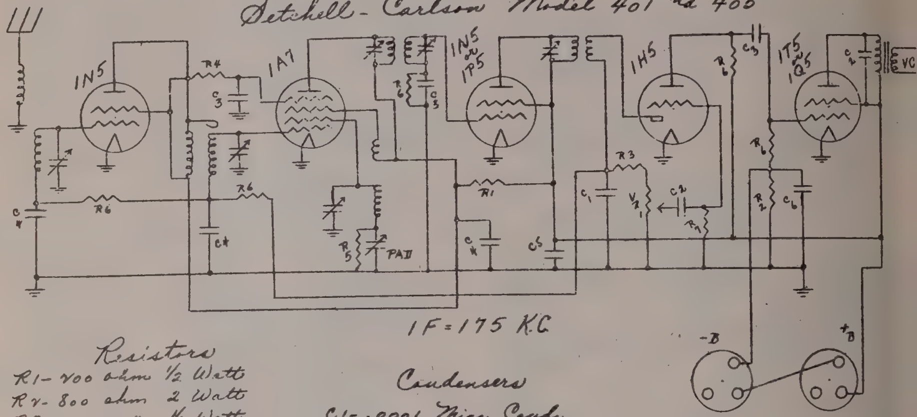
Resistors
1-600 ohm 2 Watt
2-10,000 ohm 1/2 Watt
3-25,000 " " "
4-50,000 " " "
5-500,000 " " "
6-1 Meg " " "
7-15 Meg " " "
588-1/2 Meg Control & Sw.

Model #588

MODELS 401,405
MODELS 407,408,4017
Schematics

SETCHELL CARLSON, INC.

Setchell-Carlson Model 401 and 405



IF=175 K.C.

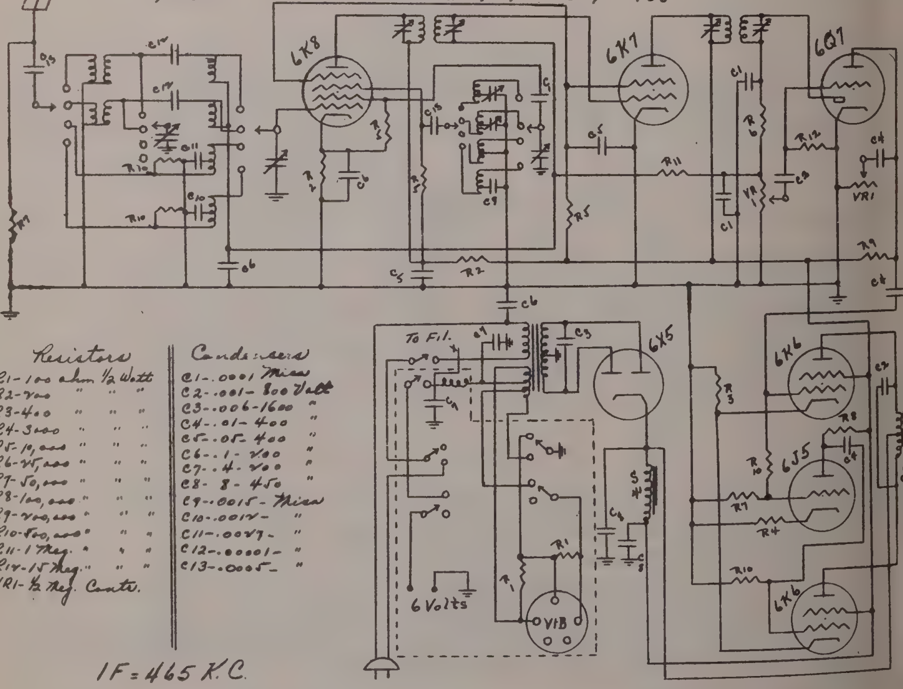
Resistors

R1-200 ohm ½ Watt
R2-800 ohm 2 Watt
R3-25,000 " ½ Watt
R4-50,000 " " "
R5-100,000 " " "
R6-1 Meg. " " "
R7-15 Meg. " " "
VR1-½ Meg. Vol. Control

Condensers

C1-.0001 Mica Cond.
C2-.001-800 Volt " "
C3-.01-400 " "
C4-.1-200 " "
C5-1 Mfd. 200 " "
C6-10 " 25 " "

Setchell-Carlson--Models 407-4017-408



Resistors

R1-100 ohm ½ Watt
R2-200 " " "
R3-400 " " "
R4-3000 " " "
R5-10,000 " " "
R6-25,000 " " "
R7-50,000 " " "
R8-100,000 " " "
R9-200,000 " " "
R10-500,000 " " "
R11-1 Meg. " " "
R12-15 Meg. " " "
VR1-½ Meg. Contr.

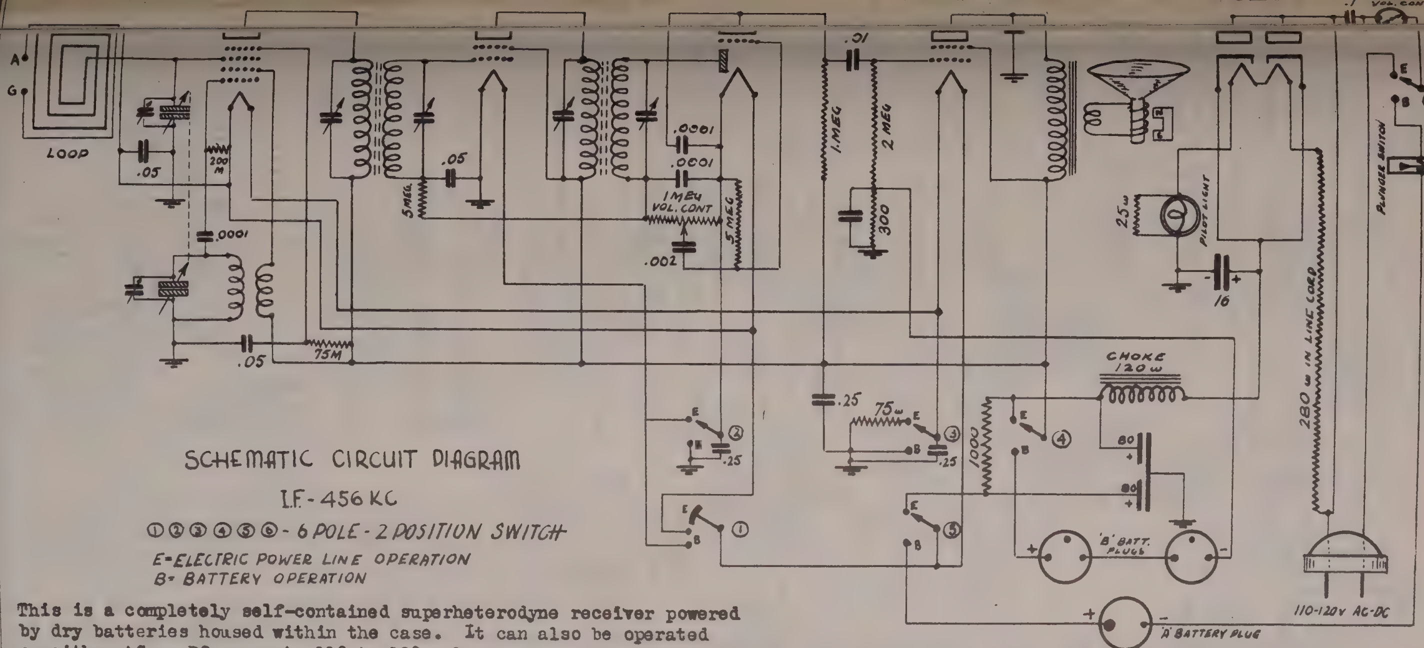
Condensers

C1-.0001 Mica
C2-.001-800 Volt
C3-.006-1600 "
C4-.01-400 "
C5-.05-400 "
C6-.1-200 "
C7-.4-200 "
C8-8-450 "
C9-.0015-Mica
C10-.0012- "
C11-.0027- "
C12-.00001- "
C13-.0005- "

IF=465 K.C.

MODEL A-218
Schematic, Notes

SKY-CHIEF RADIO CORP.



SCHEMATIC CIRCUIT DIAGRAM

I.F. - 456 KC

①②③④⑤⑥ - 6 POLE - 2 POSITION SWITCH

E = ELECTRIC POWER LINE OPERATION
B = BATTERY OPERATION

This is a completely self-contained superheterodyne receiver powered by dry batteries housed within the case. It can also be operated on either AC or DC current, 110 to 120 volts.

The batteries required are:

1- 1½ volt "A" battery (Eveready 742 or equivalent)
2- 45 " "B" batteries (Eveready 762 or equivalent)

These batteries are installed by opening the rear cover and inserting them horizontally in the lower compartment. The two plugs having three prongs are inserted into each of the receptacles on the "B" batteries and the two prong plug is inserted into the "A" battery receptacle.

To operate the set from the AC or DC power line, open the rear cover, turn the switch from battery position marked "B" to current position marked "C". Then remove the line cord from within and plug it into any convenient electric outlet. This cord should be extended to its full length. In operation it will become warm. This is natural and no danger will result. Under no circumstances should this cord be cut or shortened. If the receiver fails to operate when plugged into a DC line the plug should be rotated one half turn.

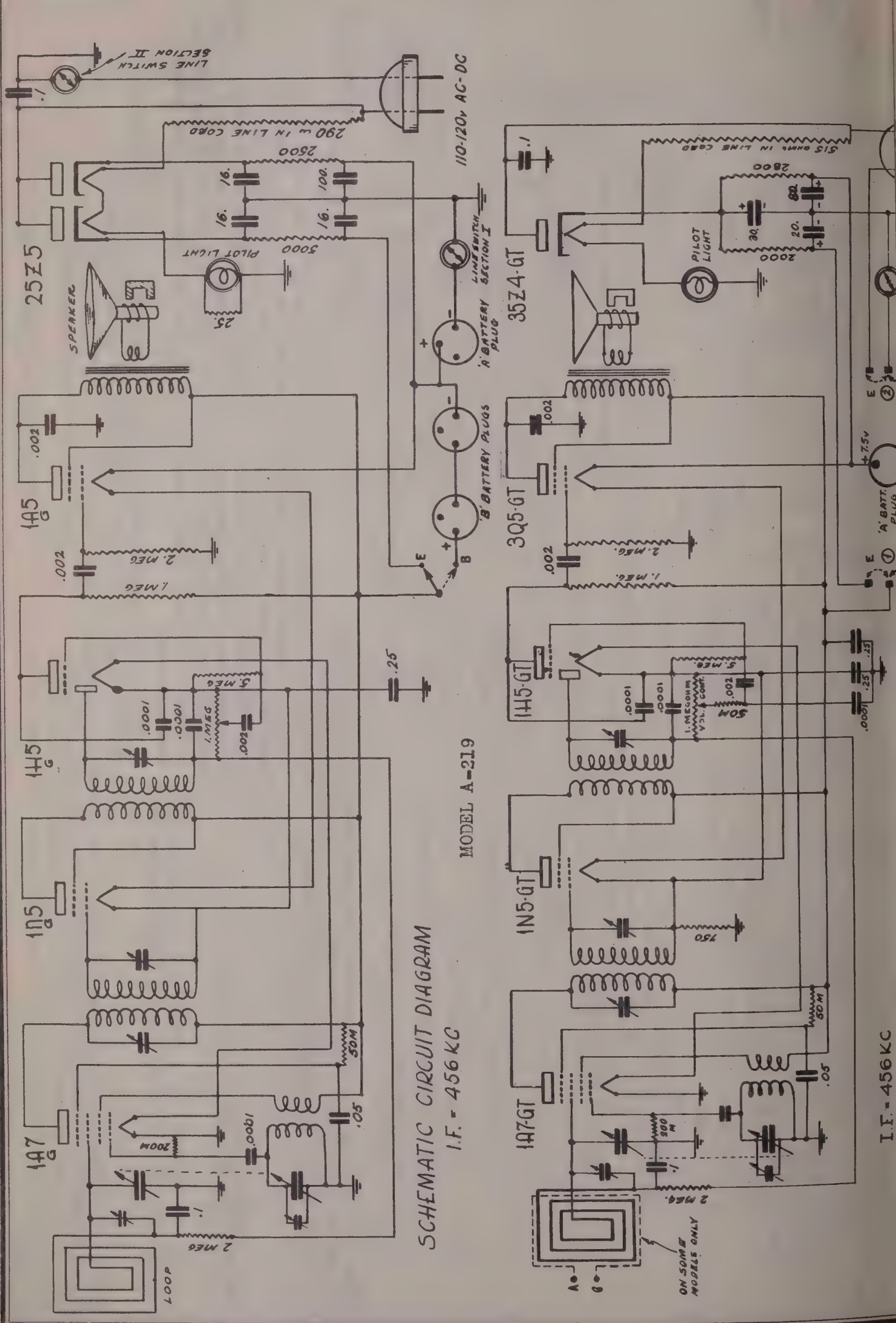
To change from power operation to battery operation, pull the line cord from the plug and turn the switch back to battery operation.

The following tubes are employed:

1- 1A7G; 1-1N5G; 1-1H5G; 1- 1Q5G; 1- 25Z5

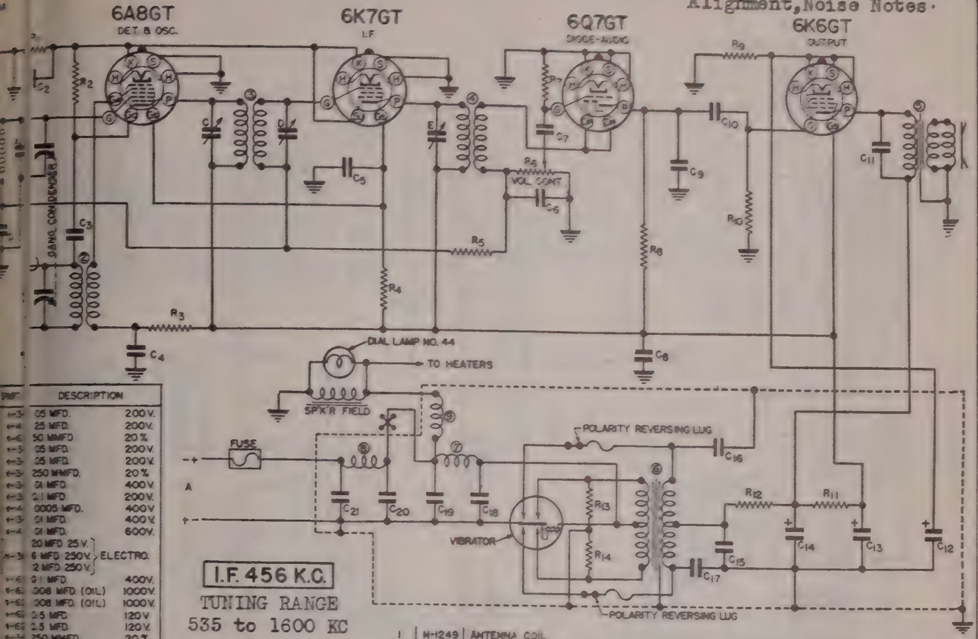
MODEL A-219
MODEL A-221
Schematics

SKY-CHIEF RADIO CORP.



SONORA RADIO & TELEV., CORP.

MODEL AU-10
Chassis AU
Schematic,Socket,Trimmers
Alignment,Noise Notes.



	DESCRIPTION		
-3	05 MFD.		200 V.
-4	25 MFD.		200V.
-6	50 MMFD		20 %
-3	05 MFD.		200 V.
-3	05 MFD.		200 V.
-3	250 MMFD.		20 %
-3	01 MFD.		400 V.
-3	2.1 MFD.		200 V.
-4	.0005 MFD.		400 V.
-3	01 MFD.		400 V.
-4	01 MFD.		600V.
-3	20 MFD 25 V. 6 MFD 250 V. 2 MFD 250 V.		ELECTRO.
-6	.1 MFD.		400V.
-6	.006 MFD. (OIL)		1000V.
-6	.006 MFD. (OIL)		1000V.
-6	2.5 MFD.		120 V.
-6	2.5 MFD.		120 V.
-3	250 MMFD.		20 %
-3	250 MMFD.		20 %
-4	200 OHM	.5 W.	10 %
-2	50,000 OHM	.5 W	20 %
-6	20,000 OHM	.5 W	20 %
-6	20,000 OHM	.5 W	20 %
-2	MEGOHM	.5 W	20 %
-3	.5 MEGOHM VOL. CONT.		
-4	6 MEGOHM	.5 W	20 %

I.F. 456 K.C.

TUNING RANGE
535 to 1600 KC

R8	N-1261	250,000 OHM	.5 W.	20 %
R9	N-1628	750 OHM	.5 W	10 %
R10	N-1264	0.5 MEGOHM	.5 W.	20 %
R11	N-1256	500 OHM	.5 W.	20 %
R12	N-1482	250 OHM	.5 W	20 %
R13	N-1629	100 OHM	1 W	20 %
R14	N 1629	100 OHM	1 W.	20 %

1	N-1249	ANTENNA COIL
2	N-1250	OSCILLATOR COIL
3	N-1248	1 ST. I.F. TRANS.
4	N-1596	2 ND. I.F. TRANS.
5	N-1235	4" SPEAKER & TRANS.
6	N-1540	VIBRATOR TRANS.
7	N-1477	HASH CHOKE
8	N-1632	MOTOR NOISE CHOKE
9	N-1631	HEATER CHOKE

N-1236	VIBRATOR (SYNCHRONOUS)
N-1237	GANG CONDENSER
N-1241	TUNING DIAL
N-1539	BATTERY LEADS
N-1239	TOGGLE SWITCH

4 TUBE-6 VOLT
SUPERHETERODYNE
SINGLE BAND
AUTO SET

DRN. J.B. APP. B.D.J. 2-25-39 AU

MOTOR NOISE ELIMINATION

Ground the antenna lead-in shield at one or more points the cowl or any other metal surface in contact with the ead-in.

Move the battery lead around to a point of least noise ck-up and fasten in place with tying cord or tape.

Bond together the throttle rod, choke rod and any metal ing with a piece of copper braid and ground to the fire all. This should be done on the engine side.

Bond steering post to firewall.

Bond hood, side panel and other protective covering for ngine if it is not making a positive contact to the body.

extreme cases, a distributor resistor and generator conenser will reduce noise interference to a minimum. These arts are available at your dealer.

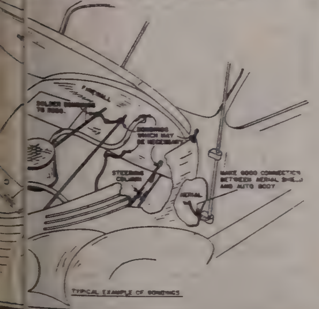
rom the standpoint of motor noise, the whip type antenna ecommended has been found to be the most satisfactory. It advisable to use this type antenna even if the car is quipped with a built-in antenna.

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three trimmers to peak or maximum reading on the output meter.

ANT. AND OSC. ALIGNMENT. Connect the antenna to the generator through a 65 MMF dummy* and set the dial and generator at 1600 KC (gang at minimum capacity). Align the BC oscillator trimmer for maximum output. Set the test oscillator at 1400 KC and tune in the signal with the dial and adjust the antenna trimmer for maximum output.

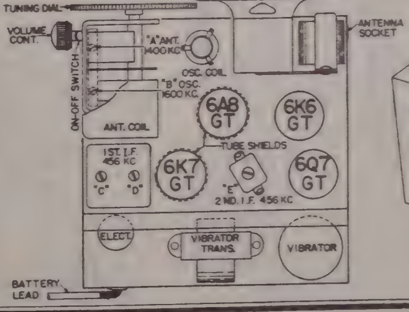
Next set the test oscillator at 600 KC and tune in the signal with the dial to check the sensitivity at this point.

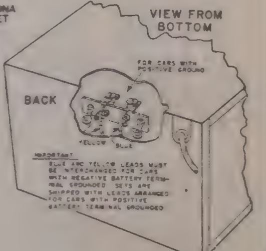
*If the antenna is aligned using a whip antenna shielded lead use a 30 MMF dummy antenna.



MAKE GOOD CONNECTION BETWEEN AERIAL SHIELD AND AUTO BODY

TYPICAL EXAMPLE OF BONDINGS

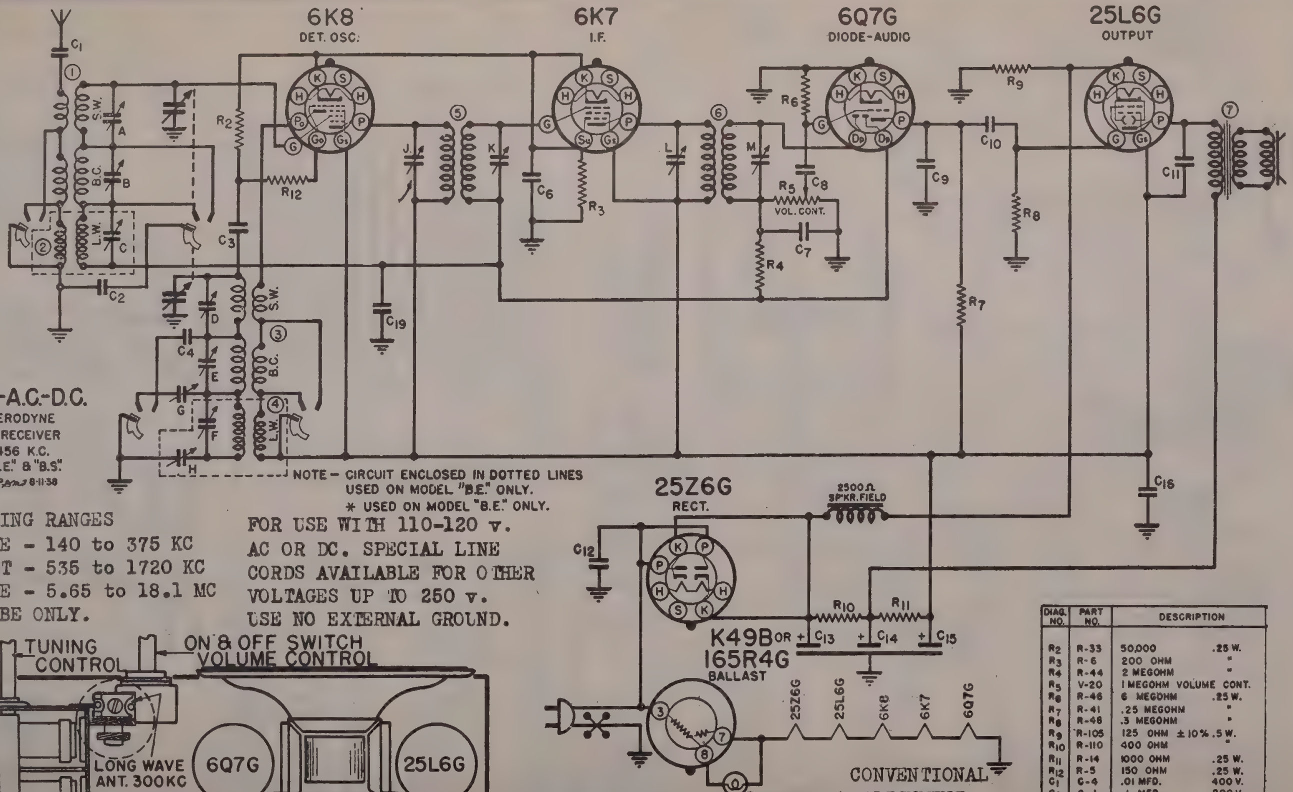




IMPORTANT
BLUE AND YELLOW LEADS MUST BE INTERCHANGED FOR CARS WITH NEGATIVE BATTERY TERMINAL GROUNDED. SETS ARE SHIPPED WITH LEADS ARRANGED FOR CARS WITH POSITIVE BATTERY TERMINAL GROUNDED

CHASSIS BE,BS
Schematic,Socket,Trimmers
Alignment

SONORA RADIO & TELEV.. CORP



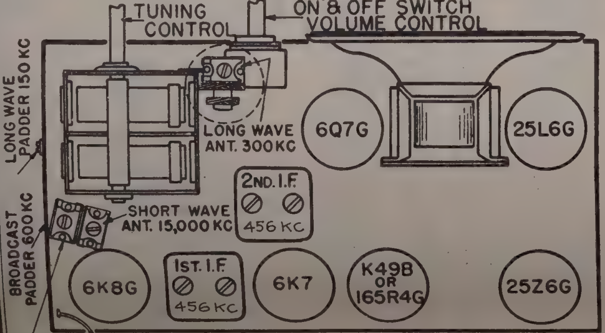
6 TUBE-A.C.-D.C.
SUPERHETERODYNE
2 & 3 BAND RECEIVER
I. F. PEAK 456 K.C.
MODELS "B.E." & "B.S."
DRN. H.W.B. APP. 8-11-38

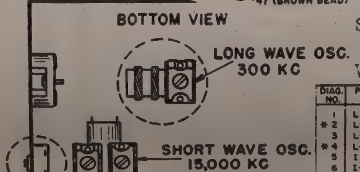
NOTE – CIRCUIT ENCLOSED IN DOTTED LINES USED ON MODEL "B.E." ONLY.
* USED ON MODEL "B.E." ONLY.

TUNING RANGES
*LONG WAVE - 140 to 375 KC
BROADCAST - 535 to 1720 KC
SHORT WAVE - 5.65 to 18.1 MC
* MODEL BE ONLY.

FOR USE WITH 110-120 v.
AC OR DC. SPECIAL LINE
CORDS AVAILABLE FOR OTHER
VOLTAGES UP TO 250 v.
USE NO EXTERNAL GROUND.

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII



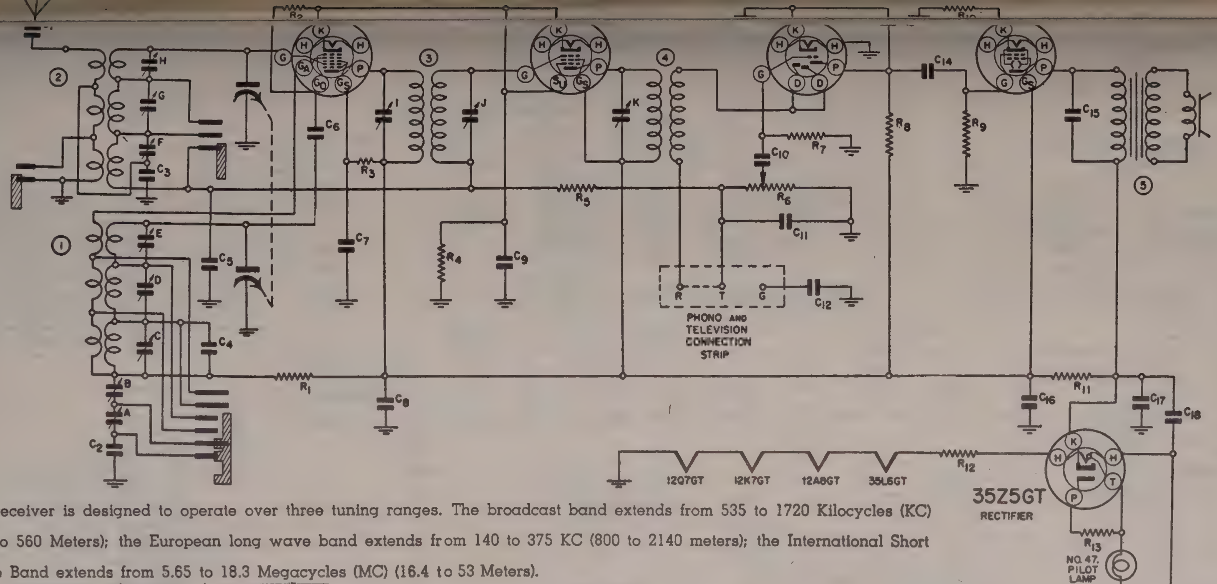


DIAG. NO.	PART NO.	DESCRIPTION
1	L-44E	ANTENNA COIL B.C. & S.W.
* 2	L-46E	ANTENNA COIL LONG WAVE
3	L-65E	OSC. COIL B.C. & S.W.
* 4	L-47E	OSC. COIL LONG WAVE
5	I-20E	1ST. I.F. TRANSFORMER
6	I-28E	2ND. I.F. "

DIAG. NO.	PART NO.	DESCRIPTION
R_2	R-33	50,000 .25 W.
R_3	R-6	200 OHM "
R_4	R-44	2 MEGOHM "
R_5	V-20	1 MEGOHM VOLUME CONT.
R_6	R-46	6 MEGOHM .25 W.
R_7	R-41	.25 MEGOHM "
R_8	R-48	.3 MEGOHM "
R_9	R-105	125 OHM ± 10% .5 W.
R_{10}	R-110	400 OHM "
R_{11}	R-14	1000 OHM .25 W.
R_{12}	R-5	150 OHM .25 W.
C_1	C-4	.01 MFD. 400 V.
C_2	C-1	.1 MFD. 200 V.
C_3	C-115	50 MMFD. 20%
C_4	C-106C	2500 MMFD. 3 %
C_6	C-16	.25 MFD. 200 V.
C_7	C-110	100 MMFD. 20%
C_8	C-27	.006 MFD. 800 V.
C_9	C-111	250 MMFD. 20%
C_{10}	C-4	.01 MFD. 400 V.
C_{11}	C-4	.01 MFD. 400 V.
C_{12}	C-14	.05 MFD. 400 V.
C_{13}	C-237	30 MFD. 150 V.
C_{14}		10 MFD. 150 V.
C_{15}		30 MFD. 150 V.
C_{16}	C-13	.05 MFD. 200 V
C_{17}	C-13	.05 MFD. 200 V.

SONORA RADIO & TELEV., CORP.

CHASSIS BJE
Schematic, Socket
Trimmers, Alignment

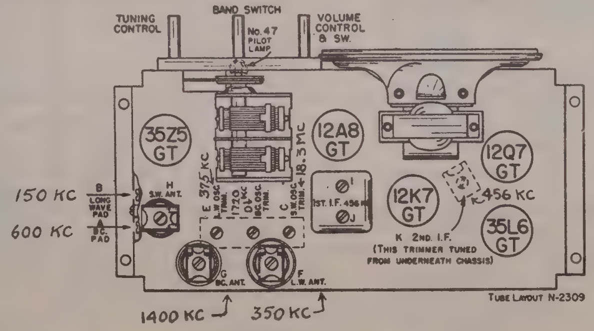


This receiver is designed to operate over three tuning ranges. The broadcast band extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters); the European long wave band extends from 140 to 375 KC (800 to 2140 meters); the International Short Wave Band extends from 5.65 to 18.3 Megacycles (MC) (16.4 to 53 Meters).

117 V. A.C.-D.C. LINE

SWITCH ON VOLUME CONTROL

DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
R_1	N-1258	10,000 OHMS .5W. 20%	C_{12}	N-1344	.01 MFD. 400V.
R_2	N-1260	50,000 OHMS .5W. 20%	C_{13}	N-1447	.0005 MFD. 400V.
R_3	N-1627	20,000 OHMS .5W. 20%	C_{14}	N-1344	.01 MFD. 400V.
R_4	N-1742	25 OHMS .5W. 20%	C_{15}	N-1376	.02 MFD. 400V.
R_5	N-1262	1 MEGOHM .5W. 20%	C_{16}	N-2015	20 MFD. 150 V. EL'T'LY'C
R_6	N-2257	.5 MEGOHM VOLUME CONTROL	C_{17}		35 MFD. 150 V.
R_7	N-1263	10 MEGOHM .5W. 20%	C_{18}	N-1346	.05 MFD. 400V.
R_8	N-1377	200,000 OHMS .5W. 20%			
R_9	N-1264	.5 MEGOHM .5W. 20%			
R_{10}	N-1787	250 OHMS .5W. 10%	A	N-2291	BC. PADDING COND.
R_{11}	N-1617	2500 OHMS .5W. 20%	B		L.W. PADDING COND.
R_{12}	N-1618	80 OHMS 2W. 10%	1		
R_{13}	N-1614	50 OHMS .5W. 20%	C	N-2310	L.W. OSC. TRIM.
			D		BC. OSC. TRIM.
			E		S.W. OSC. TRIM.
C_1	N-1344	.01 MFD. 400V	2		
C_2	N-1690	4000 MMFD. 5%	F	N-2304	L.W. ANT. COIL & TRIM.
C_3	N-2306	200 MMFD. 20%	G	N-2302	BC. ANT. COIL & TRIM.
C_4	N-2311	100 MMFD. 10%	H	N-2303	S.W. ANT. COIL & TRIM.
C_5	N-1345	.05 MFD. 200V.	3	N-1598E	1ST. I.F. TRANS.
C_6	N-1342	50 MMFD. 20%	4	N-1596E	2ND. I.F. TRANS.
C_7	N-1345	.05 MFD. 200V.	5	N-2254E	5" PM SPEAKER & TRANS.
C_8	N-1351	.1 MFD. 200V.	K	N-1597	2ND. I.F. TRIM. COND.
C_9	N-1351	.1 MFD. 200V		N-2301	GANG CONDENSER
C_{10}	N-1344	.01 MFD. 400V			
C_{11}	N-1374	100 MMFD. 20%			



I.F. 456 KC.

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

5 TUBE A.C.-D.C.
SUPERHETERODYNE
THREE BAND

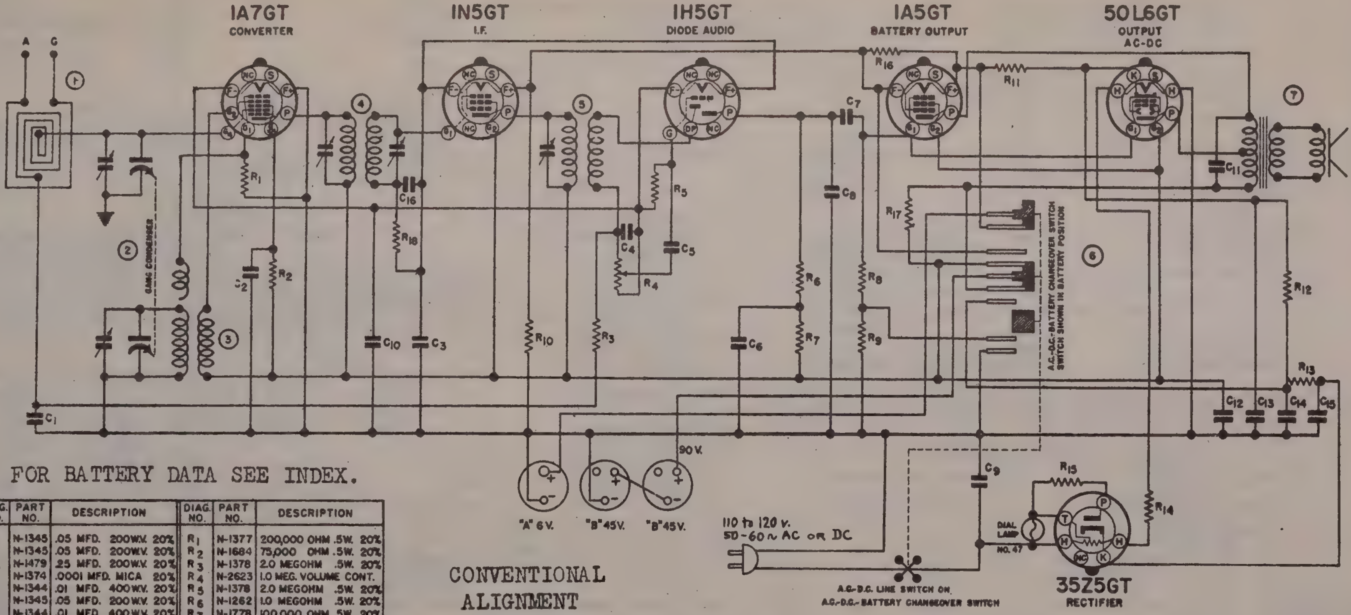
USE 100-MMF DUMMY FOR LONG-WAVE AND B.C. ALIGNMENT

DRWN. W.F. APPR. [illegible]
AUG. 3, '39

BJE-TJE

MODEL KD-75,Ch. KD
Schematic,Socket
Trimmers,Alignment

SONORA RADIO & TELEV., CORP.



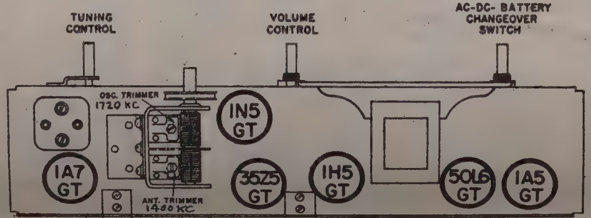
FOR BATTERY DATA SEE INDEX.

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	N-1345	.05 MFD. 200W.V. 20%	R1	N-1377	200,000 OHM .5W. 20%
C2	N-1345	.05 MFD. 200W.V. 20%	R2	N-1684	75,000 OHM .5W. 20%
C3	N-1479	.25 MFD. 200W.V. 20%	R3	N-1378	2.0 MEGOHM .5W. 20%
C4	N-1374	.0001 MFD. MICA 20%	R4	N-2623	1.0 MEG. VOLUME CONT.
C5	N-1344	.01 MFD. 400W.V. 20%	R5	N-1378	2.0 MEGOHM .5W. 20%
C6	N-1345	.05 MFD. 200W.V. 20%	R6	N-1262	1.0 MEGOHM .5W. 20%
C7	N-1344	.01 MFD. 400W.V. 20%	R7	N-1778	100,000 OHM .5W. 20%
C8	N-1343	.00025 MF. MICA 20%	R8	N-1264	500,000 OHM .5W. 20%
C9	N-1346	.05 MFD. 400W.V. 20%	R9	N-1262	1.0 MEGOHM .5W. 20%
C10	N-1351	.1 MFD. 200W.V. 20%	R10	N-1694	1000 OHM .5W. 20%
C11	N-2063	.003 MFD. 600W.V. 20%	R11	N-2713	20 OHM INS. .5W. 10%
C12	N-2627	20 MFD. 150.V. ELECTROLYTIC COND.	R12	N-2716	15,000 OHM 1.W. 10%
C13		100 MFD. 7.5 V.	R13	N-2715	160 OHM 1.W. 10%
C14		20 MFD. 150.V.	R14	N-2717	220. OHM INS. .5W. 10%
C15		40 MFD. 150.V.	R15	N-2714	50 OHM 1.W. 20%
C16	N-1376	.02 MFD. 400W.V. 20%	R16	N-1257	2000 OHM .5W. 20%
			R17	N-1776	1500 OHM .5W. 20%
			R18	N-1419	6. MEGOHM .5W. 20%
1	N-2629	LOOP ANTENNA COIL			
2	N-2612	TWO GANG COND.			
3	N-1452	OSCILLATOR COIL			
4	N-2647	FIRST I.F. TRANS.			
5	N-2648	SECOND I.F. TRANS.			
6	N-2614	CHANGEOVER SWITCH			
7	N-2624	5" P.M. SPEAKER & TRAN.			

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

TUNING RANGE
535 to 1720 KC

I.F.: 456 K.C.

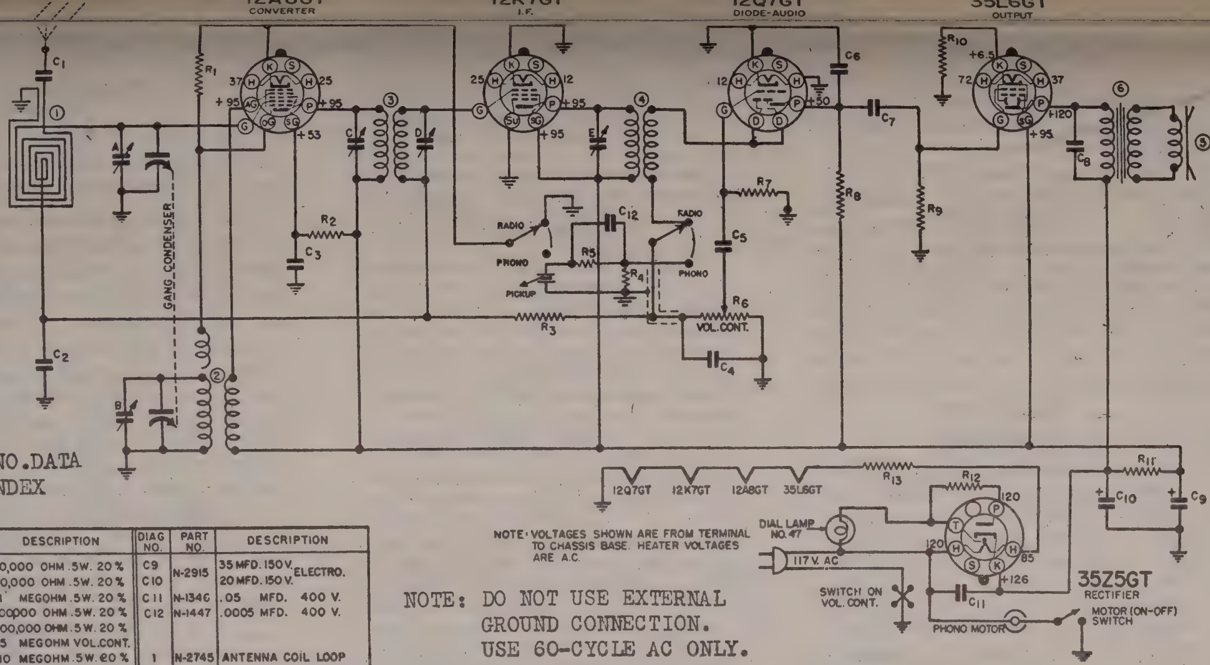


6 TUBE
BATTERY & 110-120V. AC-DC
SUPERHETERODYNE

DRWN. OCT.31,'39
APP.

SONORA RADIO & TELEV., CORP.

MODEL KE-78,Ch.KE
Schematic,Socket
Alignment,Trimmers



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C.

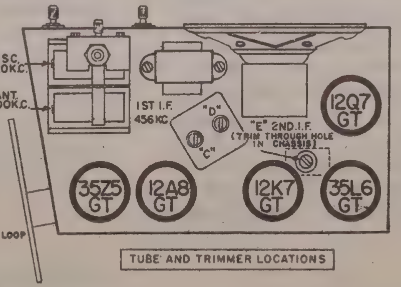
FOR PHONO.DATA
SEE INDEX

DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20 %	C9	N-2915	35 MFD. 150 V. ELECTRO.
R2	N-1627	20,000 OHM .5W. 20 %	C10		20 MFD. 150 V.
R3	N-1262	1 MEGOHM .5W. 20 %	C11	N-1346	.05 MFD. 400 V.
R4	N-1653	300,000 OHM .5W. 20 %	C12	N-1447	.0005 MFD. 400 V.
R5	N-1696	400,000 OHM .5W. 20 %			
R6	N-2876	.5 MEGOHM VOL.CONT.			
R7	N-1263	10 MEGOHM .5W. 20 %	1	N-2745	ANTENNA COIL LOOP
R8	N-1377	200,000 OHM .5W. 20 %	2	N-1452	OSCILLATOR COIL
R9	N-1264	500,000 OHM .5W. 20 %	3	N-2938	1ST.I.F. TRANSFORMER
R10	N-1616	250 OHM .5W. 10 %	4	N-2890	2ND.I.F. TRANSFORMER
R11	N-1617	2500 OHM .5W. 20 %	5	N-2914	4" P.M. SPEAKER
R12	N-1614	50 OHM .5W. 20 %	6	N-2952	OUTPUT TRANSFORMER
R13	N-1618	80 OHM 2 W. 10 %	E	N-2649	2ND.I.F. TRIMMING COND.
				N-2875	2 GANG CONDENSER
				N-2094	MOTOR ON-OFF SWITCH
C1	N-1344	.01 MFD. 400 V.		N-2877	RADIO-PHONO SWITCH
C2	N-1345	.05 MFD. 200 V.		N-2921	PHONO MOTOR & TURNTABLE
C3	N-1345	.05 MFD. 200 V.		N-2832	CRYSTAL PICK-UP
C4	N-1374	.0001 MFD. MICA			
C5	N-1344	.01 MFD. 400 V.			
C6	N-1447	.0005 MFD. 400 V.			
C7	N-1344	.01 MFD. 400 V.			
C8	N-1376	.02 MFD. 400 V.			

NOTE: DO NOT USE EXTERNAL
GROUND CONNECTION.
USE 60-CYCLE AC ONLY.

TUNING RANGE
535 to 1720 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII



TUBE AND TRIMMER LOCATIONS

I.F. 456 KC.

SUPERHETERODYNE
SINGLE BAND
PHONO. COMBINATION

DRWN L.T.C. APP'D

KE

PHONOGRAPH OPERATION

ALL TYPES

PICKUP — The pickup is the new crystal type. To insert a needle, raise the pickup arm to a vertical position, loosen the needle holder screw on the front, insert a needle to its full depth, tighten up the needle holder screw and lower pickup arm to its non-playing position outside the record and slip into the pick-up rest holder. When commencing to play, remove pickup from holder, lift and place gently the point of the needle on the smooth outer rim of the record and slide into the first groove of the record.

NOTE: In case a hum comes from the speaker when your hand is on the pick-up, reverse the power plug in the power outlet receptical.

PLAYING RECORDS

(a) Turn on the volume control and "on-off" switch on the receiver.

FOR (b),(c) SEE BELOW

(d) Lift pickup and lower the needle point gently to the smooth outer rim of the record and slide into the first groove of the record.

(e) Adjust volume to proper level by rotation of the volume control knob. Adjust tone control for best reproduction. If record and needle scratch noise is objectionable the tone control may be used to subdue or eliminate by adjustment of the tone to the left, the position that favors "Bass" response. After the selection is completed, lift the pickup, swing the arm to the right beyond the edge of the record and lower and affix to the arm rest bracket.

(f) When you have finished playing, lift pickup and place in its rest position and remove record from turntable. Never leave pickup with needle resting on record or on turntable.

KE, TB, TF ONLY

(b) Turn the "Radio-phono" switch to the phono position.

(c) Place the selected record upon the turntable and

TJF, TNF ONLY

(b) Slide the "Radio-phono" switch to the phono position.

(c) Place the selected record upon the turntable and press the motor starting switch.

This will place the record in motion.

TB ONLY

MOTOR STARTING SWITCH AND AUTOMATIC STOP—The motor starting switch is operated by the lever which comes from underneath the turntable at the right. Pressing the lever to the rear starts the motor. The arm projecting above the turntable to the rear and to the right of the turntable is the automatic stop switch. The automatic stop switch is adjustable and should be adjusted to stop the motor when the pick-up needle travels the last record groove (nearest the center). This can be done by moving the release arm to a position where it just touches the side of the pick-up arm when the needle is in the last groove and with the motor running.

TURNTABLE — Before attempting to operate the phonograph, loosen the three screws which hold the motor in place about two full turns to float the motor free in the rubber mountings. Place the turntable on the spindle and apply a slight pressure to the turntable and it will snap into the correct position. Be certain that the cabinet rests squarely on a flat surface so that the turntable is level and rotates in a true horizontal plane.

KE, TJF, TNF ONLY

MOTOR SWITCH. (Small Button located on top of cabinet underneath cover)—The radio set must first be turned on before this switch will operate. Push the switch once to turn on the motor. Push the switch again to turn off the motor.

TURNTABLE—Gently place the turntable on the motor spindle and carefully place the rubber tired drive wheel inside the turntable flange. **DO NOT FORCE TURNTABLE OVER DRIVE WHEEL.** Be certain that the

TF ONLY

MOTOR. The motor is a strong mechanical type hand wound spring motor. Insert the crank in the hole at the right. When the motor is fully wound the phonograph will play two full ten-inch records before rewinding is required.

TURNTABLE. To start turntable move the brake lever forward. To stop turntable pull lever toward you. Speed may be regulated by the control arm. For correct pitch adjust this speed to 78 revolutions per minute.

WARNING: Do not forget to turn off radio set when through playing records or the battery will run down. Battery life is appreciably shortened by continuous operation over long periods of time.

RECORD HOLDER. Eight ten-inch records may be carried in the record holder in the cabinet lid. To remove record holding clamp turn it ninety degrees. Place records in lid, replace clamp, sliding it up tight against records before turning it.

SERVICE

KE, TB ONLY

As the phonograph motor is the only moving part it is the only part of your phono-attachment that will require any attention. The motor requires oiling once every six months. Remove the turntable and apply 3 or 4 drops of Number 10 S.A.E. Oil in each of the three oil wells on the top of the motor. These oil wells are below the mounting plate and are in a straight line about one inch apart.

TF ONLY

SERVICE. The phonograph motor will require oiling once every three months. Apply 3 or 4 drops of Number 10 S. A. E. oil to the turntable bearings, to the bearings at each end of the governor shaft, to the felt pad on the governor brake, and to the gears and bearings on the gear shafts.

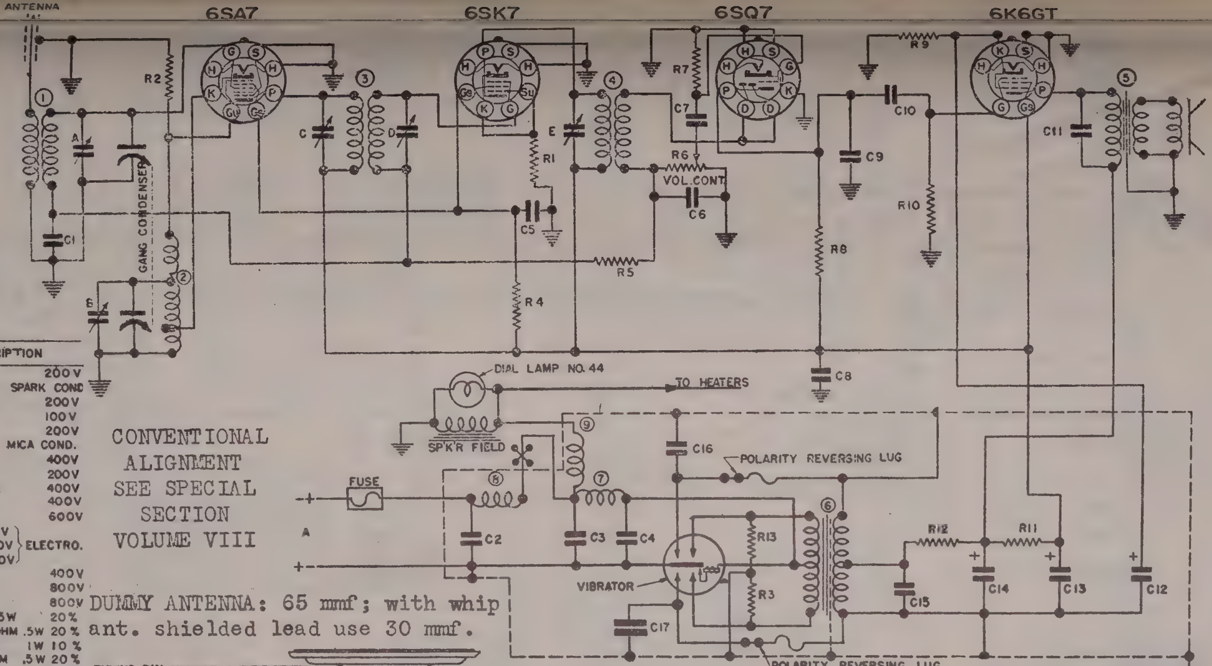
TJF, TNF ONLY

The motor requires oiling once every year.

Remove the turntable and detach the motor by removing

SONORA RADIO & TELEV.. CORP.

MODEL KU-9,Ch.KU
Schematic,Socket
Alignment,Trimmers

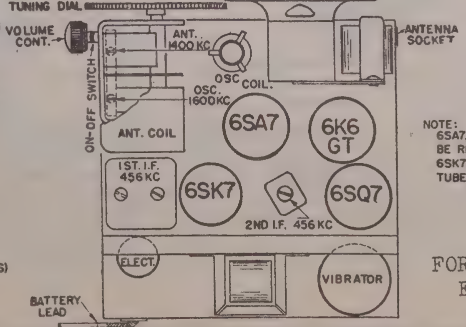


I.F. 456 KC.

DIAG. NO.	PART NO.	DESCRIPTION
C1	N-1345	.05 MFD. 200V
C2	N-2807	.0002 MFD SPARK COND
C3	N-1351	.1 MFD. 200V
C4	N-2814	.5 MFD. 100V
C5	N-1351	.1 MFD. 200V
C6	N-1343	250MMF. MICA COND.
C7	N-1344	.01 MFD. 400V
C8	N-1351	.1MFD. 200V
C9	N-1447	.0005 MFD. 400V
C10	N-1344	.01 MFD. 400V
C11	N-2817	.015 MFD. 600V
C12 C13 C14	N-2795	20 MFD. 25V 6 MFD. 250V 12 MFD. 250V ELECTRO.
C15	N-1623	.1 MFD. 400V
C16	N-2815	.013 MFD. 800V
C17	N-2815	.013 MFD 800V
R1	N-1349	100 OHM .5W 20%
R2	N-1627	20,000 OHM .5W 20%
R3	N-2816	75 OHM 1W 10%
R4	N-1683	7,500 OHM .5W 20%
R5	N-1262	1 MEGOHM .5W 20%
R6	N-1238	VOL. CONT .5 MEGOHM
R7	N-1419	6 MEGOHM .5W 20%
R8	N-1354	300,000 OHM .5W 20%
R9	N-1628	750 OHM .5W 10%
R10	N-1264	500,000 OHM .5W 20%
R11	N-1256	500 OHM .5W 20%
R12	N-1482	250 OHM .5W 20%
R13	N-2816	75 OHM 1W 10%
1	N-2797	ANTENNA COIL
2	N-2793	OSCILLATOR COIL
3	N-2791	1ST. I.F. TRANS.
4	N-1596	2ND. I.F. TRANS.
5	N-2787	4" SPKR. & TRANS.
6	N-2790	VIBRATOR TRANS.
7	N-2805	HASH CHOKE
8	N-2804	MTR. NOISE CHOKE
9	N-2843	FILAMENT CHOKE
	N-2794	VIBRATOR(SYNCHRONOUS)
	N-1237	GANG CONDENSER
	N-1241	TUNING DIAL
	N-2798	BATTERY LEADS
	N-1239	TOGGLE SWITCH

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

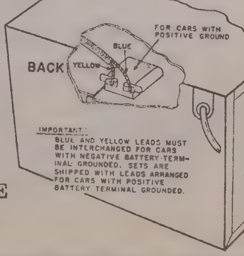
DUMMY ANTENNA: 65 mmf; with whip ant. shielded lead use 30 mmf.



NOTE:
6SA7, 6SK7 AND 6SQ7 CAN BE REPLACED BY 6SA7GT, 6SK7GT AND 6SQ7GT IF TUBE SHIELDS ARE USED.

FOR MOTOR NOISE
ELIMINATION
SEE INDEX

VIEW FROM
BOTTOM



IMPORTANT:
BLUE AND YELLOW LEADS MUST BE INTERCHANGED FOR CARS WITH NEGATIVE BATTERY TERMINAL GROUNDED. SETS ARE SHIPPED WITH LEADS ARRANGED FOR CARS WITH POSITIVE BATTERY TERMINAL GROUNDED.

TUNING RANGE
535 to 1600 KC

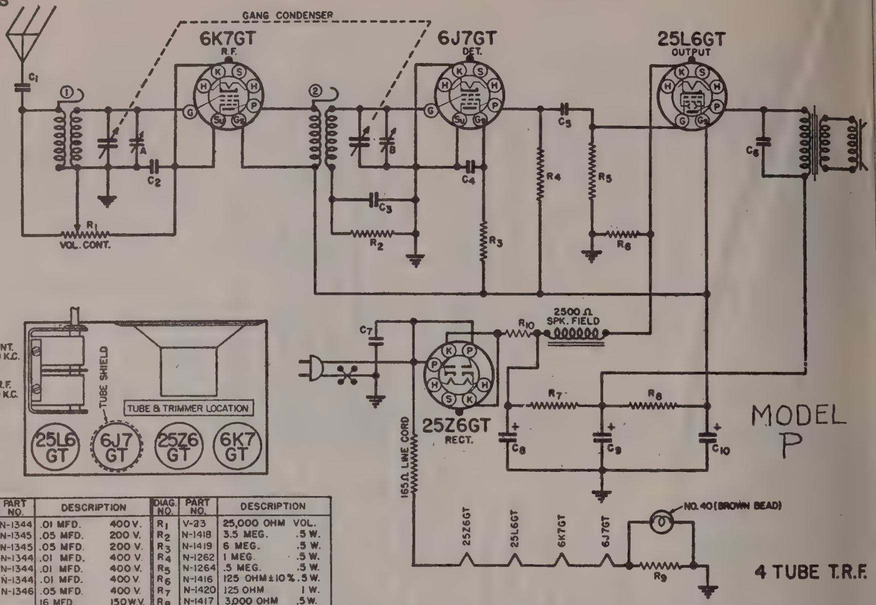
4 TUBE-6 VOLT
SUPERHETERODYNE
SINGLE BAND
AUTO SET

DRN. SK APP. JOH DMJ.

KU

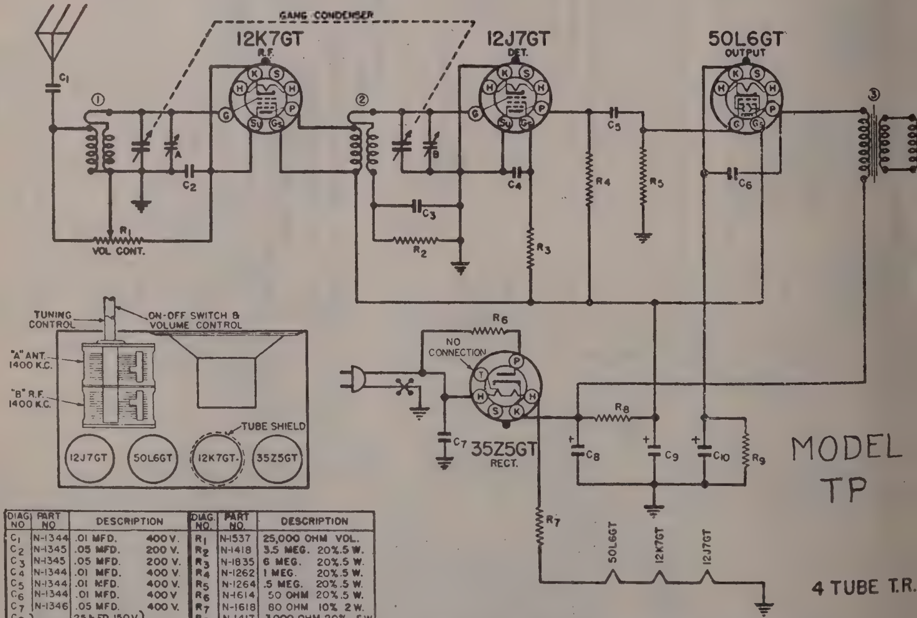
CHASSIS P
MODEL TP-108,Ch.TP
Schematics,Socket
Trimmers

SONORA RADIO & TELEV., CORP.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400 V.	R_1	V-23	25,000 OHM VOL.
C_2	N-1345	.05 MFD. 200 V.	R_2	N-1418	3.5 MEG. .5 W.
C_3	N-1345	.05 MFD. 200 V.	R_3	N-1419	6 MEG. .5 W.
C_4	N-1344	.01 MFD. 400 V.	R_4	N-1262	1 MEG. .5 W.
C_5	N-1344	.01 MFD. 400 V.	R_5	N-1264	.5 MEG. .5 W.
C_6	N-1344	.01 MFD. 400 V.	R_6	N-1416	125 OHM ± 10 % .5 W.
C_7	N-1346	.05 MFD. 400 V.	R_7	N-1420	125 OHM 1 W.
C_8	C-233	16 MFD. 150 W.V.	R_8	N-1417	3,000 OHM .5 W.
C_9		8 MFD. 150 W.V.	R_9	N-1415	30 OHM 1.0 W.
C_{10}		6 MFD. 150 W.V.	R_{10}	N-1251	25 OHM 1 W.
	S-300	SPEAKER	1	L-110	ANTENNA COIL
	G-25	GANG CONDENSER	2	L-111	R.F. COIL

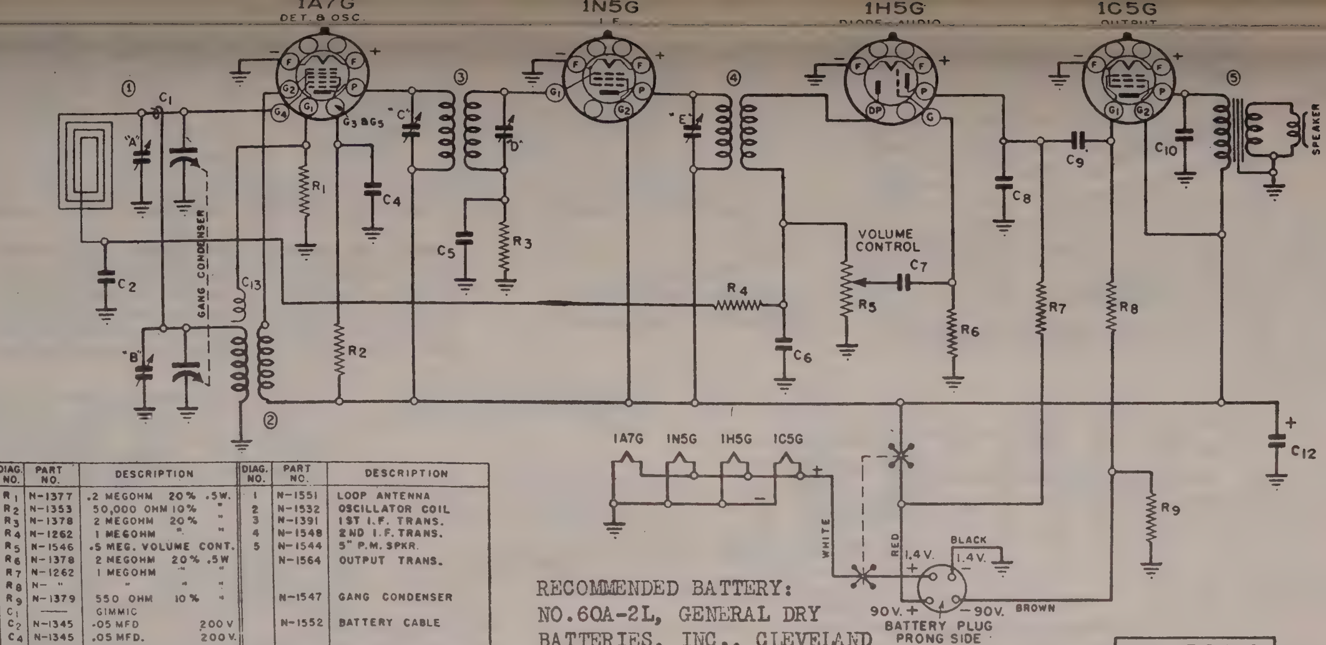
OPERATES ON 110-120 V., 50-60~ AC or DC
DO NOT CONNECT TO EXTERNAL GROUND.



DIAG. NO	PART NO	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400 V.	R_1	N-1537	25,000 OHM VOL.
C_2	N-1345	.05 MFD. 200 V.	R_2	N-1418	3.5 MEG. 20% .5 W.
C_3	N-1345	.05 MFD. 200 V.	R_3	N-1835	6 MEG. 20% .5 W.
C_4	N-1344	.01 MFD. 400 V.	R_4	N-1262	1 MEG. 20% .5 W.
C_5	N-1344	.01 MFD. 400 V.	R_5	N-1264	.5 MEG. 20% .5 W.
C_6	N-1344	.01 MFD. 400 V	R_6	N-1614	50 OHM 20% .5 W.
C_7	N-1346	.05 MFD. 400 V.	R_7	N-1618	80 OHM 10% 2 W.
C_8	N-1850	25 MFD. 150 V. ELECT.	R_8	N-1417	3,000 OHM 20% .5 W
C_9		10 MFD. 150 V.	R_9	N-1718	250 OHM 10% .5 W.
C_{10}		20 MFD. 25 V.	1	N-1790	ANTENNA COIL
	N-1401 N-1847	GANG CONDENSER	2	N-1791	R F. COIL
			3	N-2047	SPEAKER & TRANS

OPERATES ON 110-120V, 50-60~ AC or DC
DO NOT CONNECT TO EXTERNAL GROUND

CHASSIS PL
Schematic, Socket
Trimmers, Alignment



DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1377	.2 MEGOHM 20% .5W.
R_2	N-1353	50,000 OHM 10% "
R_3	N-1378	2 MEGOHM 20% "
R_4	N-1262	1 MEGOHM " "
R_5	N-1546	.5 MEG. VOLUME CONT.
R_6	N-1378	2 MEGOHM 20% .5W
R_7	N-1262	1 MEGOHM " "
R_8	N- "	" " "
R_9	N-1379	550 OHM 10% "
C_1	———	GIMMIC
C_2	N-1345	.05 MFD 200 V
C_4	N-1345	.05 MFD. 200 V.
C_5	N-1376	.02 MFD. . 400 V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1374	100 MMFD. 20%
C_9	N-1344	.01 MFD 400 V.
C_{10}	N-1347	.006 MFD. 600 V.
C_{12}	N-1367	6 MFD. ELECTROLYTIC
C_{13}	–	CAPACITY INCLUDED IN OSCILLATOR COIL.

DIAG. NO.	PART NO.	DESCRIPTION
1	N-1551	LOOP ANTENNA
2	N-1532	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1548	2ND I.F. TRANS.
5	N-1544	5" P.M. SPKR.
	N-1564	OUTPUT TRANS.
	N-1547	GANG CONDENSER
	N-1552	BATTERY CABLE
"E"	N-1453	TRIMMER COND.-2ND I.F.

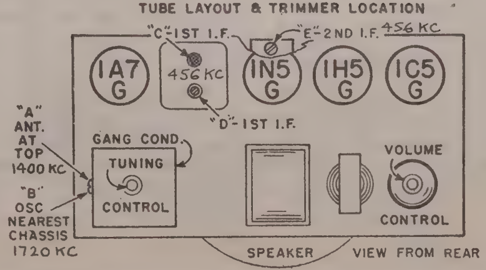
RECOMMENDED BATTERY:
NO. 6QA-2L, GENERAL DRY
BATTERIES, INC., CLEVELAND

I.F. 456 K.C.

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

TUNING RANGE
535 to 1720 KC

TUBE LAYOUT & TRIMMER LOCATION



PORTABLE
4 TUBE - $1\frac{1}{2}$ VOLT
SUPERHETERODYNE
SINGLE BAND

DRWN. F.L.C. APP. D.M.F. 2-1-39

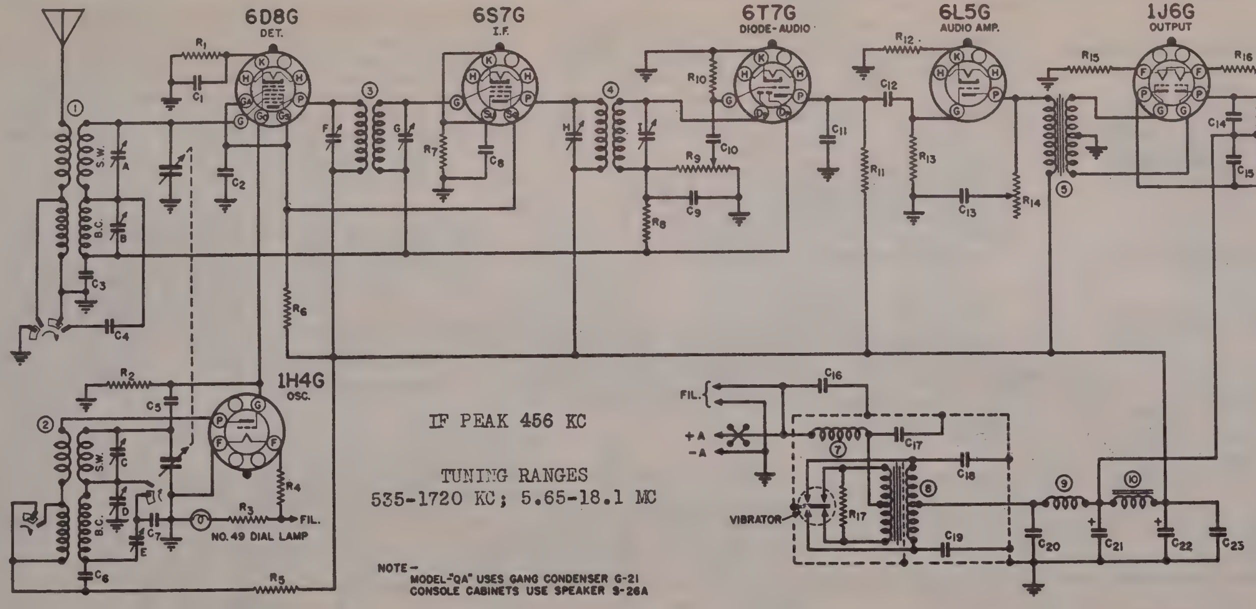
PL

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

BROADCAST BAND ALIGNMENT. Remove chassis, battery pack, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. Make a loop consisting of two turns of wire approximately one foot in diameter and connect across the generator terminals. Place this loop parallel to the loop antenna and about six inches away from it.

CHASSIS Q,QA
Schematic,Socket
Alignment,Trimmers

SONORA RADIO & TELEV., CORP.



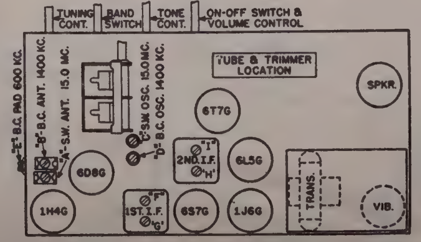
IF PEAK 456 KC

TUNING RANGES
535-1720 KC; 5.65-18.1 MC

NOTE –
MODEL-"QA" USES GANG CONDENSER G-21
CONSOLE CABINETS USE SPEAKER S-26A

IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the receiver is being used. An inexpensive double throw switch can be used for simultaneously connecting the battery to the receiver and disconnecting the windcharger. This will increase the life of the tubes and give additional economy to the use of the receiver.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



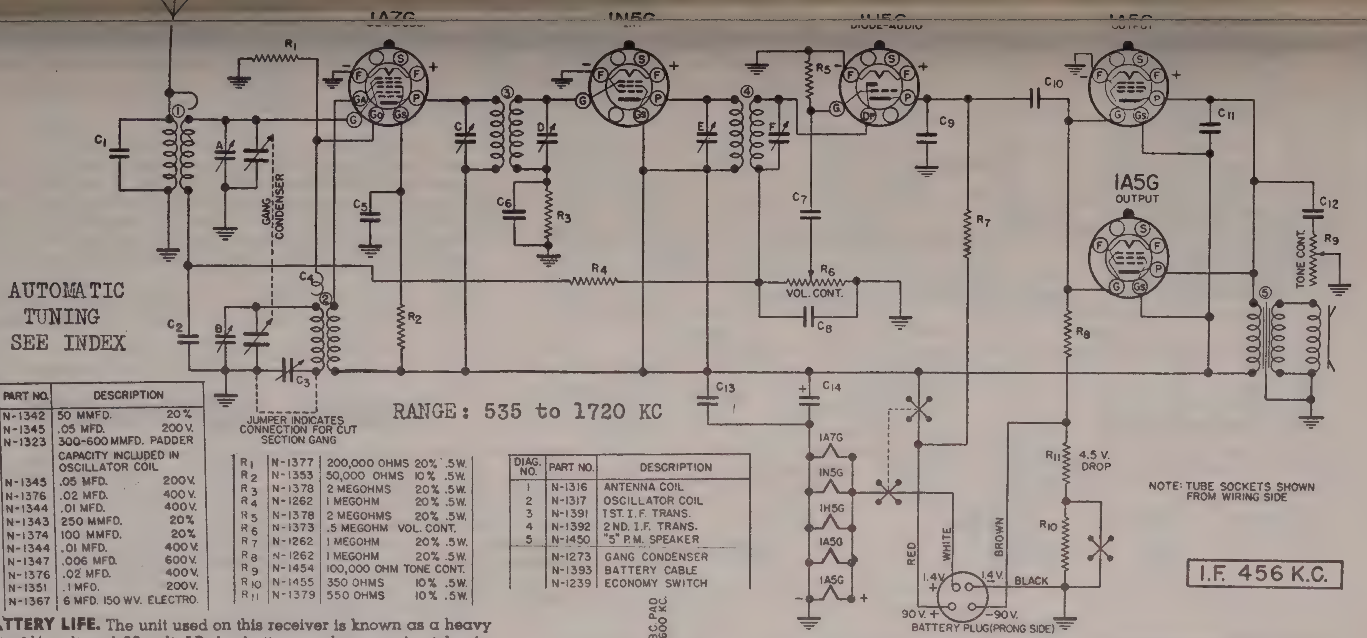
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	C-13	.05 MFD. 200 V.	C19	C-71	.01 MFD. (OIL) 1,000 V.	R9	V-20	1 MEG. VOLUME CONT.	1	L-44	ANTENNA COIL
C2	C-1	.1 MFD. 200 V.	C20	C-5	.01 MFD. 600 V.	R10	R-55	10 MEGOHM .25 W.	2	L-63	OSCILLATOR COIL
C3	C-13	.05 MFD. 200 V.	C21	C-242	10 MFD. 250 V.	R11	R-41	.25 MEGOHM .25 W.	3	I-20	1ST. I.F. TRANS.
C4	C-4	.01 MFD. 400 V.	C22		15 MFD. 250 V.	R12	R-16	2,000 OHM .25 W.	4	I-28	2ND. I.F. "
C5	C-115	50 MMFD.	C23	C-1	.1 MFD. 200 V.	R13	R-42	.5 MEGOHM .25 W.	5	T-103	AUDIO "
C6	C-4	.01 MFD. 400 V.				R14	V-110	.1 MEG. TONE CONT.	6	S-26	SPKR. "
C7	C-1090	4,000 MMFD. 3 %				R15	R-510	8.3 OHM 5 % .5 W.	7	H-206	"A" CHOKE
C8	C-13	.05 MFD. 200 V.				R16	R-510	8.3 OHM 5 % .5 W.	8	T-26	POWER TRANS.
C9	C-HO	100 MMFD.				R17	R-107	200 OHM .5 W.	9	H-207	R.F. CHOKE
C10	C-27	.006 MFD. 800 V.							10	H-9	AUDIO CHOKE
C11	C-111	250 MMFD.	R1	R-12	500 OHM .25 W.				A		2-35 MMFD.
C12	C-4	.01 MFD. 400 V.	R2	R-33	50,000 OHM .25 W.				B		"
C13	C-27	.006 MFD. 800 V.	R3	R-511	67.0 OHM .5 W.				C		"
C14	C-5	.01 MFD. 600 V.	R4	R-511	67.0 OHM .5 W.				D		"
C15	C-5	.01 MFD. 600 V.	R5	R-25	10,000 OHM .25 W.		X-17	BAND SWITCH	E	P-2	200-750 MMFD.

FOR AUTOMATIC TUNING
USED ON MODEL QA
SEE INDEX

6 TUBE-6 VOLT
SUPERHETERODYNE
TWO BAND
I.F. PEAK 456 KC.
MODEL-"Q"-"QA"

SONORA RADIO & TELEV., CORP.

CHASSIS SL
Schematic, Socket
Alignment, Trimmers



AUTOMATIC
TUNING
SEE INDEX

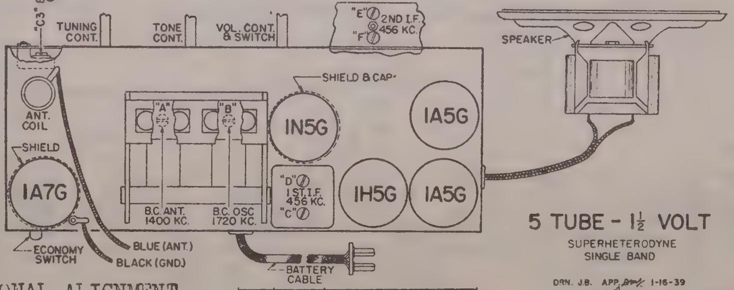
RANGE: 535 to 1720 KC

I.F. 456 K.C.

DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1342	50 MMFD. 20%
C_2	N-1345	.05 MFD. 200 V.
C_3	N-1323	300-600 MMFD. PADDER
C_4		CAPACITY INCLUDED IN OSCILLATOR COIL
C_5	N-1345	.05 MFD. 200V.
C_6	N-1376	.02 MFD. 400 V.
C_7	N-1344	.01 MFD. 400V.
C_8	N-1343	250 MMFD. 20%
C_9	N-1374	100 MMFD. 20%
C_{10}	N-1344	.01 MFD. 400V.
C_{11}	N-1347	.006 MFD. 600V.
C_{12}	N-1376	.02 MFD. 400V.
C_{13}	N-1351	.1 MFD. 200V.
C_{14}	N-1367	6 MFD. 150 WV. ELECTRO.

R_1	N-1377	200,000 OHMS 20% .5W.
R_2	N-1353	50,000 OHMS 10% .5W.
R_3	N-1378	2 MEGOHMS 20% .5W.
R_4	N-1262	1 MEGOHM 20% .5W.
R_5	N-1378	2 MEGOHMS 20% .5W.
R_6	N-1373	.5 MEGOHM VOL. CONT.
R_7	N-1262	1 MEGOHM 20% .5W.
R_8	N-1262	1 MEGOHM 20% .5W.
R_9	N-1454	100,000 OHM TONE CONT.
R_{10}	N-1455	350 OHMS 10% .5W.
R_{11}	N-1379	550 OHMS 10% .5W.

DIAG. NO.	PART NO.	DESCRIPTION
1	N-1316	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1391	1ST. I.F. TRANS.
4	N-1392	2ND. I.F. TRANS.
5	N-1450	"5" P.M. SPEAKER
	N-1273	GANG CONDENSER
	N-1393	BATTERY CABLE
	N-1239	ECONOMY SWITCH



5 TUBE - 1½ VOLT
SUPERHETERODYNE
SINGLE BAND

DRN. J.B. APP. 1-16-39

SL

BATTERY LIFE. The unit used on this receiver is known as a heavy duty 1½ volt and 90 volt AB dry battery pack, approximately sixteen inches long, four and a half inches wide and six and a half inches high with a socket type connector. A battery of this type has a probable life of six to seven months with three hours daily use and a longer or shorter life as the daily usage is decreased or increased when the set is operated in the "power position"

REAR SWITCH. (**Two Position Economy Switch.**) The switch is provided to obtain the maximum of battery life without sacrificing the performance of the set.

The switch should be operated in the "Economy" (left hand) position until the performance of the radio receiver drops sufficiently to indicate the end of the batteries' **normal** life.

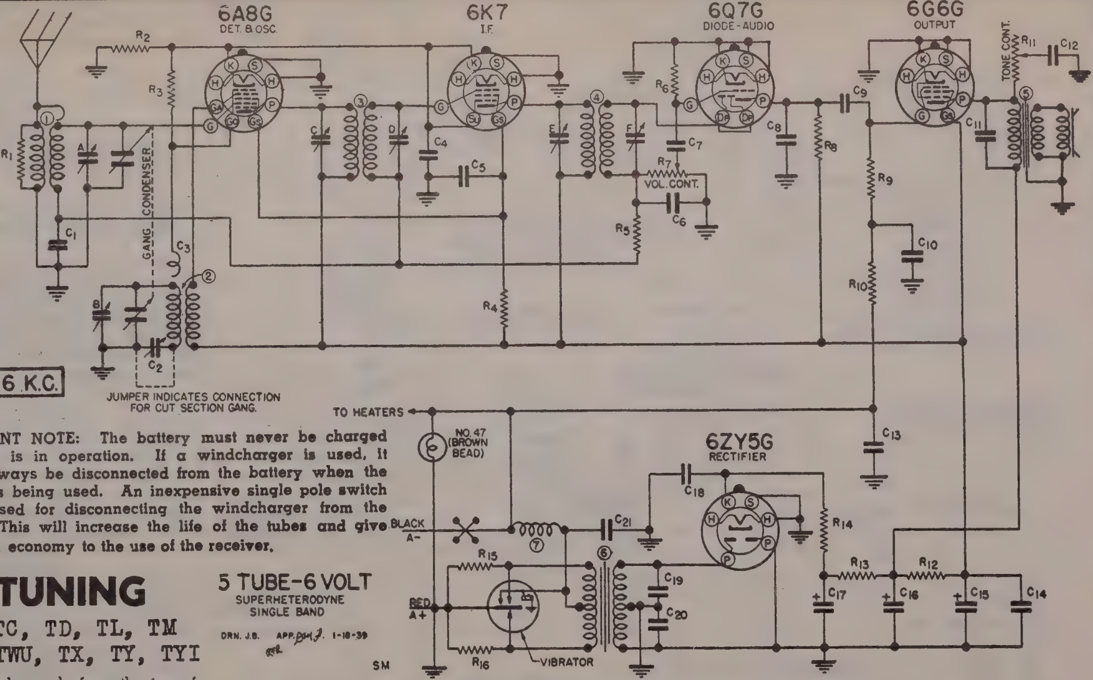
When the battery is new the set gives sufficient power output and sensitivity in the economy position and the life of the battery is materially increased.

When the battery becomes old the "Power" position (right hand) makes it possible to use the battery to the complete end of the batteries' useful life and still retain good reception.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

SET WITH CUT SECTION GANG		
C_3	N-1323	PADDER, ELIMINATED
	N-1338	GANG CONDENSER
2	N-1337	OSCILLATOR COIL

DIAG NO	PART NO.	DESCRIPTION
C_1	N-1345	.05 MFD. 200V.
C_2 C_3	N-1323	300-600 MMFD. PADDER CAPACITY INCLUDED IN OSCILLATOR COIL
C_4	N-1479	.25 MFD. 200V.
C_5	N-1351	.1 MFD. 200V.
C_6	N-1374	100 MMFD. 20%
C_7	N-1347	.006 MFD. 600V.
C_8	N-1343	250 MMFD. 20%
C_9	N-1344	.01 MFD. 400V.
C_{10}	N-1345	.05 MFD. 200V.
C_{11}	N-1347	.006 MFD. 600V.
C_{12}	N-1376	.02 MFD. 400V.
C_{13}	N-1471	.5 MFD. 50V.
C_{14}	N-1351	.1 MFD. 200V.
C_{15} C_{16} C_{17}	N-1468	20 MFD. 150V. 20 MFD. 150V. ELECTRO. 10 MFD. 250V.
C_{18}	N-1478	.01 MFD. 600V.
C_{19}	N-1480	.01 MFD. (OIL) 1000V.
C_{20}	N-1480	.01 MFD. (OIL) 1000V.
C_{21}	N-1471	.5 MFD. 50V.
R_1	N-1259	15,000 OHMS 20% .5W.
R_2	N-1473	200 OHMS 10% .5W.
R_3	N-1260	50,000 OHMS 20% .5W.
R_4	N-1474	25,000 OHMS 20% .5W.
R_5	N-1378	2 MEGOHMS 20% .5W.
R_6	N-1263	10 MEGOHMS 20% .5W.
R_7	N-1320	1 MEGOHM VOL. CONT.
SET WITH CUT SECTION GANG		
C_2	N-1323 N-1338	PADDER, ELIMINATED GANG CONDENSER
2	N-1337	OSCILLATOR COIL



IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the receiver is being used. An inexpensive single pole switch can be used for disconnecting the windcharger from the battery. This will increase the life of the tubes and give additional economy to the use of the receiver.

5 TUBE-6 VOLT
SUPERHETERODYNE
SINGLE BAND

DRN. J.S. APP. 1-18-39

AUTOMATIC TUNING

For Chassis QA, SL, SM, TC, TD, TL, TM TR, TT, TW, TWU, TX, TY, TYI

ADJUSTMENT. All adjustments are simply made from the top of the cabinet without the use of tools since the push-button knobs serve this purpose.

To make adjustments, turn each knob to the left about 1 complete turn. The knob is knurled to provide a positive grip for this purpose.

With the knob turned free, tune to any desired station with the manual tuning control. Depress the push button knob as far as possible and turn to the right to tighten adjustment. Meanwhile, hold the manual tuning control in position to the station tuned.

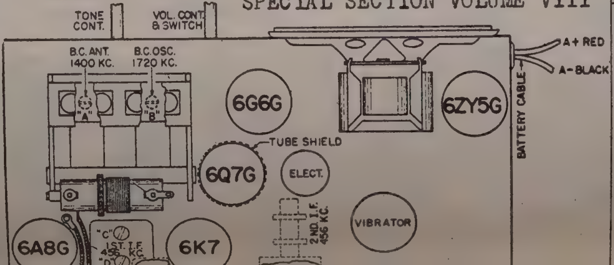
Be sure the push button knob is held down in position while being tightened.

After the stations are adjusted it is advisable to check each button to assure sufficient tightening.

To assure accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.

It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

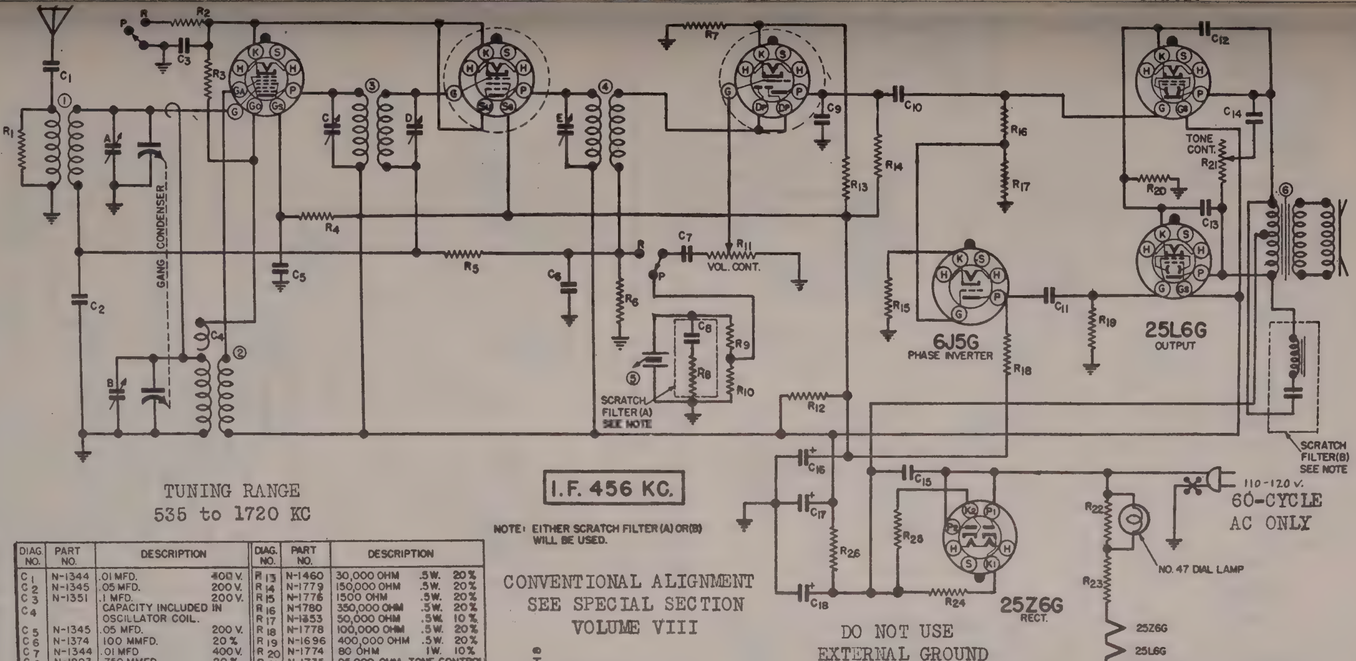


DIAG. NO.	PART NO.	DESCRIPTION
R_8	N-1261	250,000 OHMS 20% .5W.
R_9	N-1264	.5 MEGOHMS 20% .5W.
R_{10}	N-1260	50,000 OHMS 20% .5W.
R_{11}	N-1454	100,000 OHM TONE CONT.
R_{12}	N-1256	500 OHMS 20% .5W.
R_{13}	N-1482	250 OHMS 20% .5W.
R_{14}	N-1482	250 OHMS 20% .5W.
R_{15}	N-1498	50 OHMS 20% 1W.
R_{16}	N-1498	50 OHMS 20% 1W.
1	N-1461	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1318	1 ST. I.F. TRANS.
4	N-1319	2ND. I.F. TRANS.
5	N-1472	5" P.M. SPEAKER & TRANS.
6	N-1476	POWER TRANS.
7	N-1477	"A" CHOKE
	N-1273	GANG CONDENSER

SONORA RADIO & TELEV., CORP.

CHASSIS TB
Schematic, Socket, Trimmers
Alignment

)R PHONO.DATA
SEE INDEX



TUNING RANGE
535 to 1720 KC

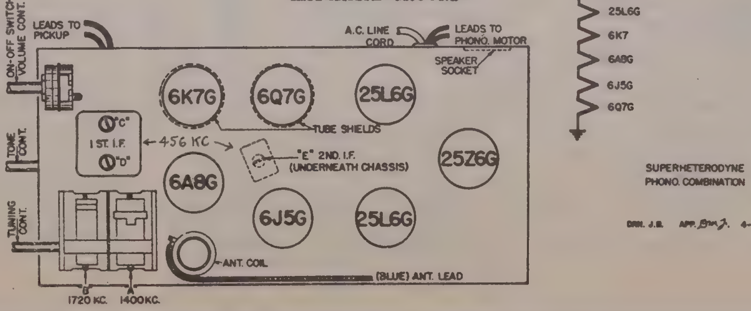
I.F. 456 KC.

NOTE: EITHER SCRATCH FILTER (A) OR (B) WILL BE USED.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

DO NOT USE
EXTERNAL GROUND

DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C 1	N-1344	.01 MFD. 400 V.		R 13	N-1460	30,000 OHM .5W. 20%
C 2	N-1345	.05 MFD. 200 V.		R 14	N-1779	150,000 OHM .5W. 20%
C 3	N-1351	.1 MFD. 200 V.		R 15	N-1776	1500 OHM .5W. 20%
C 4		CAPACITY INCLUDED IN OSCILLATOR COIL.		R 16	N-1780	350,000 OHM .5W. 20%
C 5	N-1345	.05 MFD. 200 V.		R 17	N-1353	50,000 OHM .5W. 10%
C 6	N-1374	100 MMFD. 20%		R 18	N-1778	100,000 OHM .5W. 20%
C 7	N-1344	.01 MFD 400 V.		R 19	N-1696	400,000 OHM .5W. 20%
C 8	N-1803	750 MMFD. 20%		R 20	N-1774	80 OHM 1W. 10%
C 9	N-1343	250 MMFD. 20%		R 21	N-1735	25,000 OHM TONE CONTROL
C 10	N-1344	.01 MFD. 400 V.		R 22	N-1756	22 OHM 2W. ARMORED WIRE RES.
C 11	N-1344	.01 MFD. 400 V.		R 23		45 OHM 4.5W.
C 12	N-1344	.01 MFD. 400 V.		R 24	N-1458	25 OHM .5W. 20%
C 13	N-1344	.01 MFD. 400 V.		R 25	N-1458	25 OHM .5W. 20%
C 14	N-1623	.1 MFD. 400 V.		R 26	N-1694	1000 OHM .5W. 20%
C 15	N-1346	.05 MFD. 400 V.				
C 16	N-1755	10 MFD. 150 V. ELECTRO.				
C 17		40 MFD. 150 V.				
C 18		30 MFD. 150 V.				
				1	N-1451	ANTENNA COIL
				2	N-1452	OSCILLATOR COIL
				3	N-1754	1ST. I.F. TRANSFORMER
				4	N-1596	2ND. I.F. TRANSFORMER
				5	N-1782	CRYSTAL PICKUP.
				[illegible]	N-1740	6" P.M. SPEAKER (TABLE)
					N-1741	8" P.M. SPEAKER (CONSOLE)
R 1	N-1259	15,000 OHM .5W. 20%				
R 2	N-1775	300 OHM .5W. 20%				
R 3	N-1260	50,000 OHM .5W. 20%				
R 4	N-1627	20,000 OHM .5W. 20%		E	N-1597	TRIMMER COND. (2ND. I.F.)
R 5	N-1262	1 MEGOHM .5W. 20%				
R 6	N-1264	500,000 OHM .5W. 20%			N-1733	GANG CONDENSER
R 7	N-1775	300 OHM .5W. 20%			N-1758	RADIO-PHONO CHANGEOVER SWITCH.
R 8	N-1482	250 OHM .5W 20%				
R 9	N-1264	500,000 OHM .5W. 20%			N-1539	LINE CORD
R 10	N-1377	200,000 OHM .5W. 20%				
R 11	N-1734	.5 MEGOHM VOL. CONTROL				
R 12	N-1776	1500 OHM .5W. 20%				



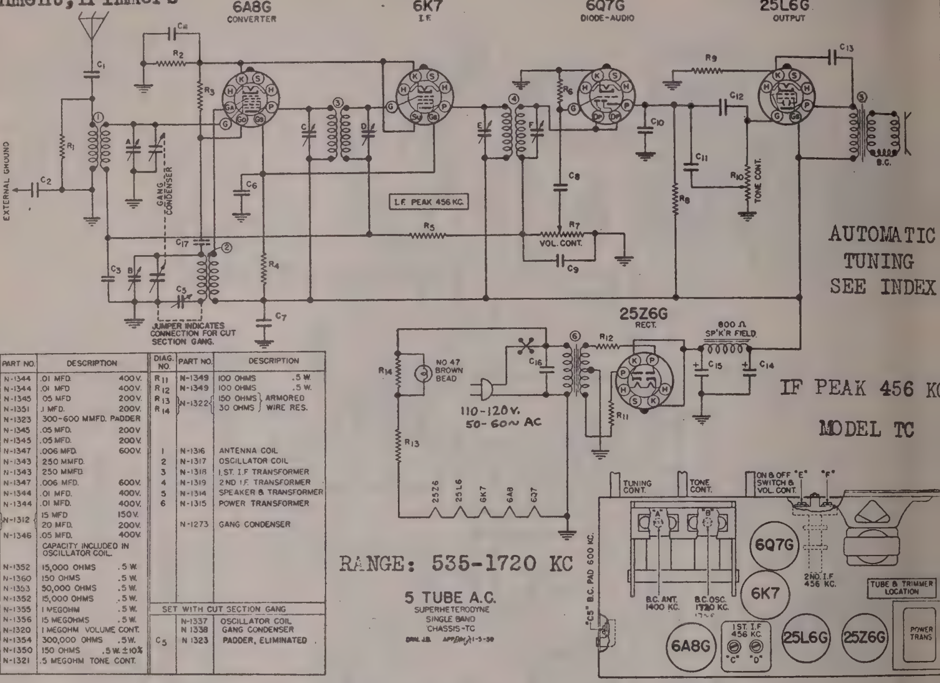
SUPERHETERODYNE
PHONO. COMBINATION

DRN. J.B. APP. 4-21-39

TB

CHASSIS TC
CHASSIS TS
Schematics, Socket
Alignment, Trimmers

SONORA RADIO & TELEV., CORP.



AUTOMATIC TUNING SEE INDEX

IF PEAK 456 K

MODEL TC

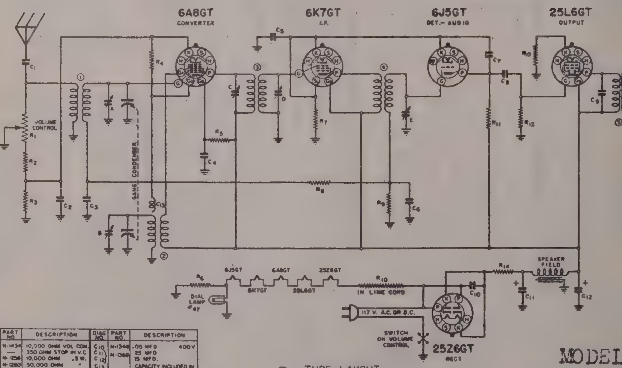
DIAG NO	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400V.
C_2	N-1344	.01 MFD 400V.
C_3	N-1345	.05 MFD 200V.
C_4	N-1351	.1 MFD. 200V.
C_5	N-1323	300-600 MMFD. PADDER
C_6	N-1345	.05 MFD. 200V
C_7	N-1345	.05 MFD. 200V.
C_8	N-1347	.006 MFD. 600V.
C_9	N-1343	250 MMFD.
C_{10}	N-1343	250 MMFD.
C_{11}	N-1347	.006 MFD. 600V.
C_{12}	N-1344	.01 MFD. 400V.
C_{13}	N-1344	.01 MFD. 400V.
C_{14}	N-1312	15 MFD 150V.
C_{15}		20 MFD. 200V.
C_{16}	N-1346	.05 MFD. 400V.
C_{17}		CAPACITY INCLUDED IN OSCILLATOR COIL.
R_1	N-1352	15,000 OHMS .5 W.
R_2	N-1360	150 OHMS .5 W.
R_3	N-1353	50,000 OHMS .5 W.
R_4	N-1352	15,000 OHMS .5 W.
R_5	N-1355	1 MEGOHM .5 W.
R_6	N-1356	15 MEGOHMS .5 W.
R_7	N-1320	1 MEGOHM VOLUME CONT.
R_8	N-1354	300,000 OHMS .5W.
R_9	N-1350	150 OHMS .5 W. ±10%
R_{10}	N-1321	.5 MEGOHM TONE CONT.

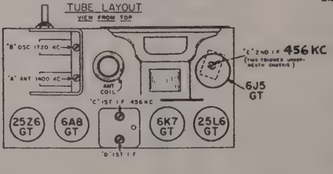
DIAG. NO.	PART NO.	DESCRIPTION
R_{11}	N-1349	100 OHMS .5 W.
R_{12}	N-1349	100 OHMS .5 W.
R_{13}	N-1322	150 OHMS ARMORED WIRE RES.
R_{14}		30 OHMS ARMORED WIRE RES.
1	N-1316	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1318	1ST. I.F TRANSFORMER
4	N-1319	2ND I.F. TRANSFORMER
5	N-1314	SPEAKER & TRANSFORMER
6	N-1315	POWER TRANSFORMER
	N-1273	GANG CONDENSER
SET WITH CUT SECTION GANG		
	N-1337	OSCILLATOR COIL
	N 1338	GANG CONDENSER
C_5	N 1323	PADDER, ELIMINATED

RANGE: 535-1720 KC

5 TUBE A.C.
SUPERHETERODYNE
SINGLE BAND
CHASSIS-TC
DRN. J.B. APP. 11-5-38

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII





MODEL TS

I.F. 456 KC.

5 TUBE A.C.-D.C.
SUPERHETERODYNE
SINGLE BAND
FROM F.L.S. APP. 11-10-38

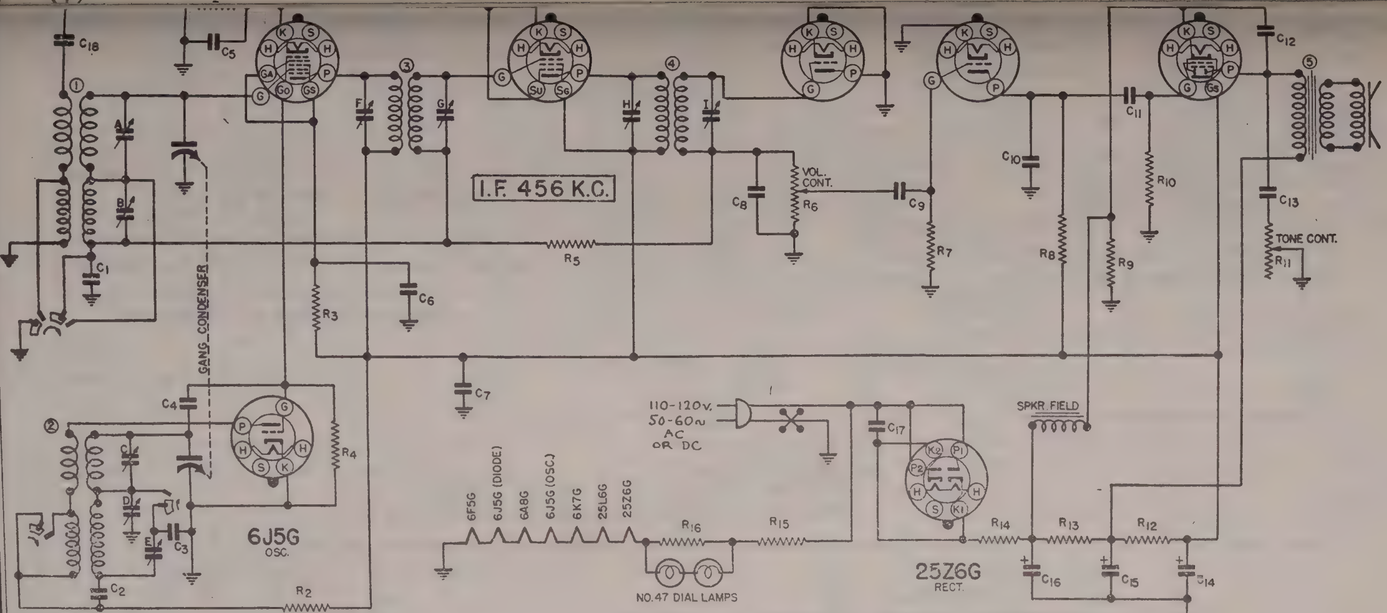
DIAG NO.	PART NO.	DESCRIPTION
R_1	N-1434	10,000 OHM VOL CON.
R_2	—	350 OHM STOP IN V.C.
R_3	N-1258	10,000 OHM .5 W.
R_4	N-1280	50,000 OHM "
R_5	N-1480	30,000 OHM "
R_6	N-1415	30 OHM 1.0 W.
R_7	N-1459	600 OHM .5 W
R_8	N-1262	1.0 MEGOHM "
R_9	N-1378	2.0 MEGOHM "
R_{10}	N-1436	150 OHM IN LINE CORD
R_{11}	N-1377	200,000 OHM .5 W
R_{12}	N-1264	500,000 OHM "
R_{13}	N-1457	125 OHM "
R_{14}	N-1458	25 OHM "
C_1	N-1344	.01 MFD 400 V
C_2	N-1345	.05 MFD 200 V
C_3	N-1345	.05 MFD "
C_4	N-1345	.05 MFD
C_5	N-1351	.10 MFD "
C_6	N-1344	.01 MFD 400 V
C_7	N-1447	.0005 MFD "
C_8	N 1344	.01 MFD. "
C_9	N 1344	.01 MFD

DIAG NO.	PART NO.	DESCRIPTION
C_{10}	N-1344	.05 MFD 400 V
C_{11}	N-1368	25 MFD
C_{12}		15 MFD.
C_{13}		CAPACITY INCLUDED IN OSCILLATOR COIL
"E"	N-1483	2ND I.F. TRIMMER
①	N-1451	ANTENNA COIL
②	N-1452	OSCILLATOR COIL
③	N-1433	1ST I.F. TRANS.
④	N-1432	2ND I.F. TRANS.
⑤	N-1370	5" SPK & TRANS
	N 1431	GANG CONDENSER

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII
DO NOT USE EXTERNAL GROUND

SONORA RADIO & TELEV., CORP.

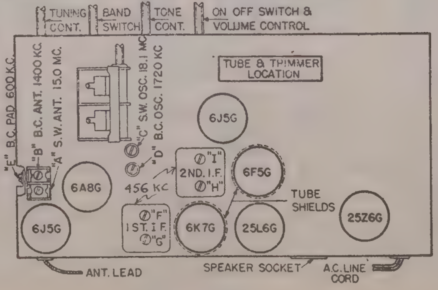
CHASSIS TD
Schematic, Socket
Alignment, Trimmers



DO NOT USE EXTERNAL GROUND CONNECTION

TUNING RANGES: 535-1720 KC; 5.65-18.1 MC

DIAG. NO	PART NO.	DESCRIPTION		DIAG. NO.	PART NO	DESCRIPTION			DIAG. NO	PART NO.	DESCRIPTION
C1	N-1345	.05 MFD.	200 V.								
C2	N-1344	.01 MFD.	400 V.								
C3	N-1690	4000 MMFD.	5 %	R1	N-1473	200 OHM	.5 W.	10 %	1	L-72	ANTENNA COIL
C4	N-1342	50 MMFD.	20%	R2	N-1695	5,000 OHM	.5 W.	20%	2	L-63	OSCILLATOR COIL
C5	N-1473	.25 MFD.	200 V.	R3	N-1259	15,000 OHM	.5 W.	20%	3	N-1688	1 ST. I.F. TRANSFORMER
C6	N-1345	.05 MFD.	200 V.	R4	N-1260	50,000 OHM	.5 W.	20%	4	N-1689	2 ND. I.F. TRANSFORMER
C7	N-1351	.1 MFD.	200 V.	R5	N-1262	1 MEGOHM	.5 W.	20%	5	N-1687	6" DYN. SP'K'R (TABLE)
C8	N-1343	250 MMFD.	20%	R6	V-22	.5 MEGOHM	VOL. CONTROL			N-1688	8" DYN. SP'K'R (CONSOLE)
C9	N-1344	.01 MFD.	400 V.	R7	N-1419	6 MEGOHM	.5 W.	20%			
C10	N-1343	250 MMFD.	20%	R8	N-1261	250,000 OHM	.5 W.	20%	E	N-1254	PADDING CONDENSER
C11	N-1344	.01 MFD.	400 V.	R9	N-1692	100 OHM	1 W.	10%			
C12	N-1376	.02 MFD.	400 V.	R10	N-1696	400,000 OHM	.5 W.	20%		X-17	BAND SWITCH
C13	N-1346	.05 MFD.	400 V.	R11	V-109	25,000 OHM	TONE CONT.			G-21	GANG CONDENSER
C14	C-237	30 MFD. 150 V.	ELECTRO.	R12	N-1694	1,000 OHM	.5 W.	20%		N-1599	LINE CORD
C15		10 MFD. 150 V.		R13	N-1693	325 OHM	1 W.	10%			
C16		30 MFD. 150 V.		R14	N-1458	25 OHM	.5 W.	20%			
C17	N-1346	.05 MFD.	400 V.	R15	N-1691	95 OHM, 9W, 10%	ARMORED WIRE RES.				
C18	N-1344	.01 MFD.	400 V.	R16		53 OHM, 45W, 10%					



FOR AUTOMATIC TUNING SEE INDEX

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

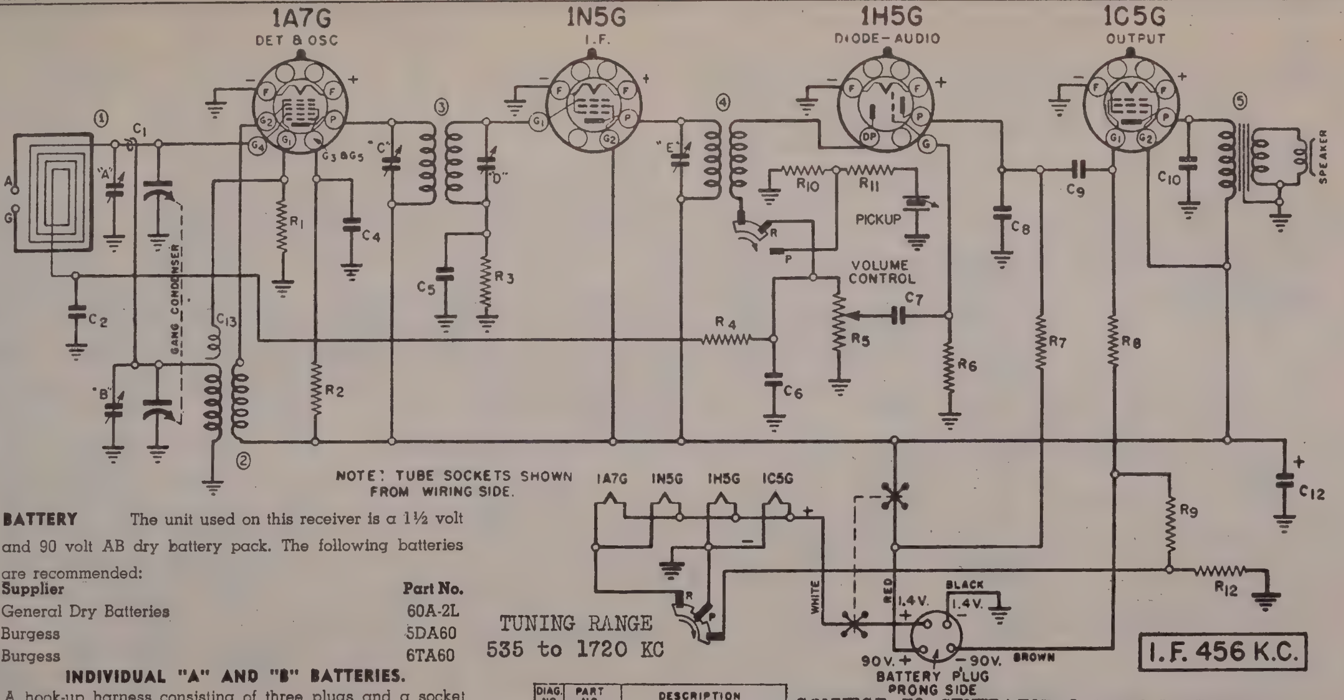
7 TUBE A.C.-D.C.
SUPERHETERODYNE
TWO BAND

DRN. BY- J.B. APP. BY- 4-25-39
TD

MODEL TF-39,Ch.TF
Schematic,Socket
Trimmers,Alignment

SONORA RADIO & TELEV., CORP.

FOR PHONO.DATA
SEE INDEX



NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

TUNING RANGE
535 to 1720 KC

I.F. 456 K.C.

BATTERY The unit used on this receiver is a 1½ volt and 90 volt AB dry battery pack. The following batteries are recommended:

Supplier	Part No.
General Dry Batteries	60A-2L
Burgess	5DA60
Burgess	6TA60

INDIVIDUAL "A" AND "B" BATTERIES.

A hook-up harness consisting of three plugs and a socket is required. This hook-up harness is not furnished with the receiver and should be purchased when obtaining separate A and B batteries.

SUPPLIER	1½ Volt A Battery (2½" x 2½" x 4")	45 Volt B Battery (2½" x 4⅛" x 5")
Eveready	No. 742	No. 762
Burgess	No. 4FAPI	No. B 30 PI
Ray-O-Vac	No. P94A	No. P 5303
General Dry Battery	No. 4H1	No. V-30-B

Use one "A" battery and two "B" batteries with the hook-up harness. Clamp down the batteries with support strap.

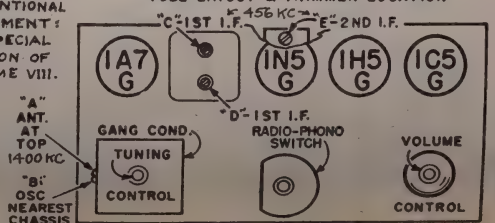
DIAG. NO.	PART NO.	DESCRIPTION
1	N-1804	LOOP ANTENNA
2	N-1452	OSCILLATOR COIL
	N-1737	GANG CONDENSER
	N-1552	BATTERY CABLE

DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1377	.2 MEGOHM 20% .5W.
R_2	N-1353	50,000 OHM 10% "
R_3	N-1378	2 MEGOHM 20% "
R_4	N-1262	1 MEGOHM " "
R_5	N-1738	.5 MEG. VOLUME CONT.
R_6	N-1378	2 MEGOHM 20% .5W
R_7	N-1262	1 MEGOHM " "
R_8	N- "	" " "
R_9	N-1661	650 OHM 10% "
R_{10}	N-1929	65,000 OHM 20% "
R_{11}	N-1779	150,000 OHM 20% "
R_{12}	N-1844	300 OHM 10% "
C_1	———	GIMMIC
C_2	N-1345	.05 MFD 200 V
C_4	N-1345	.05 MFD. 200 V.
C_5	N-1376	.02 MFD. 400 V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1374	100 MMFD. 20%
C_9	N-1344	.01 MFD 400 V.
C_{10}	N-1347	.006 MFD. 600 V.

CONNECT TO GENERATOR 2-TURN LOOP APPROX. 1 FOOT IN DIAM. PLACE THIS PARALLEL TO RECEIVER LOOP, ABOUT 6 INCHES AWAY FROM IT.

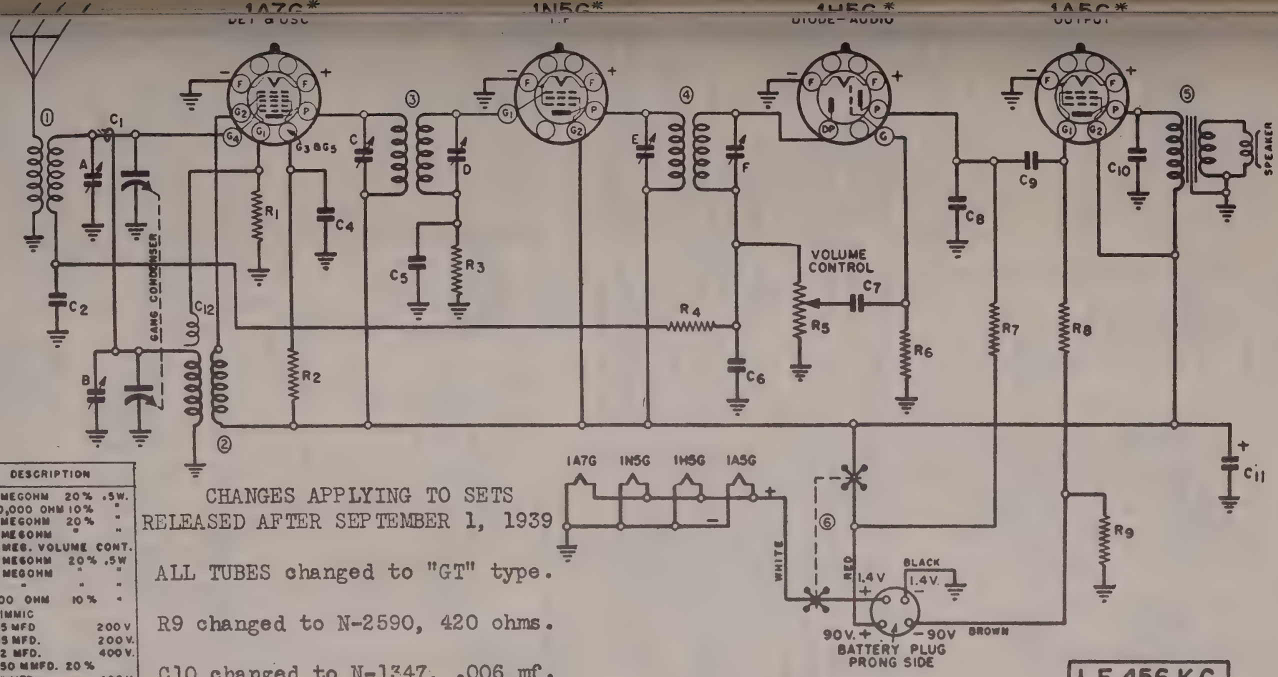
CONVENTIONAL ALIGNMENT: SEE SPECIAL SECTION OF VOLUME VIII.

TUBE LAYOUT & TRIMMER LOCATION



SONORA RADIO & TELEV.. CORP.

MODEL TH-46
Chassis TH,Early,Late
Schematic,Socket
Alignment,Trimmers



I.F. 456 K.C.

CHANGES APPLYING TO SETS
RELEASED AFTER SEPTEMBER 1, 1939

ALL TUBES changed to "GT" type.

R9 changed to N-2590, 420 ohms.

C10 changed to N-1347, .006 mf.

5 changed to Part No. N-2588.

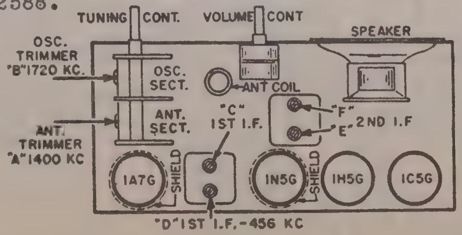
DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1377	.2 MEGOHM 20% .5W.
R_2	N-1353	50,000 OHM 10% "
R_3	N-1378	2 MEGOHM 20% "
R_4	N-1262	1 MEGOHM " "
R_5	N-2056	.5 MEG. VOLUME CONT.
R_6	N-1378	2 MEGOHM 20% .5W
R_7	N-1262	1 MEGOHM " "
R_8	N- "	" " "
* R_9	N-2064	600 OHM 10% "
C_1	——	GIMMIC
C_2	N-1345	.05 MFD 200 V
C_4	N-1345	.05 MFD. 200 V.
C_5	N-1376	.02 MFD. 400 V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1374	100 MMFD. 20%
C_9	N-1344	.01 MFD 400 V.
* C_{10}	N-2063	.003 MFD. 600 V.
C_{11}	N-1367	6 MFD. ELECTROLYTIC
C_{12}	-	CAPACITY INCLUDED IN OSCILLATOR COIL.
1	N-1451	ANTENNA COIL
2	N-1452	OSCILLATOR COIL
3	N-1391	1ST I.F TRANS.
4	N-1509	2ND I.F. TRANS.
* 5	N-1507	5" P.M. SPKR & TRANS.
6	N-2061	BATTERY SWITCH
	N-1856	GANG CONDENSER
	N-1393	BATTERY CABLE

* SEE "CHANGES"

TUNING RANGE
535 to 1720 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

TUBE LAYOUT & TRIMMER LOCATION.



NOTE: TUBE SOCKETS SHOWN
FROM WIRING SIDE.

4 TUBE - 1½ VOLT
SUPERHETERODYNE
SINGLE BAND

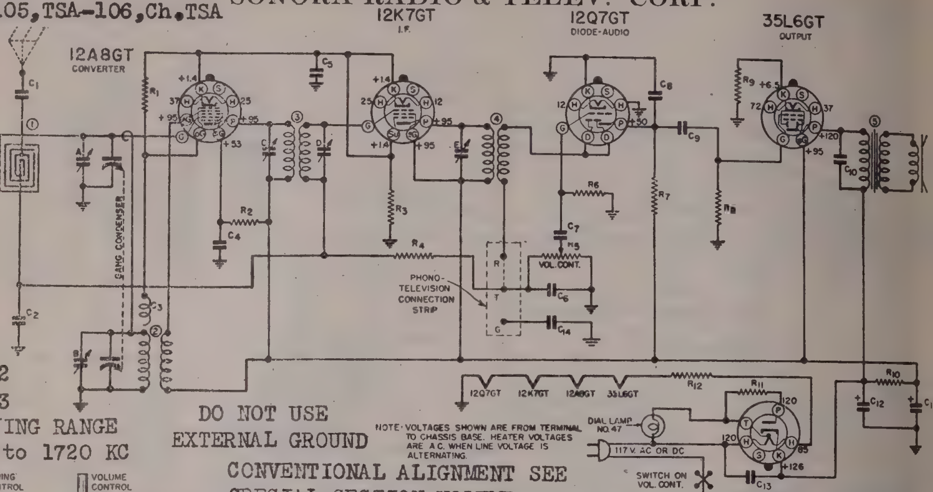
DRWN. J.B. APP. Bm.F. 20% 5-16-39

TH

MODELS TJ-62,TJ-63
Chassis TJ
MODELS TN-45,Ch.TN,
TSA-105,TSA-106,Ch.TSA

Schematics,Socket,Trimm
Alignment

SONORA RADIO & TELEV. CORP.



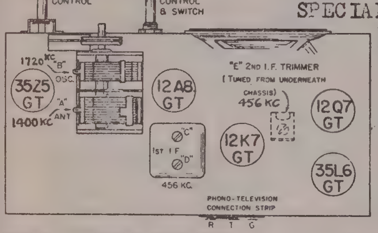
TJ-62
TJ-63
TUNING RANGE
535 to 1720 KC

DO NOT USE
EXTERNAL GROUND

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

I.F. 456 KC.



DIAG NO	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%
R2	N-1627	20,000 OHM .5W 20%
R3	N-1742	25 OHM .5W. 20%
R4	N-1262	1 MEGOHM .5W. 20%
R5	N-2257	0.5 MEGOHM VOL. CONT.
R6	N-1263	10 MEGOHM .5W. 20%
R7	N-1377	200,000 OHM .5W. 20%
R8	N-1264	500,000 OHM .5W. 20%
R9	N-1787	250 OHM .5W. 10%
R10	N-1617	2500 OHM .5W. 20%
R11	N-1614	50 OHM .5W. 20%
R12	N-1618	80 OHM 2W. 10%

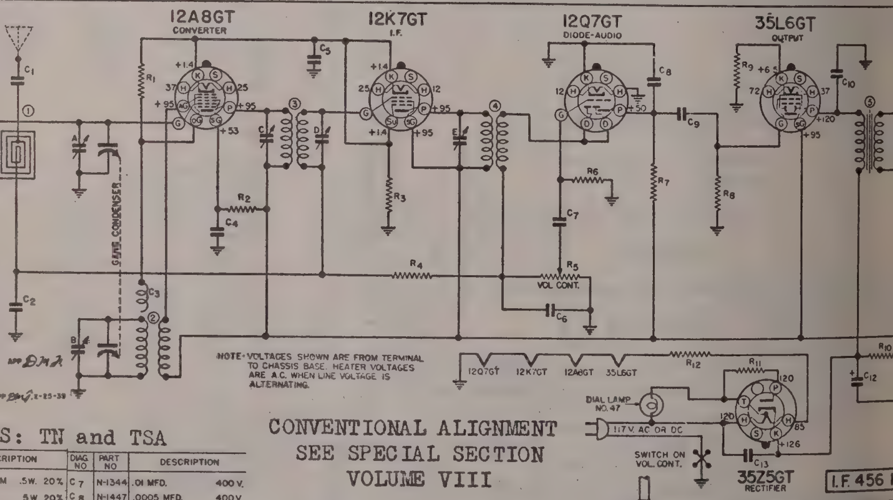
C1	N-1344	.01 MFD. 400V.
C2	N-1345	.05 MFD. 200V.
C3		CAPACITY INCLUDED IN OSCILLATOR COIL
C4	N-1345	.05 MFD. 200V.
C5	N-1351	.1 MFD. 200V.
C6	N-1374	100 MMFD.
1	N-2256	ANTENNA COIL LOOP
2	N-1452	OSCILLATOR COIL
3	N-1598	1ST. I.F. TRANSFORMER
4	N-1596	2ND. I.F. TRANSFORMER
5	N-2254	5" PM SPEAKER & TRANS.
E	N-1597	2ND I.F. TRIMMING COND.

C7	N-1344	.01 MFD. 400 V.
C8	N-1447	.0005 MFD. 400 V.
C9	N-1344	.01 MFD. 400 V.
C10	N-1376	.02 MFD. 400V.
C11	N-2015	35 MFD. 150 V. ELECTRO
C12		20 MFD. 150 V. ELECTRO
C13	N-1346	.05 MFD. 400 V.
C14	N-1344	.01 MFD 400 V.
	N-2255	GANG CONDENSER

5 TUBE A
SUPERHETEROD
SINGLE BAN

CHKD W.F. APPR .97

FOR PHONO-TELEVISIO
CONNECTIONS SEE TR



Models
TN-45
TSA-105
TSA-106

TN: DRN. J.B. APP DMJ
TSA: DRN. J.B. APP DMJ 2-25-39

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

I.F. 456

PARTS: TN and TSA

DIAG NO	PART NO	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%
R4	N-1262	1 MEGOHM .5W. 20%
R6	N-1263	10 MEGOHM .5W. 20%
R7	N-1377	200,000 OHM .5W. 20%
R8	N-1264	500,000 OHM .5W. 20%
R9	N-1616	250 OHM .5W. 10%
R10	N-1617	2500 OHM .5W. 20%
R11	N-1614	50 OHM .5W. 20%
R12	N-1618	80 OHM 2W. 10%
C1	N-1344	.01 MFD. 400V.
C2	N-1345	.05 MFD. 200V.
C3		CAPACITY INCLUDED IN OSCILLATOR COIL
C4	N-1345	.05 MFD. 200V.
C5	N-1351	.1 MFD. 200V.
C6	N-1374	100 MMFD

DIAG NO	PART NO	DESCRIPTION
C7	N-1344	.01 MFD. 400 V.
C8	N-1447	.0005 MFD. 400 V.
C9	N-1344	.01 MFD. 400 V.
C10	N-1376	.02 MFD. 400V.
C11	N-1366	25 MFD. 150V. ELECTRO.
C12		15 MFD. 150V. ELECTRO.
C13	N-1346	.05 MFD. 400 V.
1	N-1594	ANTENNA COIL LOOP
2	N-1452	OSCILLATOR COIL
3	N-1598	1ST. I.F. TRANSFORMER
4	N-1596	2ND. I.F. TRANSFORMER
E	N-1597	2ND. I.F. TRIMMING COND.
	N-1431	GANG CONDENSER

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

TSA ONLY

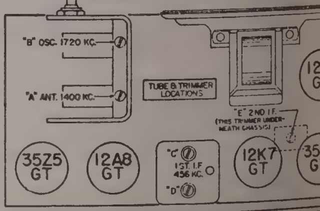
R2	N-1460	30,000 OHM .5W. 20%
R3	N-1615	100 OHM .5W. 10%
R5	N-1595	0.5 MEGOHM VOL. CONT.
5	N-1585	4" P.M. SPEAKER & TRANS.

TN ONLY

R2	N-1627	20,000 OHM .5W 20%
R3	N-1742	25 OHM .5W. 10%
R5	N-2070	0.5 MEGOHM VOL. CONT.
5	N-2074	4" PM SPEAKER & TRANS.

DO NOT
USE
EXTERNAL
GROUND

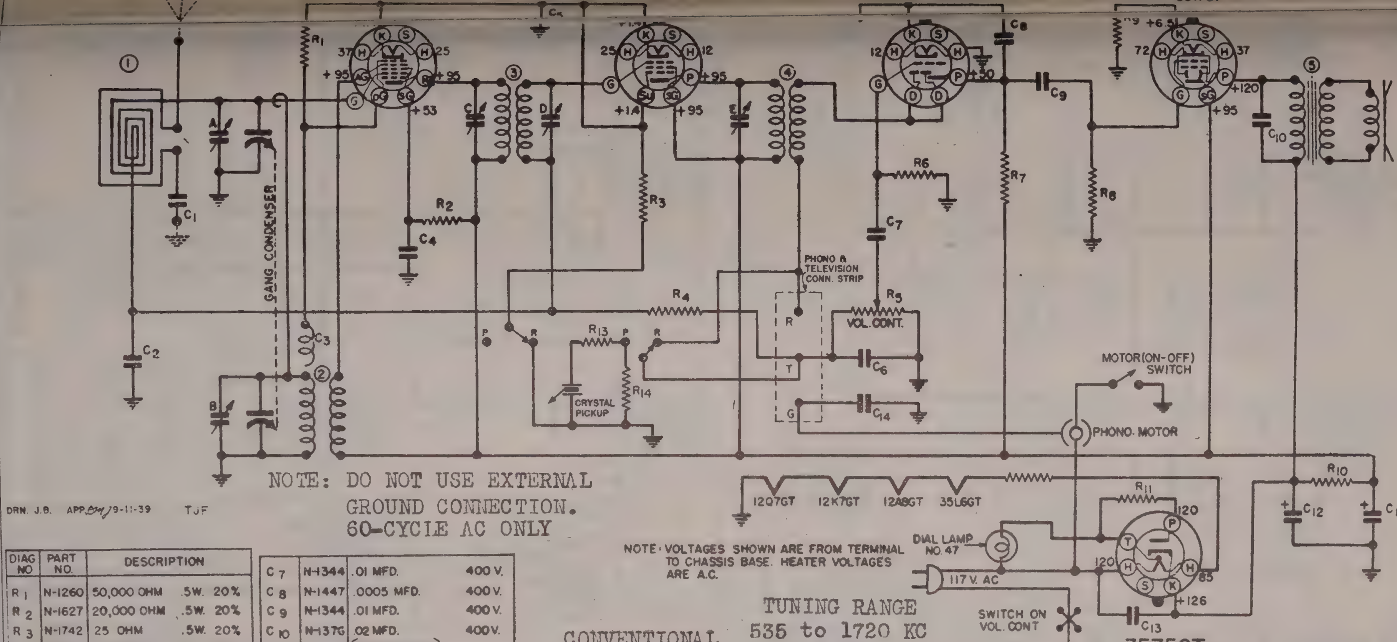
TUNING RANGE:
535 to 1720 KC



OR PHONO.
ATA SEE
NDEX

SONORA RADIO & TELEV. CORP.

CHASSIS TJF
Schematic,Socket
Alignment,Trimmers



NOTE: DO NOT USE EXTERNAL GROUND CONNECTION. 60-CYCLE AC ONLY

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C.

35Z5GT RECTIFIER

I.F. 456 KC.

TUNING RANGE 535 to 1720 KC

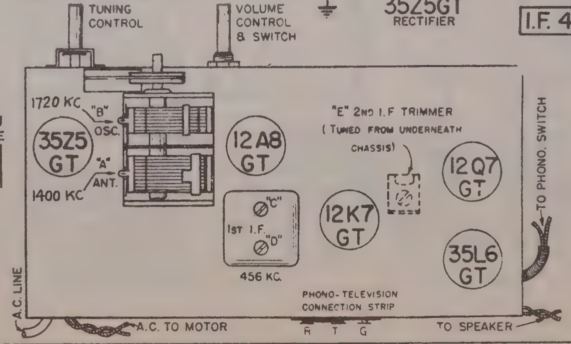
DRN. J.B. APP. 9-11-39 TJF

DIAG NO	PART NO.	DESCRIPTION
R 1	N-1260	50,000 OHM .5W. 20%
R 2	N-1627	20,000 OHM .5W. 20%
R 3	N-1742	25 OHM .5W. 20%
R 4	N-1262	1 MEGOHM .5 W. 20%
R 5	N-2257	0.5 MEGOHM VOL. CONT.
R 6	N-1263	10 MEGOHM .5W 20%
R 7	N-1377	200,000 OHM .5W. 20%
R 8	N-1264	500,000 OHM .5W. 20%
R 9	N-1787	250 OHM .5W. 10%
R 10	N-1617	2500 OHM .5W. 20%
R 11	N-1614	50 OHM .5W 20%
R 12	N-1618	80 OHM 2W. 10%
R 13	N-1264	500,000 OHM .5W. 20%
R 14	N-1260	50,000 OHM .5W. 20%
C 1	N-1344	.01 MFD. 400V.
C 2	N-1345	.05 MFD. 200V.
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL
C 4	N-1345	.05 MFD. 200V.
C 5	N-1351	.1 MFD. 200V.
C 6	N-1374	100 MMFD.
C 7	N-1344	.01 MFD. 400 V.
C 8	N-1447	.0005 MFD. 400 V.
C 9	N-1344	.01 MFD. 400 V.
C 10	N-1376	.02 MFD. 400V.
C 11	N-2015	35 MFD. 150 V. ELECTRO.
C 12		20 MFD. 150 V. ELECTRO.
C 13	N-1346	.05 MFD. 400 V.
C 14	N-1344	.01 MFD. 400V.
1	N-2256	ANTENNA COIL LOOP
2	N-1452	OSCILLATOR COIL
3	N-1598	1 ST. I.F. TRANSFORMER
4	N-1596	2ND. I.F. TRANSFORMER
5	N-2438	6" P.M. SPEAKER & TRANS.
E	N-1597	2ND. I.F. TRIMMING COND.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

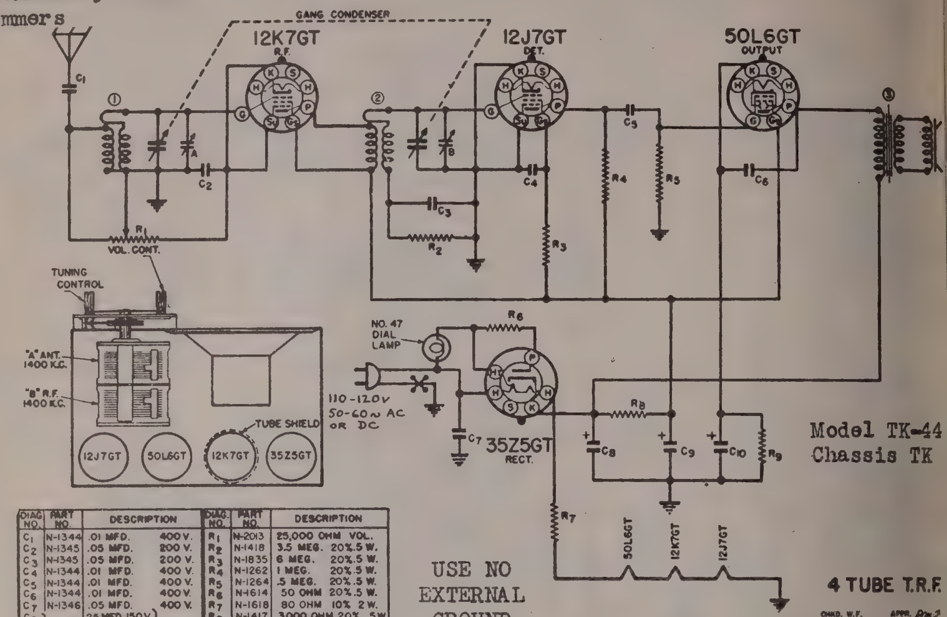
N-2255	GANG CONDENSER
N-2442	PHONO. MOTOR & TURNTABLE
N-2403	CRYSTAL PICKUP
N-2409	RADIO-PHONO SWITCH
N-1980	MOTOR(ON-OFF) SWITCH

TELEVISION CONNECTOR: Connect leads from television receiver to T and G; connect shield (if any) to G. Consult instructions accompanying television receiver. Operates with radio-phono switch in phono position.



MODEL TK-44,Ch.TK
CHASSIS TKE,TPE
Schematics,Socket
Trimmers

SONORA RADIO & TELEV., CORP.



Model TK-44
Chassis TK

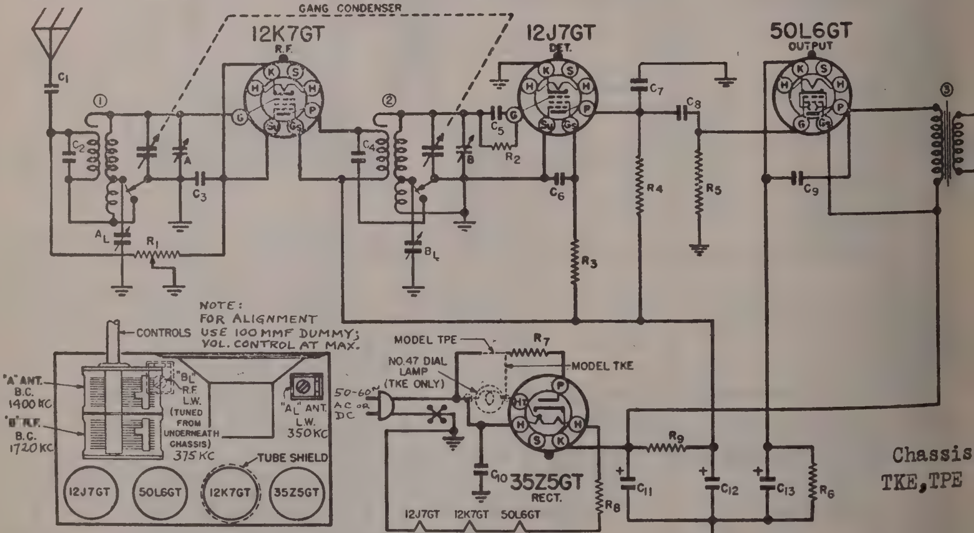
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400 V.	R_1	N-2013	25,000 OHM VOL.
C_2	N-1345	.05 MFD. 200 V.	R_2	N-1418	3.5 MEG. 20% .5 W.
C_3	N-1345	.05 MFD. 200 V.	R_3	N-1835	6 MEG. 20% .5 W.
C_4	N-1344	.01 MFD. 400 V.	R_4	N-1262	1 MEG. 20% .5 W.
C_5	N-1344	.01 MFD. 400 V.	R_5	N-1264	.5 MEG. 20% .5 W.
C_6	N-1344	.01 MFD. 400 V.	R_6	N-1614	50 OHM 20% .5 W.
C_7	N-1346	.05 MFD. 400 V.	R_7	N-1618	80 OHM 10% 2 W.
C_8	N-1850	25 MFD. 150 V. ELECT.	R_8	N-1417	3,000 OHM 20% .5 W.
C_9		10 MFD. 150 V.	R_9	N-1787	250 OHM 10% .5 W.
C_{10}		20 MFD. 25 V.	1	N-1790	ANTENNA COIL
	N-1855	GANG CONDENSER	2	N-1791	R.F. COIL
			3	N-2047	SPEAKER & TRANS.

USE NO
EXTERNAL
GROUND
CONNECTION

4 TUBE T.R.F.

CHKD. W.F. 6-21-39 APPR.

TK44



NOTE:
FOR ALIGNMENT
USE 100 MMF DUMMY;
VOL. CONTROL AT MAX.

Chassis
TKE,TPE

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400 V.	C_{11}	N-2380	35 MFD. 150 V ELYTC	R_6	N-1787	250 OHMS .5W. 10%
C_2	N-2383	150 MMFD. 20%	C_{12}		10 MFD. 150 V.	R_7	N-1614	50 OHMS .5W 20%
C_3	N-1345	.05 MFD. 200 V.	C_{13}		20 MFD. 25 V.	R_8	N-1618	80 OHMS .5W. 10%
C_4	N-2383	150 MMFD. 20%				R_9	N-1417	3000 OHMS .5W. 20%
C_5	N-1344	.01 MFD. 400 V.					N-1401	GANG COND. MODEL TPE
C_6	N-1376	.02 MFD. 400 V.	R_1	N-2013	25,000 OHM V.C. MODEL TPE		N-1855	" " " TKE
C_7	N-1343	250 MMFD. 20%		N-1537	" TKE	1	N-2378	ANTENNA COIL
C_8	N-1344	.01 MFD. 400 V.	R_2	N-1418	3.5 MEGOHM .5W. 20%	2	N-2379	R.F. COIL
C_9	N-1344	.01 MFD. 400 V.	R_3	N-1835	6 MEGOHM .5W. 20%	3	N-2047E	SPEAKER & TRANS.
C_{10}	N-1346	.05 MFD. 400 V.	R_4	N-1262	1 MEGOHM .5W. 20%	A_L	N-2315	ANT. LONG WAVE TRIMMER
			R_5	N-1264	.5 MEGOHM .5W. 20%	B_L	N-2315	R.F. " " "

USE NO
EXTERNAL
GROUND
CONNECTION

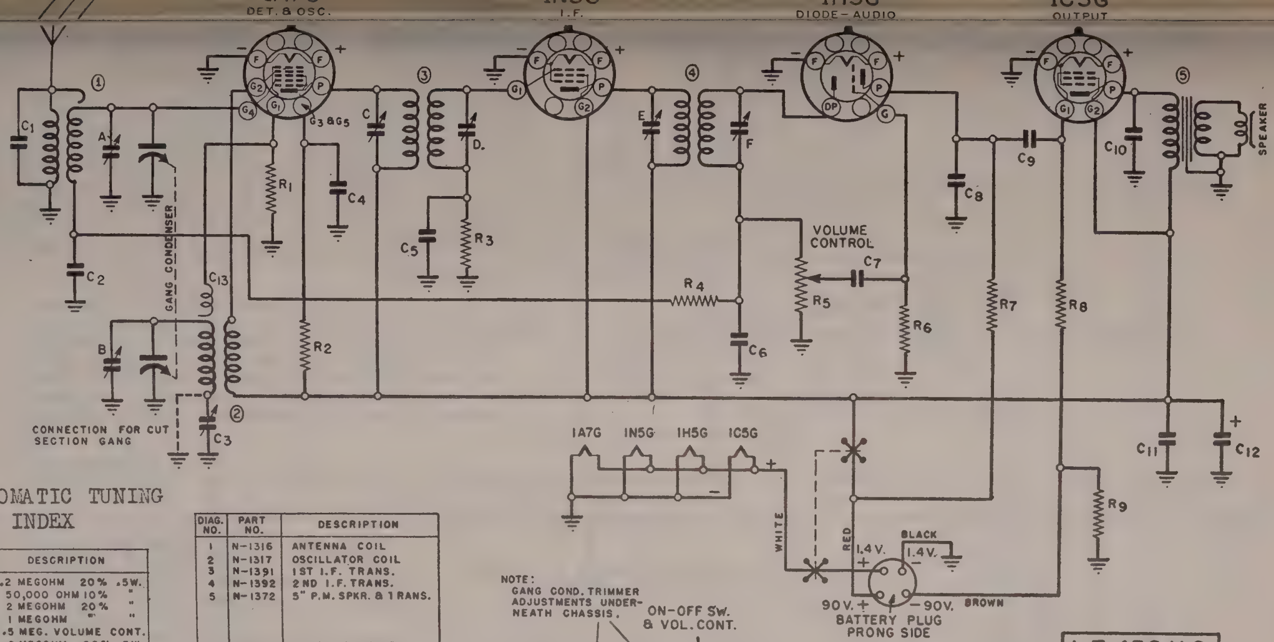
4 TUBE T.R.F.
TWO BAND
BROADCAST & LONG WAVE

CHKD. W.F. APPR.
AUG. 19, '39

TUNING RANGES
535-1720 KC; 140-375 KC

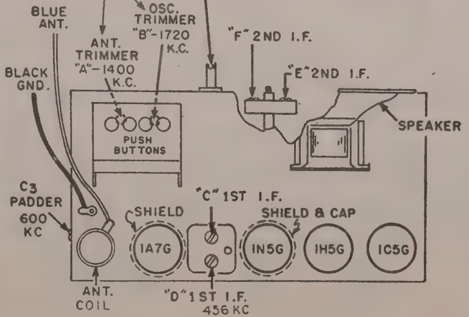
SONORA RADIO & TELEV., CORP.

CHASSIS TL
Schematic, Socket Trimmers, Alignment



NOTE: GANG COND. TRIMMER ADJUSTMENTS UNDERNEATH CHASSIS.

ON-OFF SW. & VOL. CONT.



I.F. 456 K.C.

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

TUNING RANGE
535 to 1720 KC

4 TUBE - 1½ VOLT
SUPERHETERODYNE
SINGLE BAND

DRWN. F.L.C. APP. Gory RFR 1-10-39

TL

FOR AUTOMATIC TUNING
SEE INDEX

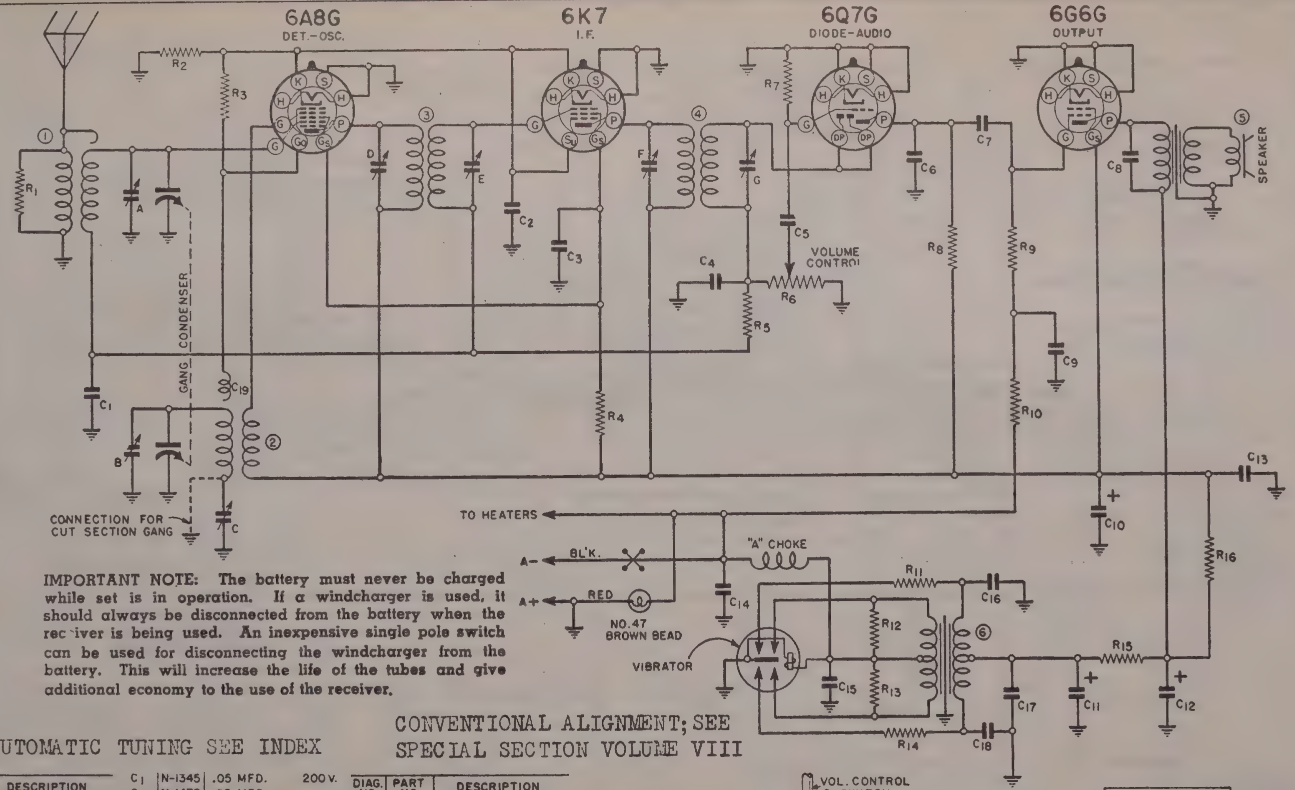
DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1377	.2 MEGOHM 20% .5W.
R_2	N-1353	50,000 OHM 10% "
R_3	N-1378	2 MEGOHM 20% "
R_4	N-1262	1 MEGOHM " "
R_5	N-1373	.5 MEG. VOLUME CONT.
R_6	N-1378	2 MEGOHM 20% .5W
R_7	N-1262	1 MEGOHM " "
R_8	N- "	" " "
R_9	N-1379	550 OHM 10% "
C_1	N-1342	50 MMFD. 20%
C_2	N-1345	.05 MFD. 200 V
C_3	N-1323	PAD. COND. 300-600 MMF.
C_4	N-1345	.05 MFD. 200 V.
C_5	N-1376	.02 MFD. 400 V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1374	100 MMFD. 20%
C_9	N-1344	.01 MFD 400 V.
C_{10}	N-1347	.005 MFD. 600 V.
C_{11}	N-1351	.10 MFD. 200 V.
C_{12}	N-1367	6 MFD. ELECTROLYTIC
C_{13}		CAPACITY INCLUDED IN OSCILLATOR COIL

DIAG. NO.	PART NO.	DESCRIPTION
1	N-1316	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1392	2ND I.F. TRANS.
5	N-1372	5" P.M. SPKR. & TRANS.
	N-1273	GANG CONDENSER
	N-1393	BATTERY CABLE
SET WITH CUT SECTION GANG		
C_3	N-1323	PADDER ELIMINATED
	N-1338	GANG CONDENSER
2	N-1337	OSCILLATOR COIL

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

CHASSIS TM
Schematic,Socket
Alignment,Trimmers

SONORA RADIO & TELEV., CORP.



IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the rec iver is being used. An inexpensive single pole switch can be used for disconnecting the windcharger from the battery. This will increase the life of the tubes and give additional economy to the use of the receiver.

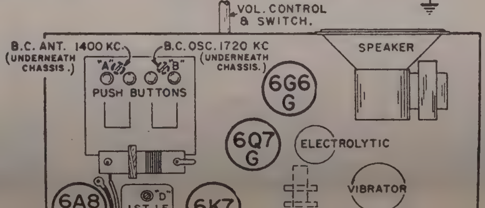
FOR AUTOMATIC TUNING SEE INDEX

CONVENTIONAL ALIGNMENT; SEE SPECIAL SECTION VOLUME VIII

DIAG. NO.	PART NO.	DESCRIPTION	
R1	N-1259	15,000 OHM	.5 W.
R2	N-1473	200 OHM	"
R3	N-1260	50,000 OHM	"
R4	N-1474	25,000 OHM	"
R5	N-1378	2.0 MEGOHM	"
R6	N-1320	1.0 MEG. VOL. CONT.	
R7	N-1263	10.0 MEGOHM	.5 W.
R8	N-1261	250,000 OHM	"
R9	N-1264	.5 MEG.	"
R10	N-1260	50,000 OHM	"
R11	N-1256	500 OHM	"
R12	N-1506	75 OHM	1. W.
R13	N-1506	75 OHM	1. W.

C1	N-1345	.05 MFD.	200 V.
C2	N-1479	.25 MFD.	"
C3	N-1351	.10 MFD.	"
C4	N-1374	100 MMFD.	—
C5	N-1347	.006 MFD.	600 V.
C6	N-1343	250 MMFD.	—
C7	N-1344	.01 MFD.	400 V.
C8	N-1347	.006 MFD	600 V.
C9	N-1345	.05 MFD.	200 V.
C10	N-1468	20 MFD.	150 V.
C11		10 MFD.	250 V.
C12		20 MFD.	150 V.
C13	N-1351	.10 MFD.	200 V.
C14	N-1471	.5 MFD.	50 V.
C15	N-1471	.5 MFD.	50 V.

DIAG. NO.	PART NO.	DESCRIPTION
①	N 1461	ANTENNA COIL
②	N 1317	OSCILLATOR COIL
③	N 1318	1 ST I.F. TRANS.
④	N 1319	2 ND I.F. TRANS.
⑤	N 1472	5" P.M. SPEAKER
⑥	N 1476	POWER TRANS.
"C"	N 1323	PADDER COND.
	N 1475	VIBRATOR (SYNCHRO.)
	N 1477	"A" CHOKE
	N 1273	2 GANG COND.-TUNER
	N 1485	BATTERY CABLE



I.F. 456 KC.

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

4 TUBE 6 VOLT
SUPERHETERODYNE
SINGLE BAND

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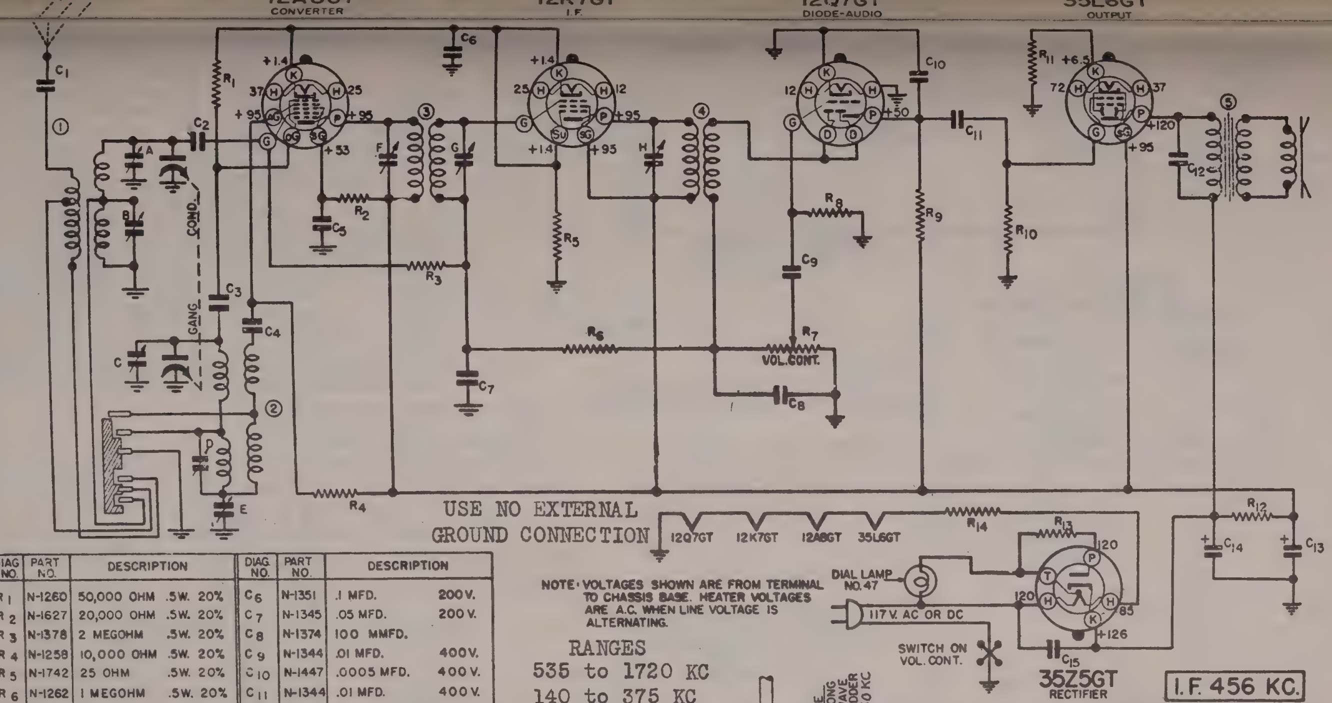
CHASSIS TNE
Schematic, Socket
Alignment, Trimmers



USE NO EXTERNAL GROUND CONNECTION

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

I.F. 456 KC.

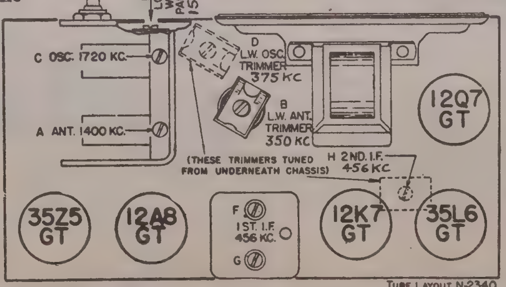
RANGES
535 to 1720 KC
140 to 375 KC

DIAG NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%
R2	N-1627	20,000 OHM .5W. 20%
R3	N-1378	2 MEGOHM .5W. 20%
R4	N-1258	10,000 OHM .5W. 20%
R5	N-1742	25 OHM .5W. 20%
R6	N-1262	1 MEGOHM .5W. 20%
R7	N-1595	.5 MEGOHM VOL. CONT.
R8	N-1263	10 MEGOHM .5W. 20%
R9	N-1377	.2 MEGOHM .5W. 20%
R10	N-1264	.5 MEGOHM .5W. 20%
R11	N-1616	250 OHM .5W. 10%
R12	N-1617	2500 OHM .5W 20%
R13	N-1614	50 OHM .5W. 20%
R14	N-1618	80 OHM 2W. 10%
C1	N-1344	.01 MFD. 400 V.
C2	N-1447	.0005 MFD. 400 V.
C3	N-1342	50 MMFD.
C4	N-1344	.01 MFD. 400 V.
C5	N-1345	.05 MFD. 200 V.

DIAG NO.	PART NO.	DESCRIPTION
C6	N-1351	.1 MFD. 200 V.
C7	N-1345	.05 MFD. 200 V.
C8	N-1374	100 MMFD.
C9	N-1344	.01 MFD. 400 V.
C10	N-1447	.0005 MFD. 400 V.
C11	N-1344	.01 MFD. 400 V.
C12	N-1376	.02 MFD. 400 V.
C13 C14	N-1366	15 MFD. 150 V. 30 MFD. 150 V. ELECTROLYTIC
C15	N-1346	.05 MFD. 400 V.
1	N-2342	ANTENNA COIL
2	N-2343	OSCILLATOR COIL
3	N-1598E	1ST. I.F. TRANSFORMER
4	N-1596E	2ND. I.F. TRANSFORMER
5	N-2074E	4" P.M. SPEAKER & TR.
B	N-2315	L.W. ANT. TRIMMER
D	N-1597	L.W. OSC. TRIMMER
E	N-2345	L.W. PADDER
H	N-1597	2ND. I.F. TRIMMER
	N-1431	GANG CONDENSER

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

NOTE: Use a 100-mmf dummy for BC and LW alignment.



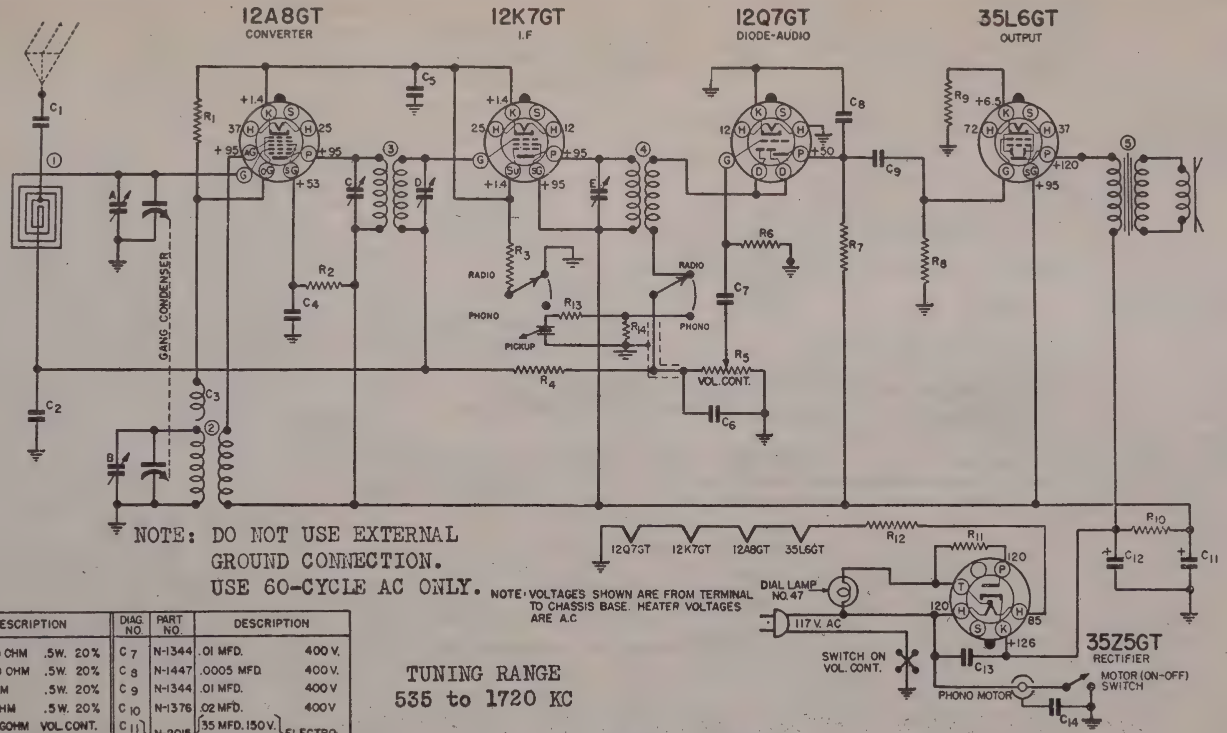
5 TUBE AC-DC
SUPERHETERODYNE
TWO BAND
LONG WAVE & BROADCAST

CHKD. W.F. APPR. L0%
AUG. ,39

TNE - TSE

MODELS TNF-60,TNF-68
Chassis TNF
Schematic,Socket
Alignment,Trimmers

SONORA RADIO & TELEV. CORP.



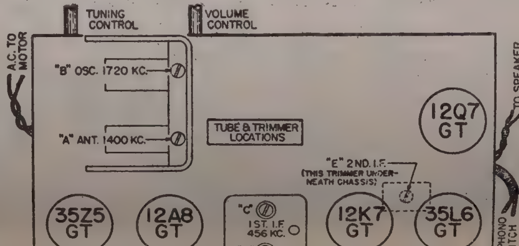
NOTE: DO NOT USE EXTERNAL
GROUND CONNECTION.
USE 60-CYCLE AC ONLY.

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C

TUNING RANGE
535 to 1720 KC

DIAG NO	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R 1	N-1260	50,000 OHM .5W. 20%	C 7	N-1344	.01 MFD. 400 V.
R 2	N-1627	20,000 OHM .5W. 20%	C 8	N-1447	.0005 MFD 400 V.
R 3	N-1742	25 OHM .5W. 20%	C 9	N-1344	.01 MFD. 400 V
R 4	N-1262	1 MEGOHM .5W. 20%	C 10	N-1376	.02 MFD. 400 V
R 5	N-2070	0.5 MEGOHM VOL. CONT.	C 11	N-2015	35 MFD. 150 V. ELECTRO.
R 6	N-1263	10 MEGOHM .5W. 20%	C 12		20 MFD. 150 V ELECTRO.
R 7	N-1377	200,000 OHM .5W. 20%	C 13	N-1346	.05 MFD. 400 V.
R 8	N-1264	500,000 OHM .5W. 20%	C 14	N-1834	.002 MFD. 600V.
R 9	N-1616	250 OHM .5W. 10%			
R 10	N-1617	2500 OHM .5W. 20%	1	N-1594	ANTENNA COIL LOOP
R 11	N-1614	50 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
R 12	N-1618	80 OHM 2W. 10%	3	N-1598	1ST. I.F. TRANSFORMER
R 13	N-1264	500,000 OHM .5W. 20%	4	N-1596	2ND. I.F. TRANSFORMER
R 14	N-1260	50,000 OHM .5W. 20%	5	N-2389	5" P.M. SPEAKER & TRANS.
C 1	N-1344	.01 MFD. 400V.	E	N-1597	2ND. I.F. TRIMMING COND.
C 2	N-1345	.05 MFD. 200V.			
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL		N-1879	GANG CONDENSER
C 4	N-1345	.05 MFD. 200V.		N-1980	MOTOR (ON-OFF) SWITCH

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII



I.F. 456 KC.

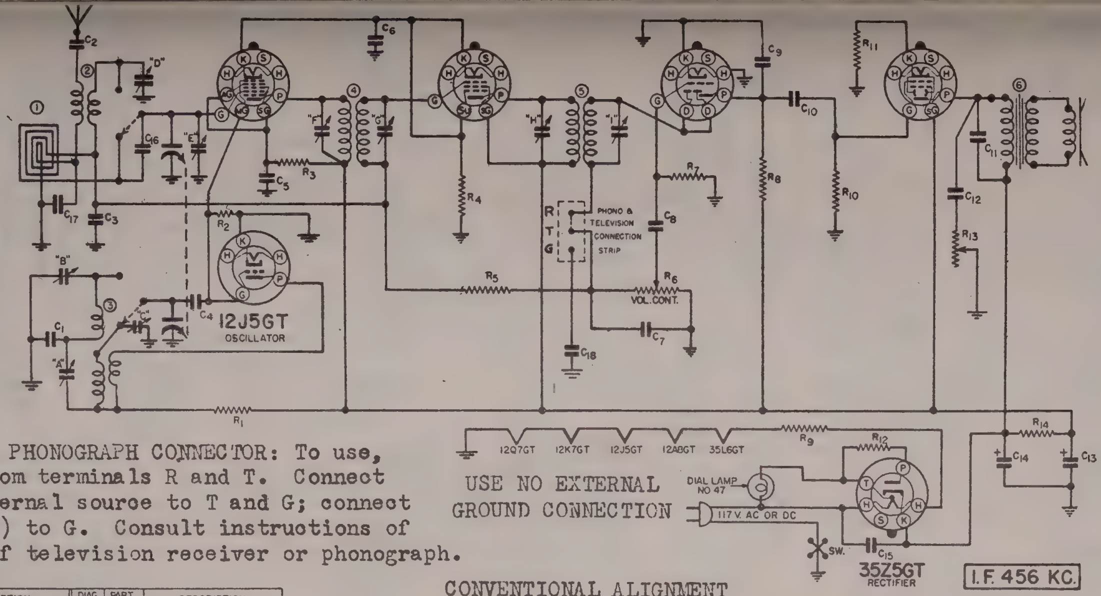
SUPERHETERODYNE
SINGLE BAND
PHONO. COMBINATION

DRN J.B. APP. 9-8-39

SONORA RADIO & TELEV., CORP.

MODEL TR-53, Ch. TR
Schematic, Socket
Alignment, Trimmers

FOR
AUTOMATIC
TUNING
SEE INDEX


12A8GT
12K7GT
12Q7GT
35L6GT
12J5GT
OSCILLATOR
35Z5GT
RECTIFIER
PHONO & TELEVISION CONNECTION STRIP
R
T
G
VOL. CONT.
DIAL LAMP NO 47
117 V. AC OR DC
SW.
12Q7GT 12K7GT 12J5GT 12A8GT 35L6GT
"A"
"B"
"C"
"D"
"E"
"F"
"G"
"H"
"I"
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14
①
②
③
④
⑤
⑥

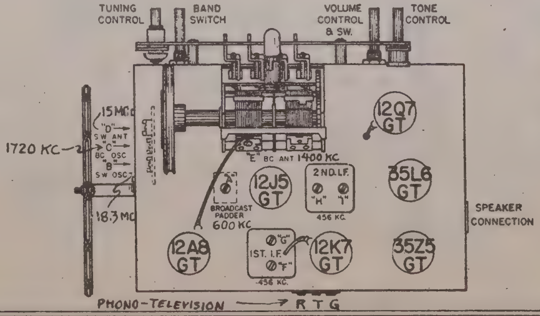
USE NO EXTERNAL GROUND CONNECTION

I.F. 456 KC.

TELEVISION and PHONOGRAPH CONNECTOR: To use, remove link from terminals R and T. Connect leads from external source to T and G; connect shield (if any) to G. Consult instructions of manufacturer of television receiver or phonograph.

DIAG NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R_1	N-1258	10,000 OHM .5W. 20%	C_8	N-1344	.01 MFD. 400 V.
R_2	N-1260	50,000 OHM .5W. 20%	C_9	N-1447	.0005 MFD. 400V.
R_3	N-1460	30,000 OHM .5W. 20%	C_{10}	N-1344	.01 MFD. 400 V.
R_4	N-2209	25 OHM .5 W. 10%	C_{11}	N-1344	.01 MFD. 400V.
R_5	N-1262	1 MEGOHM .5 W. 20%	C_{12}	N-1346	.05 MFD. 400V.
R_6	N-2163	.5 MEGOHM VOL. CONT	C_{13} C_{14}	N-2206	20 MFD. 150V. 40 MFD. 150 V. ELTLYC.
R_7	N-1263	10 MEGOHM .5W. 20%	C_{15}	N-1346	.05 MFD. 400V.
R_8	N-1377	.2 MEGOHM .5 W. 20%	C_{16}	N-1897	25 MMFD.
R_9	N-2195	40 OHM 1 W. 10%	C_{17}	N-1897	25 MMFD.
R_{10}	N-1264	.5 MEGOHM .5W. 20%	C_{18}	N-1344	.01 MFD. 400 V.
R_{11}	N-1787	250 OHM .5W. 10%	1	N-2154	ANTENNA COIL LOOP
R_{12}	N-1614	50 OHM .5W. 20%	2	N-2010	BAND 2 ANTENNA COIL
R_{13}	N-2157	25,000 OHM TONE CONT.	3	N-2008	OSC. COIL
R_{14}	N-1617	2500 OHM .5W. 20%	4	N-2159	1st. I.F. TRANSFORMER
C_1	N-1690	BAND 2 PAD .004MFD. 5%	5	N-2160	2ND. I.F. TRANSFORMER
C_2	N-1344	.01 MFD. 400 V.	6	N-2153	6" P.M. SPKR. & TRANS.
C_3	N-1345	.05 MFD. 200 V.	"A"	N-2205	BROADCAST PADDER
C_4	N-1342	50 MMFD.	"B"	N-2158	SHORT W. OSC. TRIMMER
C_5	N-1345	.05 MFD. 200V.	"C"		BROADCAST OSC. TRIM.
C_6	N-2215	.15 MFD. 200V.	"D"		SHORT W. ANT. TRIMMER
C_7	N-1374	100 MMFD.			

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



TUNING RANGES
535 to 1720 KC
5.65 to 18.3 MC

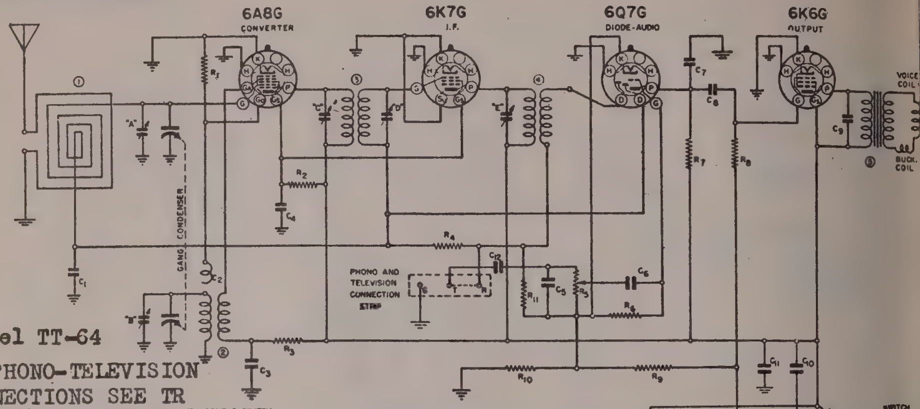
6 TUBE A.C.-D.C.
SUPERHETERODYNE
TWO BAND

DRN. W.F. APP. S.H. Dial

TR

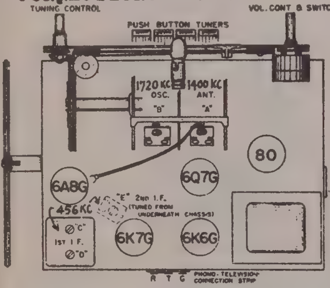
MODEL TT-64,Ch.TT
MODEL TW-49,Ch.TW,TWU
Schematics,Socket
Alignment,Trimmers

SONORA RADIO & TELEV., CORP.



Model TT-64

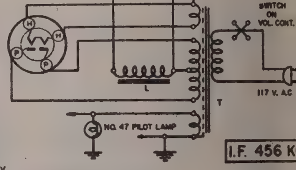
FOR PHONO-TELEVISION
CONNECTIONS SEE TR



SPEAKER CONNECTION

TUNING RANGE
535 to 1720 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



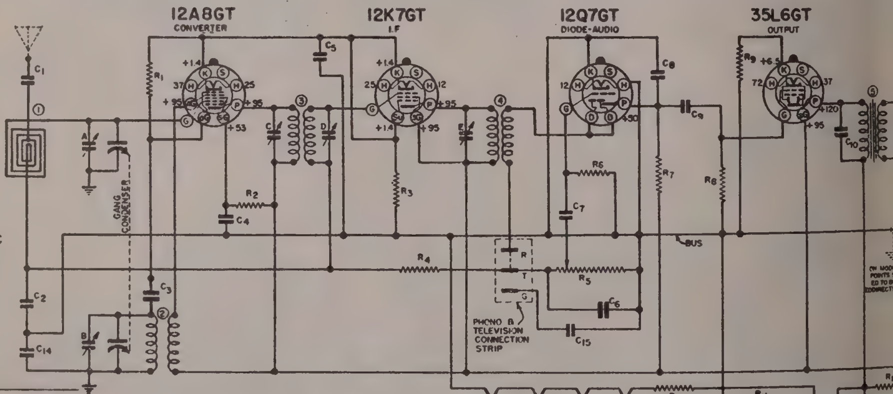
I.F. 456 K

5 TUBE A.
SUPERHETERODYNE
SINGLE BAND
DRWN. W.F. APP.

DIAG NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHMS .5W. 20%
R2	N-1460	30,000 OHMS .5W 20%
R3	N-1460	30,000 OHMS .5W. 20%
R4	N-1682	3 MEGOHMS .5W 20%
R5	N-2223	1 MEGOHM VOL. CONT.
R6	N-1419	6 MEGOHMS .5W. 20%
R7	N-1377	200,000 OHMS .5W 20%
R8	N-1264	.5 MEGOHM .5W. 20%
R9	N-1693	325 OHMS .5W. 10%
R10	N-1481	75 OHMS .5W. 20%
R11	N-1264	.5 MEGOHM .5W. 20%

C1	N-1345	.05 MFD 200V
C2		Capacity Between Coils
C3	N-1346	.05 MFD 400V.
C4	N-1623	.1 MFD. 400V.
C5	N-1374	100 MMFD.
C6	N-1347	.006 MFD 600V.
C7	N-1343	250 MMFD.
C8	N-1344	.01 MFD 400V.
C9	N-1478	.01 MFD. 600V.
C10 C11	N-2224	10 MFD. 350V. 6 MFD. 350V. ELYTC
C12	N-1344	.01 MFD. 400V.

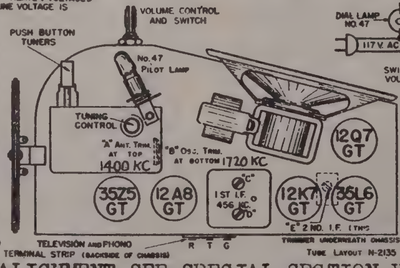
①	N-2222	ANTENNA LOOP
②	N-1452	OSCILLATOR COIL
③	N-2159	1ST I.F. TRANS.
④	N-1596	2ND I.F. TRANS.
⑤	N-2225	5" SPK. & TRANS.
L		1800 OHM SPK FIELD
T	N-2226	POWER TRANS.
	N-2000	GANG CONDENSER
"E"	N-1597	2ND. I.F. TRIMMING COND.

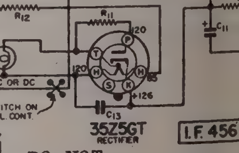


MODEL
TW-49
CHASSIS
TW,TWU

TUNING
RANGE
535-1720 KC

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUS. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.


VOLUME CONTROL AND SWITCH
PUSH BUTTON TUNERS
DIAL LAMP NO. 47
117V. AC OR DC
No. 47 PILOT LAMP
TUNING CONTROL
"A" ANT. TRIM. AT TOP 1400 KC
"B" OSC. TRIM. AT BOTTOM 1720 KC
12Q7 GT
35Z5 GT
12A8 GT
1ST I.F. 456 KC "C" "D"
12K7 GT
35L6 GT
"E" 2ND I.F. (TRIMMER UNDERNEATH CHASSIS)
TELEVISION AND PHONO TERMINAL STRIP (BACKSIDE OF CHASSIS)
R T G
TUBE LAYOUT N-2135



I.F. 456

DO NOT
USE
EXTERNAL
GROUND

5 TUBE AC-
SUPERHETERODYNE
SINGLE BAND
DRWN. J.B. AP

FOR PHONO-TELEVIS
CONNECTIONS SEE

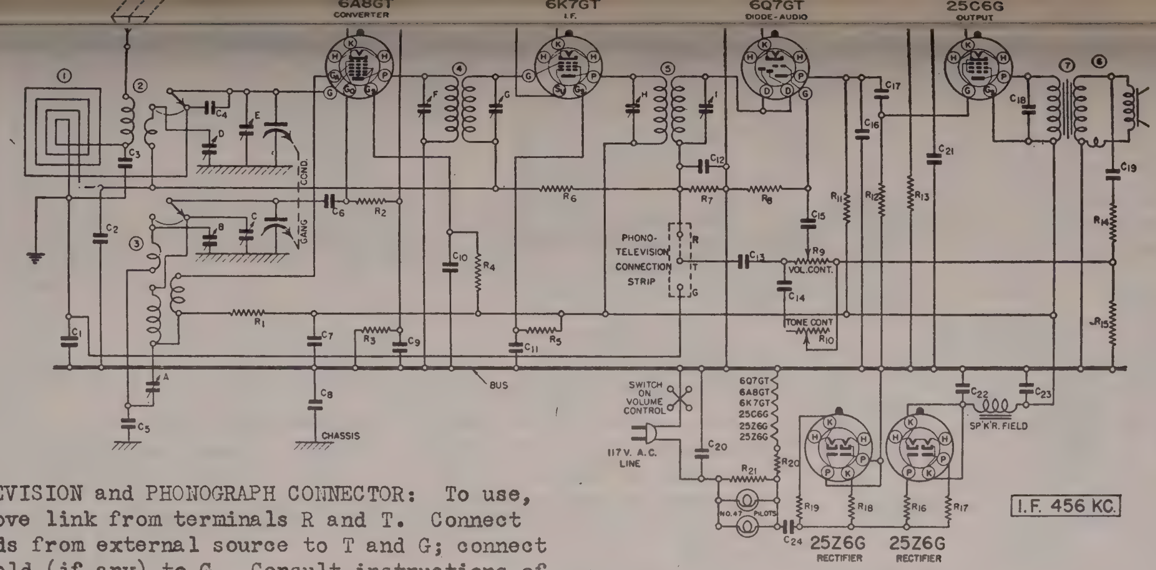
DIAG. NO	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%
R2	N-1627	20,000 OHM .5W. 20%
R3	N-1742	25 OHM .5W. 20%
R4	N-1262	1 MEGOHM .5W. 20%
R5	N-2087 N-2322	0.5 MEGOHM VOL. CONT. (TW) 0.5 MEGOHM VOL. CONT. (TWU)
R6	N-1263	10 MEGOHM .5W. 20%
R7	N-1377	200,000 OHM .5W. 20%
R8	N-1264	500,000 OHM .5W. 20%
R9	N-1616	250 OHM .5W. 10%
R10	N-1617	2500 OHM .5W. 20%
R11	N-1614	50 OHM .5W. 20%
R12	N-1618	80 OHM 2W. 10%
C1	N-1344	.01 MFD. 400V
C2	N-1345 N-1331	.05 MFD. 400V. (TW) .1 MFD. 200V. (TWU)
C3	N-1342	50 MMFD.
C4	N-1345	.05 MFD 200V.
C5	N-2215	15 MFD. 200V.
C6	N-1374	100 MMFD
	N-2053	GANG CONDENSER AND TUNER

DIAG. NO.	PART NO	DESCRIPTION
C7	N-1344	.01 MFD. 400V.
C8	N-1447	.0005 MFD. 400V.
C9	N-1344	.01 MFD. 400V
C10	N-1376	.02 MFD 400V
C11 C12	N-2015	35 MFD. 150V. 20 MFD. 150V. ELECTRO.
C13	N-1346	.05 MFD. 400V.
C14	N-1479	.25 MFD. (TWU ONLY) 400V
C15	N-1344	.01 MFD. 400V.
1	N-2123	ANTENNA COIL LOOP
2	N-1452 N-2161	OSCILLATOR COIL (TW) OSCILLATOR COIL (TWU)
3	N-1598 N-1934	1ST I.F. TRANSFORMER (TW) 1ST. I.F. TRANSFORMER (TWU)
4	N-1596	2ND I.F. TRANSFORMER
5	N-2014 N-2519	5" P.M. SPEAKER & TRANS. (TW) 5" P.M. SPEAKER & TRANS. (TWU)
E	N-1597	2ND I.F. TRIMMING COND.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

SONORA RADIO & TELEV., CORP.

MODELS TX-53,TX-58
Chassis TX
Schematic,Socket Alignment,Trimmers



FOR TUNER
SEE INDEX

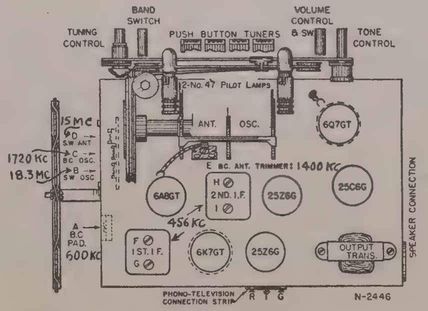
I.F. 456 KC.

TELEVISION and PHONOGRAPH CONNECTOR: To use, remove link from terminals R and T. Connect leads from external source to T and G; connect shield (if any) to G. Consult instructions of manufacturer of television receiver or phonograph.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1627	20,000 OHM .5W. 20%
R_2	N-1260	50,000 OHM .5W. 20%
R_3	N-1787	250 OHM .5W 10%
R_4	N-1460	30 000 OHM 5W 20%
R_5	N-2455	40,000 OHM 5W 20%
R_6	N-1262	1 MEGOHM .5W 20%
R_7	N-1264	0 5 MEGOHM .5W. 20%
R_8	N-1419	6 MEGOHM .5W 20%
R_9	N-2411	0.5 MEGOHM VOL CONT.
R_{10}	N-2435	1 MEGOHM TONE CONT.
R_{11}	N-1261	.25 MEGOHM .5W 20%
R_{12}	N-1264	0.5 MEGOHM .5W 20%
R_{13}	N-2453	235 OHM 1W. 10%
R_{14}	N-2454	5000 OHM .5W. 10%
R_{15}	N-1473	200 OHM 5W 10%
R_{16}	N-2452	100 OHM 1W 20%
R_{17}	N-2452	100 OHM 1W 20%
R_{18}	N-2451	75 OHM 1W 20%
R_{19}	N-2451	75 OHM 1W. 20%
R_{20}	N-2298	62 OHM ARMORED WIRE RES.
R_{21}		17 OHM
C_1	N-1344	.01 MFD 400V. 20%
C_2	N-1345	05 MFD 200V. 20%
C_3	N-1897	25 MMFD. 20%
C_4	N-1897	25 MMFD. 20%
C_5	N-1690	4000 MMFD 5%
C_6	N-1342	50 MMFD 20%
C_7	N-1351	0.1 MFD 200V. 20%
C_8	N-1479	.25 MFD. 200V. 20%
C_9	N-1479	.25 MFD 200V 20%

DIAG. NO.	PART NO.	DESCRIPTION
C_{10}	N-1345	.05 MFD. 200V 20%
C_{11}	N-1345	.05 MFD. 200V. 20%
C_{12}	N-1374	100 MMFD. 20%
C_{13}	N-1344	01 MFD. 400V. 20%
C_{14}	N-2450	.002 MFD 400V. 20%
C_{15}	N-1344	01 MFD. 400V. 20%
C_{16}	N-1343	250 MMFD. 20%
C_{17}	N-1376	02 MFD 400V. 20%
C_{18}	N-1344	.01 MFD. 400V 20%
C_{19}	N-1351	0.1 MMFD. 200V 20%
C_{20}	N-1346	.05 MFD 400V 20%
C_{21}	N-2437	20 MFD. 25V. ELECT. COND.
C_{22}		30 MFD. 250V
C_{23}		30 MFD. 150V
C_{24}	N-2436	30 MFD. 150V.
1	N-2154	ANTENNA LOOP
2	N-2010	S.W. ANTENNA COIL
3	N-2008	OSC. COIL
4	N-2461	1st. I.F. TRANS.
5	N-2462	2nd I.F. TRANS
6	N-2431	6" DYN. SPKR.(TABLE)
	N-2432	8" DYN. SPKR.(CONSOLE)
7	N-2444	OUTPUT TRANS
A	N-2205	BC PADDING COND
B	N-2158	S.W. OSC. TRIM COND.
C		BC. OSC. TRIM COND.
D		S.W. ANT. TRIM COND.
	N-2218	GANG COND. & TUNER
	N-2164	BAND SWITCH



TUNING RANGES
535 to 1720 KC
5.65 to 18.3 MC

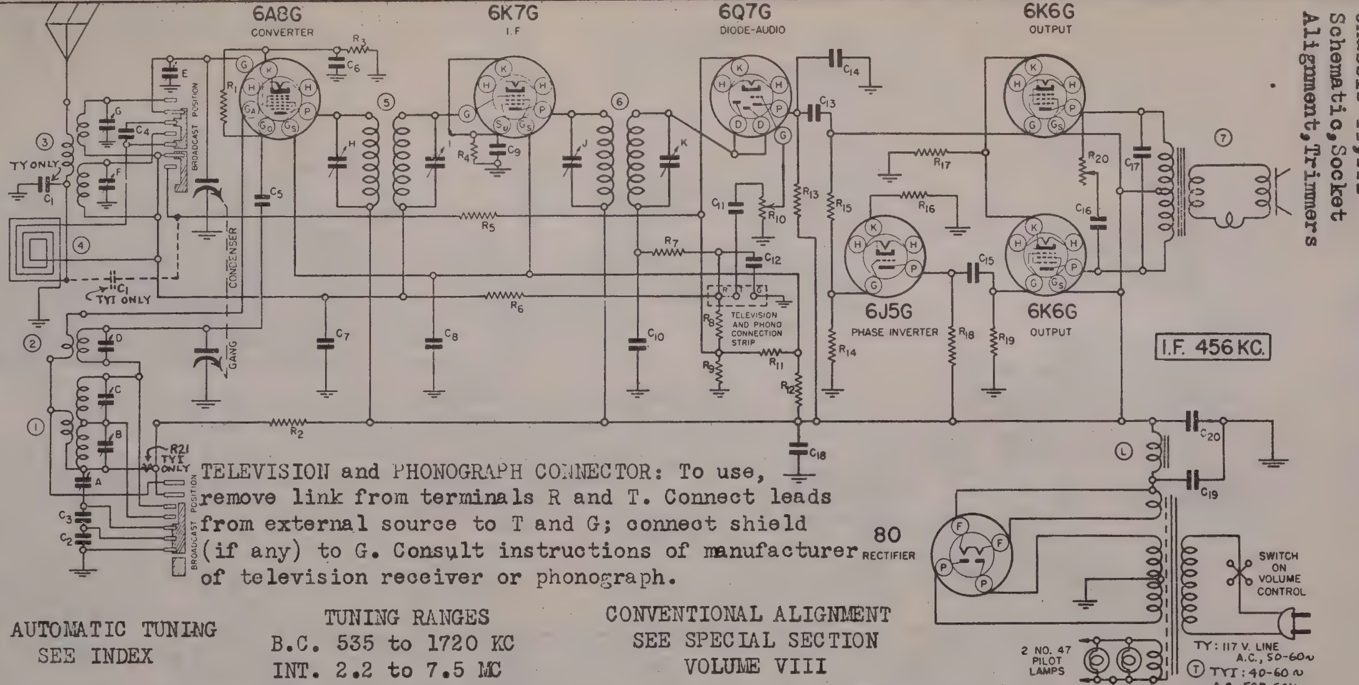
6 TUBE A.C.
SUPERHETERODYNE
TWO BAND

DRWN W.F. AUG.11,'39
APPR. SEPT.6,'39

TX

MODEL TY-54
Chassis TY,TYI
Schematic,Socket
Alignment,Trimmers

SONORA RADIO & TELEV.. CORP.



TELEVISION and PHONOGRAPH CONNECTOR: To use, remove link from terminals R and T. Connect leads from external source to T and G; connect shield (if any) to G. Consult instructions of manufacturer of television receiver or phonograph.

TY: 117 V. LINE A.C., 50-60~
Ⓣ TYI: 40-60 ~ A.C. FOR CONNECTIONS SEE BELOW.

FOR AUTOMATIC TUNING
SEE INDEX

TUNING RANGES
B.C. 535 to 1720 KC
INT. 2.2 to 7.5 MC
S.W. 7.25 to 24.0 MC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

PARTS: TY and TYI

DIAG NO	PART NO.	DESCRIPTION	
R_1	N-1260	50,000 OHM	.5W. 20%
R_2	N-1627	20,000 OHM	.5W. 20%
R_3	N-1379	550 OHM	.5W. 10%
R_4	N-1628	750 OHM	.5W 10%
R_5	N-1262	1 MEGOHM	.5W. 20%
R_6	N-1262	1 MEGOHM	.5W. 20%
R_7	N-1260	50,000 OHM	.5W. 20%
R_8	N-1264	.5 MEGOHM	.5W. 20%
R_9	N-2293	450 OHM	.5W. 10%
R_{10}	N-2282	1 MEGOHM VOLUME CONTROL	
R_{11}	N-1474	25,000 OHM	.5W. 20%
R_{12}	N-1259	15,000 OHM	.5W. 20%
R_{13}	N-1377	200,000 OHM	.5W. 20%
R_{14}	N-1777	34,000 OHM	.5W. 10%
R_{15}	N-2294	400,000 OHM	.5W. 10%
R_{16}	N-1257	2,000 OHM	.5W. 20%
R_{17}	N-2292	400 OHM	1W. 10%

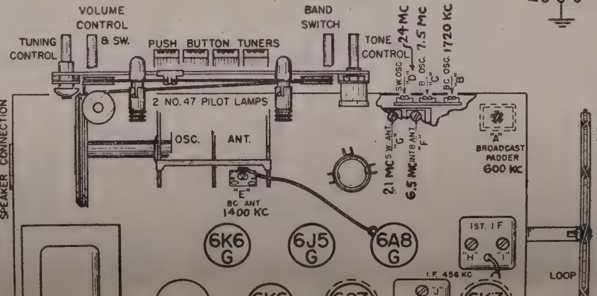
C_4	N-1897	25 MMFD.	20%
C_5	N-1342	50 MMFD.	20%
C_6	N-1345	.05 MFD.	200 V.
C_7	N-1345	.05 MFD.	200 V.
C_8	N-1351	.1 MFD.	200 V
C_9	N-1345	.05 MFD	200 V.
C_{10}	N-1342	50 MMFD.	20%
C_{11}	N-1344	.01 MFD.	400 V.
C_{12}	N-1342	50 MMFD.	20%
C_{13}	N-1344	.01 MFD.	400 V.
C_{14}	N-1343	250 MMFD.	20%
C_{15}	N-1344	.01 MFD.	400 V.
C_{16}	N-1973	.02 MFD.	600 V.
C_{17}	N-2054	.006 MFD.	800 V.
C_{18}	N-1623	.1 MFD.	400 V.
C_{19} C_{20}	N-2283	15 MFD 350 V. 10 MFD. 350 V.	EL'T'LYT'C
	N-1999	GANG COND. & TUNER	
A	N-2205	BC. PADDING COND.	

PARTS: TY ONLY

C_1	N-1897	25 MMFD.	20%
1	N-2009	BC. & INT.B. OSC COIL	
2	N-2280	S.W. OSC. COIL	
3	N-2011	INT.B. & S.W. ANT COIL	
4	N-2154	ANTENNA COIL LOOP	
5	N-2159	1ST I.F. TRANS.	
6	N-2286	2ND. I.F. TRANS.	
*7	N-2237	6-1/2" DYN SP. & TRANS.	
T	N-2149	POWER TRANSFORMER	
*	N-2300	CONSOLE SPEAKER & TRANS.	

PARTS: TYI ONLY

R_{21}	N-1265	200 OHM	.5W. 20%
C_1	N-1447	.0005 MFD.	400V
1	N-2009E	BC. & INT.B. OSC COIL	
2	N-2280E	S.W. OSC. COIL	
3	N-2011E	INT.B. & S.W. ANT. COIL	
4	N-2154	ANTENNA COIL LOOP	

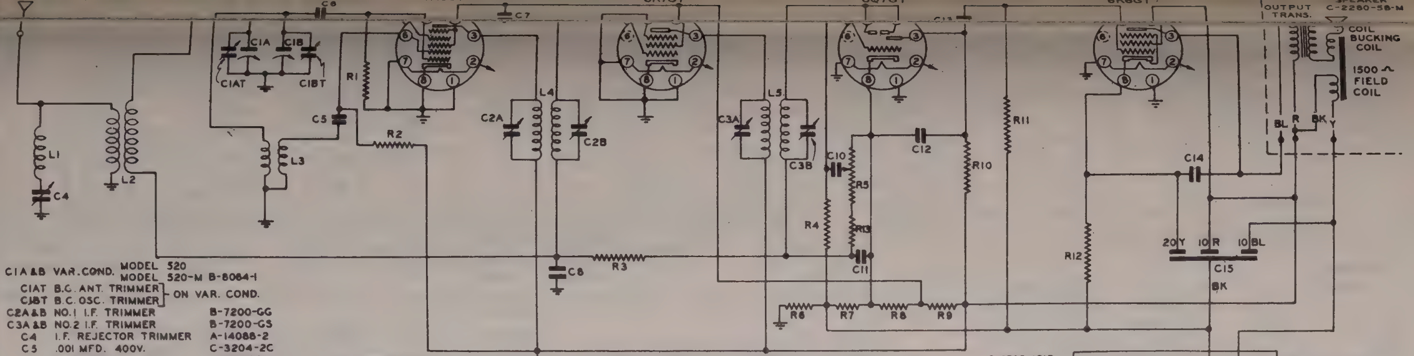


TYI POWER TRANSFORMER

Switch Position	Power Supply Voltage
110	105 to 117
130	118 to 137
150	138 to 160
220	205 to 233
250	234 to 265

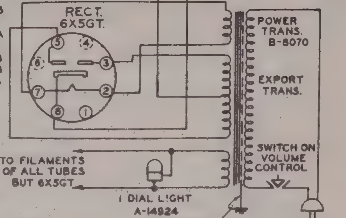
SPARKS WITHINGTON CO.

MODELS 520,520M
Schematic,Voltage



C1A & B	VAR. COND. MODEL 520 MODEL 520-M	B-8064-1
C1AT	B.C. ANT. TRIMMER	ON VAR. COND.
C1BT	B.C. OSC. TRIMMER	ON VAR. COND.
C2A & B	NO. 1 I.F. TRIMMER	B-7200-GG
C3A & B	NO. 2 I.F. TRIMMER	B-7200-GS
C4	I.F. REJECTOR TRIMMER	A-14088-2
C5	.001 MFD. 400V.	C-3204-2C
C6	50 MFD. MOLDED	C-720-320
C7	.1 MFD 200V.	C-3202-38C
C8	.05 MFD 200V.	C-3202-28C
C9	.1 MFD. 400V.	C-3204-38C
C10	.02 MFD. 200V.	C-3202-22C
C11	250 MMFD. MOLDED	C-720-324
C12	250 MMFD. MOLDED	C-720-324
C13	.05 MFD. 400V.	C 3204-28C
C14	.01 MFD. 600V.	C-3206-76C
C15	20-10-10 MFD. ELECT.	A-14684-4

R1	56,000 Ω	.25W.	C-2795-83B
R2	22,000 Ω	.5W	C-2796-78C
R3	1 MEGOHM	.25W.	C-2795-98B
R4	560,000 Ω	.25W.	C-2795-95B
R5	500,000 Ω	VOL. CONTROL	A-15129-4
R6	220 Ω	.25W.	C-2795-143B
R7	470 Ω	.25W.	C-2795-151B
R8	27,000 Ω	1W.	C-2797-79B
R9	33,000 Ω	3W.	C-2799-80A
R10	270,000 Ω	.25W.	C-2795-91B
R11	680,000 Ω	.25W.	C-2795-30B
R12	680 Ω	1W.	C-2797-60B
R13	27000 Ω	.25W.	C-2795-79B



ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer at last calibration mark with tuning condenser plates flush)						
2	I. F.	6A7 Grid	.1mf.	456 KC	Open	C3A,B C2A,B	2nd I. F. 1st I. F.
3	Rejector	Ant.	200mmf.	456 KC	Closed	C4	Adjust to minimum
4	BC Band	Ant.	200mmf.	1500 KC	1500 KC	C1B Osc. C1A Ant.	Peak Accurately Peak Accurately
5	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)						
6	(Check operations 1 to 5 inclusive)						

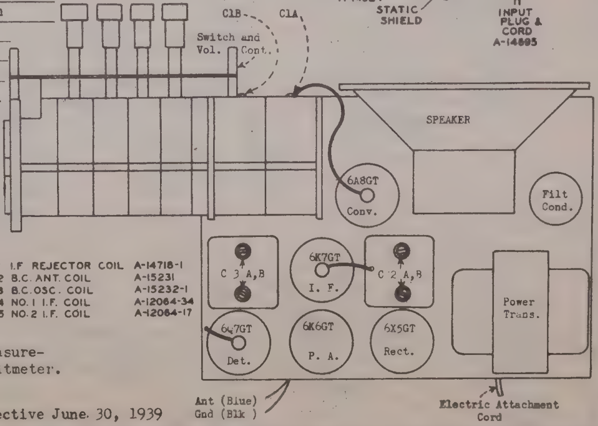
VOLTAGE CHART

Line Voltage: 115 volts Position of Volume Control: Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Diagram)								
		#1	#2	#3	#4	#5	#6	#7	#8	Grid Cap
6A8GT	Converter	0	0	250	67	4	175	*6.3	0	.1
6K7GT	I. F. Amp.	0	0	250	67	0	1.5	*6.3	0	.1
6Q7GT	2nd. Det. AVC-AF	0	0	65	**	**	**	*6.3	0	0
6K6GT	P. A.	0	0	225	250	0	3.5	*6.3	10	-
6X5GT	Rectifier	-	0	275*	0	275*	0	0	300	

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages are + DC voltages.
*AC volts.
**Cannot be measured with Weston Analyzer #665 Type 2.

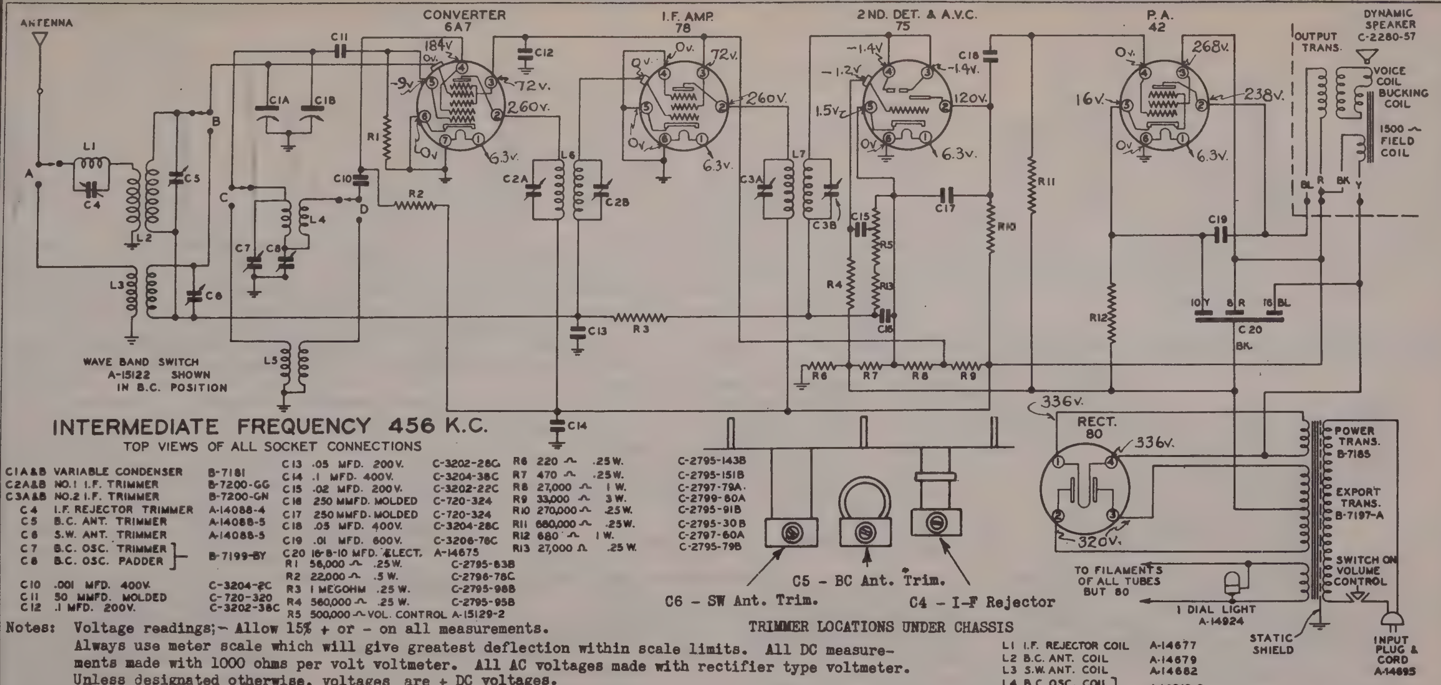
L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. ANT. COIL	A-15231
L3	B.C. OSC. COIL	A-15232-1
L4	NO. 1 I.F. COIL	A-12064-34
L5	NO. 2 I.F. COIL	A-12064-17



(Original) Effective June 30, 1939

MODEL 530X
Schematic, Voltage, Socket
Alignment, Trimmers

SPARKS WITHINGTON CO.



INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-7181
C2A&B	NO.1 I.F. TRIMMER	B-7200-GG
C3A&B	NO.2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-BY
C8	B.C. OSC. PADDER	
C10	.001 MFD. 400V.	C-3204-2C
C11	50 MMFD. MOLDED	C-720-320
C12	.1 MFD. 200V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-28C
C14	.1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.01 MFD. 600V.	C-3206-76C
C20	16-8-10 MFD. ELECT.	A-14675
R1	56,000 ∿ .25 W.	C-2795-83B
R2	22,000 ∿ .5 W.	C-2796-78C
R3	1 MEGOHM .25 W.	C-2795-98B
R4	560,000 ∿ .25 W.	C-2795-95B
R5	500,000 ∿ VOL. CONTROL	A-15129-2
R6	220 ∿ .25 W.	C-2795-143B
R7	470 ∿ .25 W.	C-2795-151B
R8	27,000 ∿ 1 W.	C-2797-79A
R9	33,000 ∿ 3 W.	C-2799-60A
R10	270,000 ∿ .25 W.	C-2795-91B
R11	680,000 ∿ .25 W.	C-2795-30B
R12	680 ∿ 1 W.	C-2797-60A
R13	27,000 Ω .25 W.	C-2795-79B

Notes: Voltage readings;— Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages are + DC voltages.

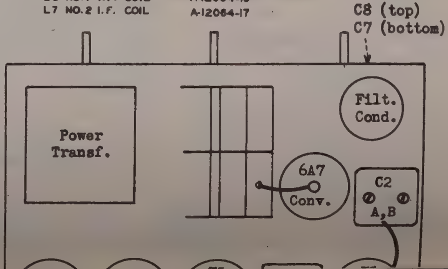
C6 - SW Ant. Trim.
C5 - BC Ant. Trim.
C4 - I-F Rejector

TRIMMER LOCATIONS UNDER CHASSIS

L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679
L3	S.W. ANT. COIL	A-14682
L4	B.C. OSC. COIL	A-14213-2
L5	S.W. OSC. COIL	
L6	NO.1 I.F. COIL	A-12064-16
L7	NO.2 I.F. COIL	A-12064-17

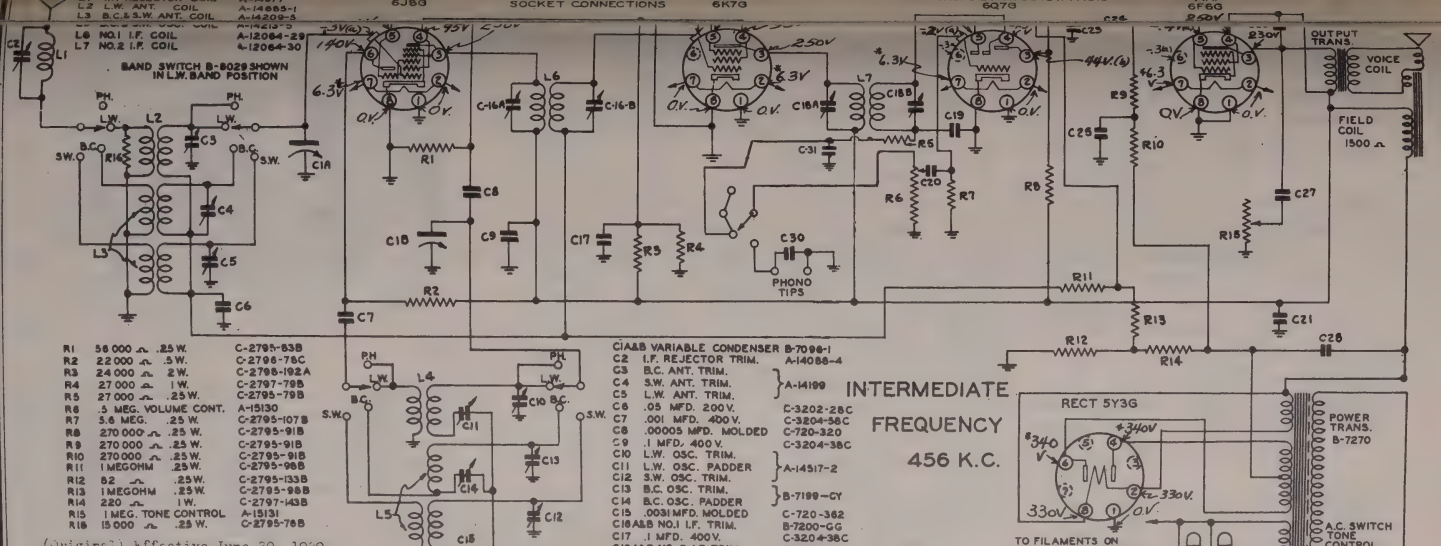
ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration mark at right end of scale with gang closed)							
2	I.F.	6A7 Grid	.1 mf.	456	BC.	Open	C3 A,B	2nd I.F.
							C2 A,B	1st I.F.
3	Rejector	Ant.	200 mmf.	456	BC.	Closed	C4	Adjust to minimum
4	Broad. Band	Ant.	200 mmf.	1500	BC.	1500	C7	
5	BC.	Ant.	200 mmf.	1500	BC.	1500	C5	
6	BC.	Ant.	200 mmf.	600	BC.	600	C8	
7	(Repeat operations 3 and 4)							
8	(Check for dial calibration and sensitivity at 1500 KC, 900 KC, 600 KC.)							
9	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6	**
10	(Check for dial calibration and sensitivity at 18 MC and 6 MC)							



SPARKS WITHINGTON CO.

MODEL 540LX
Schematic,Voltage,Socket
Alignment,Trimmers

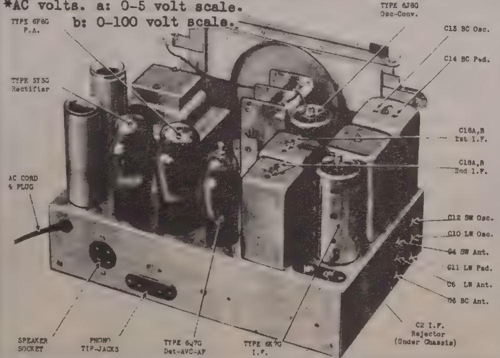


R1	56 000 Ω	.25 W.	C-2795-83B
R2	22 000 Ω	.5 W.	C-2796-78C
R3	24 000 Ω	2 W.	C-2798-192A
R4	27 000 Ω	1 W.	C-2797-79B
R5	27 000 Ω	.25 W.	C-2795-79B
R6	.5 MEG. VOLUME CONT.		A-15130
R7	5.6 MEG.	.25 W.	C-2795-107B
R8	270 000 Ω	.25 W.	C-2795-91B
R9	270 000 Ω	.25 W.	C-2795-91B
R10	270 000 Ω	.25 W.	C-2795-91B
R11	1 MEGOHM	.25 W.	C-2795-98B
R12	82 Ω	.25 W.	C-2795-133B
R13	1 MEGOHM	.25 W.	C-2795-98B
R14	220 Ω	1 W.	C-2797-143B
R15	1 MEG. TONE CONTROL		A-15131
R16	15 000 Ω	.25 W.	C-2795-76B

C1A&B	VARIABLE CONDENSER	B-7096-1
C2	I.F. REJECTOR TRIM.	A-14088-4
C3	B.C. ANT. TRIM.	A-14199
C4	S.W. ANT. TRIM.	
C5	L.W. ANT. TRIM.	
C6	.05 MFD. 200 V.	C-3202-28C
C7	.001 MFD. 400 V.	C-3204-58C
C8	.00005 MFD. MOLDED	C-720-320
C9	.1 MFD, 400 V.	C-3204-38C
C10	L.W. OSC. TRIM.	A-14517-2
C11	L.W. OSC. PADDER	
C12	S.W. OSC. TRIM.	
C13	B.C. OSC. TRIM.	B-7199-CY
C14	B.C. OSC. PADDER	
C15	.0031 MFD. MOLDED	C-720-362
C16A&B	NO.1 I.F. TRIM.	B-7200-GG
C17	.1 MFD. 400 V.	C-3204-38C
C18A&B	NO. 2 I.F. TRIM.	B-7200-GN
C19	.00025 MFD. MOLDED	C-720-319
C20	.05 MFD. 200 V.	C-3202-28C
C21	30 MFD. 300 V. ELECT.	A-14072-A
C22	.0001 MFD. MOLDED	C-720-318
C23	.00025 MFD. MOLDED	C-720-319
C24	.05 MFD. 400 V.	C-3204-84C
C-25	.1 MFD. 200 V.	C-3202-38C
C26	.006 MFD. 600 V.	C-3206-68C
C27	.03 MFD. 600 V.	C-3206-80C
C28	16 MFD. 450 V. ELECT	A-14073-A
C29	.006 MFD. 600 V.	C-3206-12C
C30	.003 MFD. 200 V.	C-3202-82C
C31	.0001 MFD. MICA	C-720-325

(Original) Effective June 30, 1939

Voltage readings: Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.
*AC volts. a: 0-5 volt scale.
b: 0-100 volt scale.



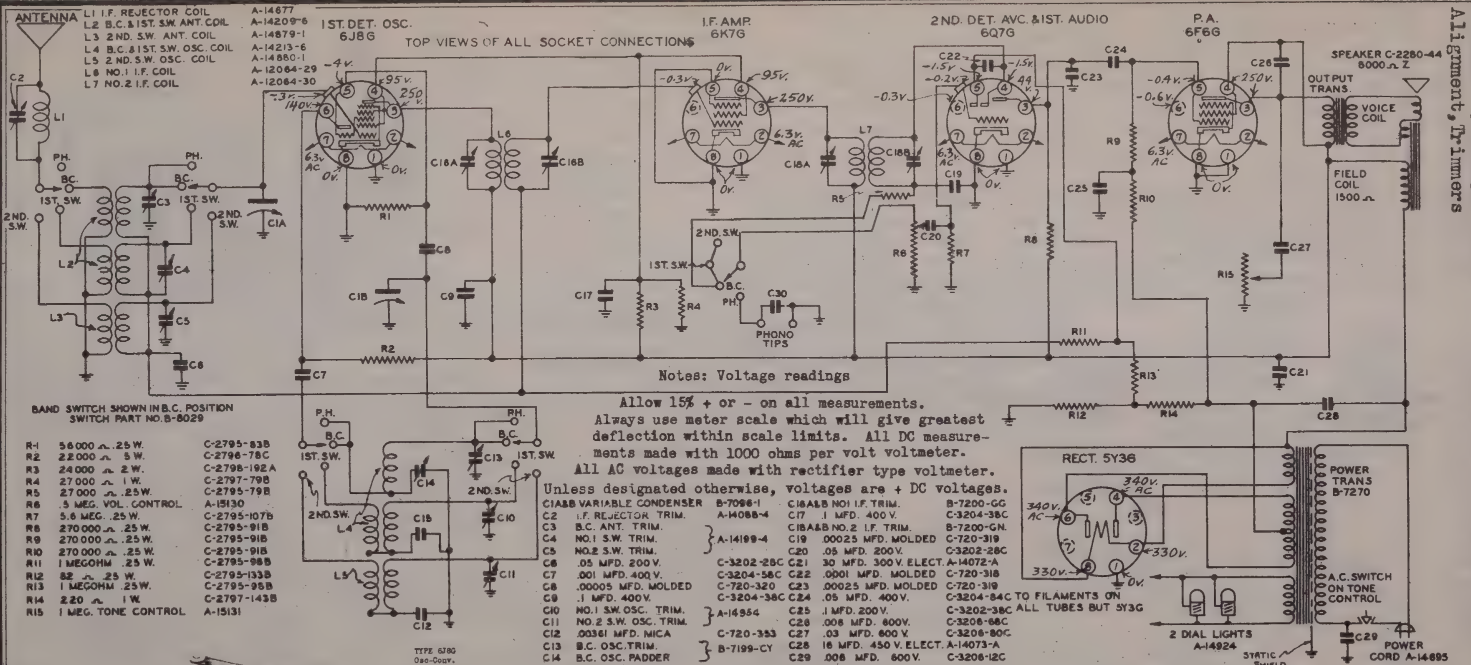
ALIGNMENT

(*) Use 200 mmf. condenser and 100 ohm non-inductive resistor in series.

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANT.	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark below 540 KC (BC) with tuning condenser plates flush)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C16A,B;C18A,B	
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C13 Osc. C3 Ant.	
5				600 KC	BC	600 KC	C14 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Long Wave Band	Ant.	200 mmf.	400 KC	LW	400 KC	C10 Osc. C5 Ant.	
9				150 KC	LW	150 KC	C11 Pad.	
10	(Repeat operations 8 and 9 once or twice to insure perfect adjustment)							
11	(Check calibration and sensitivity at 150 KC, 260 KC and 400 KC)							
12	Shortwave Band	Ant.	(*)	18 MC	SW	18 MC	C12 Osc. C4 Ant.	Rock dial for peak adjustment.
13	(Check calibration and sensitivity at 6.0 MC, 9.0 MC and 18 MC)							

MODEL 540SX
Schematic, Voltage, Socket
Alignment, Trimmers

SPARKS WITHINGTON CO.



L1	I.F. REJECTOR COIL	A-14677
L2	B.C. & 1ST. S.W. ANT. COIL	A-14209-6
L3	2ND. S.W. ANT. COIL	A-14879-1
L4	B.C. & 1ST. S.W. OSC. COIL	A-14213-6
L5	2ND. S.W. OSC. COIL	A-14880-1
L6	NO.1 I.F. COIL	A-12064-29
L7	NO.2 I.F. COIL	A-12064-30

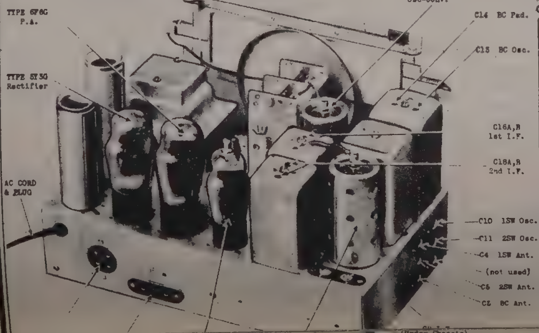
BAND SWITCH SHOWN IN B.C. POSITION
SWITCH PART NO. B-8029

R-1	56000 Ω .25 W.	C-2795-83B
R2	22000 Ω 5 W.	C-2796-78C
R3	24000 Ω 2 W.	C-2798-192A
R4	27000 Ω 1 W.	C-2797-79B
R5	27000 Ω .25 W.	C-2795-79B
R6	.5 MEG. VOL. CONTROL	A-15130
R7	5.6 MEG. .25 W.	C-2795-107B
R8	270000 Ω .25 W.	C-2795-91B
R9	270000 Ω .25 W.	C-2795-91B
R10	270000 Ω .25 W.	C-2795-91B
R11	1 MEGOHM .25 W.	C-2795-98B
R12	82 Ω .25 W.	C-2795-133B
R13	1 MEGOHM .25 W.	C-2795-98B
R14	220 Ω 1 W.	C-2797-143B
R15	1 MEG. TONE CONTROL	A-15131

Notes: Voltage readings

Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.

C1A&B	VARIABLE CONDENSER	B-7096-1
C2	I.F. REJECTOR TRIM.	A-14088-4
C3	B.C. ANT. TRIM.	A-14199-4
C4	NO.1 S.W. TRIM.	
C5	NO.2 S.W. TRIM.	
C6	.05 MFD. 200 V.	C-3202-28C
C7	.001 MFD. 400 V.	C-3204-58C
C8	.00005 MFD. MOLDED	C-720-320
C9	.1 MFD. 400 V.	C-3204-38C
C10	NO.1 S.W. OSC. TRIM.	A-14954
C11	NO.2 S.W. OSC. TRIM.	
C12	.00361 MFD. MICA	C-720-353
C13	B.C. OSC. TRIM.	B-7199-CY
C14	B.C. OSC. PADDER	
C15	.00114 MFD. MOLDED	C-720-368
C16A&B	NO1 I.F. TRIM.	B-7200-GG
C17	.1 MFD. 400 V.	C-3204-38C
C18A&B	NO.2 I.F. TRIM.	B-7200-GN.
C19	.00025 MFD. MOLDED	C-720-319
C20	.05 MFD. 200 V.	C-3202-28C
C21	30 MFD. 300 V. ELECT.	A-14072-A
C22	.0001 MFD. MOLDED	C-720-318
C23	.00025 MFD. MOLDED	C-720-319
C24	.05 MFD. 400 V.	C-3204-84C
C25	.1 MFD. 200 V.	C-3202-38C
C26	.006 MFD. 600 V.	C-3206-68C
C27	.03 MFD. 600 V.	C-3206-80C
C28	16 MFD. 450 V. ELECT.	A-14073-A
C29	.008 MFD. 600 V.	C-3206-12C
C30	.003 MFD. 200 V.	C-3202-62C

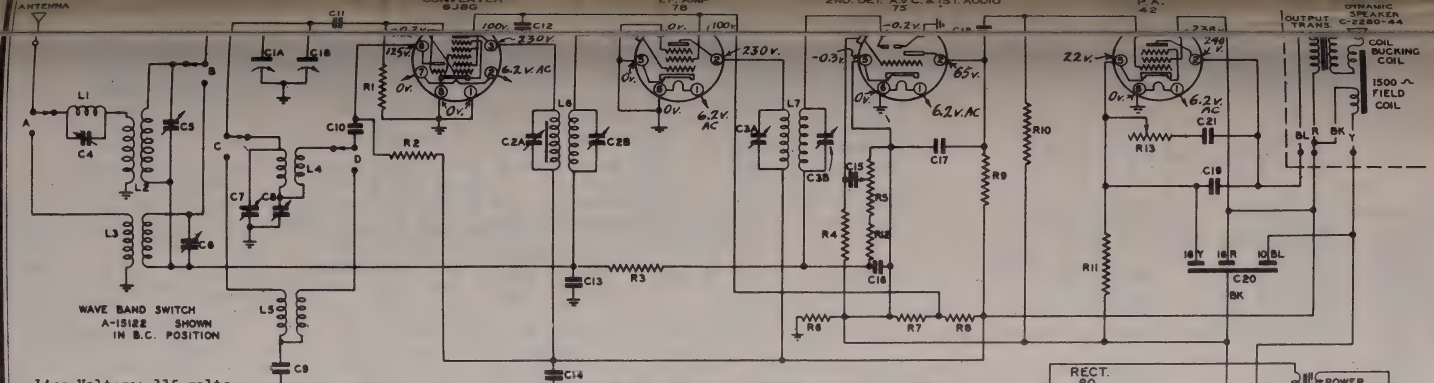


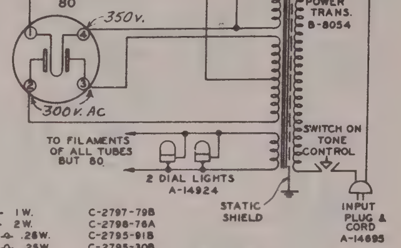
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark at end of scale with tuning condenser closed)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C18 A,B C16 A,B	2nd I.F. 1st I.F.
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1400 KC	BC	1400 KC	C13 Osc. C3 Ant.	
5				600 KC	BC	600 KC	C14 Pad	Rock dial for peak adj.
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC, 1400 KC)							
8	1st SW Band	Ant.	*	7. MC	1 SW	7. MC	C10 Osc. C4 Ant.	
9	(Check calibration and sensitivity at 2.5 MC, 4. MC and 7. MC)							
10	2nd SW Band	Ant.	*	22. MC	2 SW	22. MC	C11 Osc. C5 Ant.	Rock dial for peak adj.

INTERMEDIATE FREQUENCY 456 K.C.

(Original) Effective June 30, 1939

MODEL 550M
Schematic, Voltage, Socket
Alignment, Trimmers



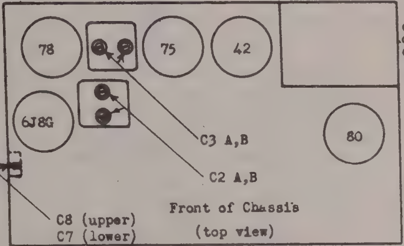


INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

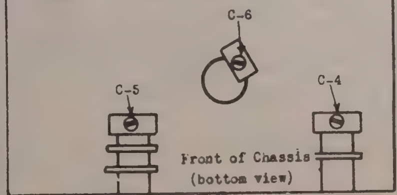
Line Voltage: 115 volts
Position of Volume Control: Full with Antenna Disconnected
Voltage readings:-Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.
*AC volts.

C1A&B	VARIABLE CONDENSER	B-8064
C2A&B	NO. 1 I.F. TRIMMER	B-7200-DD
C3A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-BY
C8	B.C. OSC. PADDER	
C9	3880 MMFD. MOLDED	C-720-346
C10	100 MMFD. MOLDED	C-720-339
C11	25 MMFD. MOLDED	C-720-342
C12	.1 MFD 200V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-28C
C14	.1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.003 MFD. 600V.	C-3206-62C
C20	16-10-16 MFD. ELECT.	A-14780
C21	.03 MFD. 600V.	C-3206-80C
R1	56,000 ∿ .25W.	C-2795-83B
R2	22,000 ∿ .5W.	C-2796-78C
R3	1 MEGOHM .25W.	C-2795-98B
R4	4.7 MEGOHM .25W.	C-2795-106B
R5	500,000 ∿ VOL. CONTROL	A-15130-1
R6	200 ∿ .25W	C-2795-142B
R7	27,000 ∿ 1W.	C-2797-79B
R8	15,000 ∿ 2W.	C-2798-76A
R9	270,000 ∿ .25W.	C-2795-91B
R10	680,000 ∿ .25W.	C-2795-30B
R11	680 ∿ 1W.	C-2797-60B
R12	56,000 ∿ .25W.	C-2795-83B
R13	TONE CONT. & SW.	A-15128
L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-4
L4	B.C. OSC. COIL	A-14213-2A
L5	S.W. OSC. COIL	
L6	NO. 1 I.F. COIL	A-15211
L7	NO. 2 I.F. COIL	A-12064-17



Front of Chassis
(top view)

Trimmer Locations under Chassis



Front of Chassis
(bottom view)

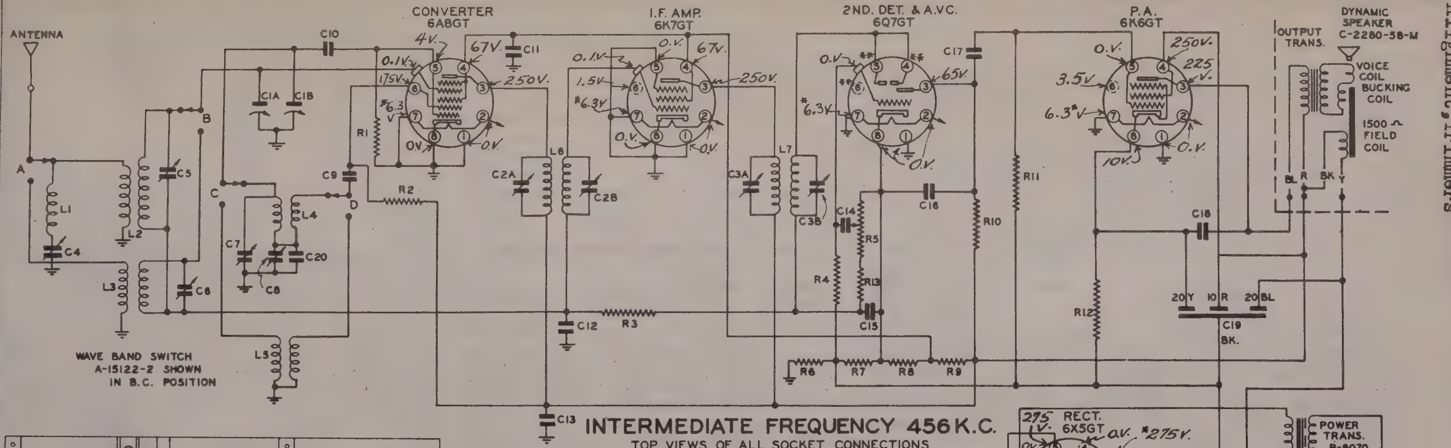
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C3 A,B	2nd I-F transformer
3							C2 A,B	1st I-F transformer
4	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
5	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 Osc trim	Peak accurately
6							C5 Ant trim	Peak accurately
7				600 KC	BC	600 KC	C8 Osc pad.	Peak accurately
8	(Repeat operations 5 and 6)							
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
10	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 Ant. trim	**
11	(Check calibration and sensitivity at 6 MC and 18 MC)							
12	(Check operations 1 to 11 inclusive)							

*100 ohm and 200 mmf. in series.
**Rock variable condenser slightly while adjusting for maximum output.

(Original) Effective June 30, 1939

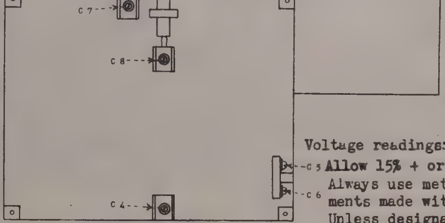
MODEL 570M
Schematic,Voltage,Socket
Alignment,Trimmers

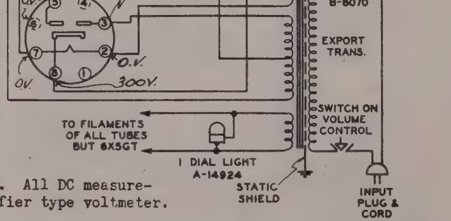
SPARKS WITHINGTON CO.



INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS





C1A&B	VARIABLE CONDENSER	B-8064-2
C2A&B	NO.1 I.F. TRIMMER	B-7200-GG
C3A&B	NO.2 I.F. TRIMMER	B-7200-GS
C4	I.F. REJECTOR TRIMMER	A-14088-2
C5	B.C. ANT. TRIMMER	A-14200
C6	S.W. ANT. TRIMMER	
C7	B.C. OSC. TRIMMER	A-14088-1
C8	B.C. OSC. PADDER	A-14088-1
C9	.001 MFD. 400V.	C-3204-2C
C10	50 MMFD. MOLDED	C-720-320
C11	.1 MFD. 200V.	C-3202-38C

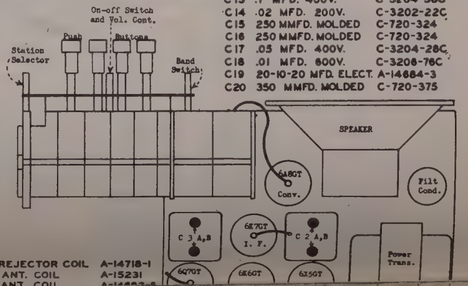
R1	33,000 Ω .25W.	C-2795-80B
R2	22,000 Ω .5W	C-2796-78C
R3	1 MEGOHM .25 W.	C-2795-98B
R4	560,000 Ω .25 W.	C-2795-95B
R5	500,000 Ω VOL. CONTROL	A-15129-4A
R6	220 Ω .25W.	C-2795-143B
R7	470 Ω .25W	C-2795-151B
R8	27,000 Ω 1 W.	C-2797-79B
R9	33,000 Ω 3 W.	C-2799-80A
R10	270,000 Ω .25W	C-2795-91B
R11	680,000 Ω .25W.	C-2795-30B
R12	680 Ω 1 W.	C-2797-60B
R13	27000 Ω .25W.	C-2795-79B

Voltage readings:
Allow 15% + or − on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.
*AC volts. **Cannot be measured with Weston Analyzer #665 Type 2. (Original) Effective June 30, 1939

C12	.05 MFD. 200V.	C-3202-28C
C13	.1 MFD. 400V.	C-3204-38C
C14	.02 MFD. 200V.	C-3202-22C
C15	250 MMFD. MOLDED	C-720-324
C16	250 MMFD. MOLDED	C-720-324
C17	.05 MFD. 400V.	C-3204-28C
C18	.01 MFD. 600V.	C-3208-76C
C19	20-10-20 MFD. ELECT.	A-14684-3
C20	350 MMFD. MOLDED	C-720-375

ALIGNMENT CHART

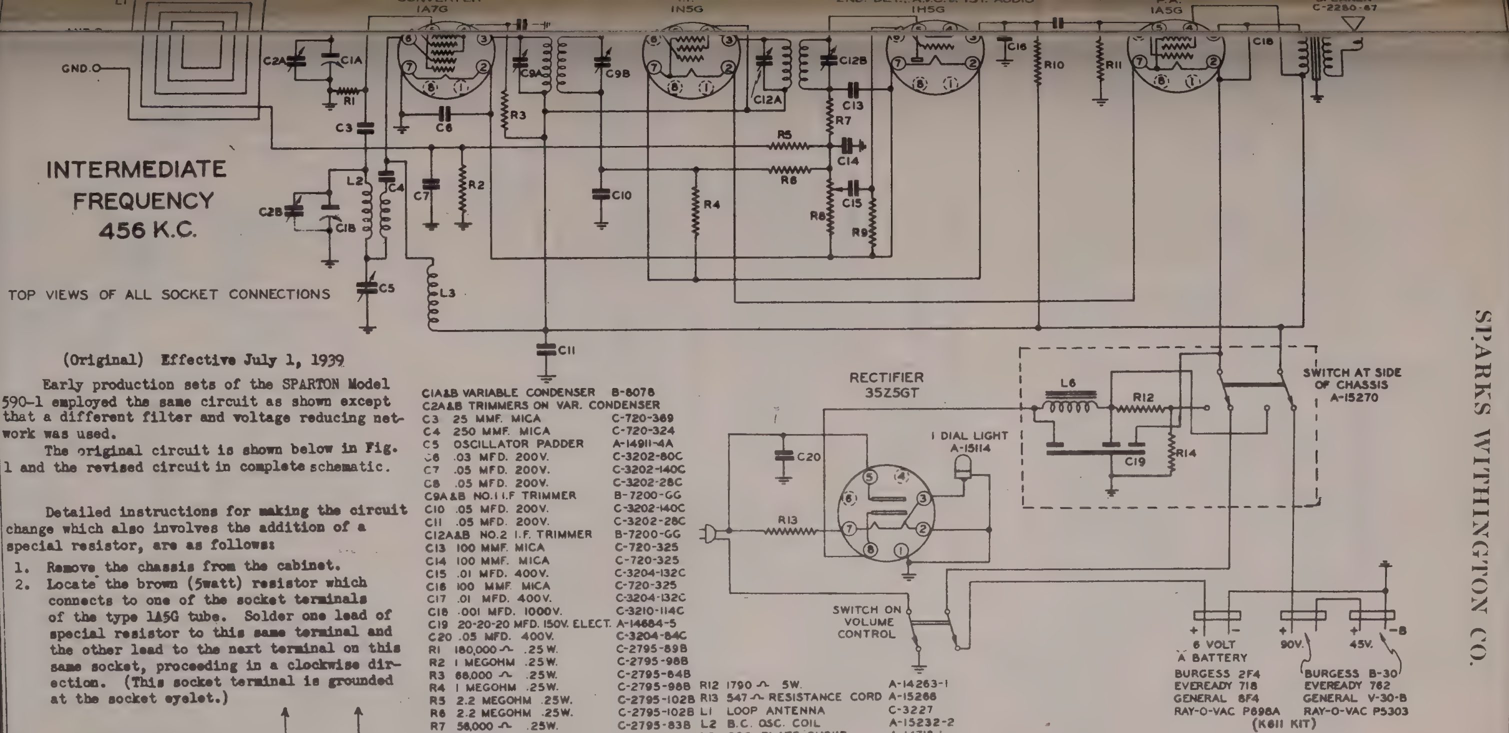
OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer at last calibration mark with tuning condenser plates flush)							
2	I. F.	6A7 Grid.	.1 mf.	456 KC	BC	Open	C3 A,B C2 A,B	2nd I. F. 1st. I. F.
3	Rejector	Ant.	200mmf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200mmf.	1500 KC	BC	1500 KC	C7 osc. C5 ant.	Peak Accurately Peak Accurately
5				600 KC	BC	600 KC	C8 pad.	Peak Accurately
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)							
8	S. W. Band	Ant.	(*)	18 MC	SW	18 MC	C6 ant.	(**)
9	(Check calibration and sensitivity at 18 MC and 6 MC)							



L1 I.F. REJECTOR COIL A-14718-1
L2 B.C. ANT. COIL A-15231
L3 S.W. ANT. COIL

SPARKS WITHINGTON CO.

MODEL 590-1
Schematic,Changes



INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

(Original) Effective July 1, 1939

Early production sets of the SPARTON Model 590-1 employed the same circuit as shown except that a different filter and voltage reducing network was used.

The original circuit is shown below in Fig. 1 and the revised circuit in complete schematic.

Detailed instructions for making the circuit change which also involves the addition of a special resistor, are as follows:

1. Remove the chassis from the cabinet.
2. Locate the brown (5watt) resistor which connects to one of the socket terminals of the type 1A5G tube. Solder one lead of special resistor to this same terminal and the other lead to the next terminal on this same socket, proceeding in a clockwise direction. (This socket terminal is grounded at the socket eyelet.)

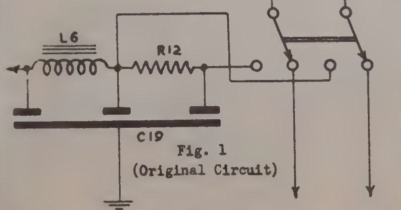


Fig. 1
(Original Circuit)

3. Clip off excess (unused) wire from resistor leads and be sure resistor (and resistor leads) do not touch other wires or parts of chassis.

C1A&B	VARIABLE CONDENSER	B-8078	R12	1790 Ω 5W.	A-14263-1
C2A&B	TRIMMERS ON VAR. CONDENSER		R13	547 Ω RESISTANCE CORD	A-15268
C3	25 MMF. MICA	C-720-369	L1	LOOP ANTENNA	C-3227
C4	250 MMF. MICA	C-720-324	L2	B.C. OSC. COIL	A-15232-2
C5	OSCILLATOR PADDER	A-14911-4A	L3	OSC. PLATE CHOKE	A-14718-1
C6	.03 MFD. 200V.	C-3202-80C	L4	NO.1 I.F. COIL	A-12064-35
C7	.05 MFD. 200V.	C-3202-140C	L5	NO.2 I.F. COIL	A-12064-35
C8	.05 MFD. 200V.	C-3202-28C	L6	FILTER CHOKE	A-15272
C9A&B	NO.1 I.F TRIMMER	B-7200-GG	R14	2700 Ω .25 W.	C-2795-67B
C10	.05 MFD. 200V.	C-3202-140C			
C11	.05 MFD. 200V.	C-3202-28C			
C12A&B	NO.2 I.F. TRIMMER	B-7200-GG			
C13	100 MMF. MICA	C-720-325			
C14	100 MMF. MICA	C-720-325			
C15	.01 MFD. 400V.	C-3204-132C			
C16	100 MMF. MICA	C-720-325			
C17	.01 MFD. 400V.	C-3204-132C			
C18	.001 MFD. 1000V.	C-3210-114C			
C19	20-20-20 MFD. 150V. ELECT.	A-14684-5			
C20	.05 MFD. 400V.	C-3204-84C			
R1	180,000 Ω .25 W.	C-2795-89B			
R2	1 MEGOHM .25 W.	C-2795-98B			
R3	68,000 Ω .25W.	C-2795-84B			
R4	1 MEGOHM .25W.	C-2795-98B			
R5	2.2 MEGOHM .25W.	C-2795-102B			
R6	2.2 MEGOHM .25W.	C-2795-102B			
R7	56,000 Ω .25W.	C-2795-83B			
R8	500,000 Ω VOL. CONTROL	A-15132-1			
R9	10 MEGOHM .25W.	C-2795-110B			
R10	1 MEGOHM .25W.	C-2795-98B			
R11	2.2 MEGOHM .25W.	C-2795-102B			

This circuit revision should be incorporated in any original Model 590-1 sets, as it will safeguard the life of the 1.4 volt tubes in case the change-over (transfer) switch is raised while the set is being operated on AC, or in case tubes are changed while the set is being operated on AC.

4. Locate the yellow and black wire which connects to the electrolytic condenser (20-20-20 mf.)
5. Follow this wire to the point where it connects to the change-over (transfer) switch. Unsolder the yellow and black wire at this connection and connect it to the middle switch terminal. (The middle terminal already has another yellow and black wire as well as a condenser lead covered with black insulation connected to it. Do not disturb these connections.
6. All soldered connections should be made clearly and carefully.
7. Install chassis in cabinet.

(First Revision)

Effective July 19, 1939

MODEL 590-1
Alignment,Voltage
Trimmers,Socket

SPARKS WITHINGTON CO.

VOLTAGE CHART

Receiver Operated on: AC Supply
Line Voltage: 117 Volts

Volume Control on Full
Dial Tuned to Quiet Channel

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd.(See Prong Nos. on Schematic Diag								
		No.1	No.2	No.3	No.4	No.5	No.6	No. 7	No.8	Grid Ca
1A7G	Converter	90	1.5	92	28	0	90	0	90	0
1N5G	I. F. Amplifier	0	4.4	92	92	0	6	2.8	0	0
1H5G	Det. AVC. Audio	0	2.8	0*	0	0	0	1.5	0	0
1A5G	P. A.	0	5.8	88	92	0	0	4.4	5.8	-
35Z5GT	Rectifier	0	0	1.8	0	120	0	28	152	-

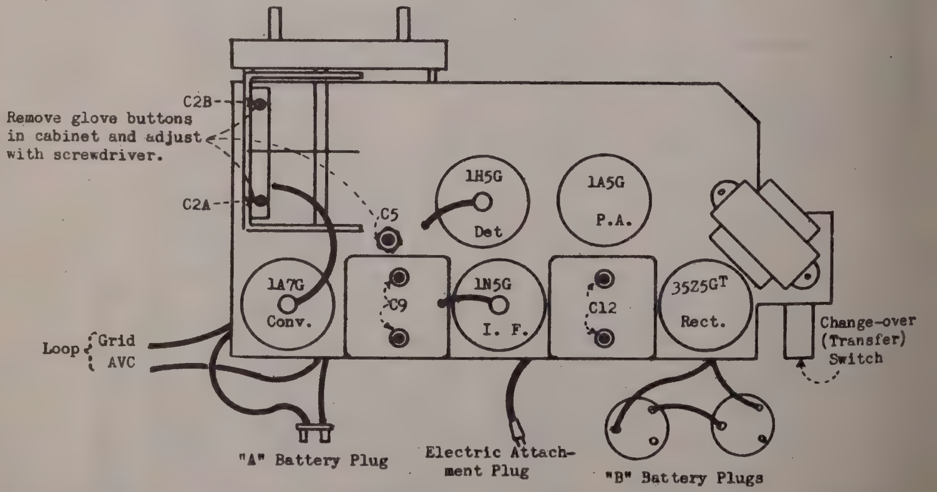
Notes: Voltage and resistance readings are for schematic diagram Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 2. (1000 ohms per volt)

*Cannot be measured with Weston Selective Analyzer No. 665, Type 2.

ALIGNMENT CHART

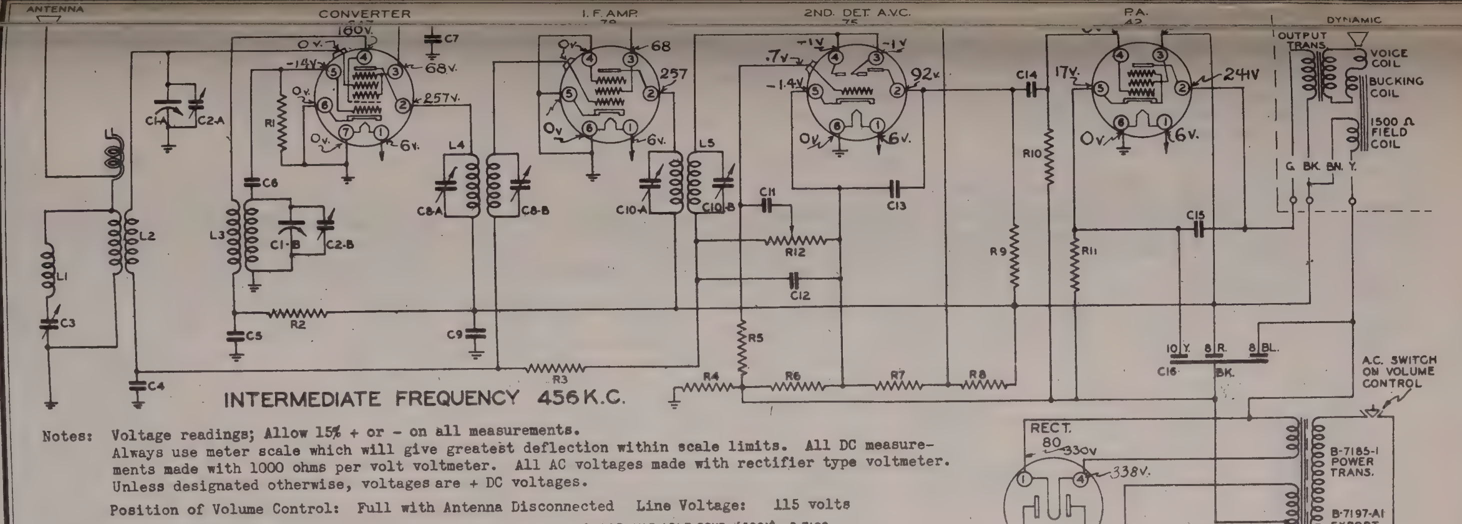
OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING CONDENSER SETTING	TRIMMER	REMARKS
1	(Set pointer parallel with horizontal lines when condenser plates are flush)						
2	I. F.	1A7G Grid	.1 mf.	456KC	Open	C 12 A & B C 9 A & B	2nd I. F. 1st I. F.
3	Broadcast Band	Separate Loop*	*	1500KC	1500KC	C 2B Osc. C 2A Ant.	Peak Accurately* Peak Accurately*
4				600KC	600KC	C5 Pad.	Peak Accurately*
5	(Repeat operation 3)						
6	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)						
7	(Check operations 1 to 6 inclusive)						

*Preliminary alignment af antenna and oscillator adjustments may be made with chassis out of cabinet. Fin
alignment must be made with chassis installed in cabinet and with back cover snapped shut.
For final alignment it is recommended that an extra Model 590-1 Loop Antenna (Part No. C-3327) be obtained
Connect generator "Ant" to loop terminal marked "Grid" and generator "Gnd" to loop terminal marked "AVC".
With back cover of set snapped shut, place the extra loop directly in back of the Model 590-1 being aligned
so that it will be parallel with the loop inside the set and from one to three feet distant.
The antenna trimmer, oscillator trimmer and oscillator padder can be reached by removing glove buttons in
top of cabinet. (See chassis diagram.)



MODEL 58QX
Schematic,Voltage,Socket
Alignment,Trimmers

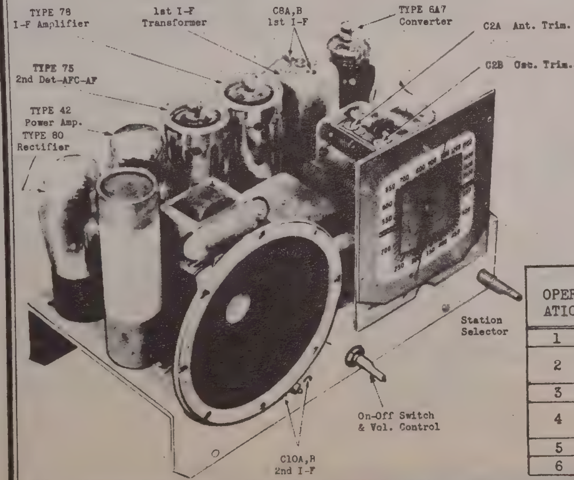
SPARKS WITHINGTON CO.



INTERMEDIATE FREQUENCY 456 K.C.

Notes: Voltage readings; Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.

Position of Volume Control: Full with Antenna Disconnected Line Voltage: 115 volts



C1-A&B	VARIABLE CONC. (580X)	B-7198
C1-A&B	VARIABLE COND. (5518-A)	B-7237-1
C2	TRIMMERS ON VARIABLE CONDENSER	
C3	I.F. REJECTOR TRIM.(5518-A)	A-14398
C3	I.F. REJECTOR TRIM.(5)	A-14720
C4	.05 MFD. 200 V.	C-3202-28C
C5	.006 MFD. 400 V.	C-3204-12C
C6	50 MMF. MOLDED	C-720-320
C7	.1 MFD. 200 V.	C-3202-38C
C8-A&B	NO.1 I.F. TRIMMER	B-7200-GG
C9	.1 MFD. 400 V.	C-3204-38C
C10-A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C11	.02 MFD. 200 V.	C-3202-22C
C12	250 MMF. MOLDED	C-720-324
C13	250 MMF. MOLDED	C-720-324
C14	.05 MFD. 400 V.	C-3204-28C
C15	.01 MFD. 600 V.	C-3206-76C
C16	10-8-8 MFD. ELECT. (580X)	A-14715
C16	10-8-8 MFD. ELECT. (5518-A)	A-14785

R1	56,000 Ω	.25 W.	C-2795-83B
R2	22,000 Ω	.5 W.	C-2796-78C
R3	1 MEGOHM	.25 W.	C-2795-31B
R4	220 Ω	.25 W.	C-2795-143B
R5	560,000 Ω	.25 W.	C-2795-95B
R6	470 Ω	.25 W.	C-2795-151B
R7	27,000 Ω	1 W.	C-2797-79B
R8	33,000 Ω	3 W.	C-2799-80A
R9	270,000 Ω	.25 W.	C-2795-91B
R10	680,000 Ω	.25 W.	C-2795-30B
R11	680 Ω	.5 W.	C-2796-60C
R12	.5 MEG. VOLUME CONT. & SWITCH		A-15129-3

L1	I.F. REJECTOR COIL	A-14718-1
L2	ANTENNA COIL	B-7094-1
L3	OSCILLATOR COIL	A-12052-4
L4	NO. 1 I.F. TRANS.	A-12064-16
L5	NO. 2 I.F. TRANS.	A-12064-17

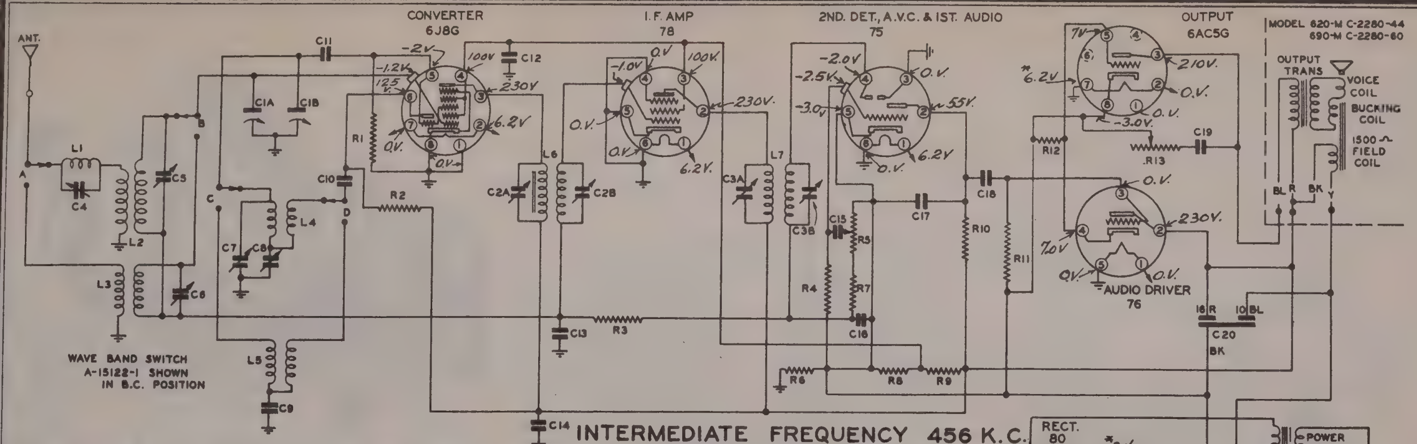
(Original) Effective June 30, 1939

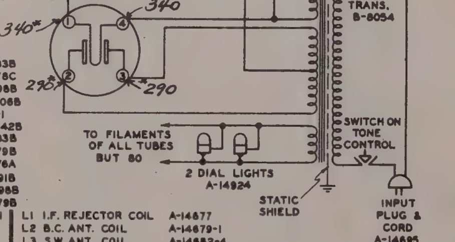
ALIGNMENT

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to end of scale with condenser gang closed)						
2	I.F.	6A7 Grid	.1 mf.	456	Closed	C10 A,B C8 A,B	(2nd I.F.) (1st I.F.)
3	Rejector	Ant.	150 mmf.	456	Closed	C3	Adjust to min.
4	Broadcast Band	Ant.	150 mmf.	1500	1500	C2 A Ant. C2 B Osc.	
5	(Check for dial reading and sensitivity at 600 kc., 1000 kc.)						
6	(Check operations 1 to 5 inclusive)						

MODELS 620M,690M
Schematic,Voltage,Socket
Alignment,Trimmers

SPARKS WITHINGTON CO.





INTERMEDIATE FREQUENCY 456 K.C.

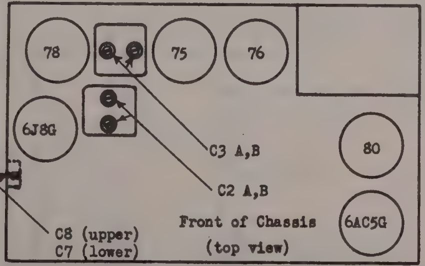
TOP VIEWS OF ALL SOCKET CONNECTIONS

Voltage readings:-Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages are + DC voltages.
*AC volts.

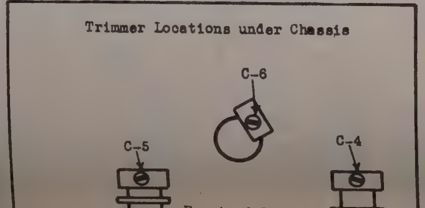
C1A&B	VARIABLE CONDENSER	B-7229
C2A&B	NO.1 I.F. TRIMMER	B-7200-DD
C3A&B	NO.2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-BY
C8	B.C. OSC. PADDER	
C9	3880 MMFD. MOLDED	C-720-346
C10	100 MMFD. MOLDED	C-720-339
C11	25 MMFD MOLDED	C-720-342
C12	.1 MFD. 200 V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-28C
C14	.1 MFD. 400V.	C-3204-38G
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324

R1	56,000 Ω .25 W.	C-2795-83B
R2	22,000 Ω .5W.	C-2796-78C
R3	1 MEGOHM .25 W.	C-2795-98B
R4	4.7 MEGOHM .25W.	C-2795-106B
R5	500,000 Ω VOL. CONTROL	A-15130-1
R6	200 Ω .25W.	C-2795-142B
R7	56,000 Ω .25W.	C-2795-83B
R8	27,000 Ω 1W.	C-2797-79B
R9	15,000 Ω 2W.	C-2798-76A
R10	270,000 Ω .25W.	C-2795-91B
R11	1 MEGOHM .25W.	C-2795-98B
R12	27,000 Ω .25W.	C-2795-79B
R13	TONE CONTROL & SW.	A-15128-1
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.03 MFD. 600V.	C-3206-80C
C20	16-10 MFD. ELECT.	A-14799

L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-4
L4	B.C. OSC. COIL	A-14213-2A
L5	S.W. OSC. COIL	
L6	NO.1 I.F. COIL	A-15211
L7	NO.2 I.F. COIL	A-12064-17



Front of Chassis (top view)


Trimmer Locations under Chassis

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C3 A,B	2nd I-F transformer
3							C2 A,B	1st I-F transformer
4	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
5	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 Osc trim	Peak accurately
6							C5 Ant trim	Peak accurately
7				600 KC	BC	600 KC	C8 Osc pad.	Peak accurately
8	(Repeat operations 5 and 6)							
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
10	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 Ant.trim	**
11	(Check calibration and sensitivity at 6 MC and 18 MC)							
12	(Check operations 1 to 11 inclusive)							

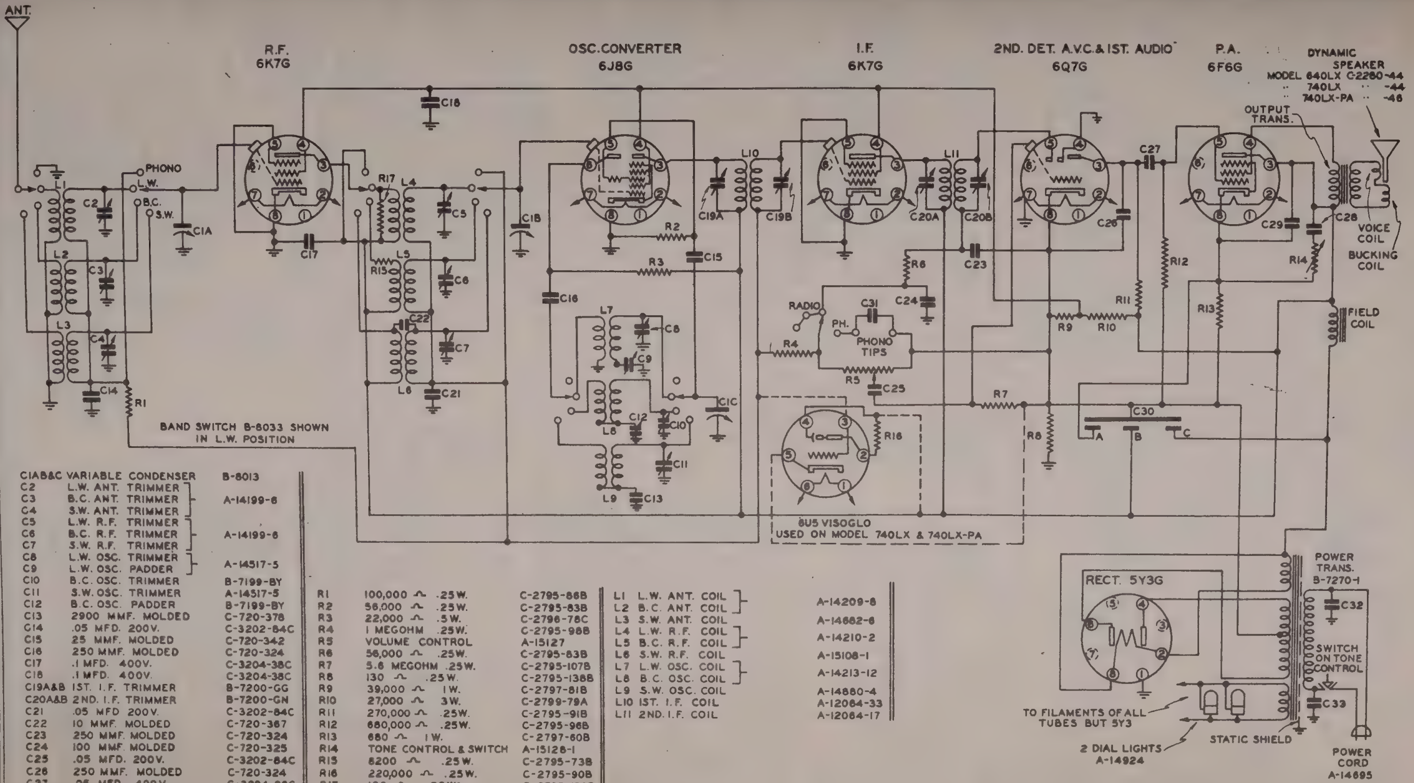
SPARKS WITHINGTON CO. Schematic

MODELS 640LX,740LX,740LX-PA

SPARTON SUPERHETERODYNE MODELS 640LX, 740LX & 740LX-PA

INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS



C1A&B&C	VARIABLE CONDENSER	B-8013
C2	L.W. ANT. TRIMMER	A-14199-6
C3	B.C. ANT. TRIMMER	
C4	S.W. ANT. TRIMMER	
C5	L.W. R.F. TRIMMER	A-14199-6
C6	B.C. R.F. TRIMMER	
C7	S.W. R.F. TRIMMER	
C8	L.W. OSC. TRIMMER	A-14517-5
C9	L.W. OSC. PADDER	
C10	B.C. OSC. TRIMMER	B-7199-BY
C11	S.W. OSC. TRIMMER	A-14517-5
C12	B.C. OSC. PADDER	B-7199-BY
C13	2900 MMF. MOLDED	C-720-378
C14	.05 MFD. 200V.	C-3202-84C
C15	25 MMF. MOLDED	C-720-342
C16	250 MMF. MOLDED	C-720-324
C17	.1 MFD. 400V.	C-3204-38C
C18	.1 MFD. 400V.	C-3204-38C
C19A&B	IST. I.F. TRIMMER	B-7200-GG
C20A&B	2ND. I.F. TRIMMER	B-7200-GN
C21	.05 MFD 200V.	C-3202-84C
C22	10 MMF. MOLDED	C-720-367
C23	250 MMF. MOLDED	C-720-324
C24	100 MMF. MOLDED	C-720-325
C25	.05 MFD. 200V.	C-3202-84C
C26	250 MMF. MOLDED	C-720-324
C27	.05 MFD. 400V.	C-3204-28C
C28	.03 MFD. 600V.	C-3206-80C
C29	.003 MFD. 600V.	C-3206-118C
C30	ELECT. CONDENSER	A-14884-2
C31	.001 MFD. 200V	C-3202-58C
C32	.006 MFD. MOLDED	C-720-347
C33	.006 MFD. MOLDED	C-720-347

R1	100,000 Ω .25W.	C-2795-86B
R2	56,000 Ω .25W.	C-2795-83B
R3	22,000 Ω .5W.	C-2796-78C
R4	1 MEGOHM .25W.	C-2795-98B
R5	VOLUME CONTROL	A-15127
R6	56,000 Ω .25W.	C-2795-83B
R7	5.6 MEGOHM .25W.	C-2795-107B
R8	130 Ω .25W.	C-2795-138B
R9	39,000 Ω 1W.	C-2797-81B
R10	27,000 Ω 3W.	C-2799-79A
R11	270,000 Ω .25W.	C-2795-91B
R12	680,000 Ω .25W.	C-2795-96B
R13	680 Ω 1W.	C-2797-60B
R14	TONE CONTROL & SWITCH	A-15128-1
R15	8200 Ω .25W.	C-2795-73B
R16	220,000 Ω .25W.	C-2795-90B
R17	130 Ω .25W.	C-2795-138B

L1	L.W. ANT. COIL	A-14209-8
L2	B.C. ANT. COIL	
L3	S.W. ANT. COIL	A-14682-6
L4	L.W. R.F. COIL	A-14210-2
L5	B.C. R.F. COIL	
L6	S.W. R.F. COIL	A-15108-1
L7	L.W. OSC. COIL	A-14213-12
L8	B.C. OSC. COIL	
L9	S.W. OSC. COIL	A-14880-4
L10	IST. I.F. COIL	A-12084-33
L11	2ND. I.F. COIL	A-12084-17

(Original) Effective September 1, 1939

MODELS 640LX,740LX
740LX-PA

SPARKS WITHINGTON CO.

MODELS 640SX,740SX
740SX-PA
Voltage,Alignment,Tri

VOLTAGE CHART

Line Voltage: 115 volts
Position of Band Switch: Broadcast

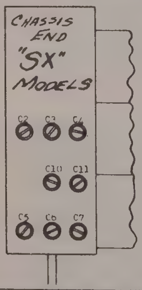
Position of Volume Control: Full with Antenna Disconne
Position of Radio-Phono Switch: Radio

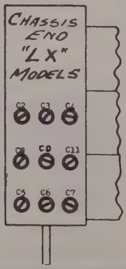
Tube	Function	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic D								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Gr
6K7G	R-F Amp.	0	0	230	90	0	-	6.3*	0	
6J8G	Osc. Converter	0	0	275	90	.2	135	6.3*	0	
6K7G	I. F. Amplifier	0	0	275	90	0	-	6.3*	0	
6Q7G	2nd Det. AVC AF.	0	0	50	1.	0	3	6.3*	3.5	
6F6G	Power Amplifier	0	0	255	275	**	3.5	6.3*	20	
5Y3G	Rectifier	0	375	-	350*	-	350*	-	375	
6U5	Viso-Glo	0	150	.5	300	4	6.3*	-	-	

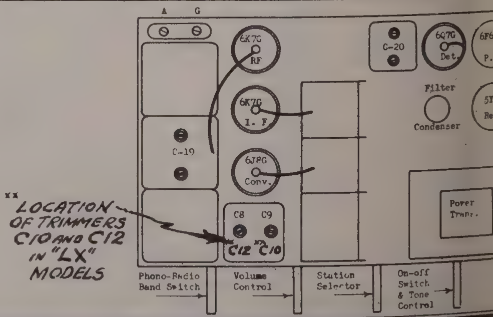
Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measur
ments made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltme
Unless designated otherwise, voltages in table are + DC voltages.
*AC volts. **Cannot test with Weston Analyzer No. 665

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER		Adjust all Trimmers for Maxim Output
1	(Set pointer even with last calibration mark when condenser plates are flush.)								
2	I. F.	6J8G	.1 mf	456 KC	BC	Open	C20 A,B	C20, A,B	2nd I. F.
							C19, A,B	C19, A,B	1st I. F.
3	Broad-cast Band	Ant.	200 mmf	1400 KC	BC	1400KC	C8 FOR	C10 FOR	BC Oscilla
							C5 "SX"	C6 "LX"	BC R.F.
							C2 MODELS	C3 MODELS	BC Antenna
4				600 KC	BC	600KC	C9	C12	BC Padder
5	(Repeat operation 3)								
6	(Check calibration and sensitivity at 600 KC, 900 KC and 1400 KC)								
"SX" MODELS									
7	1st SW Band	Ant.	100 ohm 200 mmf series	6. MC	1 SW	6. MC	C10		1SW Oscillator
							C6		1SW R-F
							C3		1SW Antenna
8	(Check calibration and sensitivity at 2.5MC and 6.MC.)								
9	2nd SW Band	Ant.	100 ohm 200 mmf series	21 MC	2 SW	21. MC	C11		2SW Oscillator
							C7		2SW R-F
							C4		2SW Antenna
10	(Check calibration and sensitivity at 7.5 MC, 18. MC and 21. MC)								
11	(Check operation 1 to 10 inclusive.)								
"LX" MODELS									
7	Long Wave Band	Ant.	200 mmf	400KC	LW	400KC	C8		LW Oscillator
							C5		LW R-F
							C2		LW Antenna
8				150KC	LW	150KC	C9		LW Padder
9	(Repeat operation 7)								
10	(Check calibration and sensitivity at 400 KC, 300 KC and 150 KC)								
11	Short Wave Band	Ant.	100 ohm 200 mmf series	18 MC	SW	18 MC	C11		SW Oscillator
							C7		SW R-F
							C4		SW Antenna
12	(Check calibration and sensitivity at 6. MC, 9. MC and 18. MC)								
13	(Check operation 1 to 12 inclusive.)								

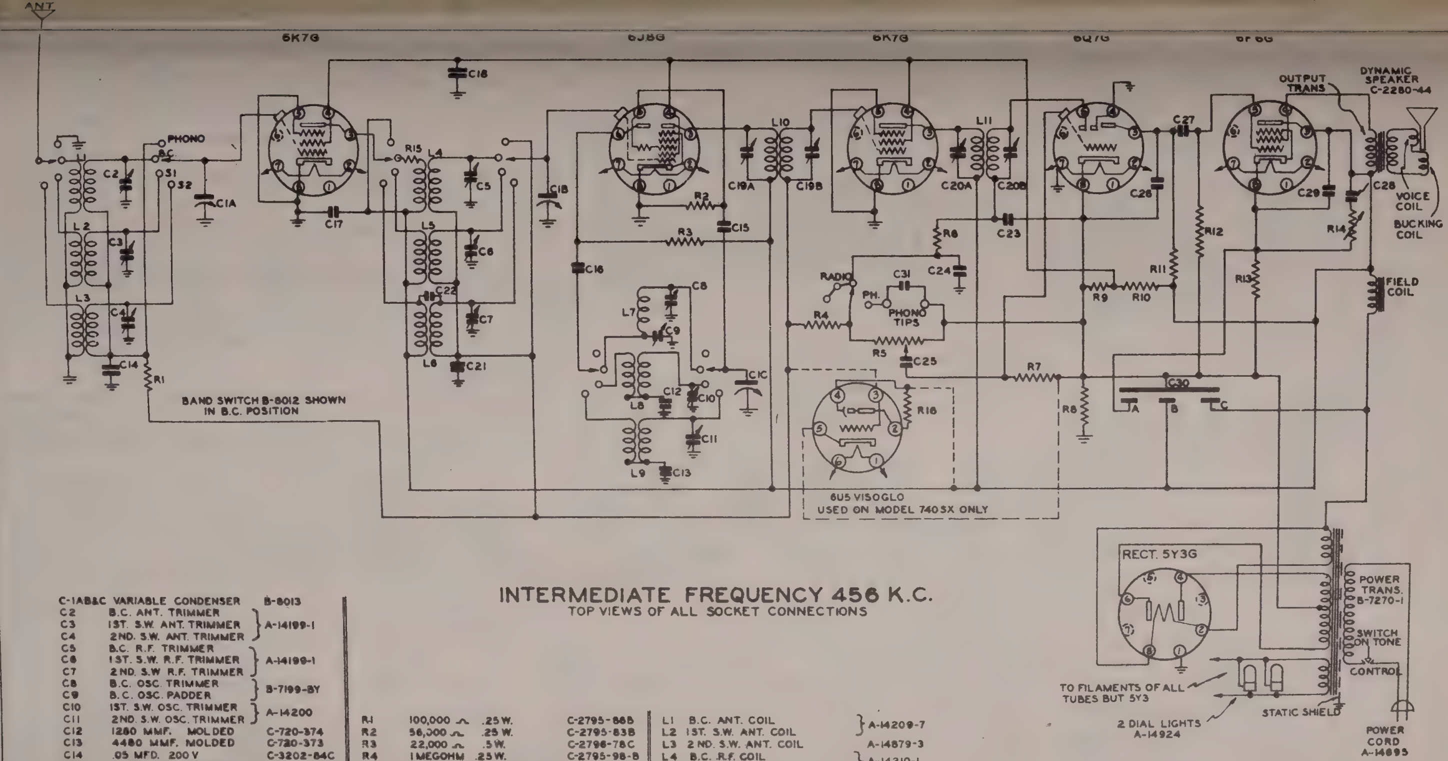






SPARKS WITHINGTON CO.

MODELS 640SX,740SX,740SX-PA Schematic



INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

C-1AB&C	VARIABLE CONDENSER	B-8013
C2	B.C. ANT. TRIMMER	A-14199-1
C3	1ST. S.W. ANT. TRIMMER	
C4	2ND. S.W. ANT. TRIMMER	
C5	B.C. R.F. TRIMMER	A-14199-1
C6	1ST. S.W. R.F. TRIMMER	
C7	2ND. S.W R.F. TRIMMER	
C8	B.C. OSC. TRIMMER	B-7199-BY
C9	B.C. OSC. PADDER	
C10	1ST. S.W. OSC. TRIMMER	A-14200
C11	2ND. S.W. OSC. TRIMMER	
C12	1280 MMF. MOLDED	C-720-374
C13	4480 MMF. MOLDED	C-720-373
C14	.05 MFD. 200 V	C-3202-84C
C15	25 MMF. MOLDED	C-720-342
C16	250 MMF. MOLDED	C-720-324
C17	.1 MFD. 400V.	C-3204-38C
C18	.1 MFD. 400V.	C-3204-38C
C19A&B	1ST. I.F. TRIMMER	B-7200-GG
C20A&B	2 ND. I.F. TRIMMER	B-7200-GN
C21	.05 MFD. 200 V.	C-3202-84C
C22	10 MMF. MOLDED	C-720-367
C23	250 MMF. MOLDED	C-720-324
C24	100 MMF. MOLDED	C-720-325
C25	.05 MFD. 200 V.	C-3202-84C
C26	250 MMF. MOLDED	C-720-324
C27	.05 MFD. 400 V.	C-3204-28C
C28	.03 MFD. 600 V.	C-3206-80C
C29	.003 MFD. 600 V.	C-3206-118C
C30	ELECT. CONDENSER	A-14684-2
C31	.001 MFD. 200 V.	C-3202-58C

R1	100,000 Ω	.25 W.	C-2795-86B
R2	56,000 Ω	.25 W.	C-2795-83B
R3	22,000 Ω	.5 W.	C-2796-78C
R4	1 MEGOHM	.25 W.	C-2795-98-B
R5	VOLUME CONTROL		A-15127
R6	56,000 Ω	.25 W.	C-2795-83B
R7	5.6 MEGOHM	.25 W.	C-2795-107B
R8	130 OHM	.25 W.	C-2795-136B
R9	39,000	1 W.	C-2797-81B
R10	27,000 Ω	3 W.	C-2799-79A
R11	270,000 Ω	.25 W.	C-2795-91B
R12	680,000 Ω	.25 W.	C-2795-96B
R13	680 OHM	1 W.	C-2797-60B
R14	TONE CONTROL & SWITCH		A-15128-1
R15	8200 Ω	.25 W.	C-2795-73B
R16	220,000 Ω	.25 W.	C-2795-90B

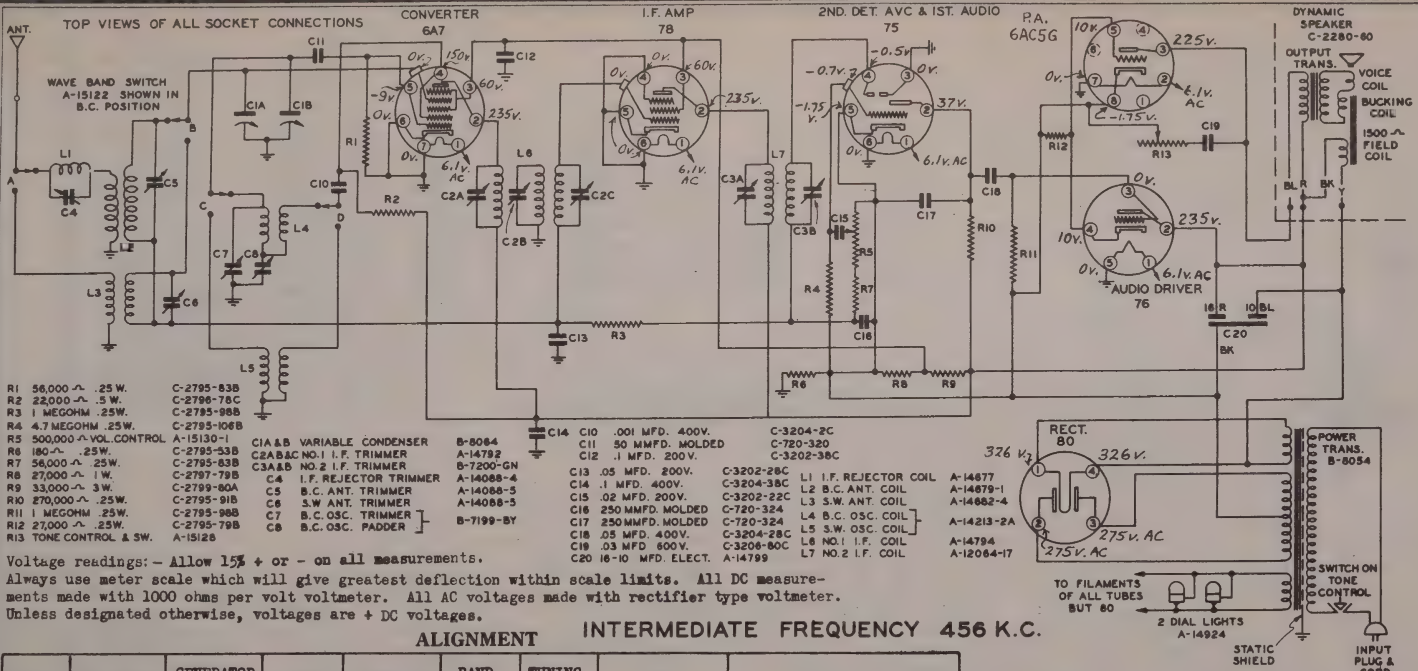
L1	B.C. ANT. COIL	A-14209-7
L2	1ST. S.W. ANT. COIL	
L3	2 ND. S.W. ANT. COIL	A-14879-3
L4	B.C. R.F. COIL	A-14210-1
L5	1ST. S.W. R.F. COIL	
L6	2ND S.W R.F. COIL	A-15108
L7	B.C. OSC COIL	A-14213-10
L8	1ST. S.W OSC. COIL	
L9	2ND. S.W. OSC. COIL	A-14880-3
L10	1ST. I.F. COIL	A-12084-33
L11	2ND. I.F. COIL	A-12084-17

MODEL 640SX & 740SX & 740SXPA

(First Revision) Effective September 1, 1939

MODEL 660M
Schematic,Voltage,Socket
Alignment,Trimmers

SPARKS WITHINGTON CO.



R1	56,000 Ω	.25 W.	C-2795-83B
R2	22,000 Ω	.5 W.	C-2796-78C
R3	1 MEGOHM	.25W.	C-2795-98B
R4	4.7 MEGOHM	.25W.	C-2795-106B
R5	500,000 Ω	VOL.CONTROL	A-15130-1
R6	180 Ω	.25W.	C-2795-53B
R7	56,000 Ω	.25W.	C-2795-83B
R8	27,000 Ω	1 W.	C-2797-79B
R9	33,000 Ω	3 W.	C-2799-80A
R10	270,000 Ω	.25W.	C-2795-91B
R11	1 MEGOHM	.25W.	C-2795-98B
R12	27,000 Ω	.25W.	C-2795-79B
R13	TONE CONTROL & SW.		A-15128

C1A&B	VARIABLE CONDENSER	B-8064
C2AB&C	NO.1 I.F. TRIMMER	A-14792
C3A&B	NO.2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-BY
C8	B.C. OSC. PADDER	

C10	.001 MFD. 400V.	C-3204-2C
C11	50 MMFD. MOLDED	C-720-320
C12	.1 MFD. 200V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-28C
C14	.1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.03 MFD 600V.	C-3206-80C
C20	16-10 MFD. ELECT.	A-14799

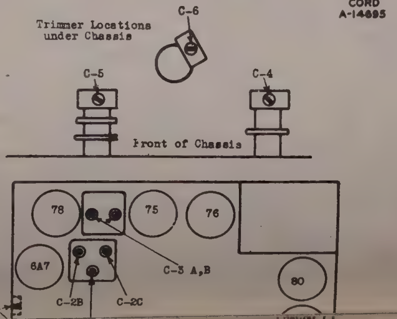
L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-4
L4	B.C. OSC. COIL	A-14213-2A
L5	S.W. OSC. COIL	
L6	NO.1 I.F. COIL	A-14794
L7	NO.2 I.F. COIL	A-12064-17

Voltage readings: - Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.

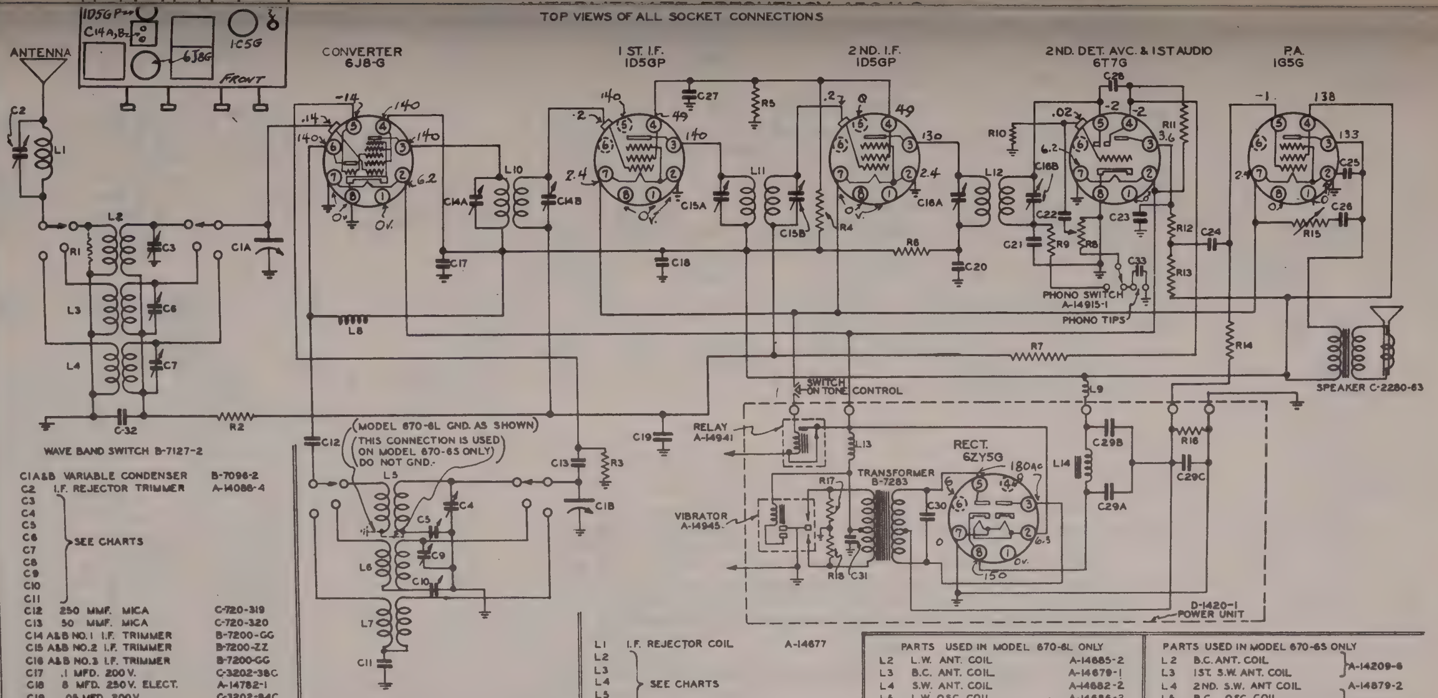
INTERMEDIATE FREQUENCY 456 K.C.

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6A7 Grid	.1 mf.	456 KC	BC	Open	C3A,B;C2A,B,C	Adjust to approx. peak
3							C2B (Transfer)	Detune by tightening ½ t.
4							C3A,B;C2A,C	Peak accurately
5							C2B	Peak accurately*
6	Rejector	Ant.	200 mmf.	456 KC	BC	Open	C4	Adjust to minimum
7	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 BC osc trim	Peak accurately
8							C5 BC ant trim	Peak accurately
9				600 KC	BC	600 KC	C8 BC osc pad.	Peak accurately
10	(Repeat operations 7 and 8)							
11	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
12	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 SW ant trim	**
13	(Check calibration and sensitivity at 6.0 MC and 18 MC)							
14	(Check operations 1 to 13 inclusive)							



SPARTON SUPERHETERODYNE MODELS 670-6S & 670-6L



C1A&B	VARIABLE CONDENSER	B-7096-2
C2	I.F. REJECTOR TRIMMER	A-14088-4
C3	SEE CHARTS	
C4		
C5		
C6		
C7		
C8		
C9		
C10		
C11		
C12	250 MMF. MICA	C-720-319
C13	50 MMF. MICA	C-720-320
C14 A&B	NO. 1 I.F. TRIMMER	B-7200-GG
C15 A&B	NO. 2 I.F. TRIMMER	B-7200-ZZ
C16 A&B	NO. 3 I.F. TRIMMER	B-7200-GG
C17	.1 MFD. 200 V.	C-3202-38C
C18	8 MFD. 250 V. ELECT.	A-14782-1
C19	.05 MFD. 200 V.	C-3202-84C
C20	.05 MFD. 200 V.	C-3202-28C
C21	250 MMF. MICA	C-720-319
C22	.05 MFD. 200 V.	C-3202-28C
C23	250 MMF MICA	C-720-319
C24	.05 MFD. 200 V.	C-3202-28C
C25	.003 MFD. 400 V.	C-3204-118C
C26	.03 MFD. 400 V.	C-3204-136C
C27	.1 MFD. 200 V.	C-3202-38C
C28	250 MMF. MICA	C-720-319
C29	16-10-20 ELECT.	A-14942
C30	.009 MFD. 800 V. BUFFER	C-3208-74C
C31	1 MFD. 120 V.	C-3203-56B
C32	.05 MFD. 200 V.	C-3202-84C
C33	.003 MFD. 200 V.	C-3202-82C

R1	SEE CHARTS		
R2	27 000 Ω	.25 W.	C-2795-79B
R3	56 000 Ω	.25 W.	C-2795-83B
R4	39 000 Ω	.5 W.	C-2796-197C
R5	56 000 Ω	.5 W.	C-2796-201C
R6	4700 Ω	.25 W.	C-2795-70B
R7	560 000 Ω	.25 W.	C-2795-95B
R8	250 000 Ω	VOL. CONTROL	A-14075-A1
R9	56 000 Ω	.25 W.	C-2795-83B
R10	5.6 MEGOHM	.25 W.	C-2795-107B
R11	1 MEGOHM	.25 W.	C-2795-98B
R12	180 000 Ω	.25 W.	C-2795-89B
R13	180 000 Ω	.25 W.	C-2795-89B
R14	560 000 Ω	.25 W.	C-2795-95B
R15	250 000 Ω	TONE CONTROL	A-14778
R16	510 Ω	.5 W.	C-2796-152C
R17	56 Ω	.5 W.	C-2796-47C
R18	56 Ω	.5 W.	C-2796-47C

L1	I.F. REJECTOR COIL	A-14677
L2	SEE CHARTS	
L3		
L4		
L5		
L6		
L7		
L8	OSC. PLATE CHOKE	A-14881-1
L9	B+ HASH CHOKE	A-14718-2
L10	NO. 1 I.F. COIL	A-12064-14
L11	NO. 2 I.F. COIL	A-12064-2
L12	NO. 3 I.F. COIL	A-12064-15
L13	A HASH CHOKE	A-14944
L14	FILTER CHOKE	A-12597

PARTS USED IN MODEL 670-6L ONLY

L2	L.W. ANT. COIL	A-14685-2
L3	B.C. ANT. COIL	A-14679-1
L4	S.W. ANT. COIL	A-14682-2
L5	L.W. OSC. COIL	A-14686-2
L6	B.C. OSC. COIL	A-14213-7
L7	S.W. OSC. COIL	
R-1	12 000 Ω .25 W.	C-2795-75B
C-3	L.W. ANT. TRIMMER	A-14517-5
C-4	L.W. OSC. TRIMMER	
C-5	L.W. OSC. PADDER	
C-6	B.C. ANT. TRIMMER	A-14088-5
C-7	S.W. ANT. TRIMMER	A-14088-5
C 9	B.C. OSC. TRIMMER	B-7199-CY
C10	B.C. OSC. PADDER	
C11	3100 MMF. MICA	C-720-362

PARTS USED IN MODEL 670-6S ONLY

L 2	B.C. ANT. COIL	A-14209-6
L3	1ST. S.W. ANT. COIL	
L 4	2ND. S.W. ANT COIL	A-14879-2
L5	B.C. OSC. COIL	A-14213-8
L6	1 ST. S.W. OSC. COIL	
L7	2ND. S.W. OSC. COIL	A-14880-1
R1	NOT USED	
C-4	B.C. OSC. TRIMMER	B-7199-CY
C-5	B.C. OSC. PADDER	
C 9	1ST. S.W. TRIMMER	A-14200-3
C3	B.C. ANT. TRIMMER	A-14199-4
C6	1ST. S.W. ANT. TRIMMER	
C7	2ND. S.W. ANT. TRIMMER	
C10	1ST. S.W. PAD. .00114 MOLDED	C-720-368
C11	2ND. S.W. PAD. .00361 MOLDED	C-720-353

Notes:

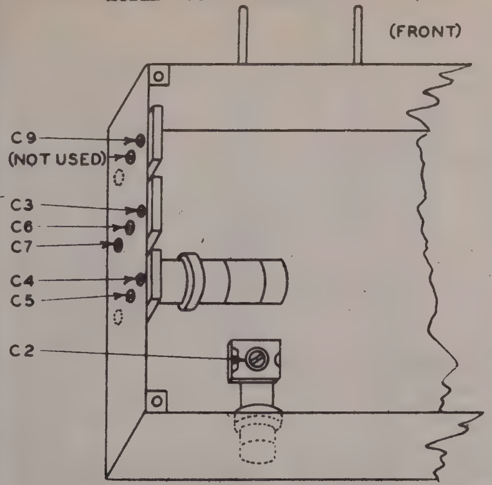
Voltage readings. Allow 15% + or - on all measurements. (Original) Effective June 30, 1939

Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

MODELS 670-6L,670-6S
Alignment,Trimmers

SPARKS WITHINGTON CO.

MODEL 670-6S CHASSIS BOTTOM



670-6S
ALIGNMENT

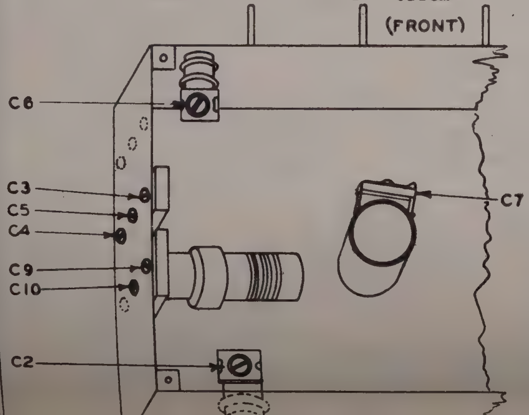
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last calibrated mark below 550 KC)							
2	I.F.	6J8G Grid Cap	.1 mf.	456 KC	BC	(Open)	C16 A&B C15 A&B C14 A&B	3rd I.F.T. 2nd I.F.T. 1st I.F.T.
3	Rejector	Ant.	200 mmf.	456 KC	BC	(Open)	C2	Adj. to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C4 Osc. C3 Ant.	
5				600 KC	B.C.	600 KC	C5 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC, & 1500 KC)							
8	1st short wave Band	Ant.	*	7.0 MC	1 SW	7.0 MC	C9 Osc. C6 Ant.	
9	(Check calibration and sensitivity at 2.5 MC, 4.0 MC & 7.0 MC)							
10	2nd SW band	Ant.	*	21.0 MC	2 SW	21.0 MC	C7 Ant.	**
11	(Check calibration and sensitivity at 7.0 MC, 15 MC & 21 MC)							

* 200 mmf. condenser and 100 ohm non-inductive resistor in series.

** Rock dial while trimming.

If dial reading is off calibration, some adjustment may be made by moving the oscillator condenser lead toward or away from the chassis base plate.

MODEL 670-6L CHASSIS BOTTOM

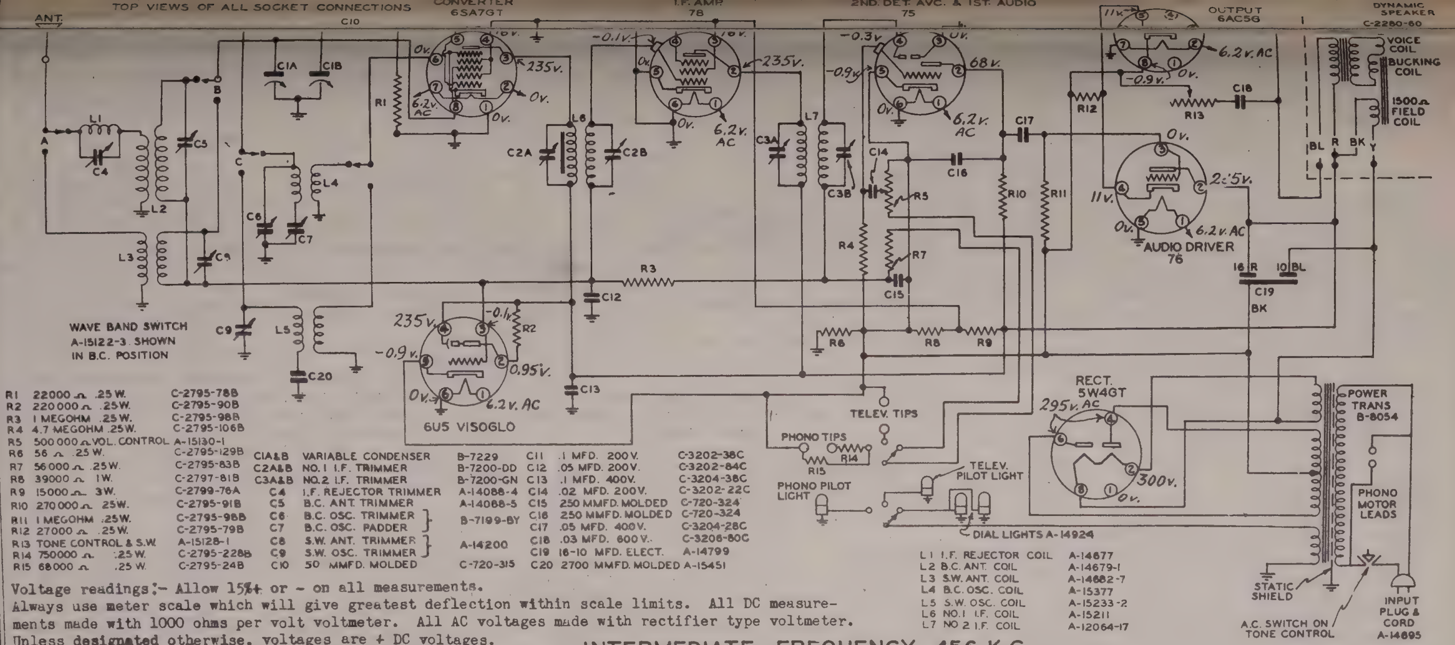


670-6L
ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last calibrated mark below 550KC)							
2	I.F.	6J8G Grid Cap	.1 mf.	456 KC	BC	(Open)	C16 A&B C15 A&B C14 A&B	3rd I.F.T. 2nd I.F.T. 1st I.F.T.
3	Rejector	Ant.	200 mmf.	456 KC	BC	(Open)	C2	Adj. to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C9 Osc. C6 Ant.	
5				600 KC	BC	600 KC	C10 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Long-Wave Band	Ant.	200 mmf.	400 KC	LW	400 KC	C4 Osc. C5 Ant.	
9				150 KC	LW	150 KC	C5 Pad.	
10	(Repeat operation 8)							
11	(Repeat operations 8, 9 and 10 if necessary, to insure accurate alignment)							
12	(Check calibration and sensitivity at 150 KC, 260 KC and 400 KC)							
13	Short Wave Band	Ant.	*	18 MC	SW	18 MC	~~C8 Osc.~~ C7 Ant.	Rock dial

SPARKS WITHINGTON CO.

MODEL 760PS
Schematic, Voltage, Socket
Alignment, Trimmers



R1	22000 Ω .25 W.	C-2795-78B
R2	220000 Ω .25W.	C-2795-90B
R3	1 MEGOHM .25 W.	C-2795-98B
R4	4.7 MEGOHM .25W.	C-2795-106B
R5	500000 Ω VOL. CONTROL	A-15130-1
R6	56 Ω .25 W.	C-2795-129B
R7	56000 Ω .25W.	C-2795-83B
R8	39000 Ω 1W.	C-2797-81B
R9	15000 Ω 3W.	C-2799-76A
R10	270000 Ω 25W.	C-2795-91B
R11	1 MEGOHM .25W.	C-2795-98B
R12	27000 Ω .25W.	C-2795-79B
R13	TONE CONTROL & S.W.	A-15128-1
R14	750000 Ω .25 W.	C-2795-228B
R15	68000 Ω .25 W.	C-2795-24B

C1A&B	VARIABLE CONDENSER	B-7229
C2A&B	NO. 1 I.F. TRIMMER	B-7200-DD
C3A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	B.C. OSC. TRIMMER	B-7199-BY
C7	B.C. OSC. PADDER	
C8	S.W. ANT. TRIMMER	A-14200
C9	S.W. OSC. TRIMMER	
C10	50 MMFD. MOLDED	C-720-315

C11	.1 MFD. 200V.	C-3202-38C
C12	.05 MFD. 200V.	C-3202-84C
C13	.1 MFD. 400V.	C-3204-38C
C14	.02 MFD. 200V.	C-3202-22C
C15	250 MMFD. MOLDED	C-720-324
C16	250 MMFD. MOLDED	C-720-324
C17	.05 MFD. 400V.	C-3204-28C
C18	.03 MFD. 600V.	C-3206-80C
C19	16-10 MFD. ELECT.	A-14799
C20	2700 MMFD. MOLDED	A-15451

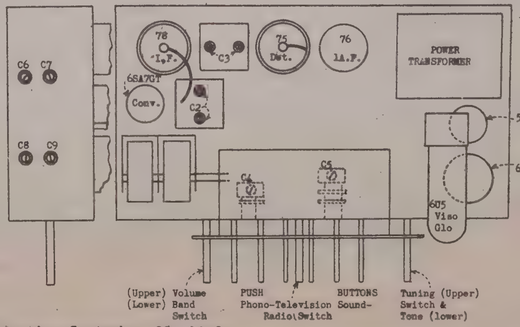
L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-7
L4	B.C. OSC. COIL	A-15377
L5	S.W. OSC. COIL	A-15233-2
L6	NO. 1 I.F. COIL	A-15211
L7	NO 2 I.F. COIL	A-12064-17

Voltage readings:- Allow 15%+ or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages are + DC voltages.

INTERMEDIATE FREQUENCY 456 K.C.

ALIGNMENT CHART

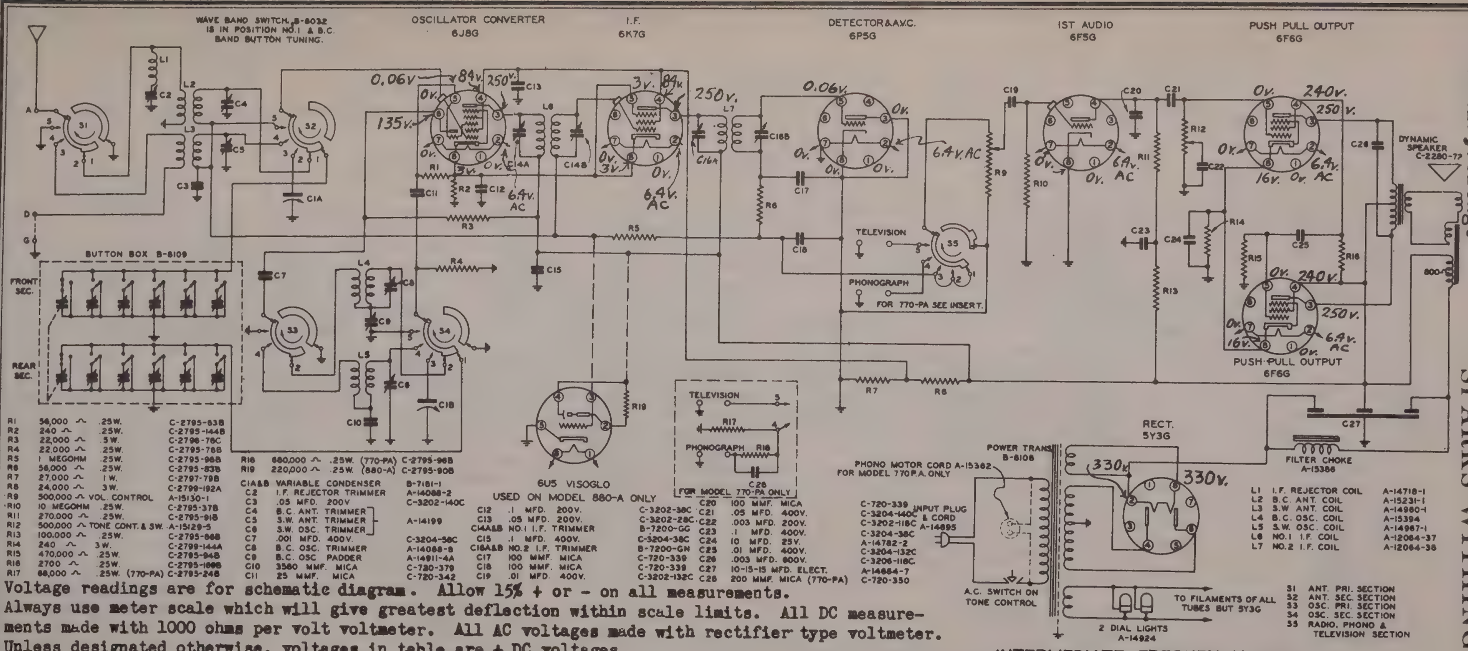
OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration mark with condenser plates flush)							
2	I.F.	6SA7GT Grid	.1 mf.	456 KC	BC	Open	C3 A & B C2 A & B	2nd I.F. 1st. I.F.
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C6 C5	BC Osc. Trim. BC Ant. Trim.
5				600 KC	BC	600 KC	C7	BC Osc. Padder **
6	(Repeat operation 4)							
7	(Check calibration and sensitivity on 600 KC, 900 KC and 1500 KC)							
8	Short Wave	Ant.	*	18MC	SW	18MC	C9 C8	SW Osc. Trim. SW Ant. Trim **
9	(Check calibration and sensitivity at 6 MC, 9 MC, and 18 MC)							
10	(Check operations 1 to 9 inclusive)							



Notes: *100 ohms and 200 mmf. in series **Rock variable condenser for maximum output. (Original) Effective September 28, 1939

MODELS 770,770PA,880A
Schematic,Voltage

SPARKS WITHINGTON CO.



R1	56,000 Ω	.25W.	C-2795-63B
R2	240 Ω	.25W.	C-2795-144B
R3	22,000 Ω	.5W.	C-2796-76C
R4	22,000 Ω	.25W.	C-2795-76B
R5	1 MEGOHM	.25W.	C-2795-96B
R6	56,000 Ω	.25W.	C-2795-83B
R7	27,000 Ω	1W.	C-2797-79B
R8	24,000 Ω	3W.	C-2799-192A
R9	500,000 Ω VOL. CONTROL		A-15130-1
R10	10 MEGOHM	.25W.	C-2795-37B
R11	270,000 Ω	.25W.	C-2795-91B
R12	500,000 Ω TONE CONT. & SW.		A-15129-5
R13	100,000 Ω	.25W.	C-2795-66B
R14	240 Ω	3W.	C-2799-144A
R15	470,000 Ω	.25W.	C-2795-94B
R16	2700 Ω	.25W.	C-2795-106B
R17	68,000 Ω	.25W. (770-PA)	C-2795-24B
R18	680,000 Ω	.25W. (770-PA)	C-2795-96B
R19	220,000 Ω	.25W. (880-A)	C-2795-90B

C1A&B	VARIABLE CONDENSER	B-7181-1
C2	I.F. REJECTOR TRIMMER	A-14088-2
C3	.05 MFD. 200V	C-3202-140C
C4	B.C. ANT. TRIMMER	A-14199
C5	S.W. ANT. TRIMMER	
C6	S.W. OSC. TRIMMER	
C7	.001 MFD. 400V.	C-3204-58C
C8	B.C. OSC. TRIMMER	A-14088-8
C9	B.C. OSC PADDER	A-14911-4A
C10	3580 MMF. MICA	C-720-379
C11	25 MMF. MICA	C-720-342
C12	.1 MFD. 200V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-28C
C14A&B	NO.1 I.F. TRIMMER	B-7200-GG
C15	.1 MFD. 400V.	C-3204-38C
C16A&B	NO.2 I.F. TRIMMER	B-7200-GN
C17	100 MMF. MICA	C-720-339
C18	100 MMF. MICA	C-720-339
C19	.01 MFD. 400V.	C-3202-132C
C20	100 MMF. MICA	C-720-339
C21	.05 MFD. 400V.	C-3204-140C
C22	.003 MFD. 200V.	C-3202-118C
C23	.1 MFD. 400V.	C-3204-38C
C24	10 MFD. 25V.	A-14782-2
C25	.01 MFD. 400V.	C-3204-132C
C26	.003 MFD. 600V.	C-3206-118C
C27	10-15-15 MFD. ELECT.	A-14684-7
C28	200 MMF. MICA (770-PA)	C-720-350

L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. ANT. COIL	A-15231-1
L3	S.W ANT. COIL	A-14980-1
L4	B.C. OSC. COIL	A-15394
L5	S.W. OSC. COIL	A-14967-1
L6	NO.1 I.F. COIL	A-12064-37
L7	NO.2 I.F. COIL	A-12064-38

S1	ANT. PRI. SECTION
S2	ANT. SEC. SECTION
S3	OSC. PRI. SECTION
S4	OSC. SEC. SECTION
S5	RADIO, PHONO & TELEVISION SECTION

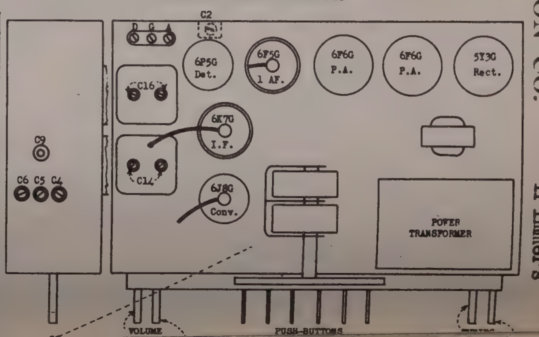
Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNE COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration mark when condenser plates are flush)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C16 A&B	2nd I.F.
							C14 A&B	1st I.F.
3	Rejector	Ant.	200 mmf.	456KC	BC	Closed	C2	Adjust to minimum
4	Broad - cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C4	BC Osc. Trim.
							C4	BC Ant. Trim.
5				600 KC	BC	600 KC	C9	BC Osc. Padder**
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)							
8	Short Wave	Ant.	*	18MC	SW	18MC	C6	SW Osc. Trim.
							C5	SW Ant. Trim **
9	(Check calibration and sensitivity at 6MC, 9MC, and 18MC)							

Socket,Align
Trimmers



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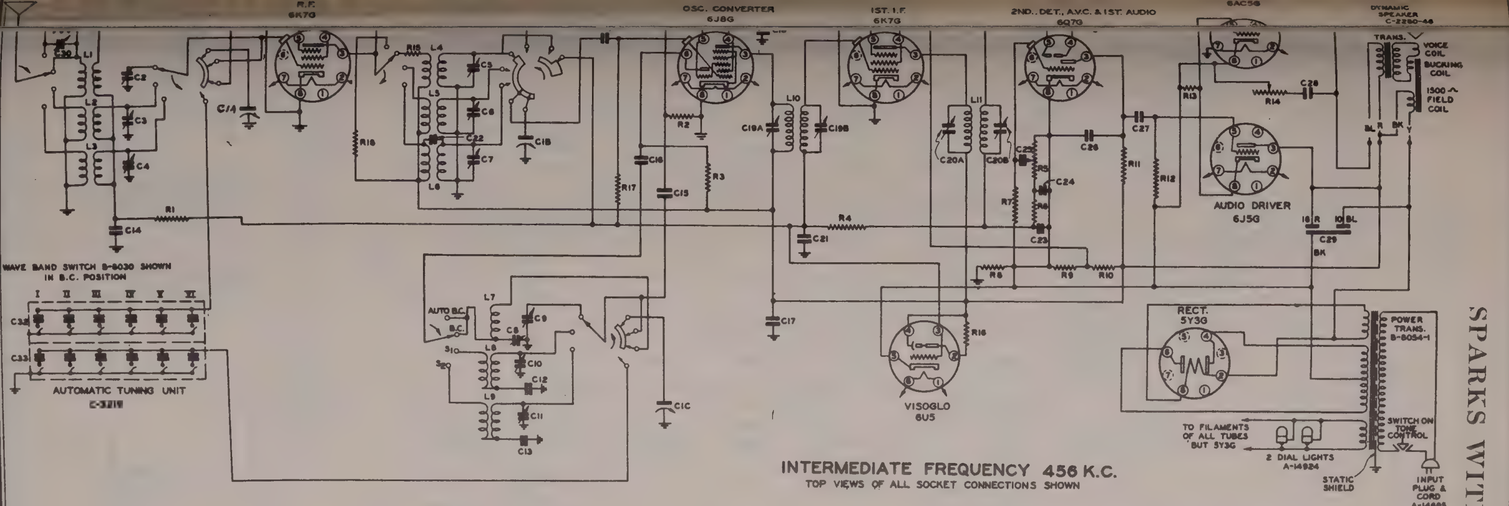
MODEL 880
Schematic,Voltage



INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS SHOWN

C1A B & C	VARIABLE CONDENSER	B-8013
C2	B.C. ANT. TRIMMER	A-14199-1
C3	1ST. S.W. ANT. TRIMMER	
C4	2ND. S.W. ANT. TRIMMER	
C5	B.C. R.F. TRIMMER	A-14199-1
C6	1ST. S.W. R.F. TRIMMER	
C7	2ND. S.W. R.F. TRIMMER	
C8	B.C. OSC. TRIMMER	B-7199-BY
C9	B.C. OSC. PADDER	
C10	1ST. S.W. OSC. TRIMMER	A-14200
C11	2ND. S.W. OSC. TRIMMER	
C12	1280 MMF. MOLDED	C-720-374
C13	4480 MMF. MOLDED	C-720-373
C14	.05 MFD. 200V.	C-3202-84C
C15	25 MMF. MOLDED	C-720-342
C16	250 MMF. MOLDED	C-720-324
C17	.1 MFD. 400V.	C-3204-38C
C18	.1 MFD. 400V.	C-3204-38C
C19A & B	NO. 1 I.F. TRIMMER	B-7200-GG

C20A & B	NO. 2 I.F. TRIMMER	B-7200-GN
C21	.05 MFD. 200V.	C-3202-84C
C22	10 MMF. MOLDED	C-720-367
C23	250 MMF. MOLDED	C-720-324
C24	100 MMF. MOLDED	C-720-325
C25	.05 MFD. 200V.	C-3202-84C
C26	250 MMF. MOLDED	C-720-324
C27	.05 MFD. 400V.	C-3204-28C
C28	.03 MFD. 600V.	C-3206-80C
C29	16-10 MFD. ELECT.	A-14799-2
C30	I.F. REJECTOR TRIMMER	A-14088-4
C31	10 MMF. MOLDED	C-720-367
C32 & C33		
I-II	150-700 MMFD. TRIM.	A-15000-1
III	75-300 MMFD. TRIM.	A-15000-2
IV	30-175 MMFD. TRIM.	
V	12-100 MMFD. TRIM.	A-15000-3
VI	6-50 MMFD. TRIM.	

R1	100,000 Ω .25W.	C-2795-86B
R2	56,000 Ω .25W.	C-2795-83B
R3	22,000 Ω .5W.	C-2795-78C
R4	1 MEGOHM .25W.	C-2795-98B
R5	VOLUME CONTROL	A-15127
R6	56,000 Ω .25W.	C-2795-83B
R7	5.6 MEGOHM .25W.	C-2795-107B
R8	130 Ω .25W.	C-2795-138B
R9	27,000 Ω 1W.	C-2797-79B
R10	22,000 Ω 3W.	C-2799-191A
R11	270,000 Ω .25W.	C-2795-91B
R12	680,000 Ω .25W.	C-2795-96B
R13	27,000 Ω .5W.	C-2796-79C
R14	TONE CONTROL & SWITCH	A-15128-1
R15	8200 Ω .25W.	C-2795-73B
R16	220,000 Ω .25W.	C-2795-90B
R17	1 MEGOHM .25W.	C-2795-98B
R18	12 000 Ω .5W.	C-2796-75C

L1	B.C. ANT. COIL	A-14209-7
L2	1ST. S.W. ANT. COIL	
L3	2ND. S.W. ANT. COIL	A-14879-3
L4	B.C. R.F. COIL	A-14210-1
L5	1ST. S.W. R.F. COIL	
L6	2ND. S.W. R.F. COIL	A-15108
L7	B.C. OSC. COIL	A-14213-11
L8	1ST. S.W. OSC. COIL	
L9	2ND. S.W. OSC. COIL	A-14880-3
L10	NO. 1 I.F. COIL	A-12064-33
L11	NO. 2 I.F. COIL	A-12064-17
L12	I.F. REJECTOR COIL	A-14877

VOLTAGE CHART

Line Voltage: 120 Volts
Band Switch: Broadcast Band (Manual)
Position of Volume Control: Full with Antenna Disconnected

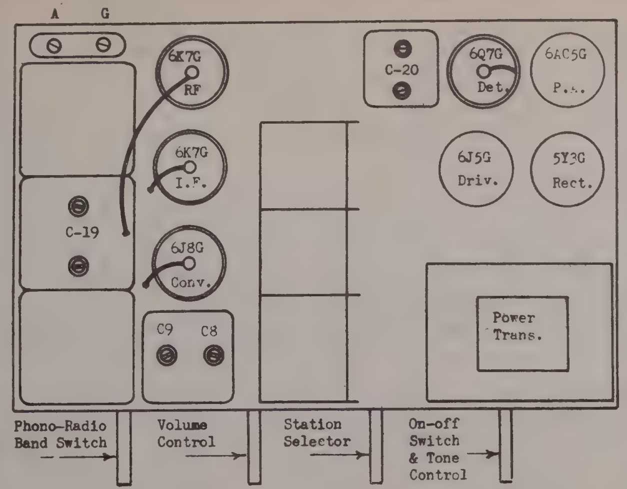
Tube	Function	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Diagram								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6K7G	R-F Amplifier	0	0	200	80	0	0	6.3*	0	-.2
6J8G	Osc - Converter	0	0	250	80	**	140	6.3*	0	-.5
6K7G	I-F Amplifier	0	0	250	80	0	7.5	6.3*	0	-.5
6Q7G	Det - AVC - AF	0	0	50	-1.25	0	-2.5	6.3*	0	-2.5
6J5G	Driver	0	0	250	--	**	--	6.3*	8	--
6AC5G	Power Amplifier	0	0	250	--	8	--	6.3*	-3	--
5Y3G	Rectifier	0	300	--	300*	--	300*	--	300	--
6U5	Viso-Glo	0	125	-.5	250	-3	6.3*	--	--	--

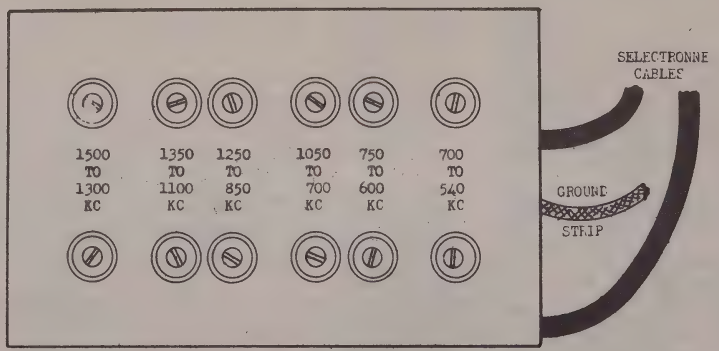
Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 100 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.
**Cannot be accurately measured with Weston Analyzer No. 665, Type 2.

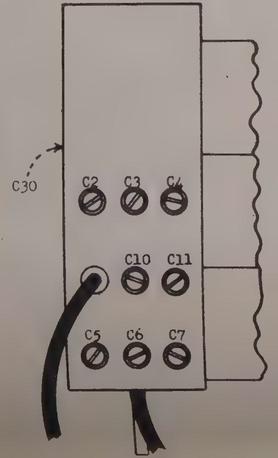
(Original) Effective July 1, 1939

MODEL 880
Alignment,Socket
Trimmers

SPARKS WITHINGTON CO.





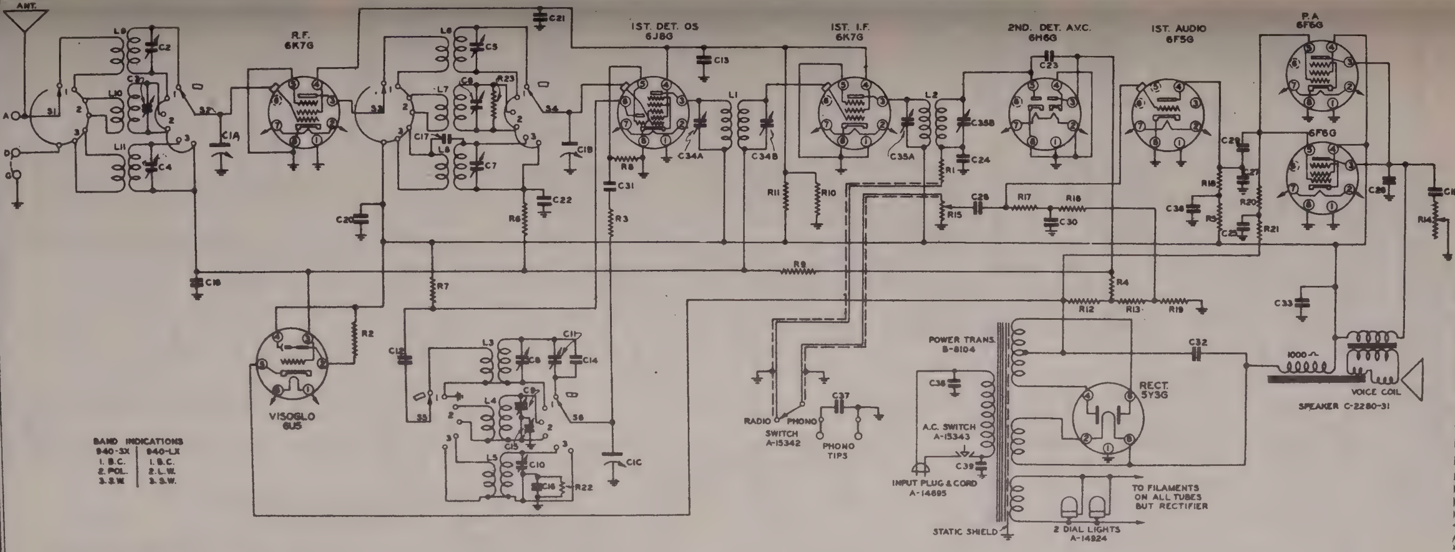


ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	ADJUST FOR MAX. OUTPUT
1	(Set dail pointer to dots at low frequency end of dial.)							
2	I.F.	6K7G	.1mf	456 KC	BC*	Open	C20 A & B C19 A & B	2nd I. F. 1st I. F.
3	I. F. Rej.	Ant.	200 mmf	456KC	BC**	Closed	C C30	Adjust for Minimum
4	Broad-Cast Band	Ant.	200 mmf	1500 KC	BC*	1500 KC	C8 C5 C2	Osc. Trimmer RF Trimmer Ant. Trimmer
5				600 KC	BC*	600 KC	C9	Osc. Padder
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)							
8	1st Short Wave Band	Ant.	200 mmf 100 ohm series	6.0 MC	1 SW	6.0 MC	C10 C6 C3	Osc. Trimmer RF Timmer Ant. Trimmer
9	(Check calibration and sensitivity at 6.0 MC, 4.0 MC and 2.5 MC)							
10	2nd Short Wave Band	Ant.	200 mmf 100 ohm series	21 MC	2 SW	21 MC	C11 C7 C4	Osc. Trimmer RF Trimmer Ant Trimmer
11	(Check calibration and sensitivity at 21.0 MC, 15.0 MC, 6.0 MC)							
12	(Check operations 1 to 11 inclusive)							

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 940-SX & 940-LX

SPARKS WITHINGTON CO.



BAND INDICATIONS

940-SX	940-LX
1. B.C.	1. B.C.
2. POL.	2. L.W.
3. S.W.	3. S.W.

INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEW OF ALL SOCKET CONNECTIONS

C1A&B&C	VARIABLE CONDENSER	B-7279-2
C2	B.C. ANT. TRIMMER	A-14088-1
C3	BAND 2 ANT. TRIMMER	A-14088-1
C4	S.W. ANT. TRIMMER	A-14088-1
C5	B.C. DET. TRIMMER	A-14088-1
C6	BAND 2 DET TRIMMER	A-14088-1
C7	S.W. DET. TRIMMER	A-14088-1
C8	B.C. OSC. TRIMMER	A-14088-1
C9	BAND 2 OSC. TRIMMER	A-14088-1
C10	S.W. OSC. TRIMMER	A-14088-1
C11	B.C. OSC. PADDER	A-14088-1
C12	.00025 MFD. MOLDED	C-720-319
C13	.05 MFD. 400V.	C-3204-28C
C14	.000475 MFD. MOLDED	C-720-332
C15	SEE SEPARATE CHART	
C16	SEE SEPARATE CHART	
C17	12 MFD COUPLER	C-720-354
C18	.05 MFD. 200V.	C-3202-28C
C19	.03 MFD. 600V.	C-3206-80C
C20	.05 MFD. 400V.	C-3204-28C
C21	.05 MFD. 400V.	C-3204-28C
C22	.05 MFD. 200 V.	C-3202-28C.
C23	.00025 MFD. MOLDED	C-720-319
C24	.0001 MFD. MOLDED	C-720-323
C25	.1 MFD. 100 V.	C-3201-38C
C26	.003 MFD. 600V.	C-3206-118C
C27	.00025 MFD. MOLDED	C-720-319
C28	.01 MFD. 200V.	C-3202-78C
C29	.05 MFD. 400V.	C-3204-28C
C30	.1 MFD. 100 V.	C-3201-38C
C31	.0001 MFD. MOLDED	C-720-339
C32	16 MFD. 450V. ELECT.	A-14073-A
C33	30 MFD. 300V ELECT.	A-14072-A
C34A&B	NO.1 I.F. TRIMMER	B-7208-GG
C35A&B	NO.2 I.F. TRIMMER	B-7200-GH
C36	.1 MFD. 400V.	C-3204-38C
C37	.003 MFD. 200V.	C-3202-62C
C38	.006 MFD. MOLDED	C-720-347
C39	.006 MFD. MOLDED	C-720-347

R1	56,000 ∿ .25 W.	C-2795-83B
R2	220,000 ∿ .25 W.	C-2795-90B
R3	10 ∿ .25 W.	C-2795-111B
R4	1 MEGOHM .25 W.	C-2795-96B
R5	100,000 ∿ .25 W.	C-2795-25B
R6	100,000 ∿ .25 W.	C-2795-25B
R7	22,000 ∿ .5 W.	C-2796-78C
R8	56,000 ∿ .25W.	C-2795-83B
R9	470,000 ∿ .25W.	C-2795-94B
R10	27,000 ∿ 1 W.	C-2797-79B
R11	18,000 ∿ 2 W.	C-2798-77A
R12	200 ∿ 2 W.	C-2798-142A
R13	8 ∿ .25W.	B-7103-8A
R14	1 MEGOHM TONE CONTROL	A-15133
R15	250,000 ∿ VOLUME CONTROL	A-15127-1
R16	1 MEGOHM .25 W.	C-2795-96B
R17	390,000 ∿ .25W.	C-2795-95B
R18	270,000 ∿ .25W.	C-2795-91B
R19	27 ∿ .25W.	C-2795-121B
R20	270,000 ∿ .25W.	C-2795-91B
R21	270,000 ∿ .25W.	C-2795-91B
R22	SEE SEPARATE CHART	
R23	SEE SEPARATE CHART	

940-SX COILS

L1	NO.1 I.F. COIL	A-12064-12
L2	NO.2 I.F. COIL	A-12064-17
L3	B.C. OSC. COIL	A-14241-16
L4	POL. OSC. COIL	A-14241-11
L5	S.W. OSC. COIL	A-14241-12
L6	B.C. DET COIL	A-14242-8
L7	POL. DET. COIL	A-14242-13
L8	S.W. DET. COIL	A-14242-8
L9	B.C. ANT COIL	A-14243-1
L10	POL. ANT. COIL	A-14243-6
L11	S.W. ANT. COIL	A-14243-7

940-LX COILS

L1	NO.1 I.F. COIL	A-12064-12
L2	NO.2 I.F. COIL	A-12064-17
L3	B.C. OSC. COIL	A-14241-16
L4	L.W. OSC. COIL	A-14241-21
L5	S.W. OSC. COIL	A-14241-3
L6	B.C. DET. COIL	A-14242-8
L7	L.W. DET. COIL	A-14242-18
L8	S.W. DET. COIL	A-14242-3
L9	B.C. ANT. COIL	A-14243-1
L10	L.W. ANT. COIL	A-14243-15
L11	S.W. ANT. COIL	A-14243-3

NO. FROM BACK OF SET

S1	ANT. PRI. SECTION
S2	ANT. SEC. SECTION
S3	DET. PRI. SECTION
S4	DET SEC. SECTION
S5	OSC. PRI. SECTION
S6	OSC. SEC. SECTION

PARTS USED IN MODEL 940-SX ONLY

C15	.00171 MFD. MOLDED	C-720-352
C16	.00381 MFD. MOLDED	C-720-353
R22	NOT USED	
R23	NOT USED	

PARTS USED IN MODEL 940-LX ONLY

C15	L.W. OSC. PADDER	A-14088-3
C16	.00388 MFD. MOLDED	C-720-346
R22	68,000 ∿ .25W.	C-2795-24B
R23	100000 ∿ .25W.	C-2795-86B

(Original) Effective July 1, 1939

MODELS 940LX, 940SX
Alignment, Voltage
Socket, Trimmers

SPARKS WITHINGTON CO.

VOLTAGE CHART

Line Voltage: 125 Volts
Voltage Tap: 115-135

Position of Volume Control: Full with Antenna Disconnected
Band Switch - Broadcast

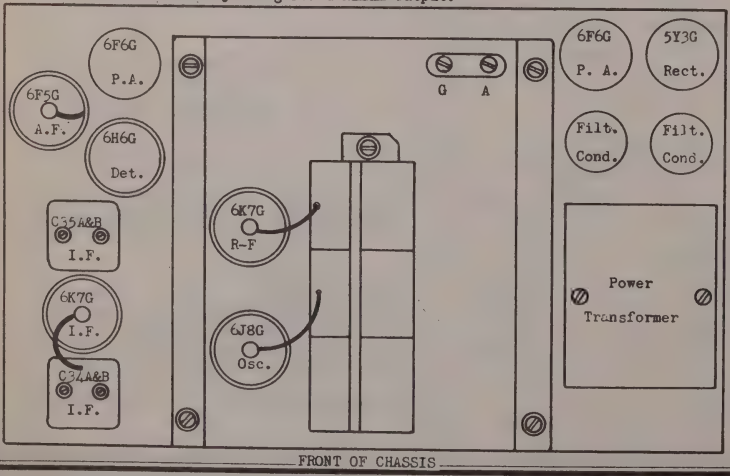
Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6K7G	R.F.	-	-	240	94	-	-	*6	-	**
6J8G	Converter	-	-	240	94	**	137	*6	-	**
6K7G	I.F.	-	-	240	94	-	-	*6	-	**
6H6G	2nd. Det. A.V.C.	-	-	*	-	**	-	*6	-	
6F5G	1st A.F.	-	*6	-	**	-	-	-	-	**
6F6G	P.A.	-	*6	235	240	**	-	-	-	
6F6G	P.A.	-	*6	235	240	**	-	-	-	
5Y3G	Rect.	-	340	-	355	-	355	-	340	
6U5	Viso-Glo	*6	**	**	240	-3.1	-			

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
Unless designated otherwise, voltages in table are + DC voltages. *AC volts.
**Cannot be measured with 1000 ohms per volt voltmeter. Bias for 6F6G can be measured from B- to Gnd.

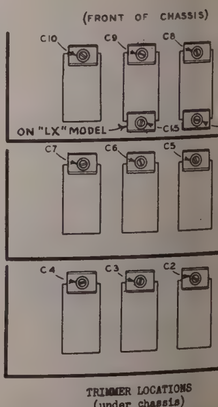
ALIGNMENT CHART

	OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SECTION	TRIMMER	ADJUST FOR MAX. OUTPUT
	1	(Set pointer even with last calibration mark when condenser plates are flush.)							
	2	I. F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C-35A6B C-34A&B	2nd I. F. 1st I. F.
	3	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C-8 C-5 C-2	Osc. Trimmer R. F. Trimmer Ant. Trimmer
	4				600 KC	BC	600KC	C11*	Osc. Padder
	5	(Repeat operation 3)							
LX MODEL ONLY	6	Long Wave Band	Ant.	200 mmf.	400 KC	LW	400 KC	C9 C6 C3	Osc. Trimmer RF Trimmer Ant. Trimmer
	7				150 KC	LW	150 KC	C15	Osc. Padder.
	8	(Repeat operation 6)							
	9	Short Wave Band	Ant.	100 ohms 200 mmf. series	18MC	SW	18 MC	C-10 C-7 C-4*	Osc. Trimmer RF Trimmer Ant. Trimmer
	10	(Check calibration and senstivity at 6. MC., 9 MC., and 18 Mc.)							
	11	(Check operations 1 to 10 inclusive)							
SX MODEL	6	1st Short Wave Band (Police)	Ant.	100 ohm 200 mmf series	7 MC	1st SW	7 MC	C9 C6 C3*	Osc. Trimmer RF Trimmer Ant. Trimmer
	7	(Check calibration and sensitivity at 7 MC and 2.5 MC.)							
	8	2nd Short Wave Band	Ant.	100 ohm 200 mmf series	21 MC	2nd SW	21 MC	C10 C7 C4*	Osc. Trimmer RF Timmer Ant. Trimmer
	9	(Check calibration and sensitivity at 8 MC. and 21 MC)							
	10	(Check operations 1 to 9 inclusive.)							

*Rock dial while adjusting for maximum output.



FRONT OF CHASSIS



TRIMMER LOCATIONS (under chassis)

SPARKS WITHINGTON CO.

MODEL 1160
Schematic

SPARTON SUPERHETERODYNE MODEL 1160
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

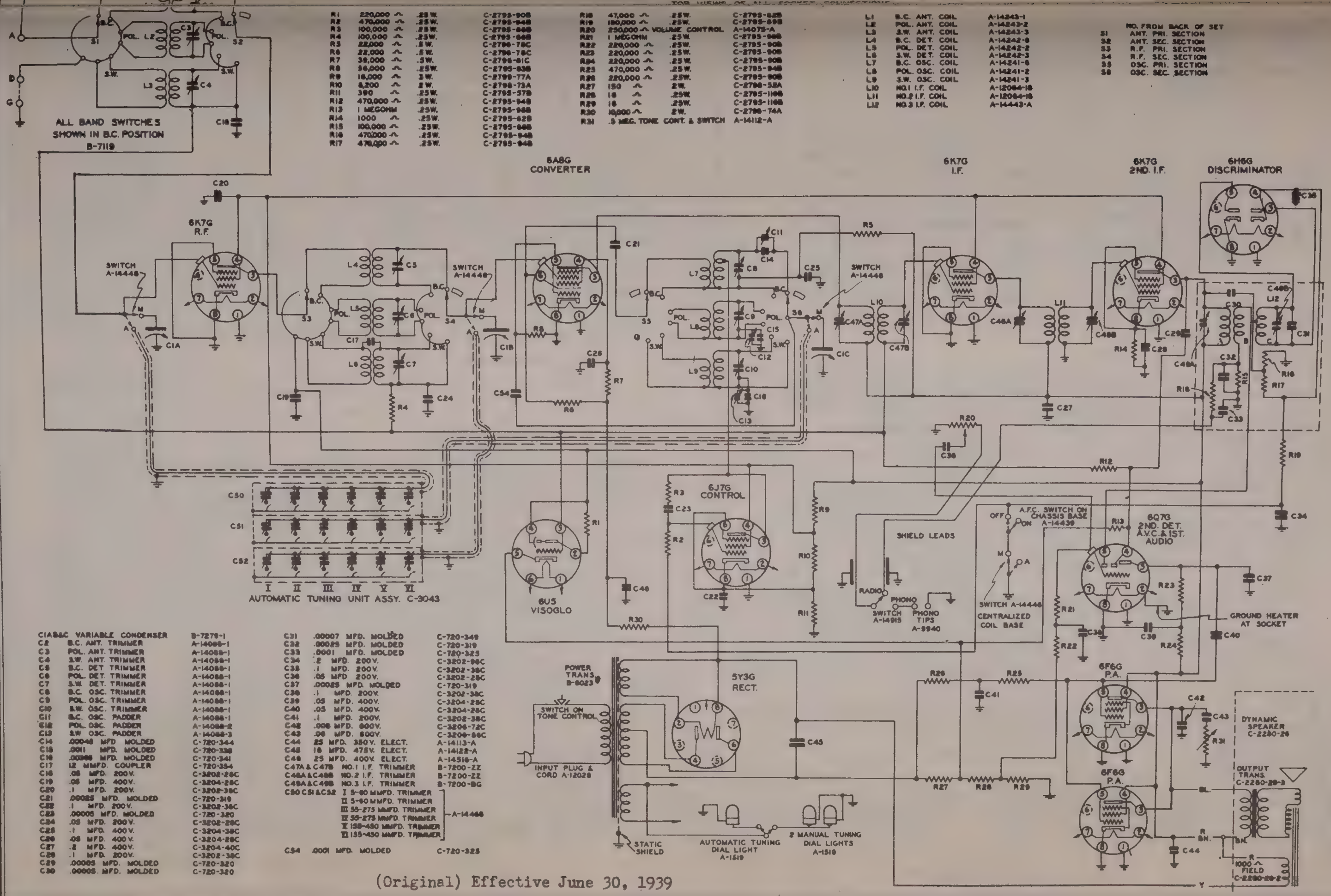
R1	220,000 Ω	.25W.	C-2795-90B
R2	470,000 Ω	.25W.	C-2795-94B
R3	100,000 Ω	.25W.	C-2795-86B
R4	100,000 Ω	.25W.	C-2795-86B
R5	22,000 Ω	.5W.	C-2796-78C
R6	22,000 Ω	.5W.	C-2796-78C
R7	39,000 Ω	.5W.	C-2796-81C
R8	56,000 Ω	.25W.	C-2795-83B
R9	18,000 Ω	3W.	C-2799-77A
R10	8,200 Ω	2W.	C-2798-73A
R11	390 Ω	.25W.	C-2795-57B
R12	470,000 Ω	.25W.	C-2795-94B
R13	1 MEGOHM	.25W.	C-2795-98B
R14	1000 Ω	.25W.	C-2795-62B
R15	100,000 Ω	.25W.	C-2795-86B
R16	470,000 Ω	.25W.	C-2795-94B
R17	470,000 Ω	.25W.	C-2795-94B

R18	47,000 Ω	.25W.	C-2795-82B
R19	180,000 Ω	.25W.	C-2795-89B
R20	250,000 Ω VOLUME CONTROL		A-14075-A
R21	1 MEGOHM	.25W.	C-2795-98B
R22	220,000 Ω	.25W.	C-2795-90B
R23	220,000 Ω	.25W.	C-2795-90B
R24	220,000 Ω	.25W.	C-2795-90B
R25	470,000 Ω	.25W.	C-2795-94B
R26	220,000 Ω	.25W.	C-2795-90B
R27	150 Ω	2W.	C-2798-58A
R28	18 Ω	.25W.	C-2795-110B
R29	18 Ω	.25W.	C-2795-110B
R30	10,000 Ω	2W.	C-2798-74A
R31	.5 MEG. TONE CONT. & SWITCH		A-14112-A

L1	B.C. ANT. COIL	A-14243-1
L2	POL. ANT. COIL	A-14243-2
L3	S.W. ANT. COIL	A-14243-3
L4	B.C. DET. COIL	A-14242-6
L5	POL. DET. COIL	A-14242-2
L6	S.W. DET. COIL	A-14242-3
L7	B.C. OSC. COIL	A-14241-6
L8	POL. OSC. COIL	A-14241-2
L9	S.W. OSC. COIL	A-14241-3
L10	NO.1 I.F. COIL	A-12064-18
L11	NO.2 I.F. COIL	A-12064-18
L12	NO.3 I.F. COIL	A-14443-A

NO. FROM BACK OF SET

S1	ANT. PRI. SECTION
S2	ANT. SEC. SECTION
S3	R.F. PRI. SECTION
S4	R.F. SEC. SECTION
S5	OSC. PRI. SECTION
S6	OSC. SEC. SECTION



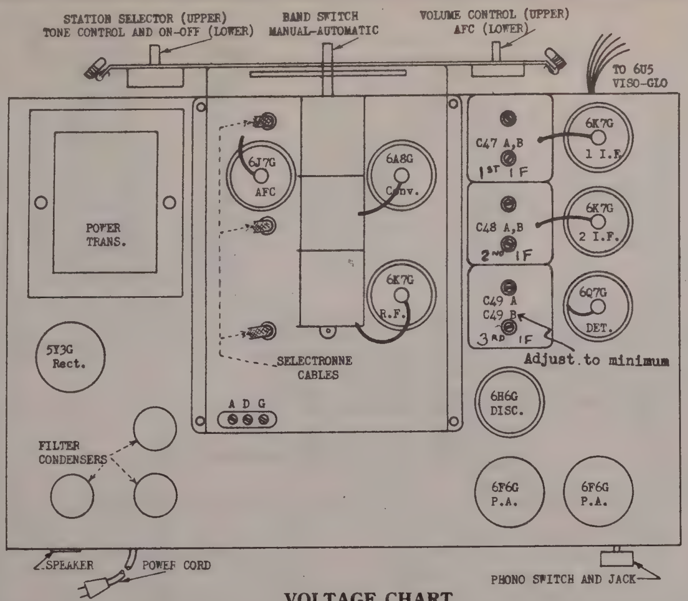
C1A B & C	VARIABLE CONDENSER	B-7276-1
C2	B.C. ANT. TRIMMER	A-14088-1
C3	POL. ANT. TRIMMER	A-14088-1
C4	S.W. ANT. TRIMMER	A-14088-1
C5	B.C. DET TRIMMER	A-14088-1
C6	POL. DET. TRIMMER	A-14088-1
C7	S.W. DET. TRIMMER	A-14088-1
C8	B.C. OSC. TRIMMER	A-14088-1
C9	POL. OSC. TRIMMER	A-14088-1
C10	S.W. OSC. TRIMMER	A-14088-1
C11	B.C. OSC. PADDER	A-14088-1
C12	POL. OSC. PADDER	A-14088-2
C13	S.W. OSC. PADDER	A-14088-3
C14	.00046 MFD MOLDED	C-720-344
C15	.0011 MFD. MOLDED	C-720-338
C16	.00366 MFD. MOLDED	C-720-341
C17	12 MMFD. COUPLER	C-720-354
C18	.05 MFD. 200V.	C-3202-28C
C19	.05 MFD. 400V.	C-3204-28C
C20	.1 MFD. 200V.	C-3202-38C
C21	.00025 MFD. MOLDED	C-720-319
C22	.1 MFD. 200V.	C-3202-38C
C23	.00005 MFD. MOLDED	C-720-320
C24	.05 MFD. 200V.	C-3202-28C
C25	.1 MFD. 400V.	C-3204-38C
C26	.05 MFD. 400V.	C-3204-28C
C27	.2 MFD. 400V.	C-3204-40C
C28	.1 MFD. 200V.	C-3202-38C
C29	.00005 MFD. MOLDED	C-720-320
C30	.00005. MFD. MOLDED	C-720-320

C31	.00007 MFD. MOLDED	C-720-349
C32	.00025 MFD. MOLDED	C-720-319
C33	.0001 MFD. MOLDED	C-720-325
C34	.2 MFD. 200V.	C-3202-96C
C35	.1 MFD. 200V.	C-3202-38C
C36	.05 MFD 200V.	C-3202-28C
C37	.00025 MFD. MOLDED	C-720-319
C38	.1 MFD. 200V.	C-3202-38C
C39	.05 MFD. 400V.	C-3204-28C
C40	.05 MFD. 400V.	C-3204-28C
C41	.1 MFD. 200V.	C-3202-38C
C42	.006 MFD. 600V.	C-3206-72C
C43	.06 MFD. 600V.	C-3206-86C
C44	25 MFD. 350V. ELECT.	A-14113-A
C45	16 MFD. 475V. ELECT.	A-14122-A
C46	25 MFD. 400V. ELECT.	A-14516-A
C47A & C47B	NO.1 I.F. TRIMMER	B-7200-ZZ
C48A & C48B	NO.2 I.F. TRIMMER	B-7200-ZZ
C49A & C49B	NO.3 I.F. TRIMMER	B-7200-BG
C50 C51 & C52	I 5-60 MMFD. TRIMMER	A-14468
	II 5-60 MMFD. TRIMMER	
	III 55-275 MMFD. TRIMMER	
	IV 55-275 MMFD. TRIMMER	
	V 155-450 MMFD. TRIMMER	
	VI 155-450 MMFD. TRIMMER	
C54	.0001 MFD. MOLDED	C-720-325

(Original) Effective June 30, 1939

MODEL 1160
Voltage, Alignment
Socket, Trimmers

SPARKS WITHINGTON CO.



ALIGNMENT CHART

(see note)

Viso-Glo Tube in socket
AFC switch "OFF"

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER
1	I.F.	Conv. Grid	.1 mf.	456	BC	Open	C47 A,B C48 A,B C49 A
2	Discrim.	Conv. Grid	.1 mf.	456	BC	Open	C49 B
3	Broadcast Band	Ant.	200 mmf.	1500	BC	1500	C8 Osc. C5 RF C2 Ant.
4		Ant.	200 mmf.	600	BC	600	C11 Pad
5	(Repeat operation 3)						
6	(Check calibration and sensitivity 1500 KC, 900 KC and 600 KC) *						
7	1st Short Wave	Ant.	100 ohm 200 mmf. series	6 MC.	1st S.W.	6 MC.	C9 Osc. C6 RF C3 Ant.
8		Ant.	200 mmf.	1.95 MC.	1st S.W.	1.95 MC.	C12 Pad
9	(Repeat operation 7)						
10	(Check calibration and sensitivity at 6 MC. and 1.95 MC.)						
11	2nd Short-Wave Band	Ant.	100 ohm 200 mmf. series	18 MC.	2nd S.W.	18 MC.	C10 Osc. C7 R.F. C4 Ant.
12		Ant.		6 MC.	2nd S.W.	6 MC.	C13 Pad
13	(Repeat operation 11)						
14	(Check calibration and sensitivity at 18 MC. and 6 MC.)						
15	(Check operations 1 to 14 inclusive)						

VOLTAGE CHART

Line Voltage: 115 volts AC   Position of Volume Control: Full with Antenna Disconnected
Band Selector Switch - BC Band - Manual Tuning   AFC Switch - Off

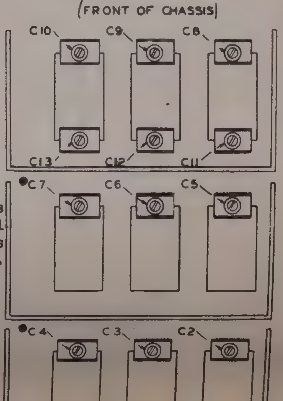
Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6K7G	R-F Amp.	0	0	260	62	0	0	6.2*	0	-.2
6A8G	Converter	0	0	260	112	-.2	150	6.2*	0	-.1
6K7G	1st I-F Amp.	0	6.2*	260	60	0	0	0	0	**
6K7G	2nd I-F Amp.	0	6.2*	260	60	2.7	0	0	2.7	0
6H6G	Discriminator	0	6.2*	**	0	**	-	0	0	-
6J7G	AFC	0	0	240	60	3	0	6.2*	0	0
6Q7G	Det-AVC-1st Audio	0	6.2*	46	**	**	0	0	0	**
6F6G	Power Amp.	0	6.2*	240	260	-.8	0	0	0	-
6F6G	Power Amp.	0	6.2*	240	260	-.8	0	0	0	-
5Y3G	Rectifier	-	390*	-	370*	-	370*	-	390*	-
6E5	Viso-Glo	6.2	**	**	260	-3.4	0	-	-	-

Notes: Voltage and resistance readings are for schematic diagram. Allow 15% + or -

* Check AFC by connecting generator to converter grid cap and tuning generator and receiver to 1500 KC. Note output meter reading with AFC switch "off". Switch AFC "on" and if output changes appreciably, touch up discriminator trimmer until there is no change in sensitivity.

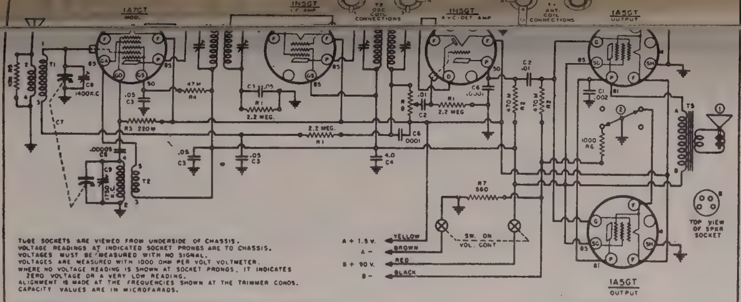
NOTE: Check to see that dial pointer is parallel to horizontal lines on dial when variable condenser rotor plates are fully meshed with stator plates.

TRIMMER LOCATIONS →
(Under Chassis)



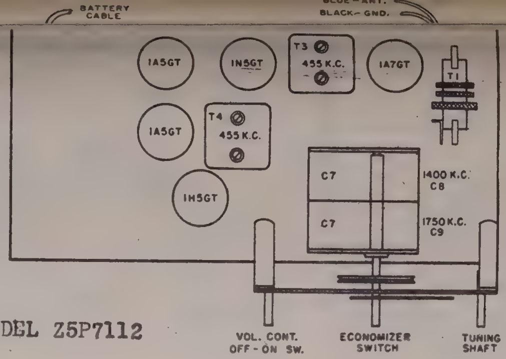
MODEL Z5P7026
MODEL Z5P7112
Schematics, Socket
Trimmers

SPIEGEL INC.



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

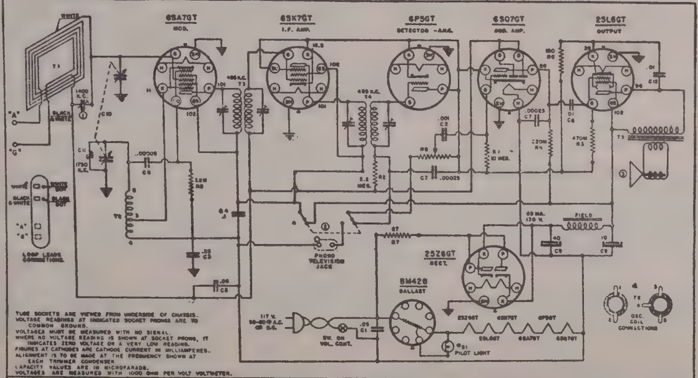
CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-52
R 1	60-179	2.2 MEGOHM 1/4 W. RESISTOR	C 1	16-138	.002 MFD 400 V TUBULAR COND.	T 1	10-344	ANTENNA COIL
R 2	60-176	470 M OHM " "	C 2	16-121	.01 " 200 V. " "	T 2	10-341	OSCILLATOR COIL
R 3	60-180	220 M " " "	C 3	1622	.05 " " " "	T 3	10-342	1 ST. I.F. TRANSFORMER
R 4	60-177	47 M " " "	C 4	18-250	4.0 " 150W.V. ELECTROLYTIC	T 4	10-343	2 ND. I.F.
R 5	60-215	10 M " " "	C 5	15-120	.00005 MFD. MICA CONDENSER	T 5	80-194	OUTPUT TRANSFORMER (ON SPKR.)
R 6	60-217	1000 " " "	C 6	1501	.0001 " "			
R 7	60-201	560 " " "	C 7	19-163	2 GANG VARIABLE COND. ALSO C8 & C9	1	79-296	6 1/2" P. M. SPEAKER
R 8	24-148	1 MEGOHM VOLUME CONT. WITH SW.				2	69-149	ECONOMIZER SWITCH



MODEL Z5P7112

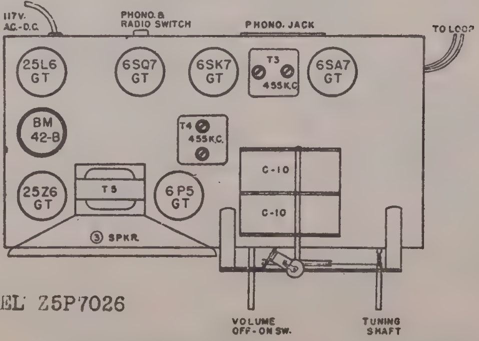
IF PEAK 455 KC

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME V111



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.

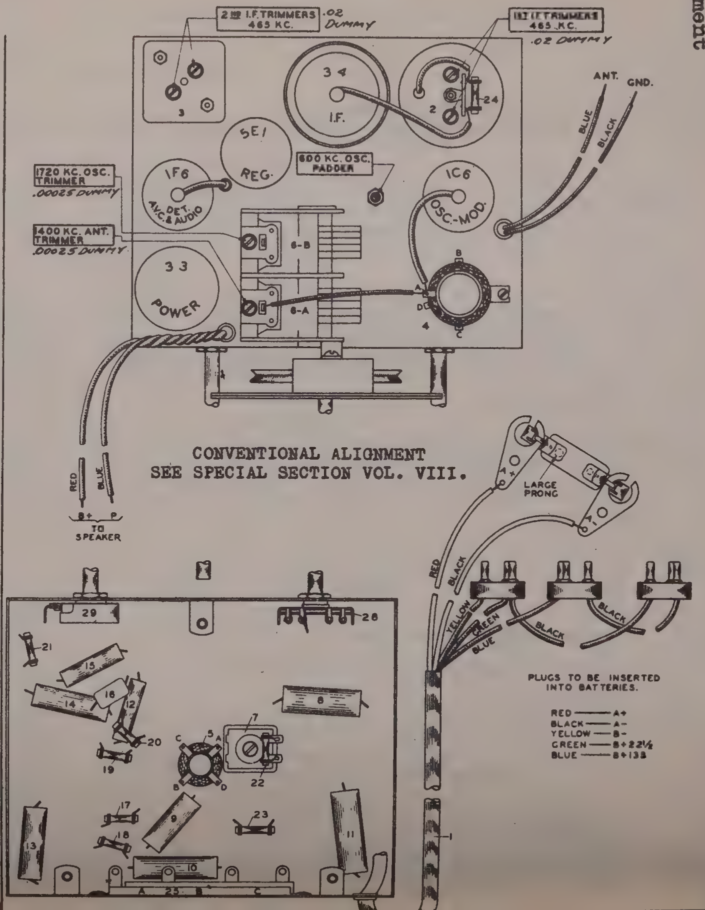
CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-77
C 1	1607	.05 MFD. 400 V. TUBULAR COND.	R 1	60-193	10 MEGOHM 1/4 W. RESISTOR	T 1	82-10	LOOP ANTENNA
C 2	16-124	.001 " " " "	R 2	60-179	2.2 " " "	T 2	10-311	OSCILLATOR COIL
C 3	16-120	.25 " 200 V. " "	R 3	60-175	470 M OHM " "	T 3	10-317	1 ST. I.F. TRANSFORMER
C 4	16-115	.1 " " " "	R 4	60-180	220 M " " "	T 4	10-312	2 ND. "
C 5	1622	.05 " " " "	R 5	60-185	82 M " " "	T 5	------	OUTPUT TRANSFORMER (ON SPKR.)
C 6	16-121	.01 " " "	R 6	60 184	150 " " "			
C 7	1504	.00025 MFD. MICA CONDENSER	R 7	60-280	27 " " "	1	20-129	TRIMMER (ON LOOP)
C 8	1503	.00005 " " "	R 8	24-146	500 M VOLUME CONTROL & SW.	2	69-140	PHONO SWITCH
C 9	18-238	40 x 10 " 150W.V. ELECTROLYTIC				3	79-283	5" DYNAMIC SPEAKER
C10	19-158	2 GANG VARIABLE CONDENSER (ALSO C11)						
C12	16-118	.01 MFD 400 V TUBULAR CONDENSER						



MODEL Z5P7026

LOCATION OF PARTS ON TOP OF CHASSIS BASE.

MODELS 1204, 1205, 1206 and 1207
Chassis 80B



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

MODEL 128B

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below and:
I.F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 1C7G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C.	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Exactly 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1400 K.C. antenna trimmer for maximum output.
	3 Approximately 600 K.C.	Approximately 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.7 to 18.1 M.C. BAND	1 Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Exactly 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 15 M.C. antenna trimmer for maximum output.

MODEL 6700 - CHASSIS 68B

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.

(c) Peak each of the second I.F. transformer trimmers.

(d) Peak each of the first I.F. transformer trimmers.

ALIGNING 1720-535 KILOCYCLE BAND:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.

(b) Remove test oscillator lead from grid of 6A7 tube and connect to receiver antenna lead through a .00025 Mfd. series condenser.

(c) Adjust band selector switch for operation on the 1720-535 kilocycle band.

(d) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles, and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. preselector and antenna trimmers for maximum sensitivity.

(f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum signal response.

ALIGNING 1.8-5.8 MEGACYCLE BAND:

(a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.

(b) Adjust band selector switch to 1.8-5.8 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.8 megacycles. Bring in 5.8 megacycle test signal to maximum output by adjusting 5.8 M.C. oscillator trimmer.

(c) Tune receiver dial and test oscillator frequency to EXACTLY 5 megacycles, and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.8-18.3 MEGACYCLE BAND:

(a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.8-18.3 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18 megacycles.

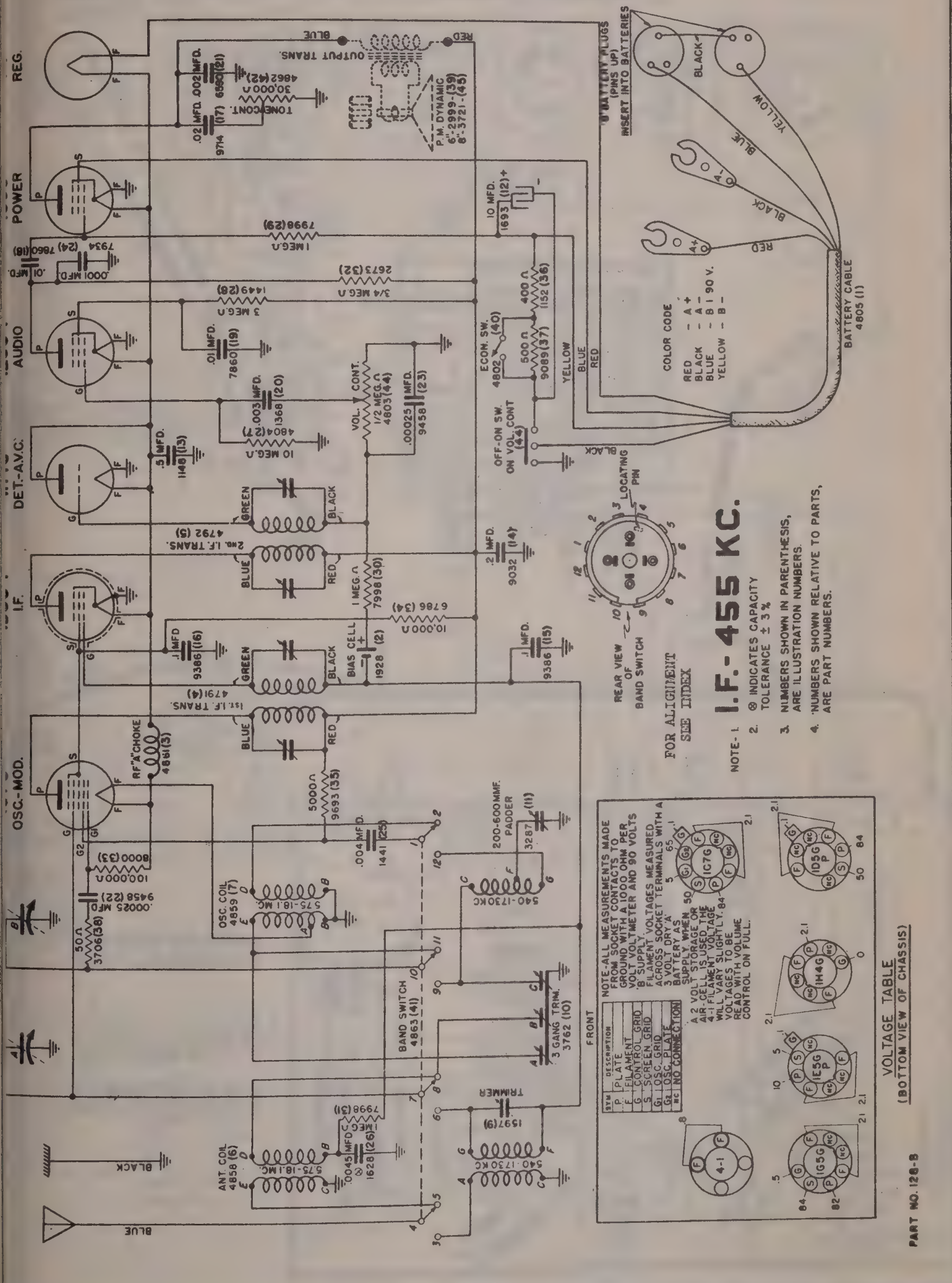
(b) Adjust 18 M.C. oscillator trimmer to bring in 18 megacycle test signal to maximum output.

NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST PEAK which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 18 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17 megacycles. Then vary the receiver dial slightly to the right and left of 17 megacycles, and if the fundamental peak was used in align-

MODEL 128B
Schematic
Voltage,Socket

SPIEGEL INC.

TWO BAND—SIX TUBE INCLUDING BALLAST TUBE
2 Volt Battery Operated Superheterodyne Receiver



FOR ALIGNMENT
SEE INDEX

NOTE- 1. **I.F.- 455 KC.**

2. ⊗ INDICATES CAPACITY TOLERANCE ± 3%
3. NUMBERS SHOWN IN PARENTHESIS, ARE ILLUSTRATION NUMBERS.
4. NUMBERS SHOWN RELATIVE TO PARTS, ARE PART NUMBERS.

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
NC	NO CONNECTION

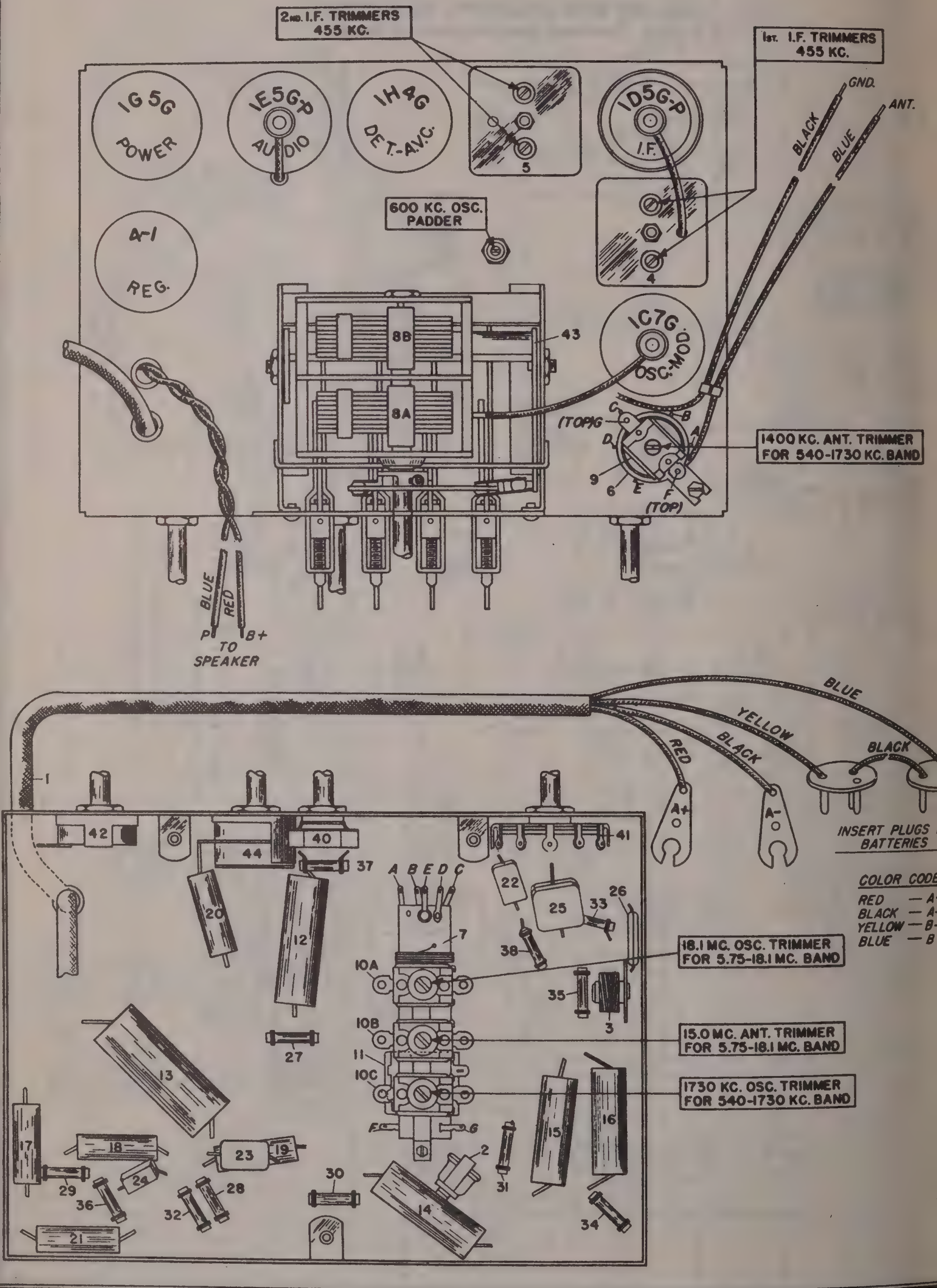
NOTE-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 90 VOLTS 'B' SUPPLY.
FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY 'A' BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR-CELL IS USED THE 4-1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.
VOLTAGES TO BE READ WITH VOLUME CONTROL ON FULL.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PART NO. 128-B

MODEL 128B
Chassis, Socket
Trimmers

SPIEGEL INC.

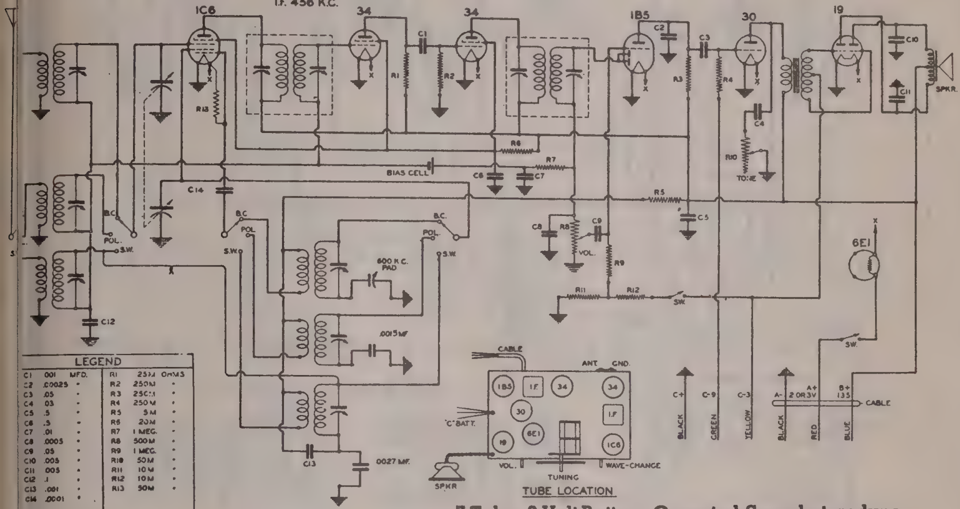


SPIEGEL INC.

MODELS 142,154,6602,6650
Chassis 725
Schematic,Socket,Trimmers
Alignment

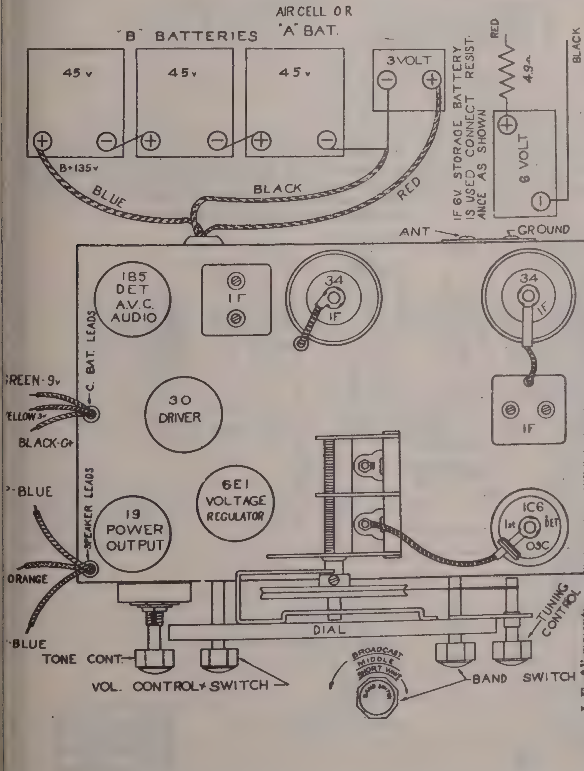
ood ground connection to a water pipe or other metallic conductor entering into the ground for some
ance is ESSENTIAL.

IF PEAK 456 KC



LEGEND					
C1	.001	MFD.	R1	25M	OHMS
C2	.00025	"	R2	250M	"
C3	.05	"	R3	250M	"
C4	.03	"	R4	250M	"
C5	.5	"	R5	5M	"
C6	.5	"	R6	20M	"
C7	.01	"	R7	1 MEG.	"
C8	.0005	"	R8	500M	"
C9	.05	"	R9	1 MEG.	"
C10	.005	"	R10	50M	"
C11	.005	"	R11	10M	"
C12	.1	"	R12	10M	"
C13	.001	"	R13	50M	"
C14	.0001	"			

7-Tube, 2-Volt Battery Operated Superheterodyne



I. F. Alignment:

Connect the oscillator through a .1 condenser to the grid of the 1C6 tube and set the oscillator to 456 kilocycles. Peak each I. F. stage to resonance as indicated by maximum output on the output meter.

R. F. Alignment:

With the wave change switch in the broadcast position, set the oscillator to 1700 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1700 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. This trimmer is located on the right side of the chassis, second position from the front. Reset the test oscillator to 1400 kilocycles and adjust antenna trimmer located under the chassis. Now set oscillator to 600 kilocycles and adjust padder located on top of the chassis. Check alignment at 1000 kilocycles.

For aligning the police band, set test oscillator to 5 megacycles and switch to the police band position on the set. With the condenser rotated to this frequency setting as indicated on the dial, adjust oscillator trimmer located on the right side of the chassis, first position from the front. Now adjust antenna trimmer located on the front of the chassis, left position, to resonance.

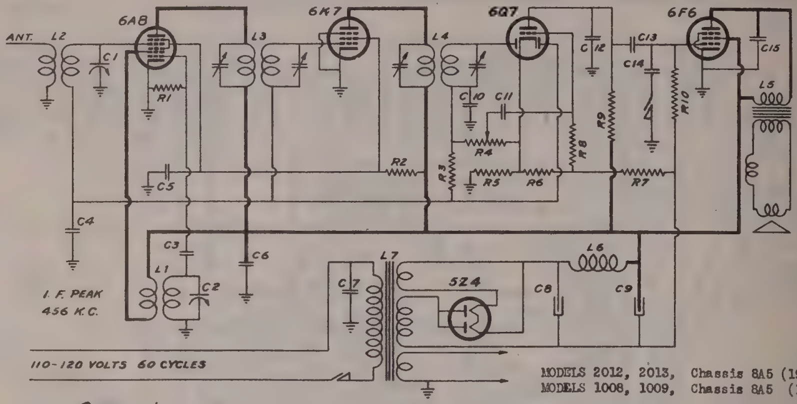
The short wave band is aligned by setting the condenser to 18 megacycles and adjust the oscillator trimmer located on the right side of the chassis, third position from the front to resonance with an 18 megacycle signal from the test oscillator. Turn dial to 16 M. C. Set test oscillator to 16 M. C. and adjust antenna trimmer through right hand hole in front of chassis, rocking variable condenser slightly back and forth to get maximum peak.

MODELS 1008,1009,Ch.8A5(1939)
2012,2013,Ch.8A5(1938)
MODELS 2006,2007,Ch.1T
Schematics,Alignment

SPIEGEL INC.

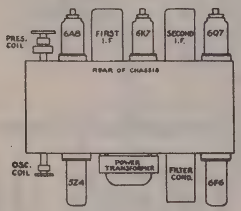
25-2149

SCHEMATIC DIAGRAM CHASSIS MODEL 8A5



MODELS 2012, 2013, Chassis 8A5 (1938)
MODELS 1008, 1009, Chassis 8A5 (1939)

CHASSIS LAYOUT



CODE OF SCHEMATIC DIAGRAM

RESISTORS		
R1	53-896	50,000 Ohm 1/4 Watt Resistor
R2	53-1042	25,000 Ohm 1/4 Watt Resistor
R3	53-926	1 Meg Ohm 1/4 Watt Resistor
R4	19-2007	500,000 Ohm Vol. Cont. & Switch
R5		60 Ohm } Candohm Resistor
R6	53-2019	30 Ohm } Candohm Resistor
R7		240 Ohm } Candohm Resistor
R8	53-925	500,000 Ohm 1/4 Watt Resistor
R9	53-924	250,000 Ohm 1/4 Watt Resistor
R10	53-925	500,000 Ohm 1/4 Watt Resistor

[redacted]		
C1,C2	77-2007	Two Gang Variable Condenser
C3	76-2002	.00005 Mfd. Mica Condenser
C4	75-2006	.1 Mfd. 200 V. Paper Cond.
C5	75-2006	.1 Mfd. 200 V. Paper Cond.
C6	75-2006	.1 Mfd. 200 V. Paper Cond.

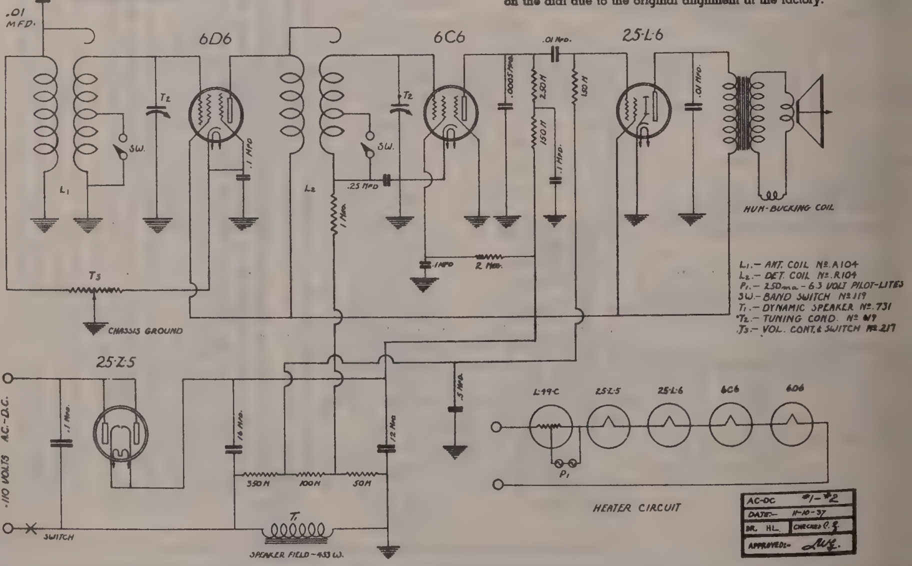
COND. (Cont.)		
C7	75-2003	.01 Mfd. 400 V. Paper Cond.
C8	18-2008	8 Mfd. 350 W.V. Elect. Cond.
C9	18-2008	8 Mfd. 250 W.V. Elect. Cond.
C10	76-307	.0005 Mfd. Mica Condenser
C11	75-2006	.1 Mfd. 200 V. Paper Cond.
C12	75-2014	.001 Mfd. 600 V. Paper Cond.
C13	75-2006	.1 Mfd. 200 V. Paper Cond.
C14	75-2003	.01 Mfd. 400 V. Paper Cond.
C15	75-2002	.004 Mfd. 600 V. Paper Cond.

ALIGNMENT FREQUENCIES
1400 KC, 1000 KC and 600 KC
FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION OF VOLUME V111

MODELS 2006 and 2007 - Chassis 1T

ALIGNMENT PROCEDURE: The alignment of this receiver requires the use of a test oscillator that covers a frequency range from 540 to 4000 KC. For exact alignment an output meter should be connected across the output transformer on the speaker. A dummy antenna of approximately 180 mmfd. should be used and connected to antenna with aerial coil left unwound.

Adjust oscillator to 1400 KC. Turn knob controlling dial to 1400 on the dial. Rotate adjustment screws on tuning condenser until maximum output is produced. (with Volume Control at maximum). Reset oscillator to 1000 KC and finally to 600 KC and check. The receiver should check OK at these points for alignment. It is only necessary to re-adjust at one poin on the dial due to the original alignment at the factory.

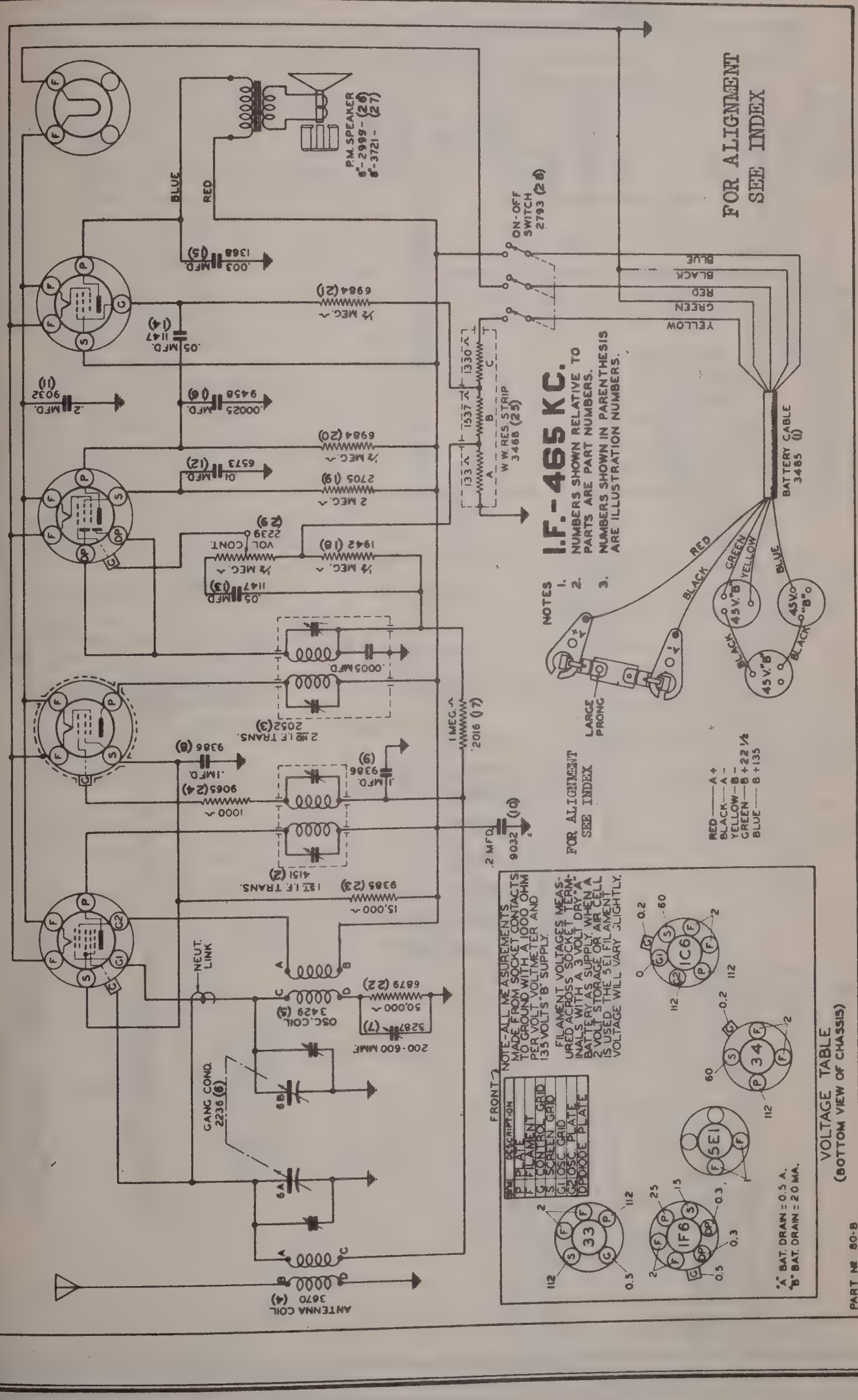


L1.- ANT. COIL Nº. A104
L2.- DET. COIL Nº. R104
P1.- 250ma - 6.3 VOLT PILOT-LITES
SW.- BAND SWITCH Nº 119
T1.- DYNAMIC SPEAKER Nº. 731
T2.- TUNING COND. Nº 619
T3.- VOL. CONT. & SWITCH Nº 217

SPIEGEL INC.

MODELS 1204 to 1207 incl.
Chassis 80B
Schematic, Voltage, Socket

The 5E1 Voltage Regulator, which is used to maintain the filament voltage on the receiver tubes at the correct value of approximately 2 volts (in order to adapt the receiver



NOTES
1. I.F. - 465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

FOR ALIGNMENT SEE INDEX

FOR ALIGNMENT SEE INDEX

RED — A +
BLACK — A -
YELLOW — B -
GREEN — B + 22½
BLUE — B + 135

FRONT

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE

NOTE—ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 135 VOLTS 'B' SUPPLY.

FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY 'A' BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR CELL IS USED THE 5E1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.

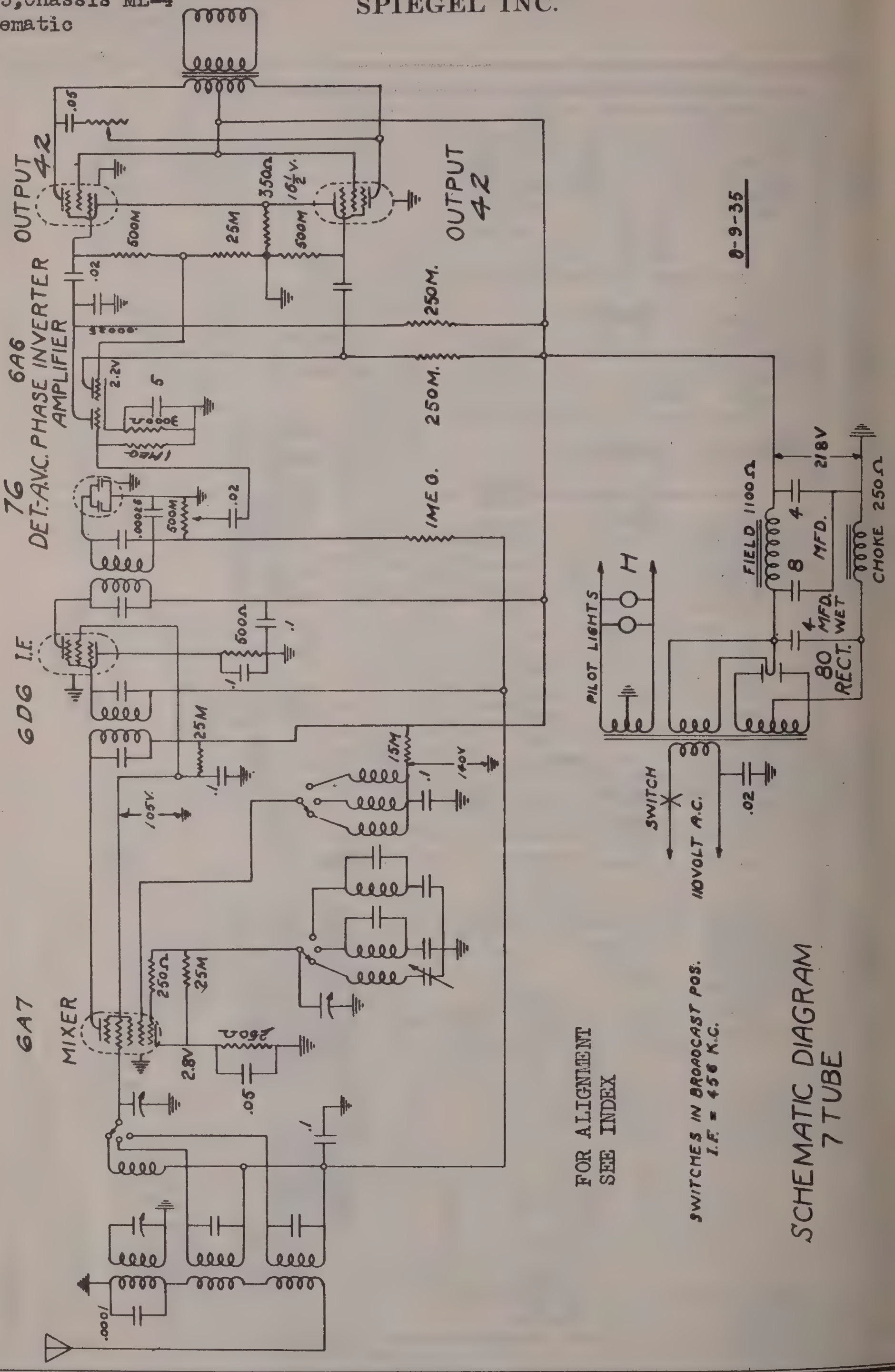
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

"A" BAT. DRAIN = 0.5 A.
"B" BAT. DRAIN = 20 MA.

PART No 80-B

MODELS 1904,1916,1952,
1965,Chassis ML-4
Schematic

SPIEGEL INC.



8-9-35

FOR ALIGNMENT
SEE INDEX

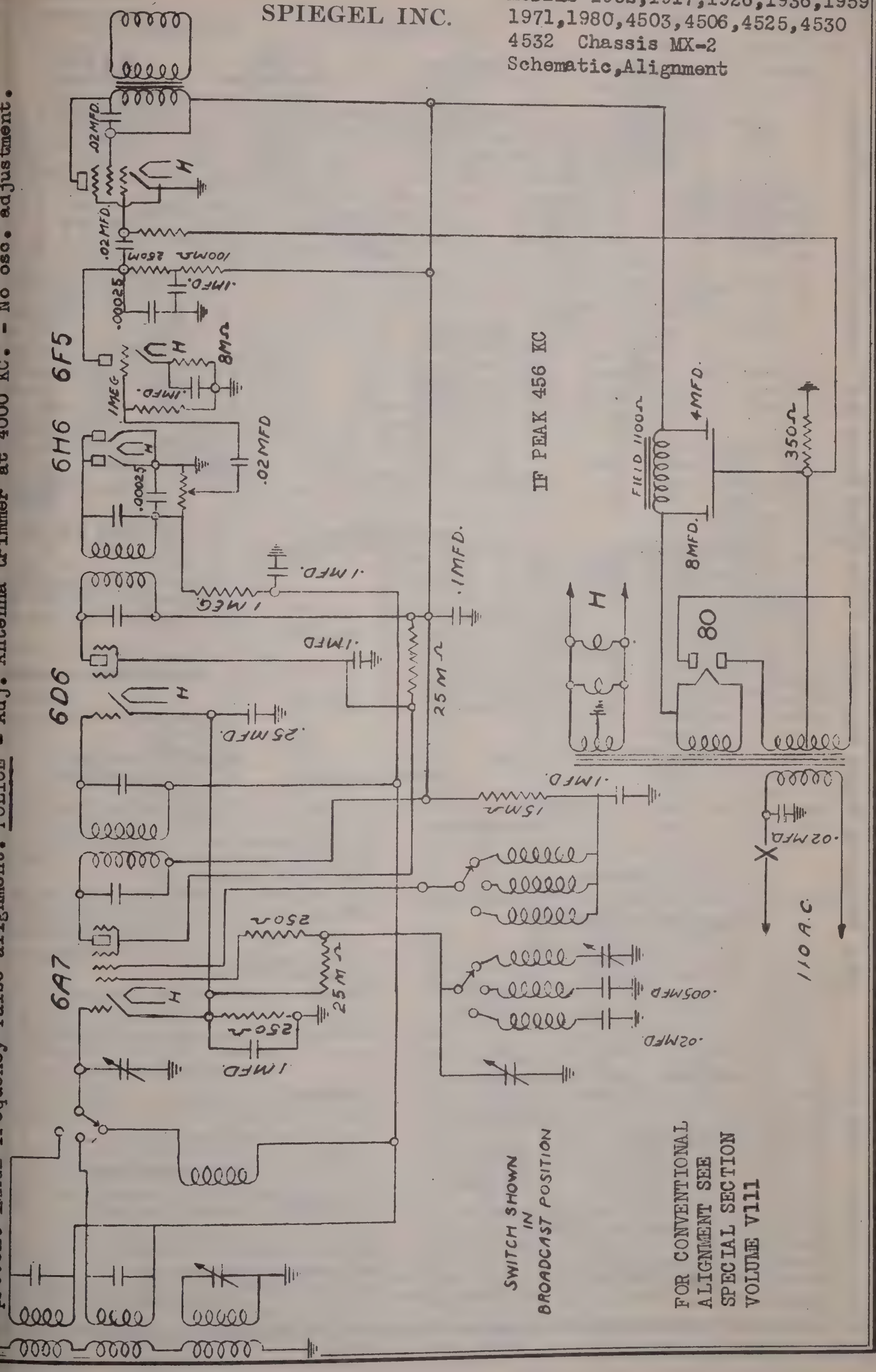
SWITCHES IN BROADCAST POS.
I.F. = 456 K.C.

SCHEMATIC DIAGRAM
7 TUBE

gang cond. trimmers at 1400 KC. Osc. Padder at 600 KC. FOREIGN BAND - 19 to 49 meters- Osc. and Ant. trimmers alignment at 14000 KC Start by Osc. prevent IMAGE frequency false alignment. POLICE - Adj. Antenna trimmer at 4000 KC. - No osc. adjustment.

SPIEGEL INC.

MODELS 1902,1917,1926,1936,1959
1971,1980,4503,4506,4525,4530
4532 Chassis MX-2
Schematic,Alignment



IF PEAK 456 KC

SWITCH SHOWN IN BROADCAST POSITION

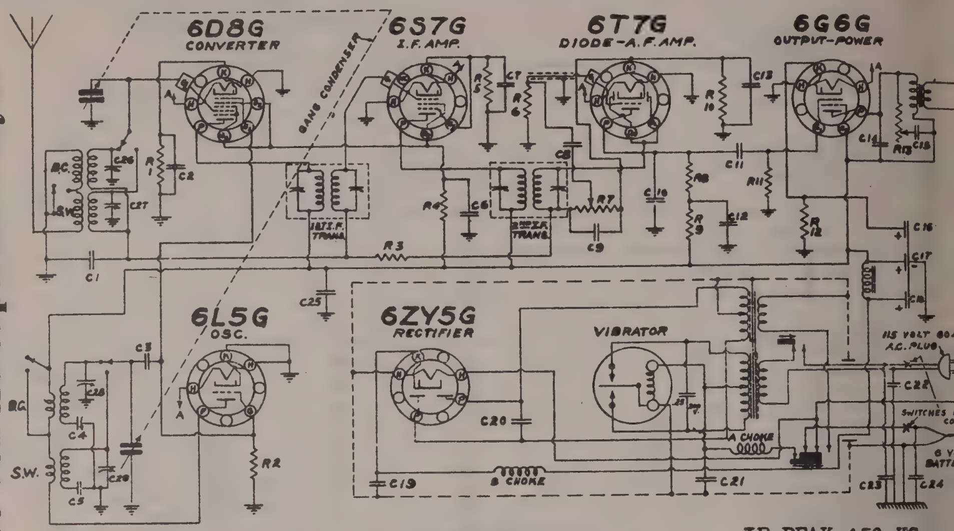
FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME V111

MODELS 2006,2007,4040
Chassis 6A

SPIEGEL INC.

Schematic,Sock
Trimmers,Align

Six Tube 6 Volt Battery 110-120 Volt AC Superheterodyne



IF PEAK 456 KC

BAND SWITCH IN BROADCAST POSI
POWER SWITCH IN BATTERY POSIT
I.F. — 456 K.C.
C26 TO C29 – 2 TO 20 μμf. TRIMMER

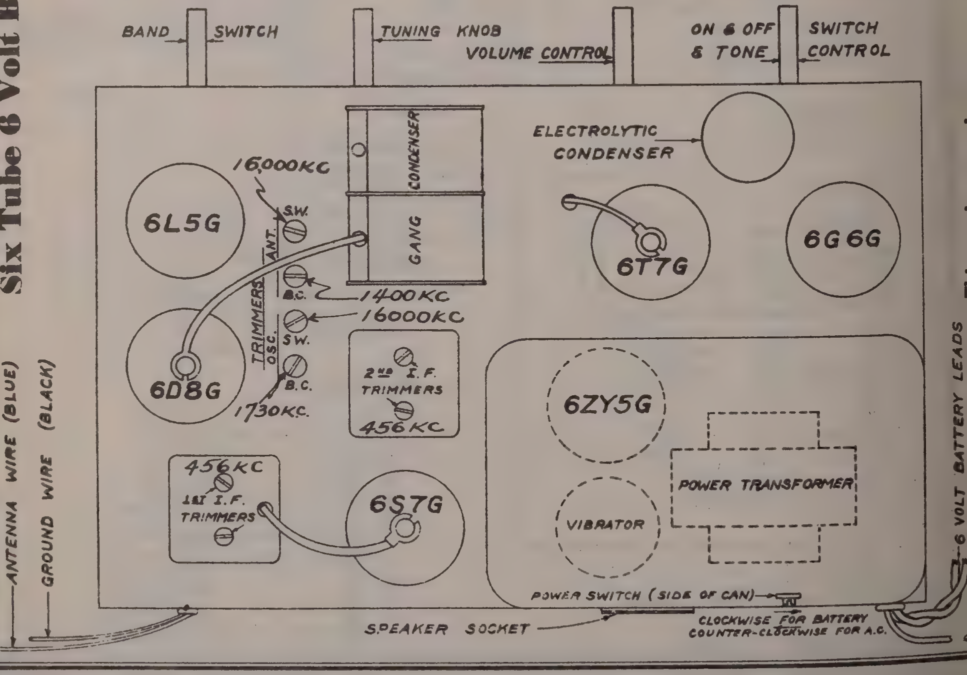
CONDENSERS

NO	CAPACITY	TYPE	NO	CAPACITY	TYPE
1	.05 Mfd.	200 V.	13	.5 Mfd.	200 V.
2	.05 Mfd.	200 V.	14	.005 "	600 V.
3	100 μμf.	MICA	15	.05 "	400 V.
4	300-600 μμf	"	16	8. "	25 V.
5	4000 μμf	M. ± 5%	17	8. "	200 V.
6	.1 Mfd	200 V.	18	8. "	200 V.
7	.05 "	200 V.	19	.01 "	600 V.
8	.01 "	400 V.	20	.015 "	1000 V. OIL TYPE
9	250 μμf.	MICA	21	.5 "	10 V.
10	250 "	"	22	.05 "	400 V.
11	.01 Mfd.	400 V.	23	.01 "	600 V.
12	.1 "	200 V.	24	.5 "	10 V.
			25	.1 "	200 V.

RESISTORS

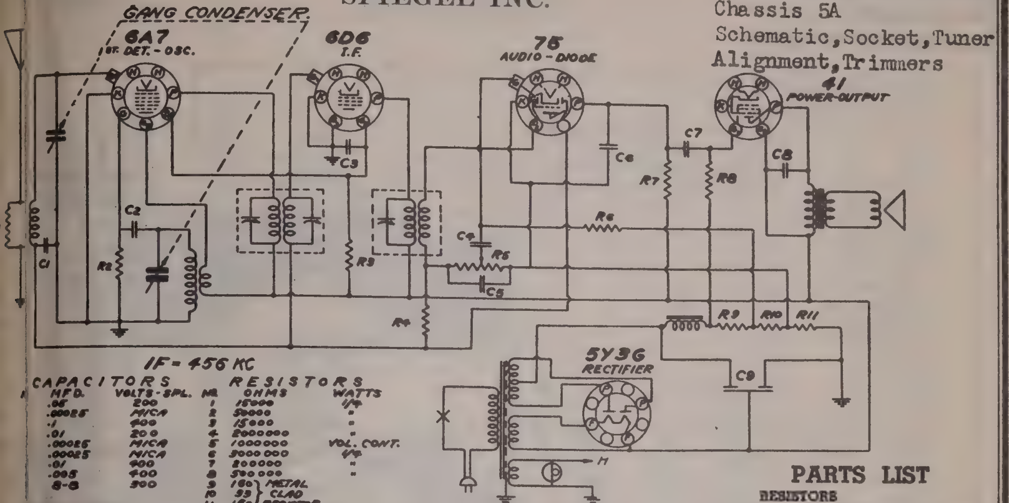
NO	OHMS	WATTS	SPL. TOL.
1	1500	¼	± 10%
2	50,000	¼	
3	1,000,000	¼	
4	38,000	¼	
5	1,000	¼	± 10%
6	1,000,000	¼	
7	500,000	¼	(VOL. CONT)
8	500,000	¼	
9	200,000	¼	
10	10,000	¼	± 10%
11	500,000	¼	
12	450	¼	± 10%
13	100,000	¼	(TONE CONT.)

SCHEMATIC DIAGRAM
6A



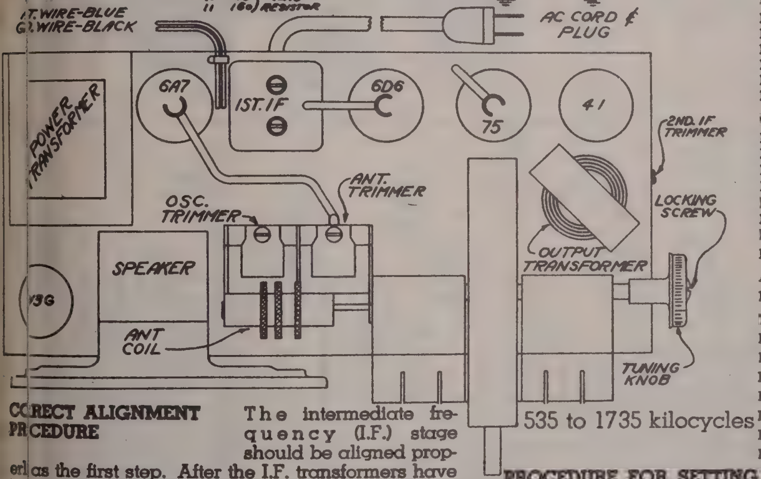
SPIEGEL INC.

MODELS 2014,2015,2016
Chassis 5A
Schematic,Socket,Tuner
Alignment,Trimmers



IF = 456 KC

CAPACITORS MFD.	VOLTS-SPL.	RESISTORS NO.	OHMS	WATTS
.05	200	1	15000	1/4
.00025	MICA	2	50000	"
.1	400	3	15000	"
.01	200	4	2000000	"
.00025	MICA	5	1000000	VOL. CONT.
.00025	MICA	6	3000 000	1/4
.01	400	7	200000	"
.005	400	8	500 000	"
8-8	300	9	160	METAL
		10	33	CLAD
		11	160	RESISTOR



PARTS LIST

RESISTORS

P1220	200,000 Ohm ¼ Watt
P417	50,000 Ohm ¼ Watt
P258	15,000 Ohm ¼ Watt
P137	500,000 Ohm ¼ Watt
P1114	2,000,000 Ohm ¼ Watt
P2438	Candohm Resistor

CONDENSERS

P164	.01 Mfd. 400 Volt
P1322	.005 Mfd. 600 Volt
P334	.05 Mfd. 400 Volt
P148	.05 Mfd. 200 Volt

MICA CONDENSERS

P817	.00025

ELECTROLYTIC CONDENSERS

P2397	Dual 8 Mfd. 300 W.V.

ADJUSTABLE CONDENSERS

P2411	Gang Condenser

TRANSFORMERS AND COILS

P2395	110 V. Power Transformer
P2396	125 V. Power Transformer
P2391	Output Transformer
P1506	1st I.F. Transformer
P2394	2nd I.F. Transformer
P2412	Oscillator Coil
P2393	Antenna Coil

CORRECT ALIGNMENT PROCEDURE The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band alignment should be the next procedure.

I.F. ALIGNMENT Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Adjust the oscillator to 1730 KC and connect the output to the antenna lead (Blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the test oscillator and the receiver to 600 KC and bend the plates into the position for maximum output.

PROCEDURE FOR SETTING UP AND OPERATING AUTOMATIC PUSH BUTTONS

Select four strong local stations tuned in regularly. Now loosen **Locking Screw** (see chassis layout) several turns with a coin or a screw driver and press in any one of the four push buttons. Holding the button down, tune in any one of four selected stations by rotating the tuning knob (side knob) slowly back and forth until the signal is cleared.

Release the push button and press in another button and hold down, tuning in another favorite station with tuning knob. Follow the same procedure for the remaining stations. Now hold tuning knob (side knob) securely and with coin or screw driver, tighten locking screw. This screw holds all stations in adjustment.

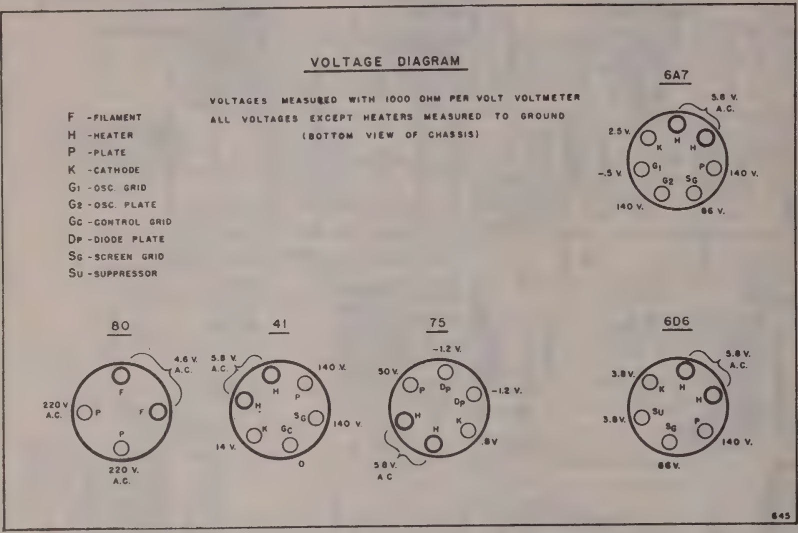
In order to change any station already set up, to another, hold tuning knob securely, loosen locking screw and select the new station as explained above. Tear the correct station call letter tabs from the set of sheets supplied and push them into rectangular windows above each push button.

The automatic push button dial is now set up for quick tuning.

MODELS 2056,2057
Chassis 645
Schematic,Voltage

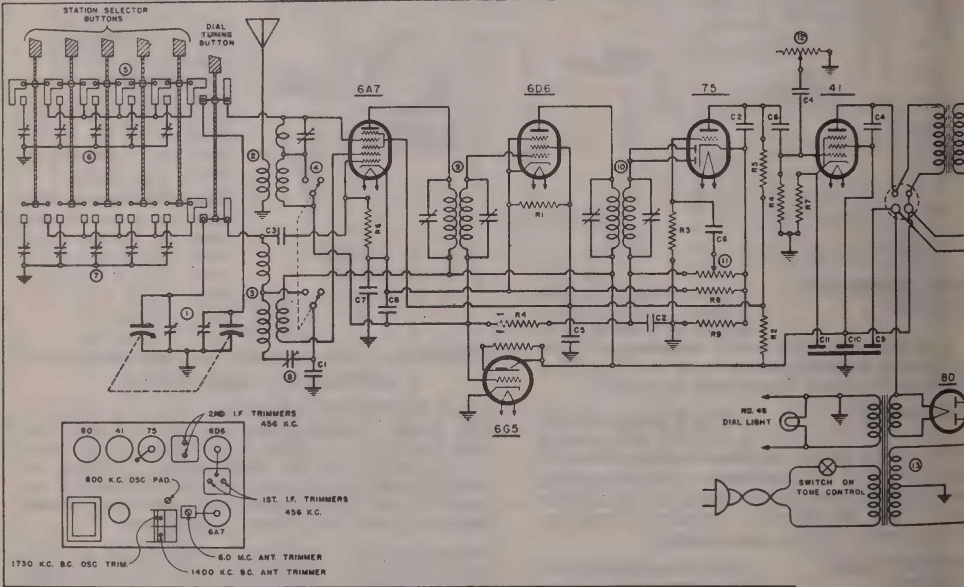
SPIEGEL INC.

Socket,Tri
Alignment



FOR
CONVENTIONA
ALIGNMENT
SEE
SPECIAL
SECTION OF
VOLUME
VIII

FOR
TUNER DAT
SEE
VOLUME X
PAGE 10-8



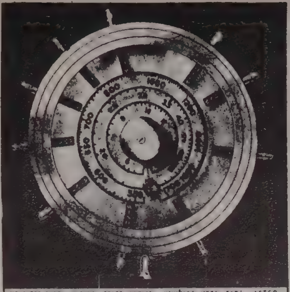
PART NO		DESCRIPTION
R1	6117	25,000 OHM 1/2 W CARBON RES.
R2	6105	10,000 " " " "
R3	6017	1 MEG. " 1/3 W " "
R4	6018	500,000 " " " "
R5	6056	200,000 " " " "
R6	6028	40,000 " " " "
R7	6052	600 " " " "
R8	60-151	160 " " " " ±10 %
R9	60-150	51 " " " " ±10%

PART NO.		DESCRIPTION
C1	15-101	.00148 MFD. MICA CONDENSER ±5%
C2	1504	.00025 " " " "
C3	1501	.0001 " " " "
C4	1651	.004 " 600 V. TUBULAR COND.
C5	1607	05 " 400 V. " "
C6	1603	01 " " " "
C7	1614	25 " 200 V. " "
C8	1622	05 " " " "
C9	18-102	8 " 250 V. WET ELECTROLYTIC
C10	"	4 " " " "
C11	"	4 " 25 V. " "

PART NO		DESCRIPTION 645
1	19-113	2 GANG CONDENSER
2	10-196	ANTENNA COIL
3	10-147	OSCILLATOR COIL
4	69-108	WAVE SWITCH
5	69-115	6 BUTTON PUSH-BUTTON SWITCH
6	20-106	ANT. TRIMMER STRIP
7	20-107	OSC. " "
8	20-100	B C OSC PADDING TRIMMER
9	10-194	IST. I.F. TRANSFORMER
10	10-195	2 ND. I.F. "
11	24-105	VOLUME CONTROL
12	26-106	TONE CONTROL WITH SWITCH
13	80-104	POWER TRANSFORMER
14		SPEAKER

SPIEGEL INC.

MODELS 2104 to 2107
Chassis 1095B
MODELS 4510,4556
Chassis 1091B
Automatic Tuner
Assembly,Data

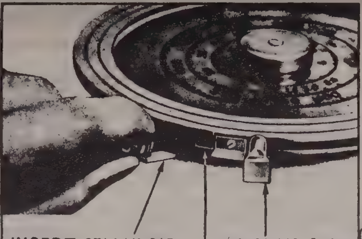


INDICATOR STOP. TO TUNE GRASP KNURLED METAL TAB BELOW THE STATION CALL LETTER OF THE DESIRED STATION BETWEEN THUMB AND FOREFINGER AND SWING DIAL UNTIL KNURLED TAB IS UNDERNEATH INDICATOR STOP.

KNURLED METAL TAB. AFTER PROPERLY SETTING TAB HOLDERS, FIRMLY TIGHTEN SO THAT THEY CANNOT MOVE ON DIAL RAIL.

FROM 1 TO 10 STATIONS OPERATING ON FREQUENCIES SEPARATED BY 40 KILOCYCLES OR MORE MAY BE AUTOMATIC TUNE ...... BY PROPERLY SETTING TAB HOLDERS

FIG. 1



INSERT CELLULOID ENVELOPE BETWEEN EDGE OF DIAL AND METAL FACE PLATE THEN LIGHTLY PRESS NUT INTO SQUARE NOTCH
INDICATOR STOP
SLOTTED DIAL TAB RAIL

FIG. 3

While an "AUTOMATIC-TUNE" tab may be set for distant weak stations, better results will be obtained if the stations selected for "AUTOMATIC-TUNE" are strong nearby or local stations.

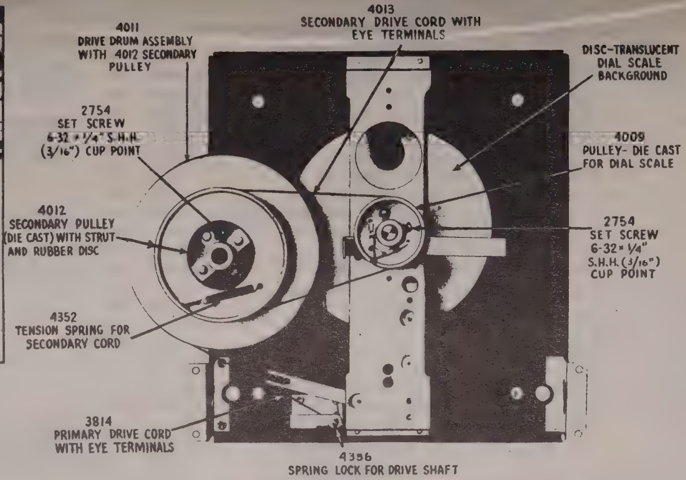
AFTER IT IS DETERMINED WHAT STATIONS YOU WISH TO "AUTOMATIC-TUNE", OBTAIN THE FREQUENCIES USED AND CALL LETTERS OF THESE STATIONS AND SET STATION TABS BY:

1. Lay station call letter tab sheet on flat surface and with a razor or sharp knife cut out desired station tab by cutting around black edges of each desired tab.
2. To illustrate the proper setting of station paper strip and metal tab holder the receiver is shipped from the factory with a station tab properly set for Station WGN 720 kilocycles.
   Carefully note that the station call letter tab appears directly below the 720 kilocycle calibration on the face of the dial and that the knurled tab is firmly screwed down on slotted tab rail. If Station WGN is not one of the selected stations or if a tab is to be set for a station which operates on a frequency less than 720 kilocycles, remove WGN celluloid envelope and station call letter paper strip by:
   (a) Loosen tab holder by grasping knurled end of metal tab with finger tips and turn one or two turns to the left.
   (b) Slide the metal holder tab to square notch in dial tab rail—adjacent to permanently attached tab stop—and pull outward on tab until it is pulled free from tab holder rail.
   (c) Slide the celluloid envelope out of the metal tab frame.
3. PLACE EACH SELECTED STATION CALL LETTER PAPER STRIP INSIDE OF CELLULOID ENVELOPE BY:
   (a) Hold celluloid envelope with curved end upward.
   (b) Place station call letter paper strip inside of celluloid envelope with printed call letters upward.
4. INSERT CELLULOID ENVELOPE INTO A METAL TAB FRAME BY:
   (a) Hold curved end of celluloid envelope towards metal knurled tab holder and insert celluloid into metal frame.
   (b) Gently push celluloid inward until curved end of envelope touches edge of celluloid envelope tab frame.
   (c) Arrange tabs in numerical order according to station frequency.
5. SET THE METAL TAB HOLDERS ON DIAL BY: (See Fig. 3)
   (a) Set the first metal tab holder for the station that broadcasts on the lowest frequency—least number of kilocycles—and then set the next station tab for the selected station operating on the next lowest frequency, continuing on in this way until a tab has been set for all of the selected stations.
   (b) Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.
   (c) Insert celluloid envelope between edge of dial and metal face plate—Lightly press nut on end of knurled tab into square notch in slotted dial rail—then slide tab holder along rail until the knurled tab is underneath the indicator stop on the dial at which point station call letter strip will appear directly below the indicator line on the face of the dial.
   (d) Tighten tab holders as much as possible without moving dial by turning knurled tab to the right—then swing dial so knurled tab is away from indicator stop on the dial and firmly tighten so that it cannot move on the dial rail. DO NOT USE PLIERS TO TIGHTEN.

REPLACING No. 4000 DIAL GLASS SCALE ASSEMBLY

As it requires special tools to properly set part No. 4005 shaft assembly on part No. 4000 glass scale—we will ship all orders for No. 4000 glass scales with the No. 4005 shaft assembled on the glass scale.

DIAL MECHANISM



4013
SECONDARY DRIVE CORD WITH EYE TERMINALS
4011
DRIVE DRUM ASSEMBLY WITH 4012 SECONDARY PULLEY
DISC-TRANSLUCENT DIAL SCALE BACKGROUND
2754
SET SCREW
6-32 × 1/4" S.H.H. (3/16") CUP POINT
4009
PULLEY- DIE CAST FOR DIAL SCALE
4012
SECONDARY PULLEY (DIE CAST) WITH STRUT AND RUBBER DISC
2754
SET SCREW
6-32 × 1/4" S.H.H. (3/16") CUP POINT
4352
TENSION SPRING FOR SECONDARY CORD
3814
PRIMARY DRIVE CORD WITH EYE TERMINALS
4356
SPRING LOCK FOR DRIVE SHAFT

WHEN INSTALLING PART No. 4000 GLASS ASSEMBLY WITH No. 4005 SHAFT ATTACHED carefully follow procedure in order given:

(a) Insert No. 4005 shaft into main bushing attached to the cadmium plated bracket on back of dial face.

b) Place steel spacer washer and brass tension spring in order named over end of No. 4005 shaft.

(c) Place the small die cast primary pulley No. 4009 on shaft—do not tighten No. 2754 set screws.

(d) Loosen the two set screws in brass spacer collar on the No. 4005 shaft.

(e) Adjust brass spacer collar—by sliding collar on shaft—so that there will be approximately 1/8" clearance between the bottom of metal tab holder and the face plate. Firmly retighten brass collar and No. 2754 die cast pulley set screws. Failure to provide proper clearance will result in scratches on dial face and the dial mechanism will not operate freely.

TO INSTALL No. 3814 PRIMARY DRIVE CORD:

(a) Looking at back of dial, wrap dial cord twice around No. 4355 drive shaft in CLOCKWISE direction.

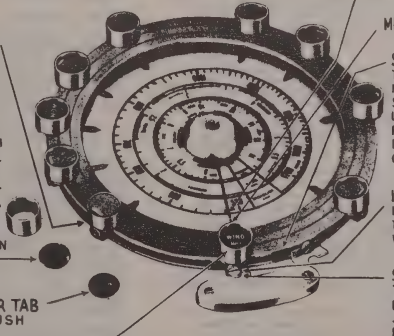
(b) Hook No. 3462 tension spring into loops at end of dial cord.

NEVER LOOSEN THE FOUR SCREWS THAT HOLD THE CADMIUM PLATED BRACKET TO DIAL FACE—OTHERWISE THE MAIN BUSHING WILL BE THROWN OUT OF CENTER.

MODELS 2104 to 2107
MODELS 4510,4556
Push-Button Tuner
Assembly,Notes,Parts

SPIEGEL INC.

SERVICE NOTES for PUSH BUTTON DIAL



INDICATOR LINE ON FACE OF DIAL

METAL INDICATOR ON PUSH BUTTON

SQUARE NOTCH IN DIAL RAIL
TO REMOVE PUSH BUTTON ASSEMBLY FROM DIAL--LOOSEN LOCKING SCREW--SLIDE PUSH BUTTON ALONG RAIL UNTIL SQUARE NUT ON BACK OF PUSH BUTTON IS IN SQUARE NOTCH IN DIAL RAIL, THEN PULL OUTWARD.

LOCKING SCREW
LOCK PUSH BUTTON IN PLACE BY TIGHTENING THIS LOCKING SCREW WITH SCREW DRIVER.

STOP LEVER
TO TUNE RECEIVER AFTER PUSH BUTTONS ARE CORRECTLY SET--JUST PRESS IN DESIRED PUSH BUTTON WITH INDEX FINGER AND SWING DIAL UNTIL PUSH BUTTON STRIKES THIS STOP LEVER.

PUSH BUTTON CUP
PLACE PROPER CALL LETTER TAB HERE WITH CELLULOID DISC ON TOP.

PUSH BUTTON CAP
GENTLY PRESS OVER PUSH BUTTON CUP AFTER CALL LETTER TAB AND CELLULOID DISC ARE IN POSITION.

CELLULOID DISC
PLACE ON TOP OF STATION CALL LETTER TAB.

STATION CALL LETTER TAB
PLACE ON TOP OF PUSH BUTTON CUP.

PUSH BUTTON ASSEMBLY

FROM ONE TO TEN STATIONS OPERATING ON FREQUENCIES SEPARATED BY FORTY KILOCYCLES OR MORE MAY BE AUTOMATICALLY TUNED BY PROPERLY SETTING PUSH BUTTONS.

IT IS A SIMPLE MATTER TO "AUTOMATIC TUNE" AFTER THE STATION PUSH BUTTONS HAVE BEEN PROPERLY SET—JUST PLACE INDEX FINGER INTO THE PUSH BUTTON HAVING CALL LETTERS OF THE DESIRED STATION PUSHING INWARD—THEN SWING DIAL UNTIL DIAL STOPS, AT WHICH POINT THE DESIRED STATION SHOULD BE PROPERLY TUNED IN AND THE METAL INDICATOR ATTACHED TO THE PUSH BUTTON SHOULD POINT TO THE INDICATOR LINE ON FACE OF DIAL. If reception is slightly distorted—which may be particularly noticeable when tuning weak stations—retune for maximum clarity by using conventional tuning knobs.

WHILE A PUSH BUTTON MAY BE SET FOR DISTANT WEAK STATIONS, BETTER RESULTS WILL BE OBTAINED IF THE STATIONS SELECTED FOR AUTOMATIC PUSH BUTTON TUNING ARE STRONG NEARBY OR LOCAL STATIONS.

AFTER IT IS DETERMINED WHAT STATIONS YOU WISH TO "AUTOMATIC PUSH BUTTON TUNE" OBTAIN THE FREQUENCY USED AND CALL LETTERS OF THESE STATIONS AND SET PUSH BUTTONS BY:

To illustrate the proper installation and setting of the Push Buttons, the receiver is shipped from the factory with a Push Button properly set for station WGN, Chicago, 720 kilocycles. If station WGN is not one of the selected stations, remove call letters by:

a. Grasp cap section of Push Button between fingers and gently pull outward until it is clear of dial.
b. Carefully remove the station call letter tab and celluloid disc.

SET STATION PUSH BUTTON BY:

a. Gently press desired round paper station call letter tabs out of station tab sets.
b. Always set the first push button for the desired station that broadcasts on the lowest frequency—the least number of kilocycles—and then set the next push button for the selected station operating on the next lowest frequency, continuing on in this manner until a Push Button has been set for all of the desired stations.
c. Loosen Push Button locking screw and remove cups on all Push Buttons by grasping cap between fingers and gently pulling outward—then remove celluloid discs.
d. Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.
e. Slide the Push Button nearest to the low frequency end of dial scale—without moving dial—until metal indicator attached to Push Button is exactly even with the indicator line on the face of the dial,—then with a small screw driver firmly lock Push Button in place by tightening Push Button locking screw.
f. Place printed paper station call letter tab, having call letters of station tuned in—on top of Push Button cup, then—place celluloid protective disc on top of this and gently press Push Button cap firmly down over Push Button cup.
g. Next set a Push Button for the desired station operating on the next lowest frequency in the same manner as above and continue on in this way until all the Push Buttons have been properly set.

AFTER THE TEN PUSH BUTTONS HAVE BEEN PROPERLY SET THEY WILL NOT REQUIRE FURTHER ATTENTION — EXCEPT WHEN MOVED FROM THEIR POSITION OR WHEN AN ADDITIONAL TAB IS INCLUDED WHICH WOULD DISTURB THE POSITION OF THE OTHER TABS.

FOR OTHER ASSEMBLIES SEE "AUTOMATIC TUNE" WHEEL DIAL ASSEMBLIES.

PARTS LIST

COMPLETE PUSH BUTTON DIAL ASSEMBLY LESS ESCUTCHEON

Part No.	Part Name	Description	List Price
211	Dial Assembly	Used With Model 78B Complete Assembly Less Escutcheon	$12.75
212	Dial Assembly	Used With Model 78BE Complete Assembly Less Escutcheon	12.75
208	Dial Assembly	Used With Model 82A Complete Assembly Less Escutcheon	12.75
209	Dial Assembly	Used With Model 82AE & 86AE Complete Assembly Less Escutcheon	12.75
210	Dial Assembly	Used With Model 91B & 95B Complete Assembly Less Escutcheon	12.25

MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

Part No.	Part Name	Description	List Price
4047	Cap	Push Button	.15
4046	Celluloid Disc	Station Call Letter Cover	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
4041	Cup Assembly	Push Button—With Clip and Compression Spring	.15
3995	Band Indicator Assem.	For Model 78BE-78B-91B-95B	.75
3992	Band Indicator Assem.	For Model 82AE-82A-86AE	.75
4011	Drive Drum Assem. with	4012 Secondary Pulley and Rubber Disc Coupler	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 78BE	.50
3984	Disc	Translucent Dial Scale Background for Model 82AE & 86AE	.55
4024	Disc	Translucent Dial Scale Background for Model 82A	.55
4029	Disc	Translucent Dial Scale Background for Model 91B, 95B & 78B	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4040	Hub Cap		.15
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4039	Plate	Slide Stop	.10
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x ¼" O.H.I.M.	.005
2754	Screw	For Pulley 6-32 x ¼" S.H.H. Cup Point	.01
4037	Slide Stop	Push Button Stop	.10
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

Prices are subject to change without notice.

When ordering parts be sure to mention part number and order all parts from:

Printed in U.S.A.

SPIEGEL INC.

MODELS 2104 to 2107
MODELS 4510,4556
Drive Cord Data

TO INSTALL No. 4013 SECONDARY DRIVE CORD:

The dial mechanism picture shows and refers to eye terminals on drive cord—these were used in early production. Loops made by knots in the cords are now used to attach cord to lugs in the No. 4009 die cast pulley and to the No. 4352 & 3462 tension springs.

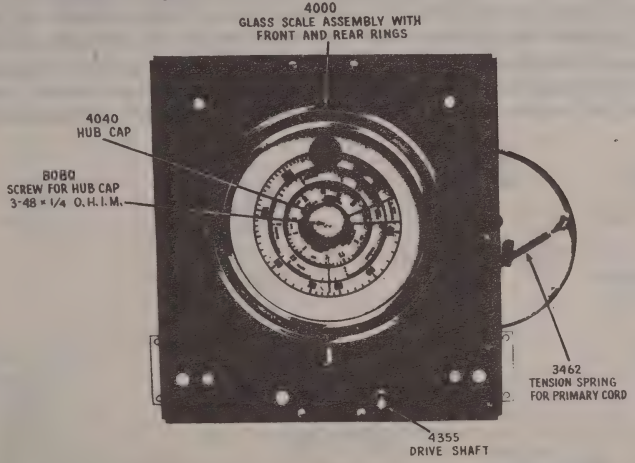
(a) Looking at the front of the dial rotate dial scale COUNTER-CLOCKWISE until dial stop is reached.

(b) Loosen the two No. 2754 set screws in small die cast pulley No. 4009.

(c) Looking at front of dial turn the small die cast pulley so that the cut out in pulley will be towards the left and approximately in line with the upper edge of the dial light bracket. This bracket which is only used in six volt battery and 110 volt AC models is shown mounted on the cadmium plated dial face plate bracket in dial mechanism picture.

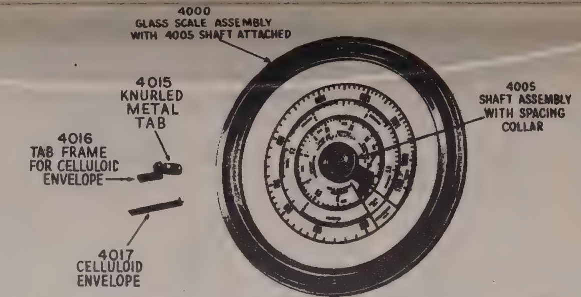
(d) Hook No. 4352 tension spring in dial cord loop.

(e) Turn No. 4011 drum so that the hole in the No. 4012 large die cast pulley—through which the secondary drive cord is pulled—is towards the top of face plate. This will bring the hole approximately in line with the left hand edge (looking at back of dial) of face plate.



(f) Take long end of No. 4013 secondary drive cord—measured from knot at spring to end of cord—then looking at the front of dial, wrap cord one complete turn CLOCK WISE around the No. 4009 small die cast pulley. The other end of the cord (short end) is placed on bottom half of secondary and primary die cast pulleys.

(g) Firmly tighten No. 2754 set screws in small die cast pulley.



COMPLETE WHEEL DIAL ASSEMBLY LESS ESCUTCHEON

Part No.	Part Name	Description	List Price
205	Dial Assembly	Used With Model 78B Complete Assembly Less Escutcheon	$12.75
206	Dial Assembly	Used With Model 78BE Complete Assembly Less Escutcheon	12.75
207	Dial Assembl·	Used With Model 82A Complete Assembly Less Escutcheon	12.75
201	Dial Assembly	Used With Model 82AE & 86AE Complete Assembly Less Escutcheon	12.75
204	Dial Assembly	Used With Model 91B & 95B Complete Assembly Less Escutcheon	12.25

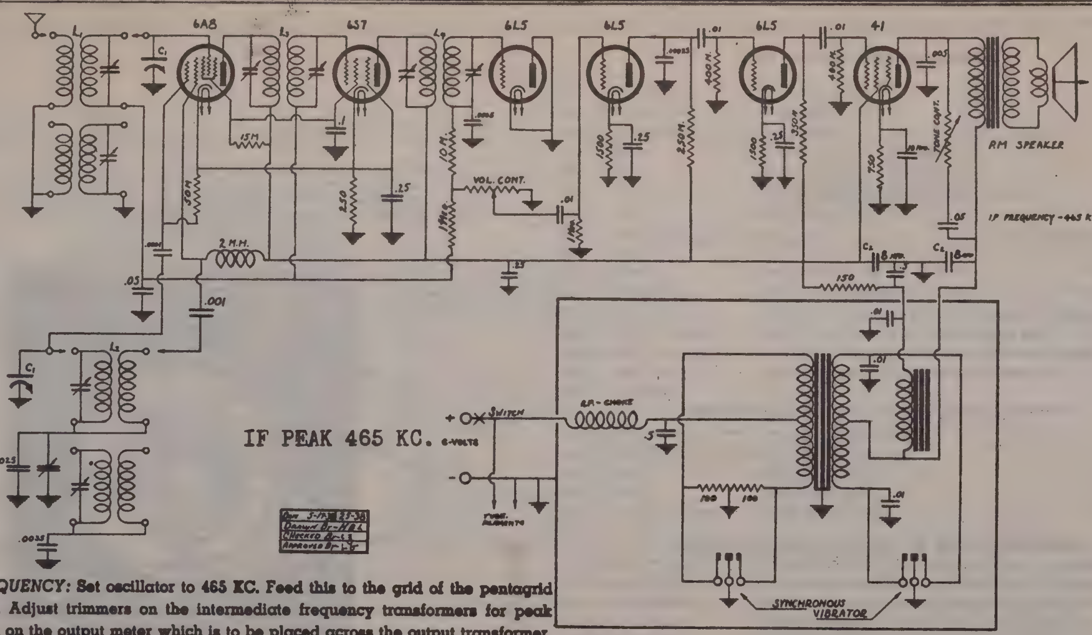
MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

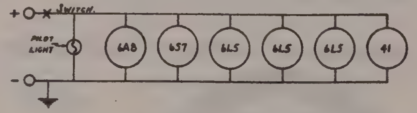
Part No.	Part Name	Description	List Price
4016	Celluloid Envelope	Station Call Letter Cover	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
3995	Band Indicator Assem.	For Model 78BE-78B-91B-95B	.75
3992	Band Indicator Assem.	For Model 82AE-82A-86AE	.75
4011	Drive Drum Assem. with	4012 Secondary Pulley and Rubber Disc Coupler	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 78BE	.50
3984	Disc	Translucent Dial Scale Background for Model 82AE & 86AE	.55
4024	Disc	Translucent Dial Scale Background for Model 82A	.55
4029	Disc	Translucent Dial Scale Background for Model 91B, 95B & 78B	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4017	Frame	Metal Holder for Celluloid Envelope	.05
4040	Hub Cap		.15
4015	Knurled Tab		.05
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x ¼" O.H.I.M.	.005
2754	Screw	For Pulley 6-32 x ¼" S.H.H. Cup Point	.01
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

Prices are subject to change without notice.

MODELS 2222,2223,2224,2225
Chassis 25
Schematic,Alignment

SPIEGEL INC.





L1 - ANT. COIL No 430
L2 - OSC COIL No 431
L3 - 1st IF TRANSFORMER No 101T
L4 - 2nd IF TRANSFORMER No 101B
BAND SWITCH No 124
TONE CONT. No 305
VOL. CONT. & SWITCH No 221

C1 - TUNING COND. No 624
C2 - FILTER COND. No 1720
SPEAKER 6" No 722 - 8" No 723
OUTPUT TRANSFORMER No 524
POWER TRANSFORMER No 526
VIBRATOR No 480

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are pro-

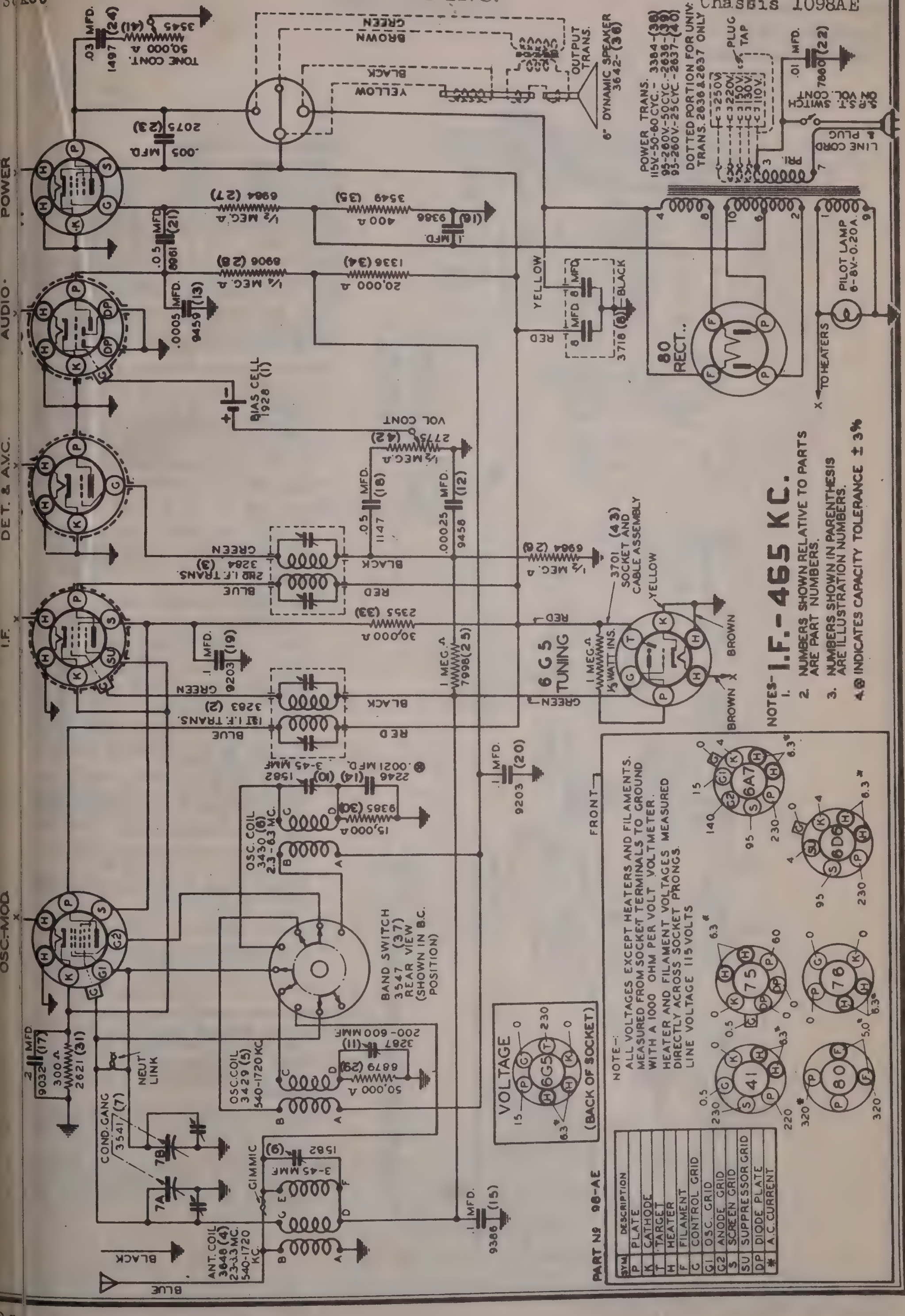
This receiver is designed to operate over two tuning ranges.

from 540 K.C. to 1730 and

Sc ematic,Voltage
Sc ket

SPIEGEL INC.

MODELS 4000,4020
Chassis 1098AE



POWER TRANS.
115V-50-60CYC.- 3384-(38)
95-260V-50CYC.-2636-(39)
93-260V-25CYC.-2637-(40)
DOTTED PORTION FOR UNIV. TRANS. 2636&2637 ONLY

NOTES-
1. I.F.-465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4.⊗ INDICATES CAPACITY TOLERANCE ± 3%

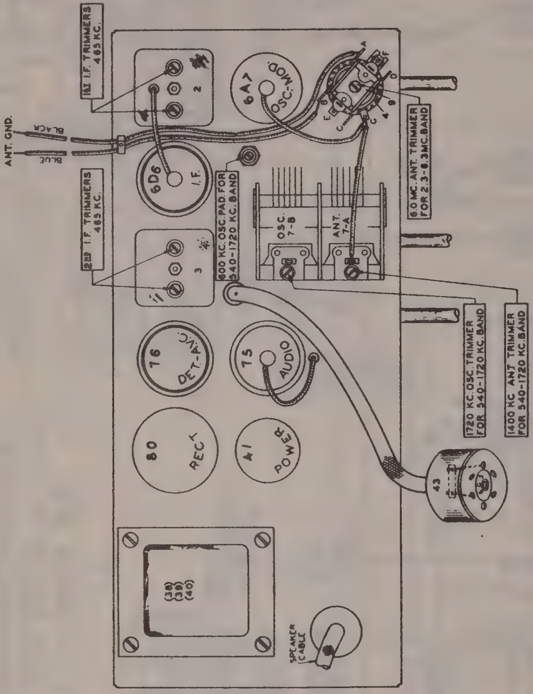
NOTE:-
ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS. MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER.
HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET PRONGS.
LINE VOLTAGE 115 VOLTS

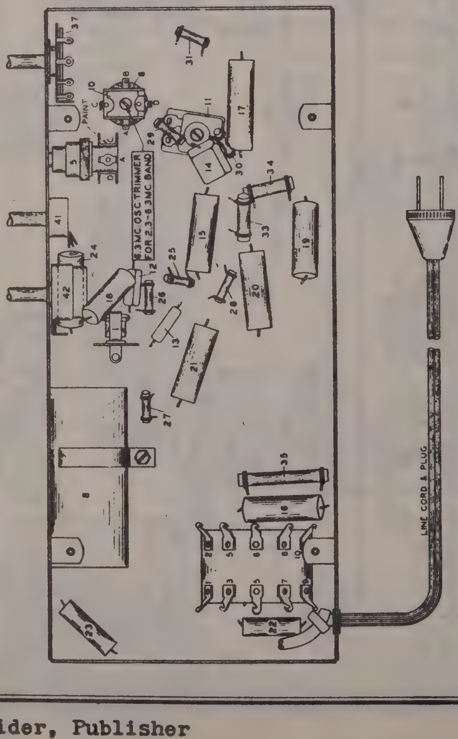
PART No 98-AE

SYM	DESCRIPTION
P	PLATE
K	CATHODE
T	TARGET
H	HEATER
F	FILAMENT
G	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
S	SCREEN GRID
SU	SUPPRESSOR GRID
DP	DIODE PLATE
*	A.C. CURRENT

MODELS 4000,4020
Chassis 1098AE
Chassis,Socket
Alignment,Trimmers

SPIEGEL INC.


1ST I.F. TRIMMERS 465 KC.
2ND I.F. TRIMMERS 465 KC.
ANT. GND.
BLACK
BLUE
2
3
6A7 OSC.-MOD.
6D6 I.F.
600 KC. OSC. PAD. FOR 540-1720 KC. BAND
6.0 MC. ANT. TRIMMER FOR 2.3-6.3 MC. BAND
OSC. 7-B
ANT. 7-A
1720 KC. OSC. TRIMMER FOR 540-1720 KC. BAND
1400 KC ANT TRIMMER FOR 540-1720 KC. BAND
76 DET.-AVC.
75 AUDIO
80 RECT.
41 POWER
43
(38)
(39)
(40)
SPEAKER CABLE
A
B
C
D
E
F
G



ALIGNMENT PROCEDURE:

Lack of sensitivity, selectivity or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.

(c) Peak each of the second I.F. transformer trimmers.

(d) Peak each of the first I.F. transformer trimmers.
To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.

(b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.

(c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.

(d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.

(f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.

(g) Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.

(h) While rocking the tuning condenser back and forth adjust 600 KC oscillator padder condenser which is accessible through the hole in the top of the chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

(a) Replace .00025 Mfd. Test oscillator antenna lead series condenser with a 400 ohm resistor.

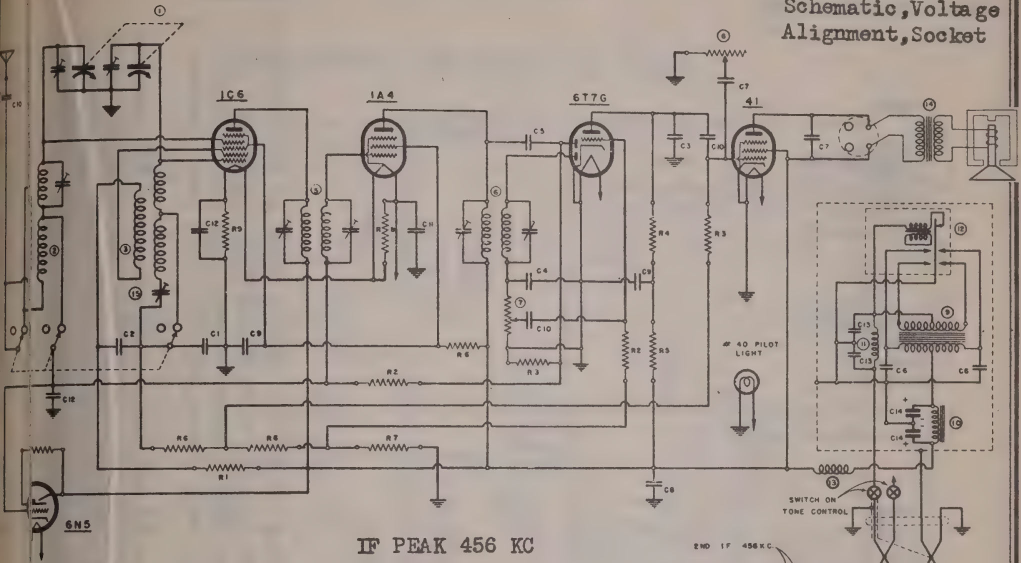
(b) Adjust band selector switch for 2.3-6.3 megacycles band operation, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.

(c) Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer on top of coil located underneath chassis.

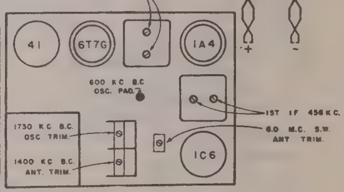
(d) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles, and adjust 6 M.C. antenna trimmer which is mounted on coil located on top of chassis for maximum sensitivity.

SPIEGEL INC.

MODELS 4402,4410
Chassis 562
Schematic,Voltage
Alignment,Socket



IF PEAK 456 KC



PART		DESCRIPTION					
R1	6120	20,000	OHM	1/2	WATT	CARBON	RES.
R2	6017	1 MEG.	"	1/3	"	"	"
R3	6018	500,000	"	"	"	"	"
R4	602	250,000	"	"	"	"	"
R5	602	100,000	"	"	"	"	"
R6	602	25,000	"	"	"	"	"
R7	60-	4,000	"	"	"	"	"
R8	60-	33 1/3	"	1/2	"	WIRE WOUND	"
R9	60-	16 2/3	"	"	"	"	"

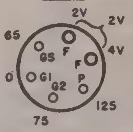
	PART NO.	DESCRIPTION				
C1	1509C	.002	MFD	MICA	± 5%	
C2	1500	.001	"	"		
C3	1504	00025	"	"		
C4	1501	0001	"	"		
C5	1503	.00005	"	"		
C6	1604	01	"	600V	TUBULAR	COND.
C7	1611	.006	"	"	"	"
C8	1616	.25	"	400V	"	"
C9	1601	1	"	"	"	"
C10	1603	.01	"	"	"	"
C11	1614	.25	"	200V	"	"
C12	1600	1	"	"	"	"
C13	1655	5	"	160V	"	"
C14	1645	DUAL 8	"	150V	ELECT'L'TIC	"

	PART NO	DESCRIPTION 562
1	19-113	2-GANG VARIABLE CONDENSER
2	10-123	ANTENNA COIL
3	10 124	OSCILLATOR COIL
4	69-111	WAVE SWITCH
5	10-185	1ST I.F TRANSFORMER
6	10-186	2ND I.F.
7	24-105	VOLUME CONTROL
8	26-107	TONE CONTROL WITH SWITCH
9	80-130	POWER TRANSFORMER
10	3307	FILTER CHOKE
11	33-200	R F "A" "
12	3407	VIBRATOR
13	33-204	R.F. "B" CHOKE
14		SPEAKER
15	20-100	B.C. OSC. PADDING CONDENSER

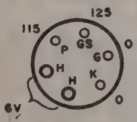
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER
ALL VOLTAGES EXCEPT HEATERS MEASURED TO GROUND.

F - - - FILAMENT
H - - - HEATER
K - - - CATHODE
SU - - SUPPRESSOR
GS - - SCREEN GRID
G1 - - OSC. GRID
G2 - - OSC. PLATE
G - - - CONTROL GRID
DP - - DIODE PLATE
P - - - PLATE

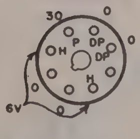
1C6



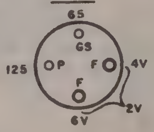
41



6T7G



1A4



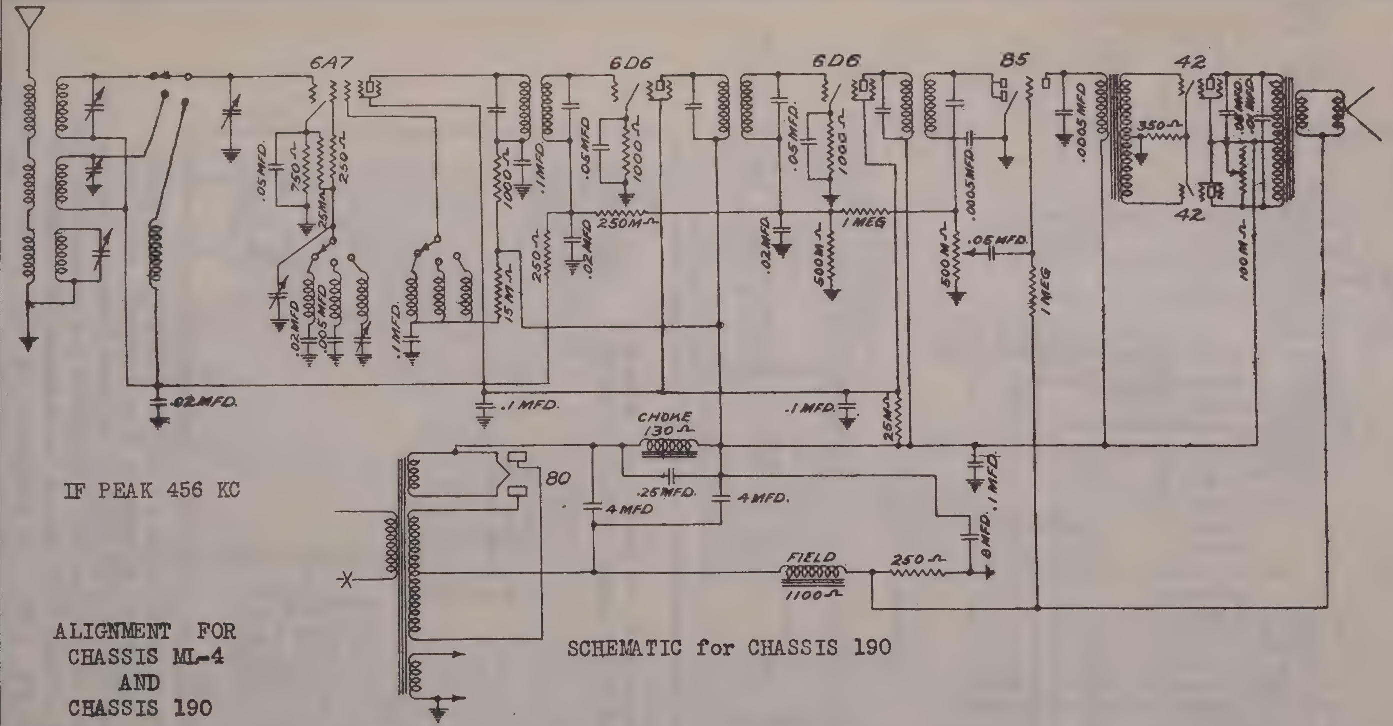
562

IF ALIGNMENT - Set test oscillator at 456 KC and adjust trimmers for maximum output. BROADCAST ALIGNMENT - At 1730 KC, adjust BC oscillator for maximum output. At 1400 KC adjust Antenna trimmer for maximum output. At 600 KC, adjust BC oscillator for maximum output. SHORT WAVE ALIGNMENT - Feed 6 MC signal to antenna thru .00025 MF and adjust SW trimmer at 6 MC. BC alignment is thru .00025 MF cond.

MODELS 4504,4507,4536
9936, Chassis 190
Schematic,Alignment

SPIEGEL INC.

MODELS 1904,1916,1952,
Chassis ML-4
Alignment



IF PEAK 456 KC

SCHEMATIC for CHASSIS 190

ALIGNMENT FOR
CHASSIS ML-4
AND
CHASSIS 190

ALIGNMENT OF IF STAGES - Align four IF trimmers to peak or max. reading at 456 KC, thru .05 or .1 mf condenser.

BROADCAST BAND - Set test osc. at 1400 KC and connect output to antenna post, thru a .0001 mf condenser. Set dial at 1400 KC and adjust Osc. trimmer to peak (located on rear gang condenser section). Then adjust center RF trimmer and front pre-selector trimmer to peak. Adjust Osc. padder at 600 KC to peak. Padder is located at left-hand end of chassis near 6D6 tube.

FOREIGN BAND - Band of 19 to 49 meters is adjusted by two trimmers on SW coil at top of chassis. Set Osc. at 14000 KC. Osc. is near 1st IF transformer and the antenna coil is in front of SW osc. coil. Adjust these two trimmers at 14000 KC for peak. NOTE: Always start by having the osc. coil trimmer loose and the antenna coil trimmer fairly tight (in all the way); other wise a false alignment of the IMAGE frequency is possible. Do not adjust gang condenser trimmers in aligning the Foreign or Police Bands, as this will

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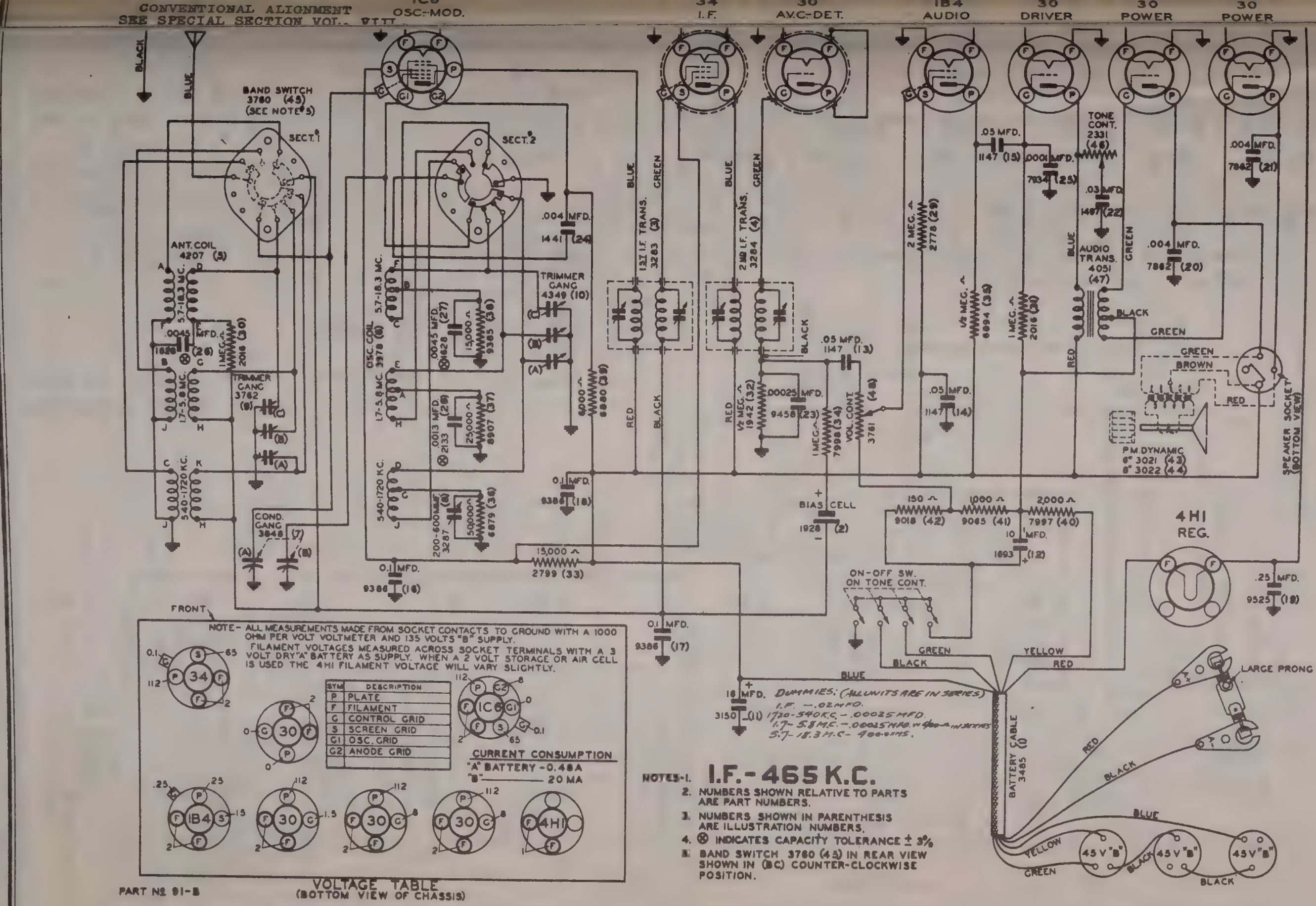
MODELS 4510,4556
Chassis 1091B
Schematic,Voltage
Alignment,Socket

SPIEGEL INC.

FOR AUTOMATIC TUNE WHEEL SEE INDEX

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII



DUMMIES: (ALL UNITS ARE IN SERIES)
I.F. — .02 MFD.
1720-540 K.C. — .00025 MFD.
1.7-5.8 M.C. — .00025 MFD. w 400-Ω in series
5.7-18.3 M.C. — 400 ohms.

NOTE- ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 135 VOLTS "B" SUPPLY.

FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY "A" BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR CELL IS USED THE 4HI FILAMENT VOLTAGE WILL VARY SLIGHTLY.

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	ANODE GRID

CURRENT CONSUMPTION
"A" BATTERY - 0.48A
"B" —— 20 MA

PART NO 91-B

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

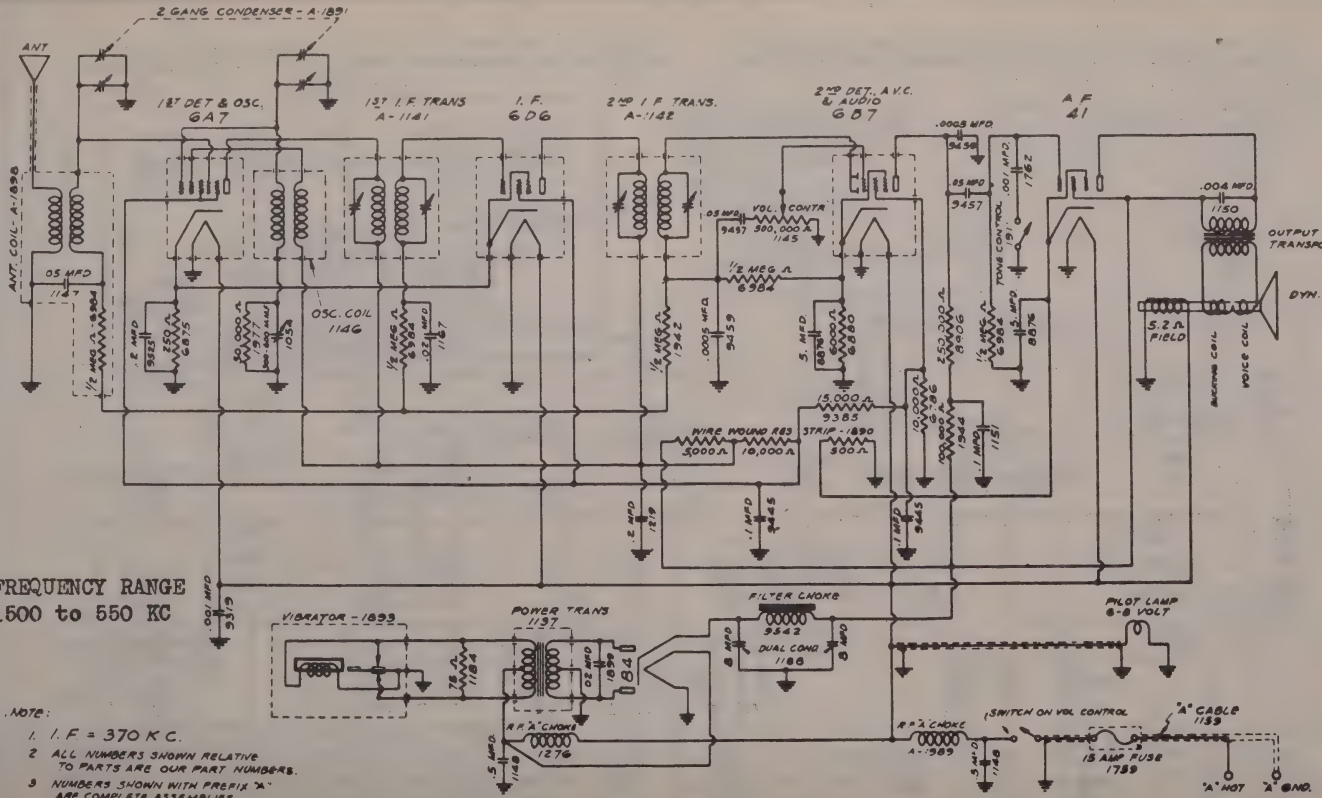
NOTES-1. I.F.-465 K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%
5. BAND SWITCH 3760 (45) IN REAR VIEW SHOWN IN (BC) COUNTER-CLOCKWISE POSITION.

Looking at bottom of chassis, the three antenna trimmers on coil attached to front of chassis, reading from front to rear are; 1400 KC, 5 MC & 15 MC.

The three oscillator trimmers on the coil mounted on side of chassis, reading from chassis to end of coils are: 1720 KC, 5.8 MC & 18.3 MC.

MODEL 4534,Chassis 10M
Schematic,Voltage
Alignment

SPIEGEL INC.



FREQUENCY RANGE
1500 to 550 KC

NOTE:
1. I.F. = 370 K C.
2 ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3 NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

ALIGNMENT FREQUENCIES
IF 370 KC
Os. & Ant. 1400 KC
Padder 600 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL

TUBE TYPE	TUBE POSITION	FILAMENT VOLTS	PLATE VOLTS	CATHODE VOLTS	SCREEN VOLTS	GRID No.1	GRIDS No. 3&5
6A7	OSC. & MOD.	6	180	3.6		180	75
6D6	I-F	6	180	3.6	75	-	-
6B7	2nd Det & AVC	6	32 *	1.9	30*	-	-
41	OUTPUT	6	220	15	230	-	-

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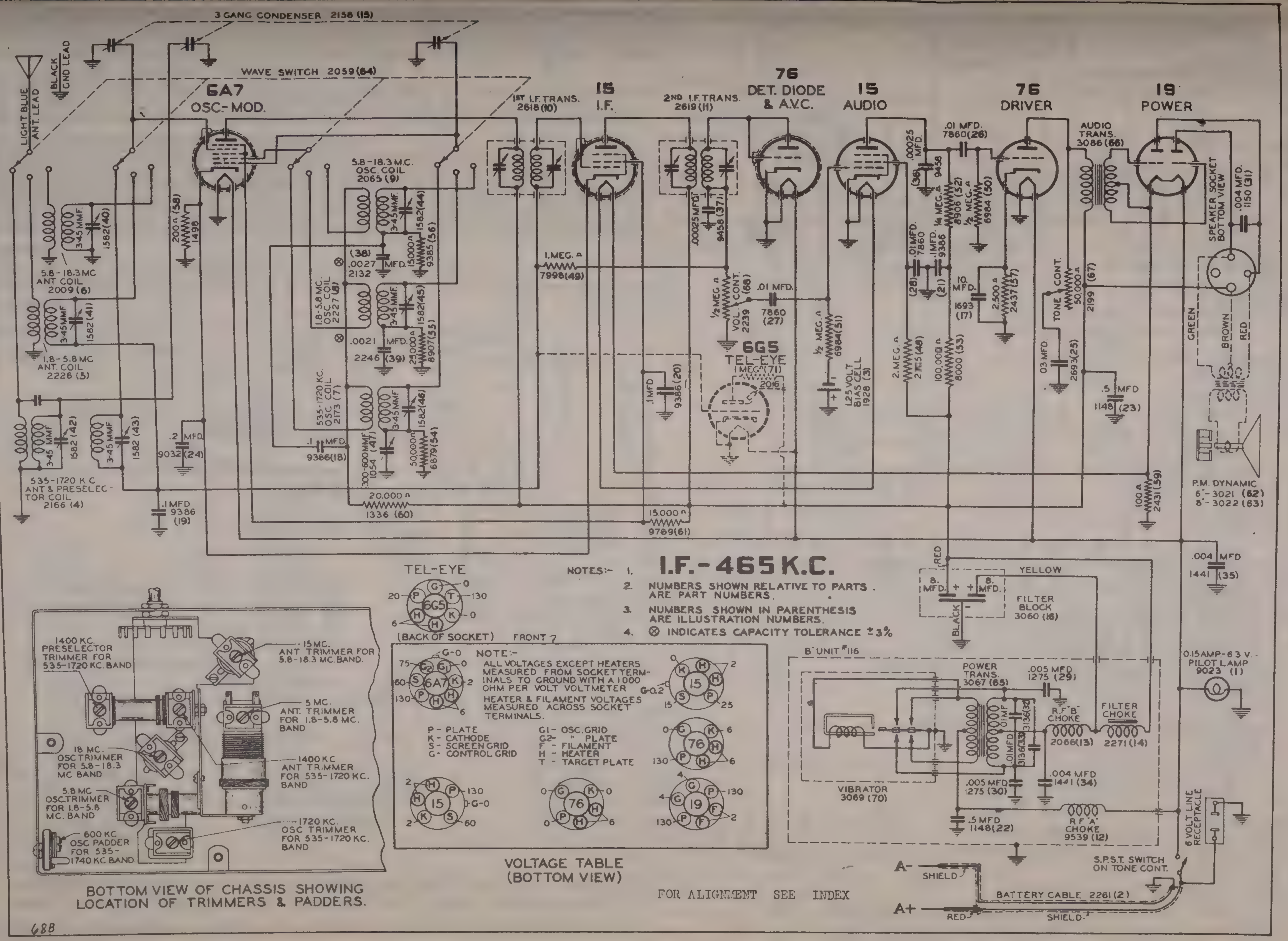
SPIEGEL INC.

MODEL 6700,Chassis 68B
Schematic,Voltage
Socket,Trimmers



NOTES:-
1. I.F.-465 K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS. ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. ⊗ INDICATES CAPACITY TOLERANCE ±3%

NOTE:-
ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER

HEATER & FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS.

P - PLATE
K - CATHODE
S - SCREEN GRID
G - CONTROL GRID
G1 - OSC. GRID
G2 - " PLATE
F - FILAMENT
H - HEATER
T - TARGET PLATE

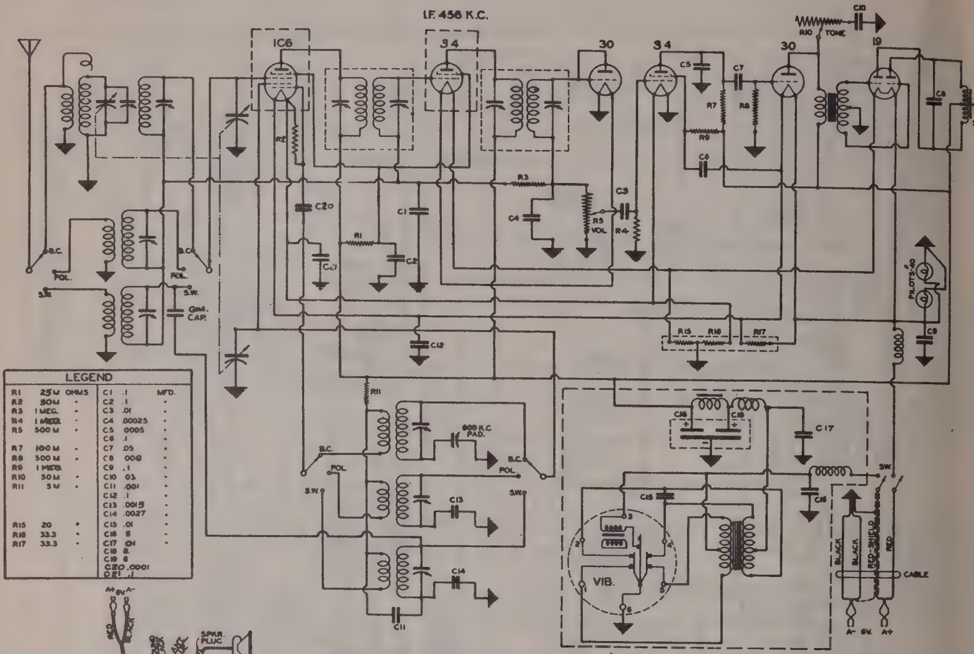
VOLTAGE TABLE (BOTTOM VIEW)

BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDERS.

FOR ALIGNMENT SEE INDEX

MODELS 6714, 6758
Chassis 600
Schematic, Alignment
Socket, Trimmers

SPIEGEL INC.

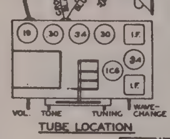


LEGEND					
R1	25M	OHMS	C1	.1	MFD.
R2	50M	"	C2	.1	"
R3	1 MEG.	"	C3	.01	"
R4	1 MEG.	"	C4	.00025	"
R5	500 M	"	C5	.0005	"
			C6	.1	"
R7	100 M	"	C7	.05	"
R8	500 M	"	C8	.006	"
R9	1 MEG.		C9	.1	"
R10	50 M	"	C10	.03	"
R11	5 M	"	C11	.001	"
			C12	.1	"
			C13	.0015	"
			C14	.0027	"
R15	20	"	C15	.01	"
R16	33.3	"	C16	5	"
R17	33.3	"	C17	.01	"
			C18	8	
			C19	8	
			C20	.0001	
			C21	.1	

A good ground connection to a water pipe or other metallic conductor entering into the ground for some distance is ESSENTIAL.

WARNING: IF WINDCHARGER IS USED DO NOT OPERATE SET WITH CHARGER CONNECTED.

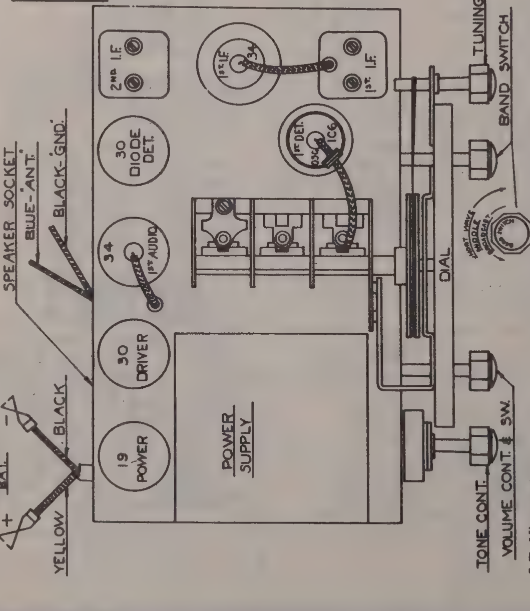
Warning: Place Storage Battery in such a position that clips on Battery Cable may be fastened directly to Battery Terminals. Do not add any additional wire length to cables as this will make the set hum.



TUBE LOCATION

6-Tube, 6-Volt Superheterodyne Battery Receiver

BANDS	SWITCH
537 to 1730 KC	LEFT
1.8 to 5.7 MC	CENTER
5.7 to 18.3 MC	RIGHT



I. F. Alignment:

Connect the oscillator through a .1 condenser to the grid of the 1C6 tube and set the oscillator to 456 kilocycles. Peak each I. F. stage to resonance as indicated by maximum output on the output meter.

R. F. Alignment:

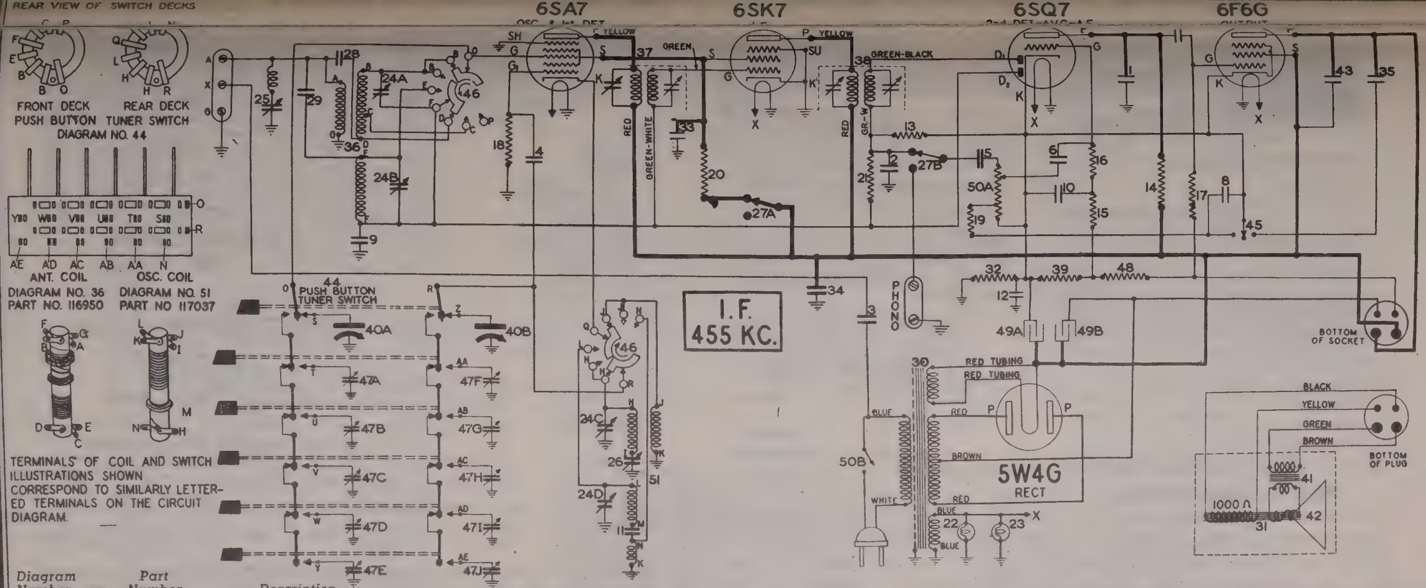
With the wave change switch in the broadcast position, set oscillator to 1700 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1700 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. This trimmer is located on the right side of the chassis, second position from the front. Reset the test oscillator to 1400 kilocycles and adjust antenna trimmer located on top of rear section of variable condenser. Peak detector trimmer located across proselector coil under chassis. Now set oscillator to 600 kilocycles and adjust padder located on top of the chassis. Check alignment at 1000 kilocycles.

For aligning the police band, set test oscillator to 5 megacycles and switch to the police band position on the set. With the condenser rotated to this frequency setting as indicated on the dial, adjust oscillator trimmer located on the right sid eof the chassis, first position from the front. Now adjust antenna trimmer located on the front of the chassis, left position, to resonance.

The short wave band is aligned by setting the condenser to 18 megacycles and adjust the oscillator trimmer located on the right side of the chassis, first position from the front to resonance with an 18 megacycle signal from the test oscillator. Turn dial to 16 M. C. Set test oscillator to 16 M. C. and adjust antenna trimmer through right hand hole in front of chassis, rocking variable condenser slightly back and forth to get maximum peak.

STEWART-WARNER CORP.

MODELS 01-5H1 to 01-5H9
Chassis 01-5H
Schematic, Voltage



TERMINALS OF COIL AND SWITCH ILLUSTRATIONS SHOWN CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

Diagram Number	Part Number	Description
1-2-3	83539	Condenser—mica 260 mmfd.
4	85061	Condenser—mica 51 mmfd.
5-6-7	88026	Condenser—paper .02 mfd. 400 volt
8	88030	Condenser—paper .01 mfd. 400 volt
9-10	88189	Condenser—paper .05 mfd. 200 volt
11	88587	Condenser—mica .0042 mfd.
12	89421	Condenser—paper .1 mfd. 200 volt
13-14	110553	Resistor—carbon 220,000 ohms ¼ watt
15-16	110554	Resistor—carbon 1 megohm ¼ watt
17	110559	Resistor—carbon 470,000 ohms ¼ watt
18-19	110566	Resistor—carbon 33,000 ohms ¼ watt
20	110568	Resistor—carbon 15,000 ohms 1 watt
21	110580	Resistor—carbon 3.3 meg. ¼ watt
22-23	110629	Lamp—6.3 volt—.25 amps.
24A to 24D	112792	Condenser—trimmer (4 section)
25	112796	Coil—wave trap (with trimmer)
26	112799	Condenser—padder (530 to 630 mmfd.)
27A-27B	114141	Switch—radio—phono (D.P.D.T.)
28-29	114969	Condenser—mica 15 mmfd.
30	114999	Transformer—power
31	M-115059	Speaker—8" electro-dynamic
32	116077	Resistor—150 ohms—¼ watt
33-34	116625	Condenser—.1 mfd. 600 volt
35	116893	Condenser—.02 mfd. 600 volt
36	116950	Coil—antenna
37	116954	Transformer—1st I.F.
38	116955	Transformer—2nd I.F.
39	116967	Resistor—25 ohms 1 watt wire wound
40A-40B	116996	Condenser—variable gang
41	M-117091	Transformer—output for M-115059 speaker
42	M-117092	Cone & Voice coil assembly for M-115059 speaker
43	117022	Condenser—.002 mfd. 600 volt
44	117024	Switch—push button
45	117025	Tone control
46	117026	Range switch
47A to 47J	117027	Trimmer condenser—gang
48	117032	Resistor—300 ohms 1 watt
49A-49B	117034	Condenser—dual electrolytic—Section A, 10 mfd.—Section B, 15 mfd.
50A-50B	117035	Volume control with on-off switch
51	117037	Coil—oscillator

NOTE A: The bias on the control grids of the 6SA7 and 6SK7 tubes and on the diode plates of the 6SQ7 tube is —2.7 volts measured across resistor No. 32.

BOTTOM VIEW OF CHASSIS SOCKET VOLTAGES

These readings taken using a voltmeter of 1000 ohms per volt.

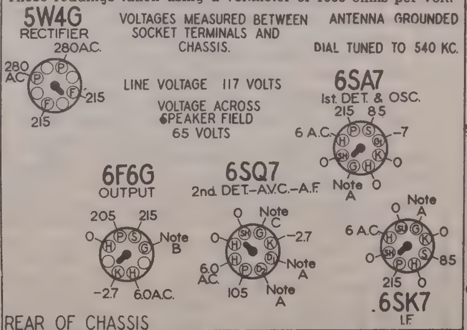
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.

ANTENNA GROUNDED

DIAL TUNED TO 540 KC.

LINE VOLTAGE 117 VOLTS

VOLTAGE ACROSS SPEAKER FIELD 65 VOLTS



REAR OF CHASSIS

NOTE B: The bias on the control grid of the 6F6G tube is —18 volts measured across resistors No. 39 and 48.

NOTE C: The bias on the control grid of the 6SQ7 tube is —4 volts measured across resistor No. 39.

CHASSIS 01-5H
CHASSIS 02-4A
Alignment, Trimmers
Socket, Notes

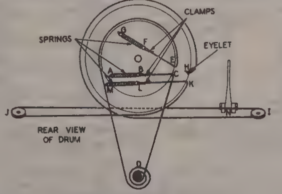
STEWART-WARNER CORP.

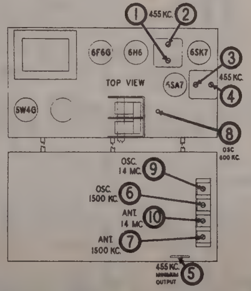
ALIGNMENT PROCEDURE FOR 01-5H CHASSIS

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis. NOTE: Remove the connector from between the "A" and "X" terminals.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the pointer at a point 1⅛" from the left flange of the brown dial plate. This point corresponds to the last mark on the low frequency end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screws on the dial drive drum and push the gang condenser in full mesh, with the pointer properly set, then retighten the set screws.

Dummy Ant. in Series with Sig Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Front Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	5	Wave Trap	Adjust for minimum output using a strong generator signal.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC (2⅜" from right Dial Plate end)	6	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune To 600 KC Generator Signal	8	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC (2-7/16" from right Dial Plate end)	9	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. If image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC	10	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

REPLACING TUNING AND POINTER DRIVE CARDS





MISCELLANEOUS PARTS

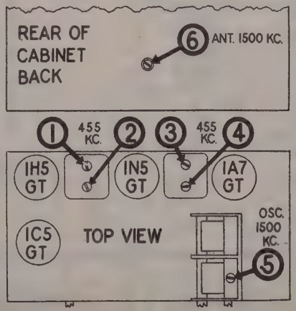
Part Number	Description		List Price
117008	Call letter tabs and instruction sheets		$0.45
114955	Clamp for dial cord		.01
112745	Clip—coil mtg.		.01
112798	Clip—wave trap mtg.		.01
85321	Connector—for internal antenna		.01
116948	Cord—dial		.18
117057	Cord—drive		.15
117021	Dial scale and escutcheon		1.75
117029	Drive drum and bushing		.50
116998	Escutcheon for push buttons		.30
88348	Eyelet for dial cord	Per Dz.	.05
116773	Knob tuning or volume		.10
116952	Pin for push buttons		.02
110496	Plug 4 prong—for speaker		.12
117036	Pointer assembly		.28
112762	Pulley dial cord drive		.04
116999	Push button		.08
117019	Reflector for pilot light		.04
81145	Retaining ring—for drive shaft	Per C	.50
83552	Screw chassis mtg.		.03
85040	Screw—No. 6 Hex. Hd.	Per C	.35
83624	Screw self tapping 8 x ¼		.01
114914	Screw special head—for mtg. escutcheon	Per Dz.	.15
114117	Socket—dial lamp		$0.18
110501	Socket—4 prong (for speaker)		.16
116690	Socket—octal base (small)		.12
111090	Spacer—steel		.02
116981	Spring—pointer cord tension		.06
113177	Spring—dial cord tension		.09
117458	Spring—push button		.05
116536	Terminal strip (G.X.A.)		.15
84407	Terminal strip—phono		.12
117033	Tuning shaft		.12
111456	Washer spring washer	Per C	.50
118530	Washer (paper) for back of knobs		.005

ALIGNMENT EQUIPMENT & PROCEDURE 02-4A

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 1C5GT output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position while aligning. The loop antenna should always be connected.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to loosen the set screw on the dial drum, move the pointer to the horizontal position with the gang in full mesh, and tighten the set screw.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Control Grid of 1A7GT	455 KC.	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
At this point place the chassis in the cabinet and turn the dial until the pointer indicates 1500, now remove the chassis and proceed with the alignment without disturbing this dial setting.						
400 Ohm Carbon Resistor	"Ant" Terminal	1500 KC.	1500 KC.	5	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
400 Ohm Carbon Resistor	"Ant" Terminal	1500 KC.	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.
Now disconnect the output meter and signal generator leads and replace the chassis and batteries in the cabinet being sure to connect the loop. Bring the antenna lead of the signal generator near the loop until the 1500 KC. signal is heard weakly, and readjust trimmer No. 6 for maximum output by ear.						



USING AN OUTSIDE ANTENNA

An outside antenna may be connected to this radio to provide better signal pick-up on weak stations. When this is done, a ground connection should also be used. The antenna and ground wires should be brought in through the hole provided in the bottom of the cabinet and connected to the terminals marked "ANT." and "GND." on the inside of the cabinet back.

When using an outside antenna, a weak signal near 1500 KC should be tuned in and trimmer No. 6 adjusted for maximum volume. If it is impossible to get a proper peak on this trimmer, check the connections of the white and green-white wires to see if they are reversed.

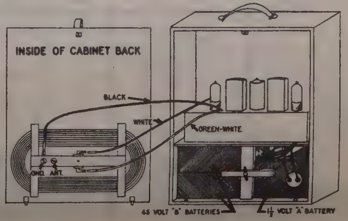
INSTALLATION OF BATTERIES

The following 1½ volt "A" batteries will fit the space provided: Eveready No. 743 or Ray-O-Vac No. P96A.

"B" batteries of the proper size are Eveready No. 727 or No. 482 or Ray-O-Vac No. BB30P. Where long life is desired, the Eveready No. 482 is especially recommended.

To install the batteries, first slide the "B" batteries into place as shown in the drawing below, and connect a three pronged plug to each one. Slide the "A" battery into place as shown and connect the two pronged plug to it. Fasten the battery supporting block as shown and secure it with a washer and wing nut.

CAUTION: Do not attempt to install or remove the "B" batteries unless the battery plugs are disconnected. When replacing the cabinet back be sure to connect the plugs to the proper receptacles on the loop as shown in the drawing, otherwise improper operation may result.



STEWART-WARNER CORP.

MODEL 01-6C9,Ch.01-6C
Notes,Parts

1. Never use force to start or stop the motor or any part of the record-changing mechanism or pickup arm.

2. The use of records which have become warped or damaged through improper care may cause the mechanism to jam and damage the instrument. In addition, records which have become warped will slide on one another when playing, resulting in unsatisfactory reproduction.

3. This instrument is NOT RECOMMENDED for playing 10-inch and 12-inch records in mixed sequence. If the user desires this service he must be positive that all records are perfectly flat and free from warp. The Index and Record Reject Lever must be set at "10" and after playing the last selection the pickup will come down in position for a 10-inch record and repeat the playing of the record on a 10-inch diameter unless the Turntable Switch is turned off. Any jamming of the mechanism under these conditions indicates that the records used are not perfectly flat or that their edges are not sufficiently smooth to permit normal operation of the separators in dropping each record in sequence onto the turntable.

Controls and Moving Mechanism

Index and Record Reject Lever.—This lever is located near the right front corner of the motorboard with its index plate marked for four positions—"MANUAL," "12," "10," and "REJECT." When you desire to change record selections manually, this lever should be set in the "MANUAL" position. With the lever in the "12" position, the mechanism is set to play a series of 12-inch records automatically. To play either a series of 10-inch records, or 10- and 12-inch records mixed, the lever should be set at the "10" position.

To reject a record being played, or to start the record-changing cycle in case the record just played does not have the standard eccentric or spiral stopping groove, simply push the lever to the "REJECT" position and let go. The pickup will raise up and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its "MANUAL" position when not actually playing records automatically.

Turntable Switch.—The switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. LEAVE THIS SWITCH IN THE "ON" POSITION AT ALL TIMES.

Pickup and Top-Loading Needle Socket.—The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved out to the right beyond the turntable and placed at rest on the support with the pickup over the needle gauge plate. The edge of the pickup in the early type record player must be in the groove provided, while in the later type, it should be just beyond the vertical lug on the corner of the used needle box. The pickup must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw.

Needle Ejector.—The extending tab on the needle gauge plate of the needle box operates the needle ejector. To change a needle, place pickup in rest position, loosen needle screw and press the extending tab on the needle gauge plate to drop the used needle into the box below. Release tab, allowing the needle gauge plate to swing back, and then insert a new needle in the pickup as described above.

The used needle box may be taken out and emptied by first lifting the pickup off its rest and allowing it to float between the rest and the turntable. Then tilt the box upwards at the front and lift out. To replace the box, tilt it upwards at front and lower it into the hole with the lug on the back of the box in the slot in the motorboard. Slide the lug under the motorboard and push the box in place. Replace the pickup on its rest.

Record Holder Shelves.—To place a record on the turntable or to remove records, raise the record holder shelves and swing clear of outer edge of record. Also push back vertical lever adjacent to the rear record holder post. You now have clear access to the turntable. Before loading the magazine for Automatic Operation swing the record holder shelves back into position.

Automatic Operation

1. Push the button marked "ON" and turn RADIO-PHONO switch to PHONO.

2. See that pickup is over needle gauge plate with needle properly in place. If not, complete a "cycle" as explained in the second paragraph under "OPERATING INSTRUCTIONS."

3. With Index and Record Reject Lever at "MANUAL" swing the record holder shelves out of the way and place the first of the series of records on the turntable. Swing the record holder shelves back into the position where they drop down slightly and snap into place. Then put the remainder of the records (up to seven 10-inch or six 12-inch records) on the record holder posts (as shown in Figure 1). The records should be arranged in the desired order with the desired selection face up and the last selection on top.

4. Set the Index and Record Reject Lever to the proper position. (See INDEX AND RECORD REJECT LEVER)

Manual Operation

To play records manually:

1. Proceed as in steps 1 and 2, under "AUTOMATIC OPERATION."
2. Place record on turntable with desired selection upwards.
3. Set Index and Record Reject Lever to "MANUAL" position.
4. Proceed as in steps 5, 6 and 7 under "AUTOMATIC OPERATION."

When you have finished playing, be sure that the turntable has stopped and the pickup is in the rest position over needle gauge plate. Never leave pickup with needle resting on a record or on the turntable.

5. Throw the Motor switch to "ON." This is the left hand knob on the front of the cabinet. The turntable should commence to revolve.

6. When turntable has attained speed, lift pickup and lower gently on to the record so that the needle point enters the outside groove.

7. Close the lid of the cabinet to eliminate mechanical reproduction of sound by the needle. Adjust the radio volume control knob to the desired volume and push in the tone control button giving the most pleasing tone.

The whole series of records will now play without further attention, and the last record will repeat until the Phono Motor Switch is turned off. **Allow the record-changing mechanism to complete its cycle before the turntable is stopped.** Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with pickup over needle gauge plate. The record player is then ready for reloading, or for manual operation.

NOTE.—A bind or a jam in the mechanism can usually be relieved by rotating the turntable by hand in the reverse direction.

PARTS LIST

OPERATING MECHANISM

Diagram No.	Part No.	DESCRIPTION
1	S-14209	Bumper—Main lever rubber bumper (early type only)
2	S-31151	Guide—Pickup lift cable guide (coil spring 80T 2-in. large)
3	S-31134	Bracket—Pickup locating lever mounting bracket
5	S-6808	Clutch—Trip lever friction clutch assembly
7	S-31116	Finger—Trip lever friction finger assembly
10	S-31121	Gear—Record post gear
11	S-31123	Guide—Main lever spring guide
12	S-31114 S-33992	Lever—Index lever assembly (early type) Lever—Index lever assembly (late type)
13	S-31137	Lever—Index lever tension spring lever
14	S-31138	Lever—Locating lever and pawl assembly
15	S-31113 S-33985	Lever—Main lever assembly (early type) Lever—Main lever assembly (late type)
16	S-31140	Lever—Pickup lift cable lever and spring assembly
17	S-31135 S-34002	Lever—Pickup locating lever assembly (early type) Lever—Pickup locating lever assembly (late type)
18	S-31130	Lever—Record separator elevating lever complete with adjusting screws
19	S-31132	Lever—Trip detaining lever
20	S-31115	Lever—Trip lever assembly
21	S-31131	Lever—Trip regulator lever
22	S-31133	Pawl—Trip pawl assembly
23	S-31124	Pin—Record post drive pin
24	S-14207	Roller—Pickup lift cable roller and bracket assembly
25	S-31126 S-34775	Separator—Record separator knife (early type) Separator—Record separator knife and cap (late type)
26	S-31122 S-33988	Shaft—Record separator post shaft (early type) Shaft—Record separator post shaft (late type)
27	S-31125 S-33989	Shelf—Record post shelf assembly (early type) Shelf—Record post shelf assembly (late type)
28	S-14190	Spring—Pickup locating lever short spring or locating lever pawl tension spring (16 turns, .180-in. O.D., 19/32-in. lg.)
30	S-31136	Spring—Index lever tension spring (25 turns, .190-in. O.D., 15/16-in. lg.)
31	S-3666	Spring—Pickup lift cable tension spring (20 turns, .195-in. O.D., 1-in. lg.)
32	S-31127	Spring—Record separator pressure spring (8 turns, ⅜-in. O.D., ¾-in. lg.) (early type only)
33	S-14191	Spring—Trip detaining lever tension spring (15 turns, .190-in. O.D., ¾-in. lg.)
34	S-31875	Spring—Pickup locating lever tension spring (14 turns, .220-in. O.D., 27/32-in. lg.)
35	S-32436	Spring—Locating lever tension spring (16 turns, .182-in. O.D., 21/32-in. lg.)
40	S-32880	Gear—Rack gear for rear right-hand record post
41	S-32879	Gear—Rack gear for front left-hand record post
42	S-32878 S-33987	Cam—Cam and drive gear (early type) Cam—Cam and drive gear (late type)
43	S-32882	Spring—Main lever tension spring (18 turns, .6-in. O.D., 3-in. lg.)
B	S-3117	Screw—Special screw to adjust friction clutch tension
S1	S-32875	Switch—Motor control switch

Note.—Most parts in the new type and old type record changers are identical. Parts which are not identical are marked "OLD TYPE" or "NEW TYPE." Refer to the first paragraph.

PICKUP AND ARM ASSEMBLIES

Part No.	DESCRIPTION
S-33096 S-34776	Arm—Pickup arm—less crystal cartridge, needle screw, pivot arm and cable (early type) Arm—Pickup arm—less crystal cartridge, needle screw, pivot arm and cable (late type)
S-32635	Cable—Pickup arm lift cable and clips
S-31156 S-34710	Crystal—Pickup crystal cartridge and needle screw (early type) Crystal—Pickup crystal cartridge and needle screw (late type)
S-33114 S-33123	Damper—Viscoloid damper for crystal armature (early type) Damper—Viscoloid damper for crystal armature (late type)
S-31160	Screw—Pickup needle screw
S-31161	Shaft—Pickup pivot arm and shaft assembly

MOTORBOARD ASSEMBLIES

Part No.	DESCRIPTION
S-31149	Base—Tone arm mounting base
S-9848 S-33909	Cup—Used needle cup, rest, and lid complete (early type) Cup—Used needle cup, rest, and lid complete (late type)
S-32877 S-33979	Escutcheon—Index escutcheon (early type) Escutcheon—Index escutcheon (late type)
S-31150	Mounting—Pickup arm base rubber mounting complete
S-31155	Spring—Needle cup lid tension spring

MISCELLANEOUS ASSEMBLIES

Part No.	DESCRIPTION
S-31129	Cover—Cap for top of record post (early type only)
S-32883	Damper—Motor spindle rubber drive sleeve and metal damper plate
S-3676	Spring—Cam pawl tension spring on main gear (12 turns, .190-in. O.D., 4-3/64-in. lg.)
S-31470	Springs—Motorboard mounting springs, screw and washers (4 required)
S-32881 S-33991	Turntable—Complete (early type) Turntable—Complete (late type)
S-31128	Washer—"C" washer for top of record post

MOTOR ASSEMBLIES

Part No.	DESCRIPTION
S-32955	Coil—Field coil and laminations for 50-cycle motor
S-32954	Coil—Field coil and laminations for 60-cycle motor
S-32960	Gear—Motor spindle gear and pin
S-32872	Motor—Motor complete, 50-cycle, 110 volts AC
S-32871	Motor—Motor complete, 60-cycle, 110 volts AC
S-32958	Spindle—Turntable spindle complete with fibre gear for 50-cycle motor
S-32957	Spindle—Turntable spindle complete with fibre gear for 60-cycle motor

MODELS 05-5L1 to 05-5L9
Chassis 05-5L
Schematic, Voltage, Socket

STEWART-WARNER CORP.

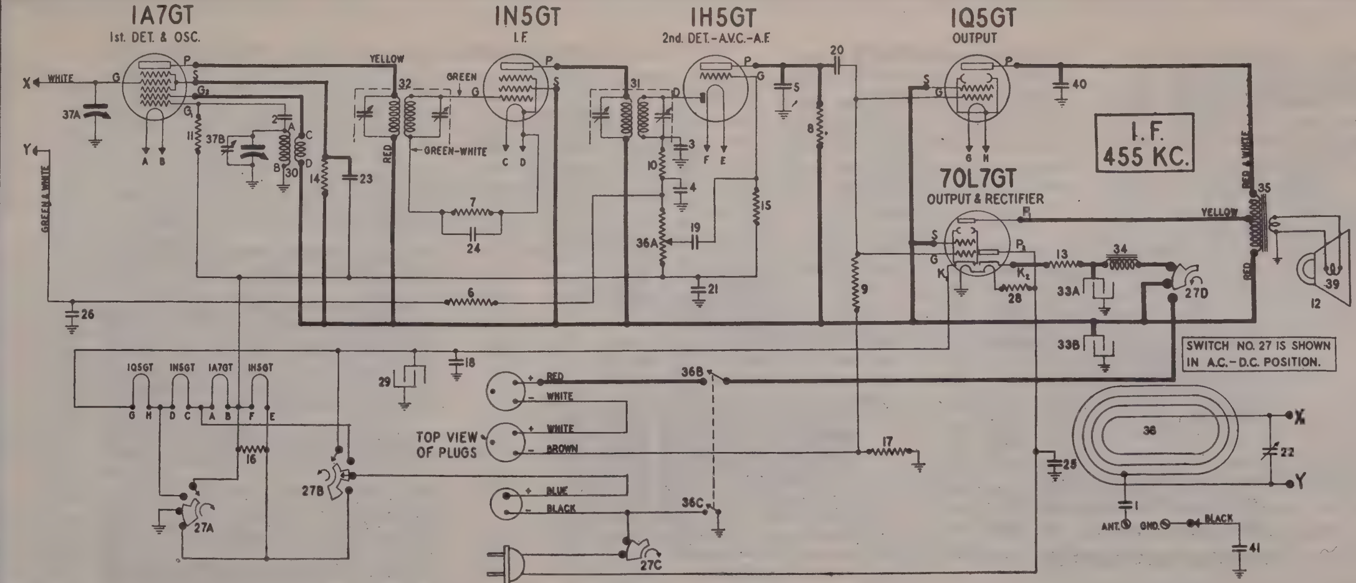
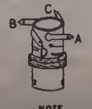


Diagram Number	Part Number	Description
1	83539	Condenser—mica, 260 mmfd.
2-3-4	83783	Condenser—mica, 110 mmfd.
5	85394	Condenser—mica, 510 mmfd.
6-7	110570	Resistor—carbon, 2.2 meg., ¼ watt
8-9	112971	Resistor—470,000 ohms, ¼ watt
10	112986	Resistor—100,000 ohms, ¼ watt
11	112987	Resistor—insulated, 220,000 ohms, ¼ watt
12	R-115069	Speaker—P.M. dynamic (5 in.)
13	116013	Resistor—50 ohms, 1 watt, W.W.
14	116058	Resistor—Insulated, 47,000 ohms, ¼ watt
15	116071	Resistor—3.3 meg., 1/10 watt
16	116095	Resistor—220 ohms, ¼ watt
17	116097	Resistor—Insulated, 400 ohms, ¼ watt
18	116625	Condenser—.1 mfd., 600 volts
19-20	116640	Condenser—.01 mfd., 600 volts
21	116706	Condenser—.2 mfd., 600 volts
22	116781	Condenser—trimmer
23-24-25-26	116819	Condenser—.05 mfd., 600 volts
27A TO 27D	117719	Switch—(A.C.-D.C.-Battery)
28	117729	Resistor—360 ohms, 7.26 watts
29	117730	Condenser—100 mfd, 10 volt electrolytic
30	117741	Coil—oscillator
31	117742	Transformer—2nd I.F.
32	117743	Transformer—1st I.F.
33A-33B	117759	Condenser—dual 20 mfd., 150 volt
34	117888	Filter—choke
35	117891	Transformer—output
36A-36B-36C	117897	Volume control—1 megohm (with switch)
37A-37B	117902	Condenser—tuning

Par. Number	Description
117708	Battery cable
117795	Battery retaining block
117837	Cabinet and back
112745	Clip—coil mounting
113019	Clip—dial scale retaining
113178	Cord—dial (supplied in 4 ft. lengths)
117802	Dial scale
117772	Knob (A.C.-D.C.-Battery)
117894	Knob—volume
117895	Knob—tuning
118732	Loop terminal strip with trimmer and contacts
116488	Nut—8-32 wing nut
117769	Plate—"Stewart-Warner"
117778	Plate—"A.C.-D.C. & BATT."
117779	Plate—"OFF—VOLUME"
117780	Plate—"TUNING"
116398	Plug—3 prong male
116397	Plug—2 prong male
116916	Pointer assembly
81145	Retaining ring—for drive shaft
83624	Screw—self tapping 8x¼
113191	Screw—special No. 8-32x1⅛
117716	Shield—tube
116690	Socket (octal base) (small)
111981	Spring—for dial cord tension

OSCILLATOR COIL
DIAGRAM NO. 30
PART NO 117741

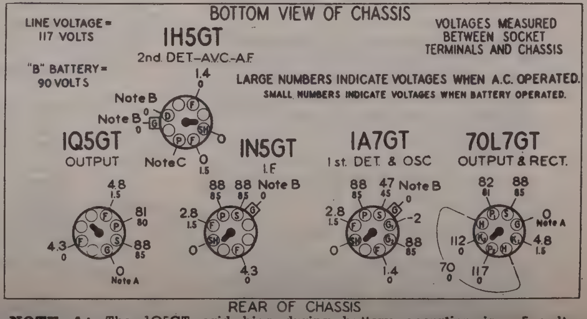


NOTE

TERMINALS OF COIL SHOWN IN ILLUSTRATION ARE LETTERED TO CORRESPOND TO SIMI-

SOCKET VOLTAGES

DIAL TUNED TO 540 KC.



NOTE A: The 1Q5GT grid bias during battery operation is —5 volts measured across resistor 17.

NOTE B: During A.C.-D.C. operation these elements are slightly positive with respect to chassis. This voltage cannot be measured properly on ordinary

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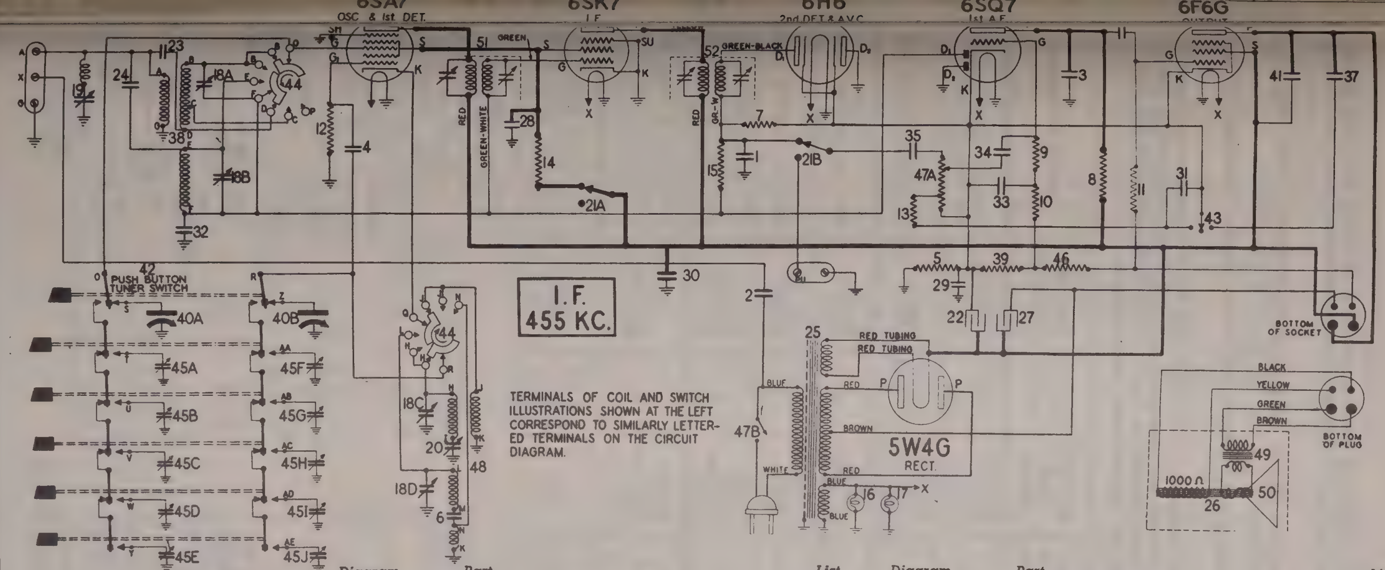
MODELS 01-6E1 to 01-6E9
Chassis 01-6E
Schematic



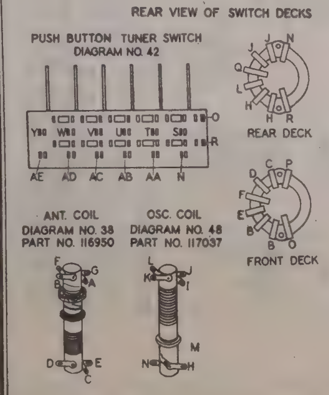


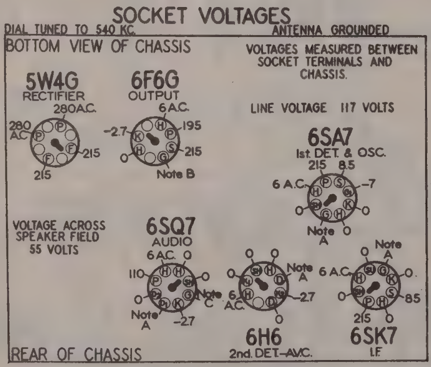
Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$0.20
4	85061	Condenser—mica 51 mmfd.	.15
5	88461	Resistor—carbon 150 ohms ¼ watt.	.12
6	88587	Condenser—mica .0042 mfd.	.35
7-8	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
9-10	110554	Resistor—carbon 1 megohm ¼ watt	.12
11	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
12-13	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
14	110568	Resistor—carbon 15,000 ohms 1 watt	.15
15	110580	Resistor—carbon 3.3 meg. ¼ watt.	.12
16-17	110629	Lamp—6.3 volt—.25 amps	.15
18A to 18D	112792	Condenser—trimmer 4 section	.60
19	112796	Coil—wave trap (with trimmer)	.50
20	112799	Condenser—padder (530 to 630 mmfd.)	.36
21A-21B	114141	Switch—D.P.D.T.	.44
22	114258	Condenser—electrolytic 8 mfd. 450 volt	.98
23-24	114969	Condenser—mica 15 mmfd.	.12
25	114999	Transformer—power 117 volt 60 cycle	3.50
26	M-115059	Speaker—10" electro-dynamic	7.60
27	116262	Condenser—electrolytic 16 mfd. 450 volt	$0.78
28-29-30	116625	Condenser—.1 mfd. 600 volt	.25
31	116640	Condenser—.01 mfd. 600 volt	.15
32-33	116819	Condenser—.05 mfd. 600 volt	.20
34-35-36-37	116893	Condenser—.02 mfd. 600 volt	.15
38	116950	Coil—antenna	1.00
39	116967	Resistor—25 ohm 1 watt 10% wire wound	.16
40A-40B	116996	Condenser—variable gang	3.30
41	117022	Condenser—.002 mfd. 600 volt	.15
42	117024	Switch—push button	2.80
43	117025	Tone control	.60
44	117026	Range switch	1.30
45A to 45J	117027	Trimmer condenser gang	4.00
46	117032	Resistor—300 ohms 1 watt	.15
47A-47B	117035	Volume control with switch—1 meg.	1.00
48	117037	Coil—oscillator	.86
49	M-117091	Transformer—output for M-115059 speaker	1.50
50	M-117092	Cone and Voice coil assembly for M-115059 speaker	2.20
51	117885	Transformer—1st I.F.	1.10
52	117886	Transformer—2nd I.F.	1.10

MODELS 01-6E1 to 01-6E9
Alignment, Voltage
Trimmers, Socket

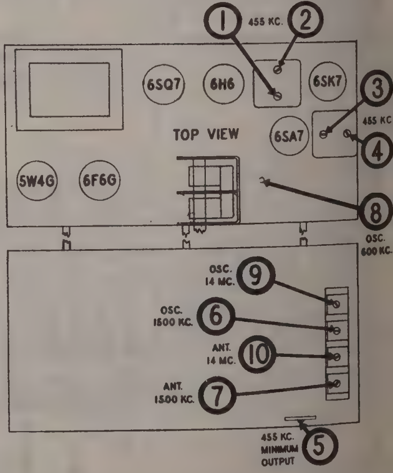
STEWART-WARNER CORP.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis. NOTE: Remove the connector from between the "A" and "X" terminals.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the pointer at a point 1⅜" from the left flange of the brown dial plate. This point corresponds to the last mark on the low frequency end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screws on the dial drive drum and push the gang condenser in full mesh, with the pointer properly set, then retighten the set screws.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Front Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I. F.	
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	5	Wave Trap	Adjust for minimum output using a strong generator signal.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC (2⅜" from right Dial Plate end)	6	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	8	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC (2-7/16" from right Dial Plate end)	9	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. If image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	"A" Terminal	14 MC	Foreign	14 MC	10	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

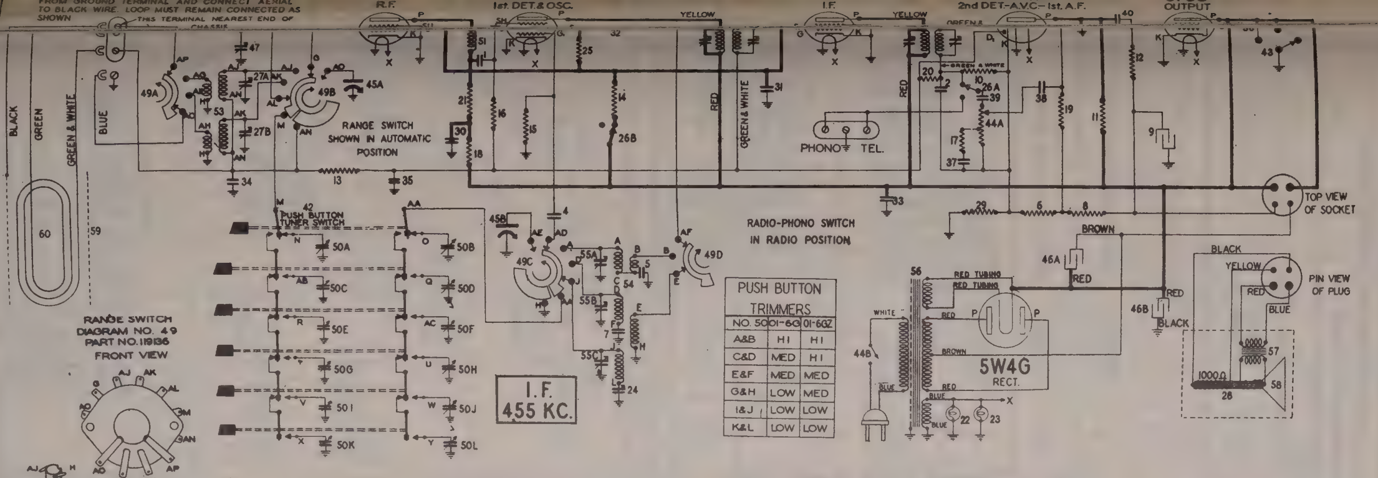


These readings taken using a voltmeter of 1000 ohms per volt.
NOTE A: The bias on the control grids of the 6SA7 and 6SK7 tubes and on diode plate D_1 of the 6H6 and 6SQ7 tubes is -2.7 volts, measured across resistor No. 5.
NOTE B: The bias on the control grid of the 6F6G tube is -17 volts measured across resistors No. 39 and 46.
NOTE C: The bias on the control grid of the 6SQ7 tube is -4 volts, measured across resistor No. 39.

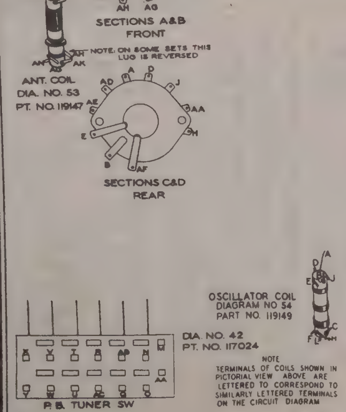


STEWART-WARNER CORP.

MODELS 01-6G1, 01-6G4-1 to 01-6G4-5 inc. Ch. 01-6G 01-6G1-Z, 01-6G4-1-Z to 01-6G4-5-Z inc. Ch. 01-6G-Z Schematic


FROM GROUND TERMINAL AND CONNECT AERIAL TO BLACK WIRE. LOOP MUST REMAIN CONNECTED AS SHOWN
THIS TERMINAL NEAREST END OF CHASSIS
R.F.
1st. DET. & OSC.
I.F.
2nd DET-A.V.C.-1st. A.F.
OUTPUT
BLACK
GREEN
GREEN & WHITE
BLUE
YELLOW
RED
BROWN
60
59
RANGE SWITCH SHOWN IN AUTOMATIC POSITION
PUSH BUTTON TUNER SWITCH
PHONO
TEL.
TOP VIEW OF SOCKET
PIN VIEW OF PLUG
RADIO-PHONO SWITCH IN RADIO POSITION
I.F. 455 KC.
5W4G RECT.
RED TUBING
WHITE
1000Ω
RANGE SWITCH DIAGRAM NO. 49 PART NO. 119136 FRONT VIEW
SECTIONS A&B FRONT

PUSH BUTTON TRIMMERS		
NO. 50	01-6G	01-6GZ
A&B	HI	HI
C&D	MED	HI
E&F	MED	MED
G&H	LOW	MED
I&J	LOW	LOW
K&L	LOW	LOW


NOTE: ON SOME SETS THIS LUG IS REVERSED
ANT. COIL DIA. NO. 53 PT. NO. 119147
SECTIONS C&D REAR
OSCILLATOR COIL DIAGRAM NO 54 PART NO. 119149
DIA. NO. 42 PT. NO. 117024
P.B. TUNER SW

NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEW ABOVE ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$0.20
4	85061	Condenser—mica 51 mmfd.	.15
5	85440	Condenser—mica .00351 mfd. 3%	.40
6	88465	Resistor—wire wound 25 ohms ½ watt	.15
7	89275	Condenser—mica .002 mfd.	.40
8	89762	Resistor—wire wound 220 ohms 1 watt	.16
9	110377	Condenser—electrolytic 10 mfd.—35 volts	.24
10-11-12	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
13	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
14	110561	Resistor—carbon 15,000 ohms 2 watts	.30
15-16	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
17	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
18	118805	Resistor—carbon 10,000 ohms 1 watt	.12
19	110570	Resistor—carbon 2.2 meg. ¼ watt	.12
20	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
21	110586	Resistor—carbon 2,200 ohms ¼ watt	.12
22-23	110629	Lamp—6.3 volt .25 amps.	.15
24	112799	Condenser—padder (530 to 630 mmfd.)	.36
25	112978	Resistor—insulated, 470 ohms ¼ watt	.12
	113035	Condenser—.006 mfd. 600 volt	.14
26A-26B	114141	Switch—D.P.D.T. (Radio-Phono)	.44
27A-27B	114937	Condenser—2 section trimmer	.40
28	U-115086	Speaker—dynamic 6 in.	4.95
29	116275	Resistor—wire wound 50 ohms ½ watt (10%)	.15
30-31	116625	Condenser—.1 mfd. 600 volt	.25
32	116640	Condenser—.01 mfd. 600 volt	.15
33	116706	Condenser—.2 mfd. 600 volt	.35
34-35	116819	Condenser—.05 mfd. 600 volt	.20
36-37-38-39-40	116893	Condenser—.02 mfd. 600 volt	.15
41	117022	Condenser—.002 mfd. 600 volt	.15
42	117024	Switch—push button	2.80
43	117025	Tone control switch	.60
44A-44B	117035	Volume control with switch—1 meg.	1.00
45A-45B	117527	Condenser—gang	3.25
46A-46B	118421	Condenser—electrolytic 10-15 mfd. 450 volts	1.50
47	118431	Condenser—trimmer	.22
	119024	Transformer—2nd I.F.	1.10
48	119042	Transformer—1st I.F.	1.10
49A to 49C	119136	Range switch	1.45
50A to 50L	119662	Condenser—push button trimmer (Low) 540 to 1000 KC.	.24
	119663	Condenser—push button trimmer (Med.) 750 to 1375 KC.	.24
	119664	Condenser—push button trimmer (Hi) 980 to 1550 KC.	.24
51	119138	Coil—compensating	.25
52	119024	Transformer—2nd I.F.	1.10
53	119147	Coil—antenna	1.10
54	119149	Coil—oscillator	1.10
55A-55B-55C	119174	Condenser—trimmer 3 section	.45
56	119205	Transformer—power	4.20
57	U-119226	Transformer—output for U-115086 speaker	1.10
58	U-119227	Cone & Voice coil for U-115086 speaker	1.65
59	119246	Shield for loop antenna	.45
60	119331	Cabinet back and loop antenna complete 01-6G1 & 01-6G1-Z	2.00
	119349	Cabinet back and loop antenna complete 01-6G4-1 & 01-6G4-1-Z	2.00
	119347	Cabinet back and loop antenna complete 01-6G4-2 & 01-6G4-2-Z 01-6G4-3 & 01-6G4-3-Z 01-6G4-5 & 01-6G4-5-Z	2.00
	119352	Cabinet back and loop antenna complete 01-6G4-4 & 01-6G4-4-Z	2.00
61	113035	Condenser—.006 mfd. 600 volt	.14

CHASSIS 01-6G,01-6G-Z
Alignment,Voltage,Socket
Trimmers

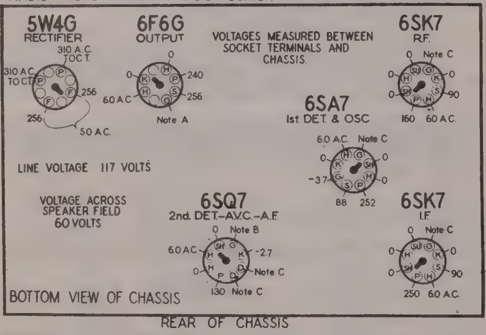
STEWART-WARNER CORP.

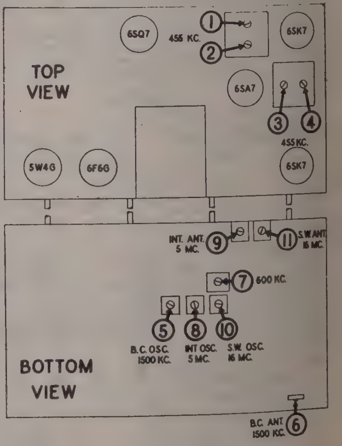
1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condens (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis AND REMOVE THE BLUE WIRE FROM THE CHASSIS TERMINA
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Set the pointer 2⅛" from left end of brown dial plate with condenser gang in full mesh.
5. The loop must be connected as indicated in circuit diagram at all times, and must be in the same relative position it occupies when set is in the cabinet.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then r peat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	Black Loop Wire	1500 KC	Broadcast	1500 KC 2⅞" from right end of dial plate	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD Mica Condenser	Black Loop Wire	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Black Loop Wire	600 KC	Broadcast	Tune to 600 KC Generator Signal	7	Broadcast Oscillator (Series Pad)	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.
400 OHM Carbon Resistor	Black Loop Wire	5 MC	Intermediate	5 MC 2-13/16" from right end of dial plate	8	Intermediate Oscillator	Adjust for Maximum Output. Check to se if Proper Peak was Obtained by Tunir in Image at Approx. 4.1 MC. If Imag does not appear, Realign at 5 MC, wi Trimmer Screw farther out. Recheck Imag
400 OHM Carbon Resistor	Black Loop Wire	5 MC	Intermediate	Tune to 5 MC Generator Signal	9	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Black Loop Wire	16 MC	Foreign	16 MC 2-15/16" from right end of dial plate	10	Foreign Oscillator	Adjust for Maximum Output. Check to se if Proper Peak was Obtained by Tunir in Image at Approx. 15.1 MC. If Imag does not appear, Realign at 16 MC, wi Trimmer Screw farther out. Recheck Imag
400 OHM Carbon Resistor	Black Loop Wire	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.

*NOTE: Realign trimmer No. 6 after set is in cabinet by connecting blue wire to ground terminal, placing range switch in broadcast position, and adjusting for maximum output on a weak signal at approximately 1500 KC.

RADIO-PHONO SWITCH IN RADIO POSITION NO SIGNAL CONDITION





NOTE A: Bias on 6F6G output tube is —18 volts measured across resistors 29, 6 and 8.

NOTE B: Bias on 6SQ7 grid is —1.5 volts measured across resistor 6.

NOTE C: Bias on diode plates, 6SK7 I.F., 6SA7 DET., and 6SK7 R.F. is —3 volts measured across resistor 29.

Part Number	*Description*	*List Price*
119317	Call letter tabs and instruction sheets	$0.45
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—dial drive (supplied in 2 foot lengths)	.15
116948	Cord—pointer drive (supplied in 6 ft. lengths)	.18
117029	Drive drum and bushing	.50
88348	Eyelet—for dial cord ... Per Dz.	.05
119202	Escutcheon and dial (01-6G1 & 01-6G1-Z)	.90
119373	Escutcheon and dial 01-6G4 & 01-6G4-Z)	.90
119209	Escutcheon and P. B. Assembly (01-6G1 & 01-6G1-Z)	1.15
116953	Escutcheon and P. B. Assembly (01-6G4 & 01-6G4-Z)	.90
119210	Escutcheon for push buttons (01-6G1 & 01-6G1-Z)	.30
116998	Escutcheon for push buttons (01-6G4 & 01-6G4-Z)	.30
119167	Knob (01-6G1 & 01-6G1-Z)	.10
116773	Knob (01-6G4 & 01-6G4-Z)	.10

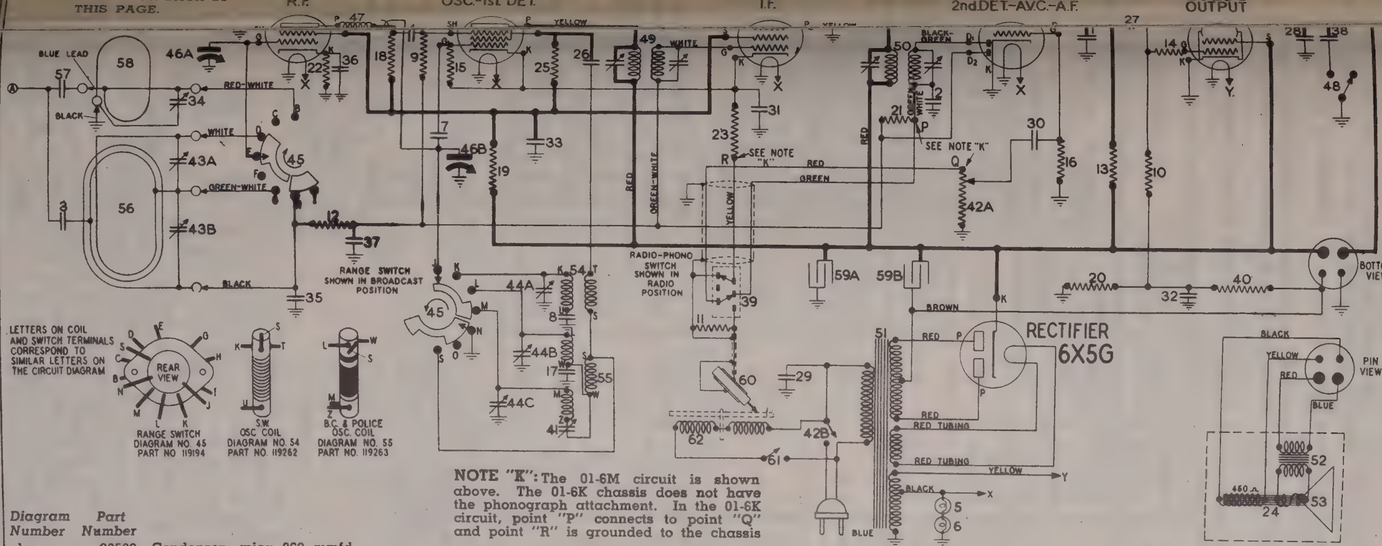
CABINET BACKS

119332	Cabinet Back only (01-6G1 & 01-6G1-Z)	
119351	Cabinet Back only (01-6G4-1 & 01-6G4-1-Z)	
119348	Cabinet Back only (01-6G4-2 & 01-6G4-2-Z) (01-6G4-3 & 01-6G4-3-Z) (01-6G4-5 & 01-6G4-5-Z)	
119353	Cabinet Back only (01-6G4-4 & 01-6G4-4-Z)	
116952	Pin for push buttons	
117195	Pointer	
119211	Push button (01-6G1 & 01-6G1-Z)	
116999	Push button (01-6G4 & 01-6G4-Z)	
117019	Reflector—for pilot light ... Per C	
81145	Retaining ring—for drive shaft	

STEWART-WARNER CORP.

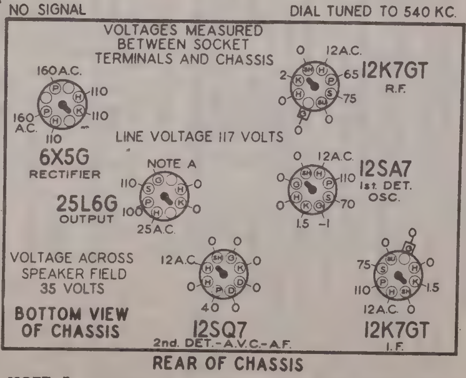
MODELS 01-6K1, Ch. 01-6K
01-6M9, Ch. 01-6M
Schematic, Voltage

THIS PAGE.



NOTE "K": The 01-6M circuit is shown above. The 01-6K chassis does not have the phonograph attachment. In the 01-6K circuit, point "P" connects to point "Q" and point "R" is grounded to the chassis

Diagram Number	Part Number	
1	83539	Condenser—mica 260 mmfd.
2	83539 85061	Condenser—mica 260 mmfd. (Model 01-6K only) Condenser—mica 50 mmfd. (Model 01-6M only)
3-4	83783	Condenser—mica 110 mmfd.
5-6	85296	Lamp—6-8 volt Mazda No. 51
7	88173	Condenser—mica 50 mmfd.
8	88587	Condenser—mica .0042 mfd.
9	110552	Resistor—carbon 47,000 ohms 1/4 watt
10	110553	Resistor—carbon 220,000 ohms 1/4 watt
11	110553	Resistor—carbon 220,000 ohms 1/4 watt (Model 01-6M only)
12-13	110559	Resistor—carbon 470,000 ohms 1/4 watt
14	110560	Resistor—carbon 100 ohms 1/4 watt
15	110564	Resistor—carbon 100,000 ohms 1/4 watt
16	110580	Resistor—carbon 3.3 meg. 1/4 watt
17	112426	Condenser—mica 1650 mmfd. (3%)
18-19	112952	Resistor—carbon 3,300 ohms 1/4 watt
20	112956	Resistor—carbon 220,000 ohms 1/4 watt
21	112973	Resistor—carbon 1.5 meg. 1/4 watt
22	112978	Resistor—insulated 470 ohms 1/4 watt
23	116062	Resistor—150 ohms 1/4 watt
24	U-115088	Speaker—dynamic 6"
25	118803	Resistor—680 ohms 1/4 watt
26-27-28	119193	Condenser—.01 mfd. 600 volt
29	119757	Condenser—.01 mfd. 600 volt (shielded)
30	116647	Condenser—.004 mfd. 600 volt
31-32-33	116706	Condenser—.2 mfd. 600 volt
34	116781	Condenser—trimmer
35-36-37	116819	Condenser—.05 mfd. 600 volt
38	116984	Condenser—.04 mfd. 600 volt
39	117054	Switch—"Radio-Phono" with escutcheon (Model 01-6M only)
40	118809	Resistor—carbon 680,000 ohms 1/4 watt
41	118919	Condenser—padding
42A-42B	119086	Volume control—1 meg. (with switch)
43A-43B	119126	Trimmer condenser—2 section
44A to 44C	119174	Condenser—trimmer 3 section
45	119194	Switch—range
46A-46B	119212	Condenser—gang (with drum)
47	119213	Coil—compensating
48	119214	Switch—tone control
49	119220	Transformer—1st I.F.
50	119221	Transformer—2nd I.F.
51	119223	Transformer—power
52	U-119228	Transformer—output—for U-115088 speaker
53	U-119229	Cone & Voice coil assembly for U-115088 speaker
54	119262	Coil—short wave oscillator
55	119263	Coil—B.C. & Pol. Oscillator
56	119302 119620	Loop antenna (BC & POL) with cabinet back (01-6K only) Loop antenna (BC & POL) with cabinet back (01-6M only)
57	119314	Condenser—mica 5 mmfd.
58	119329 119622	Short wave loop antenna assembly complete (01-6K only) Short wave loop antenna assembly complete (01-6M only)
59A-59B	119343	Condenser—electrolytic 20-40 mfd. 200 volt
60	119864	Crystal Cartridge (01-6M9)
61	119619	Automatic stop for motor (Model 01-6M only)
62	119728	Motor (Model 01-6M only)



NOTE A: The bias on the control grid of the 25L6G tube is —9 volts, measured across resistor No. 20. Due to the high resistances involved the voltage measured will be less than this value.

ALIGNMENT PROCEDURE FOR 01-6K AND 01-6M CHASSIS

1. Connect the output meter across the voice coil or between the plate of the 25L6G output tube and ground in series with a .1 mfd condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

2. If a dummy antenna is used, connect the ground lead of the signal generator to the chassis. The information in the table below assumes a dummy antenna will be used when aligning this receiver.

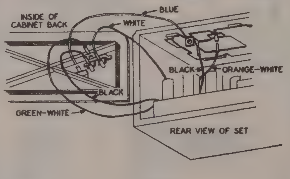
   If no dummy is to be used omit the connection from generator ground to the chassis. Then connect an unshielded lead to the outpu terminal of the signal generator and place the lead near the loops of the receiver, and make no connection to the antenna termina on the rear of the cabinet.

3. Turn the volume control to the maximum clockwise position and keep it in this position throughout the entire alignment procedure
4. With the gang condenser in full mesh, set the pointer so that its position is horizontal.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Position	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Grid of 12K7GT R.F. Tube	455 KC	Broadcast	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	Antenna Terminal	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	10	Broadcast Antenna	Place broadcast loop antenna in same position relative to chassis as it occupies when in cabinet. Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	6	Broadcast Oscillator (Series)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	Antenna Terminal	5 MC	Intermediate	5 MC	7	Intermediate Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak is obtained by tuning in image at approx. 4.1 MC. If image does not appear realign at 5 MC with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	Antenna Terminal	16 MC	Foreign	16 MC	8	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak is obtained by tuning in image at approx. 15.1 MC. If image does not appear realign at 16 MC with trimmer screw farther out. Recheck image.
Before making the following adjustments, install the chassis and both loops in the cabinet							
400 OHM Carbon Resistor	Antenna Terminal	5 MC	Intermediate	Tune to 5 MC Generator Signal	9	Intermediate Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
200 MMFD. Mica Condenser	Antenna Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	10	Broadcast Antenna	Adjust for maximum output Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	Antenna Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

DIAL AND MISCELLANEOUS PARTS

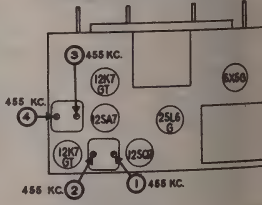
Part No.	*Description*	*List Price*
119304	Cabinet back (back only) Model 01-6K....	$0.20
119621	Cabinet back (back only) Model 01-6M....	.22
117117	Cable—for connecting motor (01-6M only)	.38
114955	Clamp—for dial cord..................	.01
113019	Clip—dial scale retaining...............	.01
112745	Clip—coil mounting	.01
116948	Cord—dial drive (supplied in 6 ft. lengths).	.18
119618	Phono Pick-up arm (Model 01-6M only).....	5.85
119274	Dial scale	.26
119208	Escutcheon—dial	.80
117806	Idler wheel with rubber rim (01-6M9)......	.60
119167	Knob	.10
84571	Needle cup (Model 01-6M)...............	.10
110496	Plug—4 prong—for speaker..............	.12
116883	Pointer	.16
81145	Retaining ring—for drive shaft......Per C	.50
117807	Rubber rim for idler wheel (01-6M9).......	.12
83624	Screw—self tapping 8 x ¼...............	.01
112874	Screw—No. 10 x 1⅛ chassis mtg..........	.01
119218	Screw for mounting escutcheon...........	.02
119204	Shaft-tuning	.10
85427	Socket—octal base (standard)............	.15
110501	Socket—4 prong (for speaker)............	.16
111008	Socket—dial lamp (grounded side).........	.12
113122	Socket—dial lamp (ungrounded side).......	.12
111090	Spacer—steel	.02
114968	Spring—dial cord tension................	.03
119729	Turntable (Model 01-6M)................	1.50
117816	Turntable shaft (01-6M9)...............	.35
110829	Washer—flat steel, for mtg. chassis......	.01
116530	Washer (paper) for back of knobs........	.005

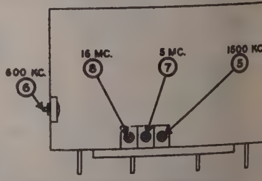


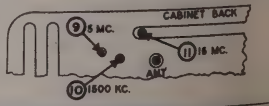
NOTE

If this receiver is to be used with an outside aerial, it is recommended when aligning the receiver that the signal generator be connected to the antenna terminal through the dummy antenna shown in the table above. If the set is to be used without an external aerial, it is preferable to make adjustments on Trimmers No. 6, 9, 10 and 11 with no connection to the antenna terminal, and with an unshielded wire from the signal generator output placed near the receiver loop.

When making the initial adjustment of Trimmers No. 10 and No. 6 the loops should be placed in their approximately correct position with respect to the chassis. Otherwise the adjustment of Trimmer No. 6 may be incorrect.

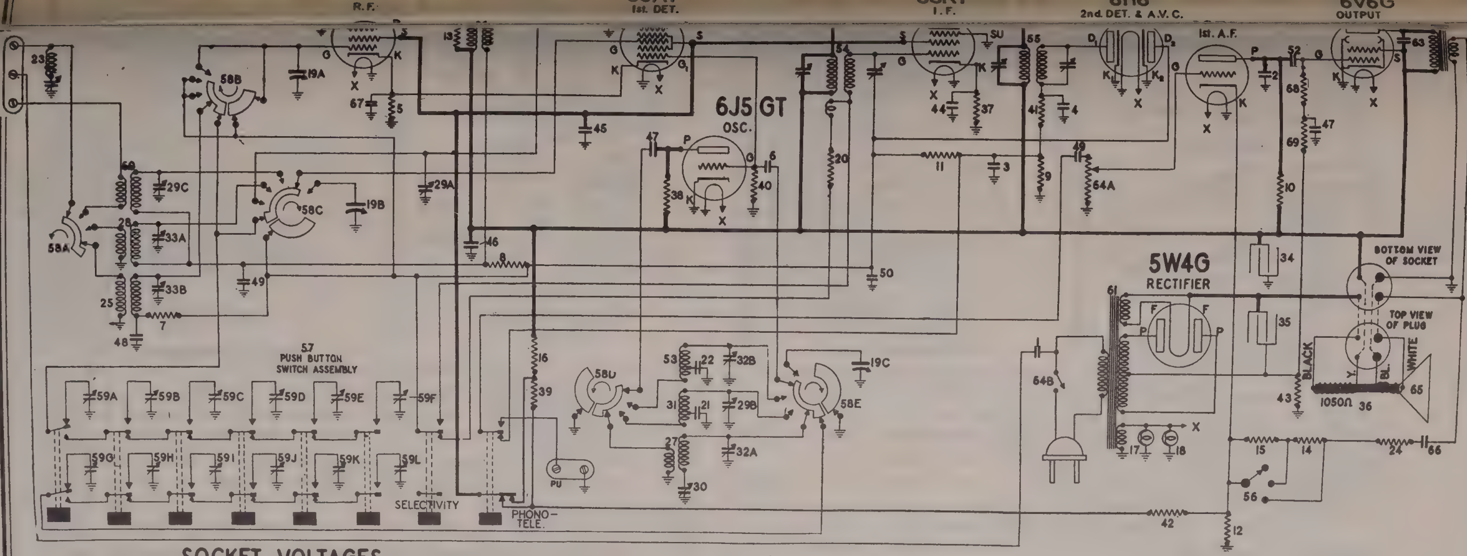






STEWART-WARNER CORP.

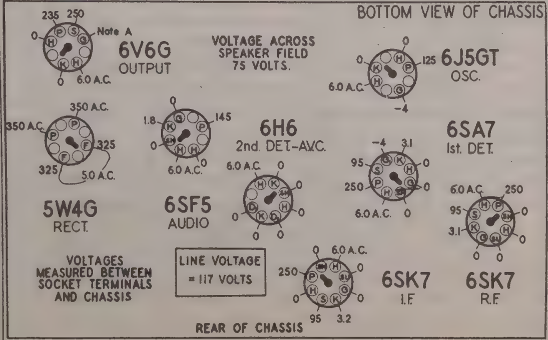
MODELS 01-8A1 to 01-8A9
Chassis 01-8A



SOCKET VOLTAGES

ANTENNA GROUNDED

DIAL TUNED TO 540 KC.



All voltages measured in radio position.

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 6V6G is 15 volts measured across resistor 43.

Diagram Number	Part Number	Description
1-2	83539	Condenser—mica 260 mmfd.
3-4	83783	Condenser—mica 110 mmfd.
5	84979	Resistor—250 ohms ½ watt Wire Wound
6	85061	Condenser—mica 51 mmfd.
7-8-9-10	110553	Resistor—carbon 220,000 ohms ¼ watt
11	110554	Resistor—carbon 1 megohm ¼ watt
12	110556	Resistor—330 ohms ¼ watt
13-14	110573	Resistor—carbon 2,200 ohms ¼ watt
15	110587	Resistor—3,900 ohms ¼ watt
16	110595	Resistor—carbon 12,000 ohms 3 watts
17-18	110629	Lamp—6.3 volt—.25 amps.
19A-19B-19C	110936	Condenser—variable gang
20	110975	Resistor—wire wound 33 ohms ½ watt
21	112426	Condenser—mica 1650 mmfd.
22	112427	Condenser—mica 4050 mmfd.
23	112796	Coil—wave trap with trimmer
24	112978	Resistor—470 ohms ¼ watt
25	113295	Coil—antenna (B.C.)
26	113296	Coil—R.F. (B.C.)
27	113297	Coil—Oscillator (B.C.)
28	113298	Coil—Antenna (Police)
29A-29B-29C	113320	Condenser—trimmer—3 section
30	113346	Condenser—padding
31	113412	Coil—oscillator (Police)
32A-32B 33A-33B	114937	Condenser—trimmer—2 section
34-35	114972	Condenser—electrolytic—16 mfd. 450 volt
36	U-115071	Speaker—12" electro dynamic
37	116015	Resistor—400 ohms ½ watt wire wound.
38-39	116055	Resistor—carbon 22,000 ohms ½ watt
40-41	116058	Resistor—47,000 ohms ¼ watt insulated
42	116086	Resistor—18,000 ohms 1 watt
43	116094	Resistor—220 ohms 2 watts wire wound
44-45-46	116625	Condenser—.1 mfd. 600 volt
47	116640	Condenser—.01 mfd. 600 volt
48-49-50	116819	Condenser—.05 mfd. 600 volt
51-52	116893	Condenser—.02 mfd. 600 volt
53	117530	Coil—short wave oscillator
54	117616	Transformer—1st I.F.
55	117618	Transformer—2nd I.F.
56	117678	Switch—tone control
57	117694	Push button switch
58A to 58E	117787	Range switch
59A to 59L	117788	Condenser—trimmer gang
60	117819	Coil—short wave antenna
61	117830	Transformer—power
62	118144	Transformer—output
63	118194	Condenser—.006 mfd. 600 volt
64A-64B	118198	Volume control 1 meg. (with switch)
65	U-118202	Cone & Voice coil for U-115071 speaker
66-67	118206	Condenser—.25 mfd. 600 volt
68-69	110553	Resistor—carbon 220,000 ohms ¼ watt

CHASSIS 01-8A
CHASSIS 01-8B
Alignment,Socket
Trimmers

STEWART-WARNER CORP.

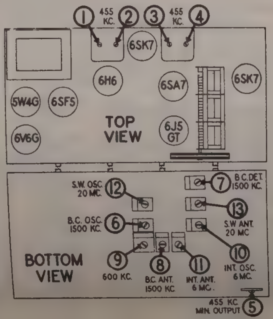
ALIGNMENT PROCEDURE FOR 01-8A CHASSIS

1. Connect the output meter across the voice coil or from the plate of the 6V6G output tube to ground through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and remove the connector from between the "A" and "X" terminals.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Push in the "Selectivity" button and keep it pushed in. Check the pointer to see that it is correctly set.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, Using a Strong Generator Signal.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7 8	Broadcast Detector Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	6 MC	10	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	Tune to 6 MC Generator Signal	11	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	20 MC	12	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 19.1 MC. If Image does not appear, Realign at 20 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	Tune to 20 MC Generator Signal	13	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

MISCELLANEOUS PARTS

Part Number	Description	List Price
114032	Bracket & Pulley Assembly—right hand	$0.34
114034	Bracket & Pulley Assembly—left hand	.34
117012	Call tabs and instructions	.44
114042	Clamp—for dial scale	.10
114955	Clamp- for dial cord	.01
112745	Clip- coil mounting	.01
112798	Clip—for mtg. wave trap coil	.01
85321	Connector -for internal antenna	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
117057	Cord--drive (supplied in 3 ft. lengths)	.15
114921	Dial background—brown suede paper	.10
114915	Dial mounting plate	.38
117840	Dial scale	.80
113338	Drum dial drive	.54
114052	Escutcheon—dial	2.00
117757	Escutcheon-- for push buttons	.40
116773	Knob tuning, etc.	.10
117758	Pin- for push buttons	.02
117662	Pointer assembly	.32
112762	Pulley dial cord drive	.04
116999	Push button	.08
113463	Rubber bushing chassis mtg.	.03
83624	Screw self tapping 8x¼	.01
85040	Screw -No. 6 Hex. Hd. Per C	.35
112874	Screw No. 10x1⅛" chassis mtg.	.01
113191	Screw special No. 8 32x1⅛	.01
114914	Screw No. 2x⅜ Phillips head Per Doz.	.15
85827	Set Screw 8 32 square head	.02
118463	Screw—large adjusting for top deck P.B. trimmers	.03
118464	Screw small adjusting for top deck P.B. trimmers	.03
118465	Screw large adjusting for bottom deck P.B. trimmers	.03
85427	Socket octal base (standard)	.15
110501	Socket 4 prong (for speaker)	.16
113025	Socket- octal base (with special ground)	.15
114117	Socket dial lamp	.18
113177	Spring dial cord tension	.09
117458	Spring push button	.05
116536	Terminal strip (G.X.A.)	.15
84407	Terminal strip phono	



ALIGNMENT PROCEDURE FOR 01-8B CHASSIS

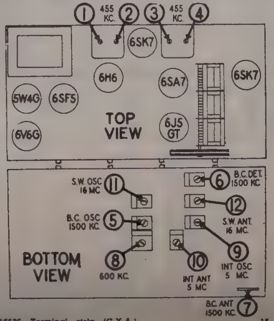
1. Connect the output meter across the voice coil or from the plate of the 6V6G output tube to ground through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and remove the connector from between the "G" and "X" terminals.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Push in the "Selectivity" button and keep it pushed in. Check the pointer to see that it is correctly set.
5. The loop must be connected as indicated in circuit diagram at all times.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then repeat Adjustment.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6 7	Broadcast Detector Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	8	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	5 MC	Intermediate	5 MC	9	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If Image does not appear, Realign at 5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	5 MC	Intermediate	Tune to 5 MC Generator Signal	10	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	16 MC	Foreign	16 MC	11	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	12	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

NOTE: Realign trimmer No. 7 after set is in cabinet by connecting "X" and "G" together, placing range switch in broadcast position, and adjusting for maximum output on a weak signal at approximately 1500 KC.

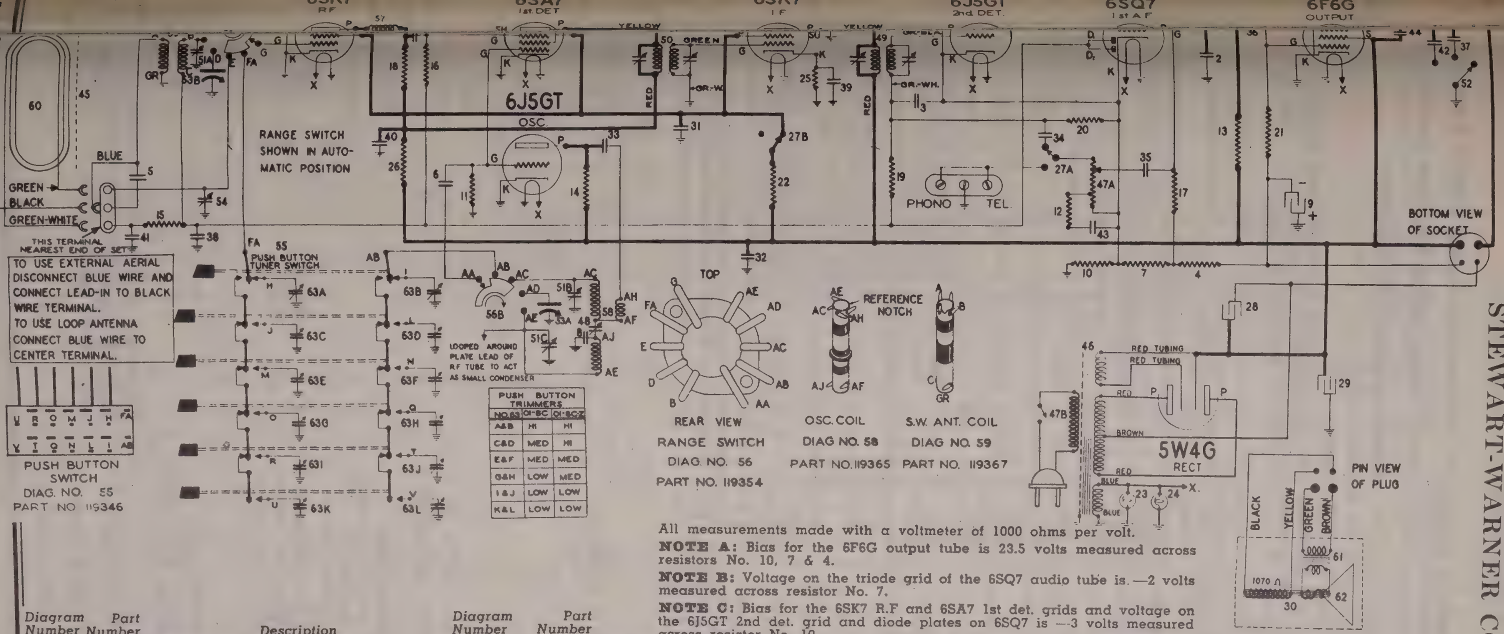
MISCELLANEOUS PARTS

Part Number	Description	List Price
114032	Bracket & Pulley Assembly—right hand	$0.34
114034	Bracket & Pulley Assembly—left hand	.34
118704	Call tabs and instructions	.45
114955	Clamp—for dial cord	.01
114042	Clamp for dial scale	.10
112745	Clip—coil mounting	.01
85321	Connector—for internal antenna	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
117057	Cord—drive (supplied in 2 ft. lengths)	.15
110075	Cup washer for gang condenser mounting	.02
111973	Cushion—rubber rest for back of chassis	.06
114921	Dial back ground—brown suede paper	.10
114915	Dial mounting plate	.38
118699	Dial scale	.85
118480	Disc—for end of loop antenna	.05
113338	Drum—dial drive	.54
114052	Escutcheon—dial	2.00
117757	Escutcheon—for push buttons	.40
88348	Eyelet—pointer rope Per Doz.	.05
116773	Knob—tuning or volume	.10
117758	Pin—for push buttons	.02
117662	Pointer assembly	.32
116999	Push buttons	.08
113463	Rubber bushing—chassis mtg.	.03
83722	Rubber grommet for gang condenser mounting	.03
93624	Screw—self tapping 8x¼	.01
85040	Screw—No. 6 Hex. Hd. Per C	.35
112874	Screw—No. 10x1⅛ Chassis mtg.	.01
113191	Screw—special No. 8/32x1⅛	.01
114914	Screw—special head—for mounting escutcheon Per Doz.	.15
118463	Screw—large adjusting for top deck P.B. trimmers	.03
118464	Screw—small adjusting for top deck P.B. trimmers	.03
118465	Screw—large adjusting for bottom deck P.B. trimmers	.03
85827	Set Screw -8-32 Square Head (Drive drum)	.02
85427	Socket octal base (standard)	.15
110501	Socket—4 prong (for speaker)	.16
113025	Socket octal base (with special ground)	.15
114117	Socket—dial lamp	.18
116536	Terminal strip (G.X.A.)	.15
118681	Terminal strip (1-2-3)	.12
84407	Terminal strip (phono)	.12
113205	Thrust Plate—for tuning shaft	.02



STEWART-WARNER CORP.

MODELS 01-8C7,Ch.01-8C
01-8C7-Z,Ch.01-8C-Z
Schematic,Voltage


6SK7 RF
6SA7 1st DET
6SK7 IF
6J5GT 2nd DET.
6SQ7 1st A F
6F6G OUTPUT
6J5GT OSC.
YELLOW
GREEN
RED
GR.-WH.
GR.-BLA.
RANGE SWITCH SHOWN IN AUTO-MATIC POSITION
GREEN
BLACK
GREEN-WHITE
BLUE
THIS TERMINAL NEAREST END OF SET
PUSH BUTTON TUNER SWITCH
PHONO
TEL.
BOTTOM VIEW OF SOCKET
TOP
REAR VIEW RANGE SWITCH DIAG. NO. 56 PART NO. 119354
REFERENCE NOTCH
OSC. COIL DIAG NO. 58 PART NO. 119365
S.W. ANT. COIL DIAG NO. 59 PART NO. 119367
PUSH BUTTON SWITCH DIAG. NO. 55 PART NO 119346
LOOPED AROUND PLATE LEAD OF RF TUBE TO ACT AS SMALL CONDENSER
RED TUBING
BROWN
BLUE
5W4G RECT
PIN VIEW OF PLUG
BLACK
YELLOW
GREEN
BROWN
1070 Ω

TO USE EXTERNAL AERIAL DISCONNECT BLUE WIRE AND CONNECT LEAD-IN TO BLACK WIRE TERMINAL.
TO USE LOOP ANTENNA CONNECT BLUE WIRE TO CENTER TERMINAL.

PUSH BUTTON TRIMMERS NO. 63	01-8C	01-8C-Z
A&B	HI	HI
C&D	MED	HI
E&F	MED	MED
G&H	LOW	MED
I&J	LOW	LOW
K&L	LOW	LOW

All measurements made with a voltmeter of 1000 ohms per volt.

NOTE A: Bias for the 6F6G output tube is 23.5 volts measured across resistors No. 10, 7 & 4.

NOTE B: Voltage on the triode grid of the 6SQ7 audio tube is —2 volts measured across resistor No. 7.

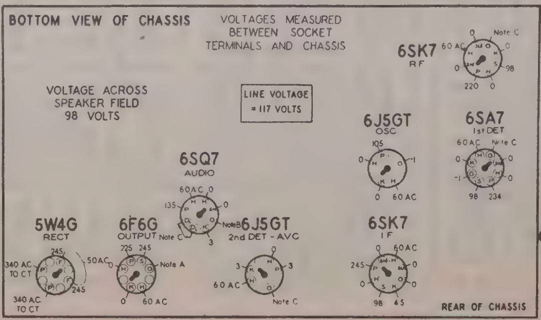
NOTE C: Bias for the 6SK7 R.F and 6SA7 1st det. grids and voltage on the 6J5GT 2nd det. grid and diode plates on 6SQ7 is —3 volts measured across resistor No. 10.

Diagram Number	Part Number	Description
1-2	83539	Condenser—mica 260 mmfd.
3	83783	Condenser—mica 110 mmfd.
4	88460	Resistor—wire wound 150 ohms ½ watt
5-6	85061	Condenser—mica 51 mmfd.
7	88465	Resistor—25 ohms ½ watt W.W.
8	38587	Condenser—mica .0042 mfd.
9	110377	Condenser—electrolytic 10 mfd. 35 volt
10	110534	Resistor—wire wound 40 ohms ½ watt
11-12	110552	Resistor—carbon 47,000 ohms ¼ watt
13	110553	Resistor—carbon 220,000 ohms ¼ watt
14	110558	Resistor—carbon 33,000 ohms ½ watt
15	110559	Resistor—carbon 470,000 ohms ¼ watt
16	110564	Resistor—carbon 100,000 ohms ¼ watt
17	110570	Resistor—carbon 2.2 meg. ¼ watt
18	110573	Resistor—carbon 2,200 ohms ¼ watt
19	110580	Resistor—carbon 3.3 meg. ¼ watt
20-21	110584	Resistor—carbon 330,000 ohms ¼ watt
22	110595	Resistor—carbon 12,000 ohms 3 watts
23-24	110629	Lamp—6.3 volt—.25 amps.
25	112978	Resistor—insulated 470 ohms ¼ watt
26	112980	Resistor—carbon 1000 ohms ¼ watt
27A-27B	114141	Switch—D.P.D.T.
28-29	114972	Condenser—electrolytic 16 mfd. 450 volt.
30	U-115091	Speaker—dynamic 10"
31-32	116625	Condenser—.1 mfd. 600 volt
33 to 37	116640	Condenser—.01 mfd. 600 volt
38 to 41	116819	Condenser—.05 mfd. 600 volt
42-43	116893	Condenser—.02 mfd. 600 volt
44	117022	Condenser—.002 mfd. 600 volt
45	118475	Shield for loop antenna
46	118665	Transformer—power
47A-47B	118669	Volume control with switch 1 meg.
48	118919	Condenser—padding
49	119024	Transformer—2nd I.F.
50	119042	Transformer—1st I.F.
51A-51B-51C	119174	Condenser—trimmer—3 section
52	119289	Switch—tone
53A-53B	119291	Condenser—variable tuning
54	119345	Condenser—trimmer
55	119346	Switch—push button
56A-56B	119354	Switch—range
57	119362	Coil—compensating
58	119365	Coil—oscillator
59	119367	Coil—S. W. antenna
60	119390	Loop antenna (complete
61	U-119464	Transformer—output for U-115091 speaker
62	U-119465	Cone & Voice coil for U-115091 speaker
63A to 63L	119662	Condenser—push button trimmer (Low) 540 to 1000 KC
	119663	Condenser—push button trimmer (Med.) 750 to 1375 KC
	119664	Condenser—push button trimmer (Hi) 980 to 1550 KC

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC.



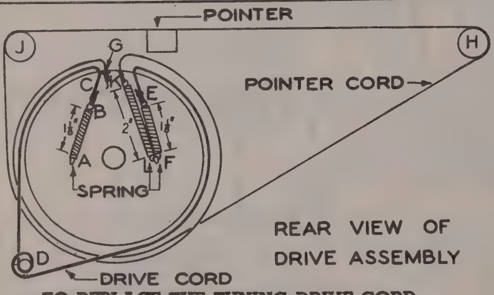
MODELS 01-8C7,01-8C7-Z
Alignment,Socket,Trimmers
Drive Cord Data

STEWART-WARNER CORP.

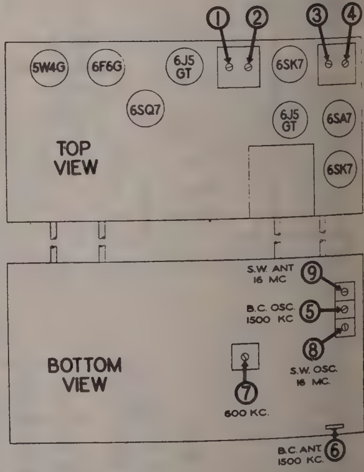
1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condens (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and REMOVE THE BLUE WIRE FROM THE CENTER SCRE ON ANTENNA TERMINAL STRIP.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Check the pointer to see that it is correctly set to 540 KC with gang in full mesh.
5. The loop must be connected as indicated in circuit diagram at all times.
6. With some signal generators it may be found that reducing the input to a useable value is impossible using the dummy antenn recommended below. In such cases the signal generator may be disconnected entirely from the set and the R. F. lead of the sign generator placed in the vicinity of the loop. On the S. W. position the shield wire (black) may be disconnected from set and input to center terminal.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	Center Screw on Antenna Terminal Strip	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Center Screw on Antenna Terminal Strip	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Center Screw on Antenna Terminal Strip	600 KC	Broadcast	Tune to 600 KC Generator Signal	7	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.
400 OHM Carbon Resistor	Center Screw on Antenna Terminal Strip	16 MC	Foreign	16 MC	8	Foreign Oscillator	Adjust for Maximum Output. Check to se if Proper Peak was Obtained by Tunin in Image at Approx. 15.1 MC. If Imag does not appear, Realign at 16 MC, wi Trimmer Screw farther out. Recheck Imag
400 OHM Carbon Resistor	Center Screw on Antenna Terminal Strip	16 MC	Foreign	Tune to 16 MC Generator Signal	9	Foreign Antenna	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.

*NOTE: Realign trimmer No. 6 after set is in cabinet by connecting blue wire to center screw on antenna terminal strip, placing range switch in broadcast position, and adjusting for maximum output on a weak signal at approximately 1500 KC.



REAR VIEW OF DRIVE ASSEMBLY



TO REPLACE THE TUNING DRIVE CORD

1. Make a loop in one end of the dial drive cord (Part No. 117057 and fasten a spring (Part No. 113177) to this loop.
2. Fasten the spring to tab A and pass the cord through hole C in the rear of the drum.
3. Make one and one half turns of the cord about tuning shaft D.
4. Continue the cord around the drum through the other hole in the rear of the drum and form a loop at E. Fasten a spring (Part No. 113177) to the loop and adjust the loop to give the approximate dimension indicated.
5. Fasten the spring to tab F.

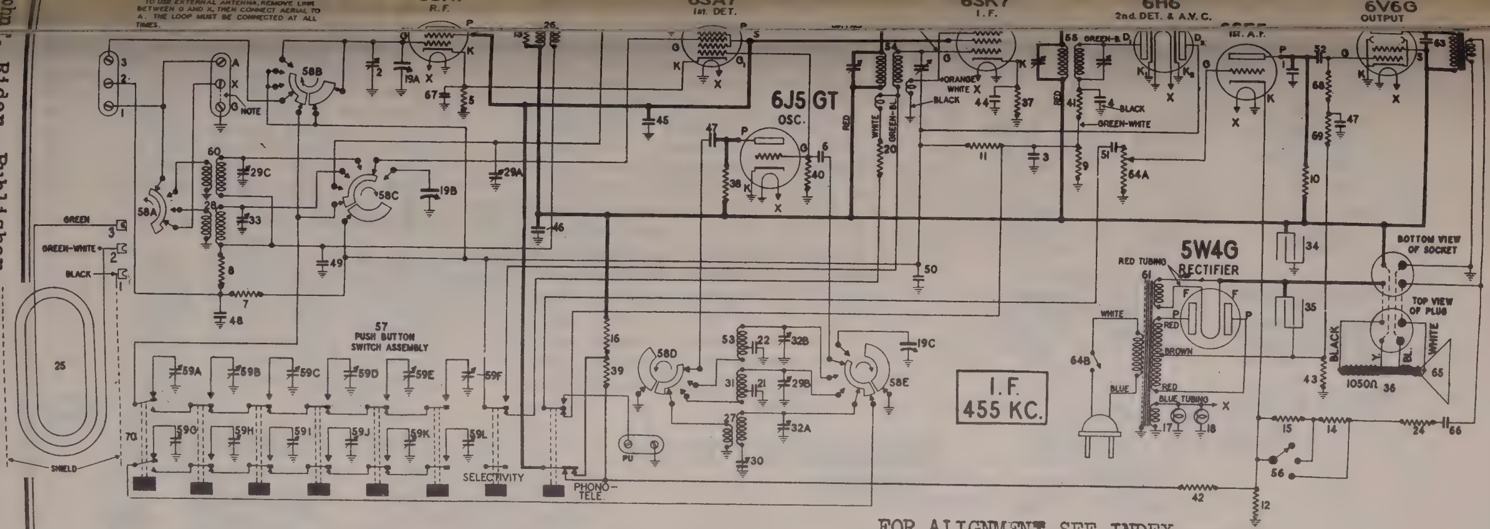
TO REPLACE THE POINTER DRIVE CORD

1. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of the cord (Part No. 116948) and pass the cord through hole G in the front of the drum.
2. Continue the cord around the drum and around pulley H.
3. Go from pulley H to pulley J and around the drum through hole K in the front of the drum.
4. Fasten a spring (Part No. 113177) at this point by forming a loop in the cord.
5. Adjust the loop so that the spring is extended to 2 inches.
6. Fasten the spring to tab L.
7. The condenser should be one quarter meshed (or at an of 45°) when the drum is in the indicated position.
8. Cement the pointer to the pointer drive cord so that it 540 KC with the gang in full mesh.

Schematic, Voltage

STEWART-WARNER CORP.

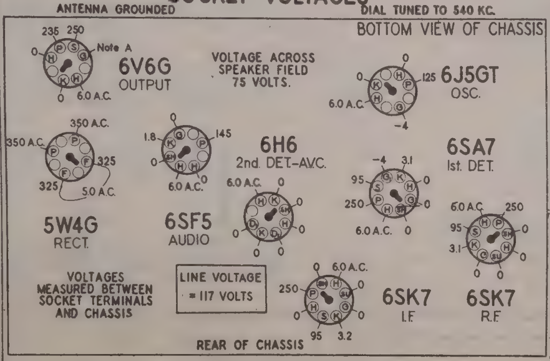
MODELS 01-8B1 to 01-8B9 inc.
Chassis 01-8B



FOR ALIGNMENT SEE INDEX

Diagram Number	Part Number	Description	Diagram Number	Part Number	Description
1	83539	Condenser—mica 260 mmfd.	37	116015	Resistor—wire wound—400 ohms ½ watt
2	111043	Condenser—trimmer (single section)	38-39	116055	Resistor—carbon 22,000 ohms ½ watt
3-4	83783	Condenser—mica 110 mmfd.	40-41	116058	Resistor—insulated 47,000 ohms ¼ watt.
5	84979	Resistor—250 ohms ½ watt W.W.	42	116086	Resistor—carbon 18,000 ohms 3 watts
6	85061	Condenser—mica 51 mmfd.	43	116094	Resistor—220 ohms 2 watts W.W.
7-8-9-10	110553	Resistor—carbon 220,000 ohms ¼ watt	44-45-46	116625	Condenser—.1 mfd. 600 volt
11	110554	Resistor—carbon 1 megohm ¼ watt	47	116640	Condenser—.01 mfd. 600 volt
12	110556	Resistor—carbon 330 ohms ¼ watt	48-49-50	116819	Condenser—.05 mfd. 600 volt
13	110557	Resistor—carbon 4,700 ohms ¼ watt	51-52	116893	Condenser—.02 mfd. 600 volt
14	110586	Resistor—carbon 2,200 ohms ¼ watt	53	118688	Coil—short wave oscillator
15	110587	Resistor—carbon 3,900 ohms ¼ watt	54	118682	Transformer—1st I.F.
16	110595	Resistor—carbon 12,000 ohms 3 watts	55	118684	Transformer—2nd I.F.
17-18	110629	Lamp—6.3 volt—.25 amps	56	117678	Switch—tone control
19A-19B-19C	110743	Condenser—variable gang	57	117694	Push button switch
20	110975	Resistor—wire wound 33 ohms ½ watt	58A to 58E	117787	Range switch
	111043	Trimmer condenser (single section)	59A to 59L	117788	Condenser—trimmer gang
21	118679	Condenser—mica .00113 mfd.	60	118690	Coil—short wave antenna
22	112427	Condenser—mica 4050 mmfd. (3%)	61	117830	Transformer—power
24	112978	Resistor—insulated 470 ohms ¼ watt	62	118144	Transformer—output
25	118696	Loop antenna complete	63	118194	Condenser—.006 mfd. 600 volts
26	118706	Coil—broadcast R.F.	64A-64B	118198	Volume control with switch
27	118686	Coil—broadcast oscillator	65	U-118202	Cone & Voice coil for U-115071 speaker
28	118689	Coil—police antenna	66-67	118206	Condenser—.25 mfd. 600 volts
29A-29B-29C	113320	Condenser—trimmer—3 section	68-69	110553	Resistor—220,000 ohms ¼ watt
30	113346	Condenser—padding	70	118475	Shield for loop antenna (also see No. 118696)
31	118687	Coil—police oscillator			
32A-32B	114937	Condenser—2 section trimmer			
33	111043	Trimmer condenser (single section)		118682	Transformer—1st I.F.
34-35	114972	Condenser—electrolytic 16 mfd. 450 volt		118684	Transformer—2nd I.F.
36	U-115071	Speaker—12" dynamic		118696	Loop antenna complete (with shield)

SOCKET VOLTAGES



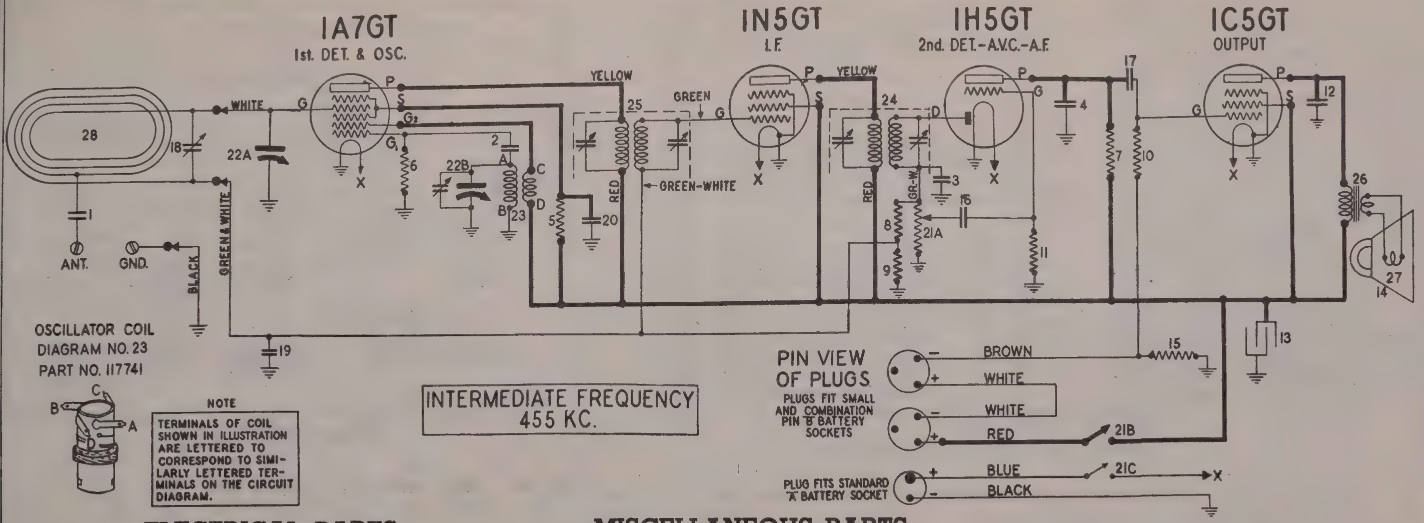
All voltages measured in radio position.

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 6V6G is 15 volts measured across resistor 43.

MODELS 02-4A1 to 02-4A9 inc.
Chassis 02-4A
Schematic, Voltage

STEWART-WARNER CORP.



ELECTRICAL PARTS

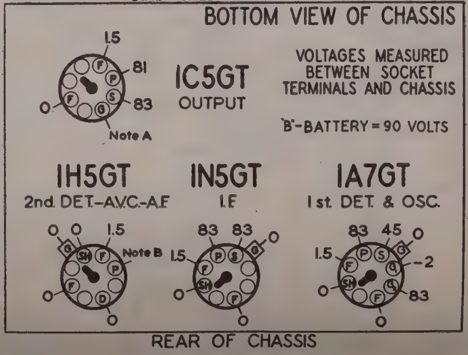
Diagram Number	Part Number	Description
1	83539	Condenser—mica, 260 mmfd.
2-3-4	85061	Condenser—mica, 51 mmfd.
5	110552	Resistor—carbon, 47,000 ohms, ¼ watt
6	110553	Resistor—carbon, 220,000 ohms, ¼ watt
7	110554	Resistor—carbon, 1 megohm, ¼ watt
8-9-10	110570	Resistor—carbon, 2.2 meg., ¼ watt
11	110580	Resistor—carbon, 3.3 meg., ¼ watt
12	113035	Condenser—Ceramic Tube, .006 mfd., 600 volt
13	113118	Condenser—Electrolytic—8 mfd., 150 volt
14	U-115068	Speaker—P.M. Dynamic (4 in.)
15	116061	Resistor—800 ohm, ¼ watt
16-17	116640	Condenser—.01 mfd., 600 volt
18	116781	Trimmer Condenser
19-20	116819	Condenser—.05 mfd., 600 volt
21A-21B-21C	117706	Volume Control—1 meg., with switch
22A-22B	117707	Condenser—Tuning
23	117741	Coil—Oscillator
24	117742	Transformer—2nd I.F.
25	117743	Transformer—1st I.F.

MISCELLANEOUS PARTS

Part Number	Description
117770	Battery retaining Block
117927	Button—"Off" Marker
116399	Cable—for Batteries
117836	Cabinet & Back
112745	Clip—Coil Mounting
113178	Cord—Dial (Supplied in 4 ft. lengths)
117715	Drive Drum and pointer assembly
117800	Dial scale
117894	Knob—volume
117895	Knob—tuning
118732	Loop terminal strip with trimmer & contacts
116397	Plug—2 prong Male
116398	Plug—3 prong Male
116488	Nut—8-32 Wing Nut
81145	Retaining Ring—for drive shaft
85040	Screw—No. 6 Hex. Hd.
113191	Screw—Special No. 8-32 x 1⅛
117716	Shield—Tube

SOCKET VOLTAGES

DIAL TUNED TO 540 KC.



NOTE A: The bias for the control grid of the 1C5GT tube is —7 volts measured across resistor 15

STEWART-WARNER CORP.

MODELS 03-5A1 to 03-5A9 inc.
Chassis 03-5A

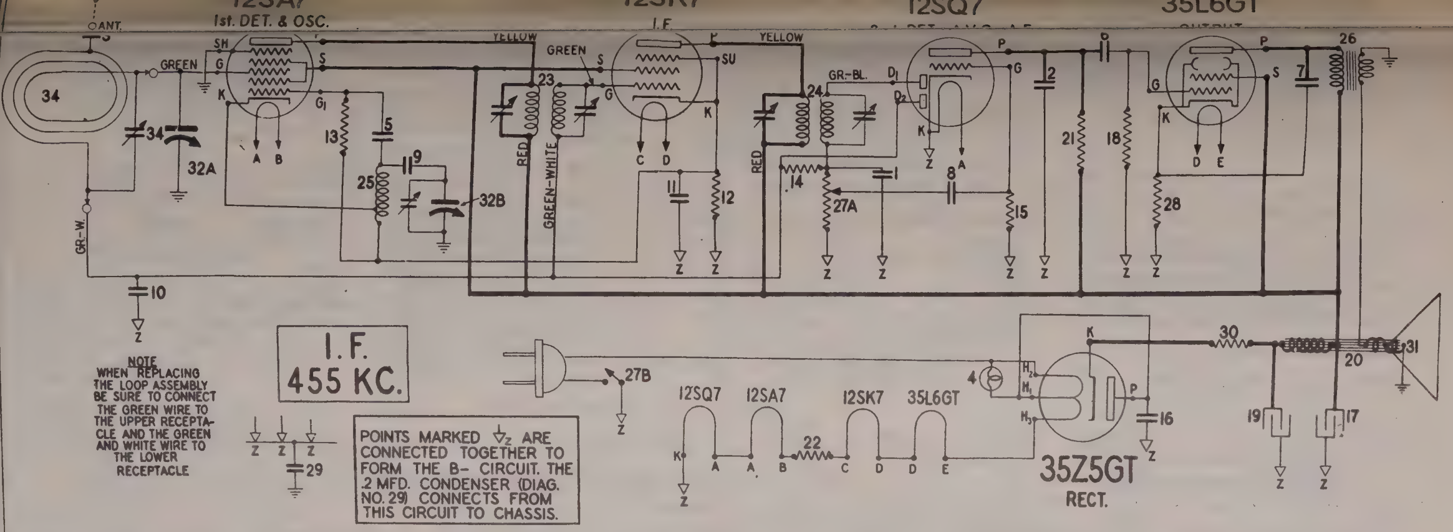
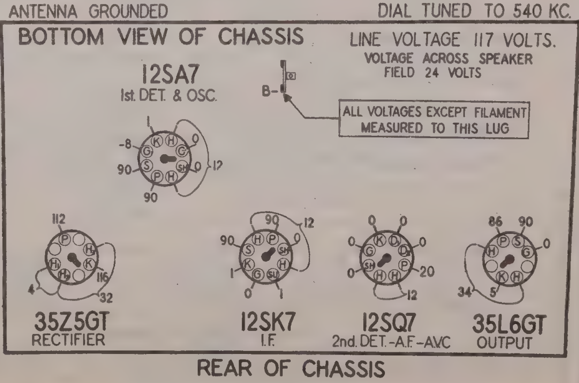

12SA7
1st DET. & OSC.
12SK7
I.F.
12SQ7
35L6GT
ANT.
34
GREEN
SH
G
K
S
G1
A
B
34
32A
13
5
9
25
32B
GR.-W.
10
Z
YELLOW
GREEN
23
RED
GREEN-WHITE
S
SU
G
K
C
D
11
12
P
YELLOW
24
RED
GR.-BL.
D1
D2
K
A
14
27A
1
8
15
G
P
2
21
18
D
28
G
K
D
E
S
P
7
26
30
20
31
19
17
4
H2
H1
H3
K
P
16
27B
12SQ7
12SA7
22
12SK7
35L6GT
K
A
A
B
C
D
D
E
35Z5GT
RECT.
29
Z
NOTE
WHEN REPLACING THE LOOP ASSEMBLY BE SURE TO CONNECT THE GREEN WIRE TO THE UPPER RECEPTACLE AND THE GREEN AND WHITE WIRE TO THE LOWER RECEPTACLE
I.F. 455 KC.
POINTS MARKED ▽Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .2 MFD. CONDENSER (DIAG. NO. 29) CONNECTS FROM THIS CIRCUIT TO CHASSIS.

Diagram Number	Part Number	Description
1-2	83539	Condenser—mica, 260 mmfd.
3	83783	Condenser—mica, 110 mmfd.
4	85296	Lamp—dial, 6 to 8 volt (mazda #51)
5	85394	Condenser—mica, 510 mmfd.
6-7	88026	Condenser—paper, .02 mfd., 400 volt
8-9	88030	Condenser—paper, .01 mfd., 400 volt
10	88189	Condenser—paper, .05 mfd., 200 volt
11	88193	Condenser—paper, .25 mfd., 150 volt
12	110560	Resistor—carbon, 100 ohms, ¼ watt
13	110565	Resistor—22,000 ohms, ¼ watt
14-15	110580	Resistor—carbon, 3.3 meg., ¼ watt
16	111252	Condenser—paper, .05 mfd., 400 volt
17	112898	Condenser—electrolytic, 16 mfd., 150 volt
18	112971	Resistor—insulated 470,000 ohms, ¼ watt
19	113472	Condenser — electrolytic 40 mfd., 150 volt
20	U-115055	Speaker—electro dynamic
21	116067	680,000 ohm, ¼ watt—20% insulated
22	116527	Resistor—100 ohms—10% 3 watt W.W.
23	116667	Transformer—1st I.F.
24	116672	Transformer—2nd I.F.
25	116674	Coil—oscillator
26	U-116676	Transformer—output for U-115055 speaker
27A-27B	116691	Volume control with switch
28	116702	Resistor—140 ohms—10% ½ watt W.W.
29	116706	Condenser—0.2 mfd., 600 volt
30	116752	Resistor—33 ohms, 1 watt W.W.
31	U-116727	Cone & Voice Coil Assem. for U-115055 speaker
32A-32B	116755	Condenser—2 gang
33	116775	Loop antenna
34	116781	Condenser—trimmer for loop ant. assembly

SOCKET VOLTAGES



Use a high resistance voltmeter of at least 1000 ohms per volt.

CHASSIS 03-5A
CHASSIS 05-5L
Alignment, Trimmers
Socket

STEWART WARNER CORP.

SERVICE DATA for MODEL 03-5A CHASSIS

ALIGNMENT PROCEDURE

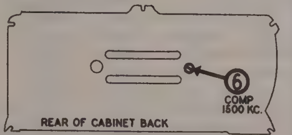
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil; or, using a condenser in series, connect between the plate of the 35L6GT output tube and B- as shown on the voltage chart. The more sensitive type should be connected across the voice coil.
2. Connect the ground lead of the signal generator to the B- lug (shown on the voltage chart) through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results, as one side of the power line may be grounded in the signal generator, or hum may be encountered.
3. Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.
4. TO CALIBRATE THE DIAL—Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). With the gang in full mesh, the last dial division (just below 55) on the low frequency end, should be exactly 4⅜ inches above the table surface. If this is not the case, release the set screw in the collar which connects the gang condenser shaft with the tuning unit, and holding the gang in full mesh, turn the dial until the last division is exactly 4⅜ inches above the table surface. Now re-tighten the set screw in the collar. The 4⅜ inch division on the ruler (when measured vertically from table surface), is to be used as the dial indicator for all calibration and alignment.

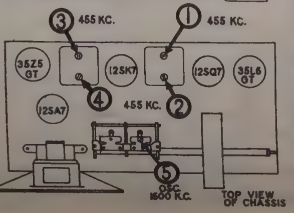
Dummy Ant. in Series with Signal Generator	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Green wire of Loop (loop must be connected)	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	Tune to 1500 KC Generator Signal	6	Broadcast Antenna (Shunt)	Adjust for maximum output. Then re-adjust as explained below.

Now remove the output meter and signal generator connections and replace the set in the cabinet. Replace the cabinet back and MAKE SURE THAT THE GREEN WIRE GOES TO THE UPPER RECEPTACLE OF THE LOOP AND THE GREEN-WHITE WIRE TO THE LOWER RECEPTACLE. Place the antenna lead from the signal generator near the back of the cabinet and turn the output up until the 1500 KC signal is weakly heard. Adjust trimmer No. 6 for maximum output by ear.

IMPORTANT: In order to get maximum sensitivity, trimmer condenser No. 6 (marked COMP. on back of cabinet) should be adjusted for maximum volume on a weak signal near 1400 KC. This should be done every time an external antenna is connected or disconnected.



REAR OF CABINET BACK



TOP VIEW OF CHASSIS

MISCELLANEOUS PARTS

Part Number	Description	List Price
112745	Clip—coil mounting	$0.01
113504	Collar—coupling (between tuner unit and gang condenser shaft)	.06
113558	Clutch spring—for tuner (on cam shaft)	.04
113560	Dial Scale—celluloid strip	.22
113582	Dial Window—celluloid	.12
113557	Key—for push button tuner (left hand)	.24
113572	Key—for push button (right hand)	.24
116556	Insulator—pilot light	.10
113500	Mechanical tuner unit—less tenite tips for push buttons	3.90
116689	Pad—for push button levers	.02
85827	Set Screw—8-32 square head	.02
83624	Screw—self tapping 8 x ¼	.01
113636	Screw—No. 8 x ¾" Chassis mtg.	.01
113537	Screw—for tuning knob (antique bronze)	.18
113538	Screw—for tuning knob (chrome head)	.14
85040	Screw—No. 6 Hex. Head ....Per C	.35
113699	Screw—No. 8 x 1" for chassis mtg.	.01
113542	Socket—dial lamp—insulated	.10
116690	Socket—(Octal base) (small)	.12
113550	Tabs—station call letters	.28
113559	Spring—for key return	.02
CABINETS		
116699	Cabinet (walnut)	3.75
116731	Cabinet—ivory sprayed	4.50
CABINET BACKS		
116795	Back—cabinet (ivory)	.15
116780	Back—cabinet (walnut)	.15
FELT PADS (Cabinet feet)		
113589	Felt Pad (cabinet feet—walnut and colors)	.06
113592	Felt Pad (cabinet feet ivory) 3/16"	.06
FELT STRIP (behind push buttons)		
113548	Felt Strip (brown) behind push button levers	.02
113549	Felt Strip (white) behind push button levers	.03
PUSH BUTTON TIPS		
113529	Tip—for push button (ivory)	.05
114710	Tip—for push button (walnut)	.05
TUNING KNOBS		
113531	Knob—tuning (ivory)	.30
114711	Knob—tuning (walnut)	.26
VOLUME KNOBS		
113574	Knob—volume (ivory)	.18

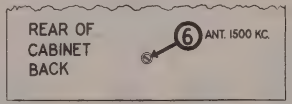
SERVICE DATA for MODEL 05-5L CHASSIS

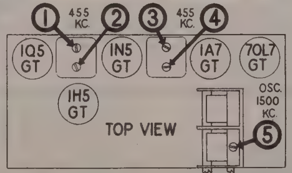
ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil of the speaker or between the plate of the 1Q5GT output tube and chassis through a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis through a .25 mfd. condenser.
3. Turn the "A.C.-D.C.-Battery" switch to "A.C.-D.C." or "Battery" depending upon the source of power being used.
4. Turn the volume control to the maximum volume position and keep it in this position while aligning. The loop antenna must be connected.
5. With the gang condenser in full mesh, the dial pointer should be in the horizontal position. If the pointer is incorrectly set, hold the gang in full mesh and move the pointer to the correct position by hand.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Condenser	Control Grid of 1A7GT	455 KC.	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Condenser	"Ant" Terminal	1500 KC.	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	"Ant" Terminal	1500 KC.	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.

Now disconnect the output meter and signal generator leads and replace the chassis and batteries in the cabinet being sure to connect the loop. Bring the antenna lead of the signal generator near the loop until the 1500 KC. signal is heard weakly and re-adjust trimmer No. 6 for maximum output by ear.





TOP VIEW

USING AN EXTERNAL ANTENNA

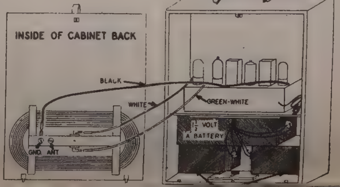
An external antenna may be connected to this radio to provide better signal pickup on weak stations. If the radio is being operated on A.C. or D.C. power lines, do not use a ground. If hum is encountered when operating from A.C. lines, the power cord plug should be reversed at the wall outlet. When the radio is operated from batteries and an external antenna is used, a ground must be used to obtain satisfactory pickup.

After an external antenna has been connected, a weak signal near 1500 KC should be tuned in, and trimmer No. 6 adjusted for maximum volume. If it is impossible to get a proper peak on this trimmer, check the connections of the white and green-white wires to see that they are connected exactly as shown in the drawing to the right. Please note that this drawing is slightly different from the one on the back cover

INSTALLATION OF BATTERIES

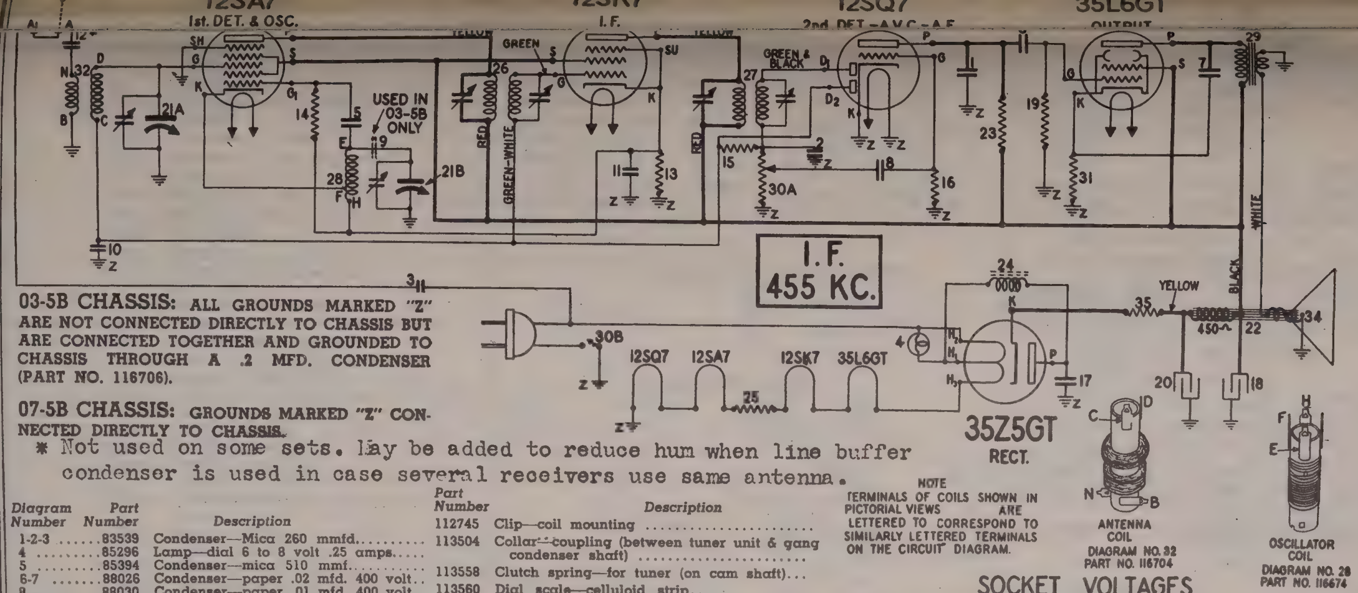
Two Eveready No. 482 "B" Batteries and one Eveready No. 745 "A" Battery are required for battery operation. To install the batteries proceed as follows:

1. If the power cord plug is connected to a power outlet disconnect it.
2. Remove the cabinet back.
3. Remove the three wires from the clips on the inside of the cabinet back.
4. Place the "A" battery in the bottom of the case and connect the two pronged plug to it.
5. Connect the three pronged plugs to the "B" batteries and slide them UNDER the "A" battery into the positions shown in the figure below.
6. Fasten the battery retaining block as shown, slide it against the batteries until REASONABLY tight, and tighten the wing nut.
7. Replace the cabinet back, being sure to connect the three wires to the proper clips as shown in the figure below. Improper operation will result if this is not done.



STEWART-WARNER CORP.

MODEL Senior Varsity
CHASSIS 03-5B,07-5B
Schematic,Voltage



03-5B CHASSIS: ALL GROUNDS MARKED "Z" ARE NOT CONNECTED DIRECTLY TO CHASSIS BUT ARE CONNECTED TOGETHER AND GROUNDED TO CHASSIS THROUGH A .2 MFD. CONDENSER (PART NO. 116706).

07-5B CHASSIS: GROUNDS MARKED "Z" CONNECTED DIRECTLY TO CHASSIS.

* Not used on some sets. May be added to reduce hum when line buffer condenser is used in case several receivers use same antenna.

NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

ANTENNA COIL
DIAGRAM NO. 32
PART NO. 116704

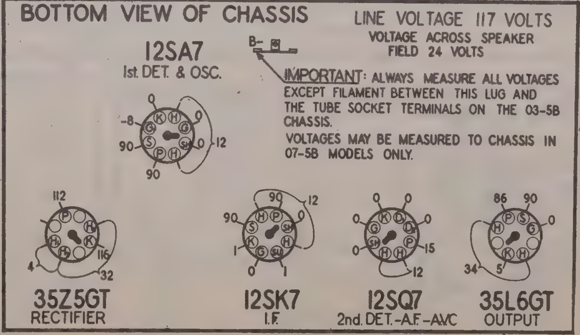
OSCILLATOR COIL
DIAGRAM NO. 28
PART NO. 116674

Diagram Number	Part Number	Description
1-2-3	83539	Condenser—Mica 260 mmfd.
4	85296	Lamp—dial 6 to 8 volt .25 amps.
5	85394	Condenser—mica 510 mmf.
6-7	88026	Condenser—paper .02 mfd. 400 volt.
8	88030	Condenser—paper .01 mfd. 400 volt.
9	88030	Condenser—paper .01 mfd. 400 volt (03-5B only)
10	88189	Condenser—paper .05 mfd. 200 volt.
11	88193	Condenser 0.25 mfd. 150 volt.
12	89826	Condenser—paper .004 mfd. 400 volt.
13	110560	Resistor—carbon 100 ohms 1/4 watt.
14	110565	Resistor—carbon 22,000 ohms 1/4 watt
15-16	110580	Resistor—carbon 3.3 meg. 1/4 watt.
17	111252	Condenser—paper .05 mfd. 400 volt.
18	112898	Condenser—electrolytic 16 mfd. 150 volt
19	112971	Resistor—insulated 470,000 ohms 1/4 watt
20	113472	Condenser—electrolytic 40 mfd. 150 volt
21A & 21B	113478	Condenser—variable gang
22	U-115055	Speaker—electro dynamic
23	116067	680,000 ohms 1/4 watt insulated
24	116232	R. F. Choke
25	116527	Resistor 100 ohms 3 watt W.W.
26	116667	Transformer—1st I.F.
27	116672	Transformer—2nd I.F.
28	116674	Coil—oscillator
29	U-116676	Transformer—output for U-115055 speaker
30A-30B	116691	Volume control with switch
31	116702	Resistor—140 ohms 1/2 watt W.W.
32	116704	Coil—antenna
	116706	Condenser—0.2—600 volts (03-5B only)
34	U-116727	Cone & voice coil for U-115055 speaker
35	116752	Resistor—33 ohms 1 watt W.W.

Part Number	Description
112745	Clip—coil mounting
113504	Collar—coupling (between tuner unit & gang condenser shaft)
113558	Clutch spring—for tuner (on cam shaft)
113560	Dial scale—celluloid strip
113582	Dial Window—celluloid
116556	Insulator Pilot Light (03-5B only)
113572	Key—for push button (right hand)
113557	Key—for push button tuner (left hand)
113500	Mechanical tuner unit—less tenite tips for push buttons
116689	Pad—for push button levers
83624	Screw—self tapping 8x1/4
85040	Screw—No. 6 Hex. Hd.
85827	Set Screw—8-32 Square Head
113537	Screw—for tuning knob (antique bronze)
113538	Screw—for tuning knob (chrome head)
113636	Screw—No. 8x3/4" chassis mtg.
113638	Screw—back cover retaining
113699	Screw—No. 8x1" for chassis mtg.
113542	Socket—dial lamp—insulated
116690	Socket—Octal Base (small)
113559	Spring—for key return
113550	Tabs—station call letters
116223	Terminal strip—for antenna (A-A$_1$)
113548	Felt Strip (Brown) behind push buttons
113549	Felt Strip (White) behind push buttons
113837	Felt Strip (Gray) behind push buttons

SOCKET VOLTAGES

ANTENNA GROUNDED
DIAL TUNED TO 540 KC.



LINE VOLTAGE 117 VOLTS
VOLTAGE ACROSS SPEAKER FIELD 24 VOLTS

IMPORTANT: ALWAYS MEASURE ALL VOLTAGES EXCEPT FILAMENT BETWEEN THIS LUG AND THE TUBE SOCKET TERMINALS ON THE 03-5B CHASSIS.

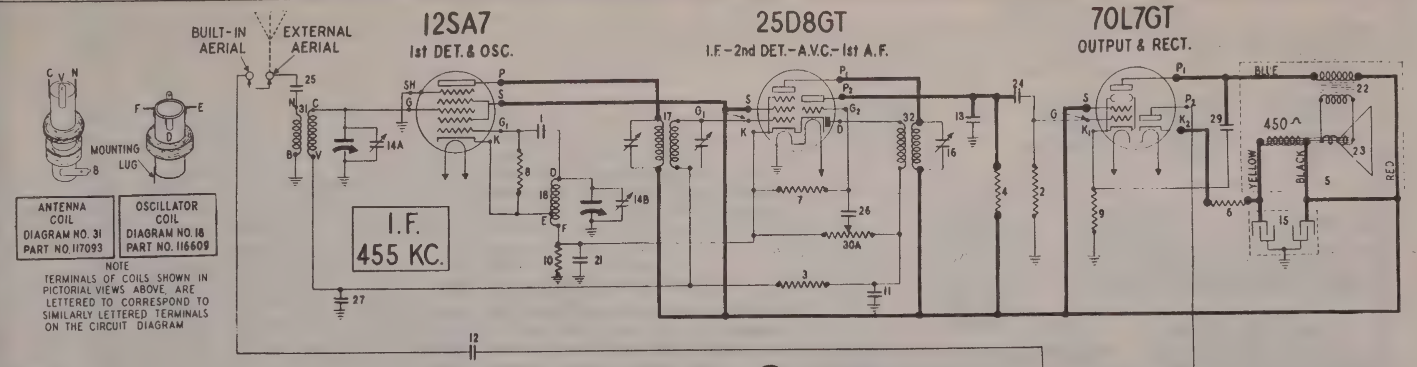
VOLTAGES MAY BE MEASURED TO CHASSIS IN 07-5B MODELS ONLY.

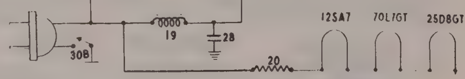
REAR OF CHASSIS

Use a High Resistance Voltmeter of at Least 1000 Ohms per Volt.

MODEL A-6S, Ch. 07-32
Schematic, Voltage, Socket
Trimmers, Alignment

STEWART WARNER CORP.


BUILT-IN AERIAL
EXTERNAL AERIAL
12SA7
1st DET. & OSC.
25D8GT
I.F.-2nd DET.-A.V.C.-1st A.F.
70L7GT
OUTPUT & RECT.
MOUNTING LUG
ANTENNA COIL DIAGRAM NO. 31 PART NO. 117093
OSCILLATOR COIL DIAGRAM NO. 18 PART NO. 116609
NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM
I.F. 455 KC.
BLUE
YELLOW
BLACK
RED
450 ^
12



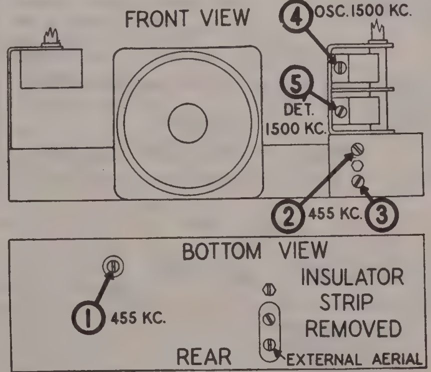


Diagram Number	Part Number	Description
1	83783	Condenser—mica, 110 mmf.
2	112971	Resistor—insulated, 470,000 ohms, ¼ watt
3	112972	Resistor—insulated, 1 megohm, ¼ watt
4	112987	Resistor—insulated, 220,000 ohms, ¼ watt
5	R-115053	Speaker—dynamic 3"
6	116013	Resistor—50 ohm, 1 watt
7	116050	Resistor—insulated, 10 megohm, ¼ watt
8	116059	Resistor—insulated, 22,000 ohm, ¼ watt
9	116064	Resistor—insulated, 100 ohm ½ watt
10	116069	Resistor—insulated, 100 ohm, ¼ watt
11-12-13	116224	Condenser—mica, 260 mmfd.
14A-14B	116578	Condenser—2 gang tuning
15	116587	Condenser—electrolytic, Dual 20 mfd. 150 volt
16	116599	Condenser—trimmer for 2nd I.F.
17	116605	Transformer—1st I.F.
18	116609	Coil—oscillator
19	116616	Coil—R. F. Choke
20	116618	Resistor—65 ohms, 2 watts, Wire Wound
21	116625	Condenser—.1 mfd., 600 volt
22	R-116633	Transformer — output for R-115053 speaker
23	R-116635	Cone & Voice coil assembly for R-115053 speaker
24	116640	Condenser—.01 mfd., 600 volt
25-26	116647	Condenser—.004 mfd., 600 volt
27	116819	Condenser—.05 mfd., 600 volt

116637—Cabinet—(walnut)
116657—Cabinet—(sprayed ivory)
112745—Clip—coil mounting
85321—Connector—for internal antenna
116576—Insulator—fibre for base (inside)
117101—Insulator—fibre for base (outside)
116532—Knob—volume control (red)
116533—Knob—tuning (red)
116886—Knob—volume control (ivory)
116887—Knob—tuning (ivory)
116584—Rubber foot for bottom of cabinet.
116629—Screw—No. 8-32 x 1⅛ Bind H.M.S.

For ALIGNMENT

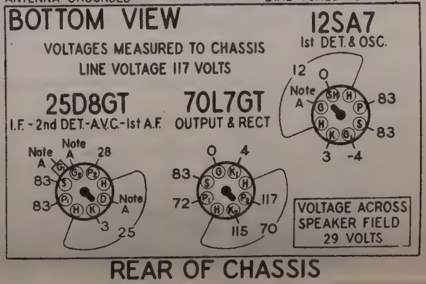
See Stewart-Warner Page 10-2

GANG CONDENSER TRIMMER

There are three trimmers located on the gang condenser used in this receiver. Two of these trimmers are shown in the trimmer location diagram which is shown on this page, and are marked No. 4 and No. 5. The third trimmer is located on the back of the gang condenser and has been adjusted at the factory so that further adjustment should be unnecessary. If this trimmer has been tampered with, however, it may be necessary to adjust it so that a satisfactory peak can be secured on trimmer No. 4.

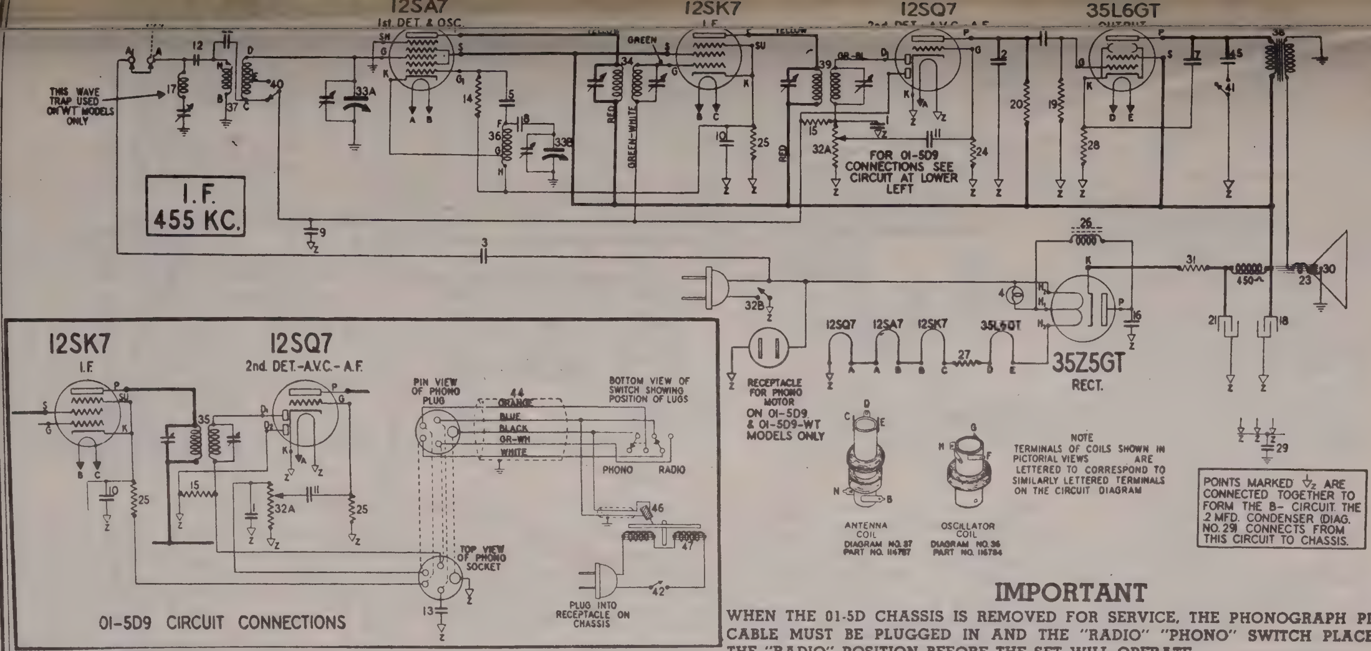
SOCKET VOLTAGES

VOLUME CONTROL SET AT MAXIMUM VOLUME POSITION
ANTENNA GROUNDED DIAL TUNED TO 540 KC.



STEWART-WARNER CORP.

MODELS 03-5C1,Ch.03-5C,
01-5D9,01-5D9-WT,Ch.01-5D
Schematic,Voltage,Socket
Phono.Connections


12SA7
1st DET. & OSC.
12SK7
I.F.
12SQ7
2nd DET.-A.V.C.-A.F.
35L6GT
OUTPUT
THIS WAVE TRAP USED ON WT MODELS ONLY
I.F. 455 KC.
GREEN
GREEN-WHITE
RED
YELLOW
GR-BL
FOR 01-5D9 CONNECTIONS SEE CIRCUIT AT LOWER LEFT
450~
35Z5GT
RECT.
RECEPTACLE FOR PHONO MOTOR ON 01-5D9 & 01-5D9-WT MODELS ONLY
12SQ7 12SA7 12SK7 35L6GT
ANTENNA COIL DIAGRAM NO.37 PART NO. 116787
OSCILLATOR COIL DIAGRAM NO.36 PART NO. 116784
12SK7
I.F.
12SQ7
2nd DET.-A.V.C.-A.F.
PIN VIEW OF PHONO PLUG
ORANGE
BLUE
BLACK
GR-WH
WHITE
BOTTOM VIEW OF SWITCH SHOWING POSITION OF LUGS
PHONO
RADIO
TOP VIEW OF PHONO SOCKET
PLUG INTO RECEPTACLE ON CHASSIS

01-5D9 CIRCUIT CONNECTIONS

NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM

POINTS MARKED ∇_Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .2 MFD. CONDENSER (DIAG. NO. 29) CONNECTS FROM THIS CIRCUIT TO CHASSIS.

IMPORTANT

WHEN THE 01-5D CHASSIS IS REMOVED FOR SERVICE, THE PHONOGRAPH PICKUP CABLE MUST BE PLUGGED IN AND THE "RADIO" "PHONO" SWITCH PLACED IN THE "RADIO" POSITION BEFORE THE SET WILL OPERATE.

THE 01-5D9 PHONOGRAPH MOTOR MUST BE OPERATED ON A.C. ONLY.

Diagram Number	Part Number	Description
1-2-3	83539	Condenser—mica 260 mmfd.
4	85296	Lamp—dial 6 to 8 volt .25 amps.
5	85394	Condenser—mica 510 mmfd.
6-7	88026	Condenser—paper .02 mfd. 400 volt
8	88030	Condenser—paper .01 mfd. 400 volt
9	88189	Condenser—paper .05 mfd. 200 volt
10	88193	Condenser- paper .25 mfd. 150 volt
11-12-13	89826	Condenser—paper .004 mfd. 750 volt (2 used on 03-5C & 03-5C-WT)
14	110565	Resistor—22,000 ohms
15	110580	Resistor—carbon 3.3 meg. 1/4 watt
16	111252	Condenser—paper .05 mfd. 400 volt
17	112796	Coil—wave trap with trimmer (WT models only)
18	112898	Condenser—electrolytic 16 mfd. 150 volt
19	112971	Resistor—insulated 470,000 ohms 1/4 watt
20	112987	Resistor—insulated 220,000 ohms 1/4 watt
21	113472	Condenser—electrolytic 40 mfd. 150 volt
22	114969	Condenser—mica 15 mmfd.
23	U-115055	Speaker—dynamic 5"
24	116050	Resistor—insulated 10 meg. 1/4 watt
25	116062	Resistor—150 ohms 1/4 watt
26	116232	R. F. Choke
27	116527	Resistor 100 ohms 3 watt wire wound
28	116702	Resistor—140 ohms 1/2 watt wire wound
29	116706	Condenser—.2 mfd. 600 volt
30	U-116727	Cone & voice coil assembly for U-115055 speaker
31	116752	Resistor—33 ohms 1 watt wire wound
32A-32B	116762	Volume control—1 meg. with switch
33A-33B	116763	Condenser—variable gang
34	116782	Transformer—1st I.F.
35	116783	Transformer—2nd I.F. (01-5D & 01-5D-WT)
36	116784	Coil—oscillator
37	116787	Coil—antenna
38	116788	Transformer—output
39	116809	Transformer—2nd I.F. (03-5C & 03-5C-WT)
40-41	116896	Switch—S.P.D.T.
42	116942	Switch—(On-Off) for phono motor (01-5D & 01-5D-WT)
43	116945	Switch—(Radio-phono) (01-5D & 01-5D-WT)
44	116966	Pickup cable and plug (01-5D & 01-5D-WT)
45	116984	Condenser—.04 mfd. 600 volt
46	117053	Phono pickup unit (01-5D & 01-5D-WT)
47		Phono motor unit (see phonograph parts list)

ANTENNA GROUNDED
DIAL TUNED TO 540 K.C.

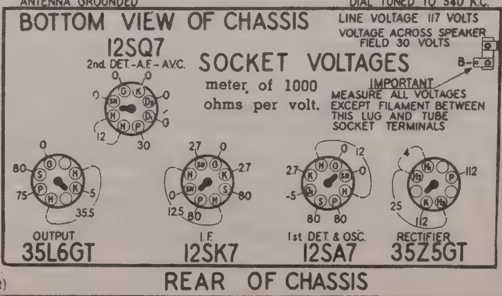
BOTTOM VIEW OF CHASSIS

SOCKET VOLTAGES

meter of 1000 ohms per volt.

LINE VOLTAGE 117 VOLTS
VOLTAGE ACROSS SPEAKER FIELD 30 VOLTS

IMPORTANT
MEASURE ALL VOLTAGES EXCEPT FILAMENT BETWEEN THIS LUG AND TUBE SOCKET TERMINALS



REAR OF CHASSIS

CHASSIS 03-5C,01-5D
CHASSIS 07-5B,03-5B
Alignment,Trimmers
Socket,Notes

STEWART-WARNER CORP.

CHASSIS MODELS 03-5C AND 01-5D

ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil, or using a .1 mfd. condenser in series connect between the 35L6GT tube plate and B— as shown on the voltage chart.
2. Connect the ground lead of the signal generator through a .25 mfd. condenser to B— as shown on the voltage chart.
3. Remove the connector between terminals A and A₁, turn the volume control to maximum position and place the band switch in the broadcast position. On the 01-5D chassis the "Phono" cable must also be plugged in and the "Radio" "Phono" switch placed in the "Radio" position.
4. With the gang condenser in full mesh, the pointer should be in a horizontal position. If it is not, it should be moved to this position before alignment.

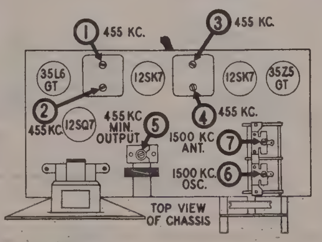
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 Mfd. Condenser	Trimmer Lug On Large Section Of Variable Condenser	455 KC.	Any Point Where it Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
				3-4	1st I.F.	
200 Mmfd. Mica Condenser	"A" Terminal	455 KC.	Any Point Where it Does Not Affect the Signal	5 Used Only On Chassis Marked "WT"	Wave Trap "WT" Models Only	Adjust for Minimum Output Using a Strong Generator Signal.
200 Mmfd. Mica Condenser	"A" Terminal	1500 KC.	1500 KC.	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 Mmfd. Mica Condenser	"A" Terminal	1500 KC.	Tune to 1500 KC. Generator Signal	7	Broadcast Antenna (Shunt)	Adjust for Maximum Output.

DIAL AND MISCELLANEOUS PARTS

Part Number	Description	List Price
112745	Clip—coil mounting	$0.01
113019	Clip—dial scale retaining	.01
112798	Clip—for mtg. wave trap coil (used on WT model)	.01
85321	Connector for built-in antenna	.01
113178	Cord—dial	.30
116800	Dial scale	.10
116773	Knob—tuning or volume	.10
116916	Pointer assembly	.04
116165	Receptacle—2 prong for Phono motor (01-5D & 01-5D-WT)	.50
81145	Retaining ring—for drive shaft Per C	.50
83624	Screw—self tapping 8x¼	.01
85040	Screw—No. 6 Hex. Head Per C	.35
116758	Shaft—tuning	.12
116690	Socket—octal base	.12
116793	Socket—for pilot light	.25
114271	Socket—5 prong for Phono motor (01-5D & 01-5D-WT)	.17
111981	Spring—for dial cord tension	.03
116223	Terminal strip—for antenna (A-A₁)	.12
116530	Washer—(paper) for back of knobs	.005
111456	Washer—spring washer Per C	.50
116414	Window, dial	.25

PHONOGRAPH PARTS (01-5D9 & 01-5D9-WT)

Part Number	Description	List Price
117884	Crystal Cartridge only (with leads)	$4.00
117053	Crystal Pickup unit complete	7.25
117810	Idler wheel mounting stud and plate	.22
117806	Idler wheel with rubber rim	.60
117816	Motor drive pulley with set screw	.26
117817	Motor mounting plate	.75
84571	Needle cup	.10
117085	Needle screw	.18
117812	Nut—large to retain idler assembly	.01
117813	Nut—small to lock idler retaining nut	.01
117168	Phono motor unit for 60 cycles (less turntable)	7.40
117815	Retaining clip for turntable shaft	.02
117808	Retaining clip for idler wheel	.02
117807	Rubber rim for idler wheel	.12
117814	Spacer for motor mounting	.04
117809	Spring for idler assembly	.10
117083	Turntable	1.00



RADIO AND PHONOGRAPH OPERATION

These radios are equipped with a police band covering frequencies from about 2320 KC. to 2500 KC. at one end of the dial scale as indicated by the word POLICE. To use this band, push the switch located on the back of the chassis to the position marked POLICE.

A Built-in Line Antenna is incorporated in all models and will generally give satisfactory results in localities where powerful broadcast stations are located. To use this built-in antenna, terminals A and A₁ on the back of the chassis must be connected together. When aligning the set the connector between these two terminals should be removed. This will prevent pickup of signals which may interfere with the alignment procedure.

The Model 01-5D9 receiver is equipped with a phonograph turntable and crystal pickup unit. This receiver can be operated on A.C. only when the phonograph unit is used. Attempts to operate the phonograph unit on D.C. will damage it. The 03-5C chassis however may be operated on either A.C. or D.C. of the

SERVICE DATA FOR MODEL 07-5B and 03-5B CHASSIS

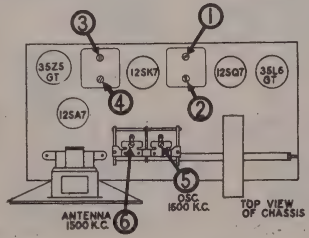
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 455 KC to 1500 KC are required.

1. Connect the output meter across the voice coil or, using a .1 mfd. condenser in series, connect as follows:
   MODEL 03-5B: Between the 35L6GT plate and B— terminal shown on voltage chart.
   MODEL 07-5B: Between the 35L6GT plate and chassis.
2. Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator. If oscillation or hum occurs in the model 03-5B, connect the ground lead of the signal generator through a .25 mfd. condenser to B— as shown on the Voltage Chart.
3. Remove the connector between terminals A and A₁, also turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. TO CALIBRATE THE DIAL: Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). With the gang condenser in full mesh, the last dial division (just below 55) on the low frequency end should be exactly 4⅜ inches above the table surface. If the dial is not in this position with the gang in full mesh, it is necessary to re-set the dial. Loosen the set screw in the collar which connects the gang condenser shaft with the tuning unit, adjust to the correct position and tighten the screw.

   The 4⅜ inch division on the ruler (when measured vertically from the table surface) is to be used as the dial indicator for all calibrations and alignment.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Trimmer lug on large section of variable condenser	455 KC	Any point where it does not affect the signal	1-2	1st I.F. 2nd I.F.	Adjust for Maximum Output. Then repeat adjustment.
				3-4		
200 MMFD. Mica Condenser	Antenna Terminal A	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal A	1500 KC	Tune to 1500 KC Generator Signal	6	Broadcast Antenna (Shunt)	Adjust for Maximum Output.



BUILT-IN ANTENNA SYSTEM

The Built-In Antenna incorporated in this receiver will generally give very satisfactory results in localities where Powerful broadcast stations exist. This Built-In Antenna will function when terminals A and A₁ on the back of the chassis are connected together. In cases where noises are excessive or greater sensitivity is desired, remove the jumper connecting terminals A and A₁ and connect an external antenna to terminal A.

When aligning this receiver, the jumper connecting terminals A and A₁ should be removed. This will prevent picking up signals which might interfere with the alignment procedure. When the I.F. channel is being aligned, the gang condenser should be set at a point where no interfering signal will be received.

HOW TO SET UP PUSH BUTTON TUNER

1. Connect the set to a good antenna system and allow it to operate for at least 15 minutes before setting up buttons.
2. Select four nearby powerful stations to which you wish to set up the buttons. Any button may be set to any desired station.
3. Hold the tuning knob firmly and loosen the screw in its center not more than two whole turns.
4. Hold the button, you wish to set, down firmly and tune in the station to be set to that button. Be sure to tune in the station accurately. Release the push button. The rest of the buttons may be set up in the same manner.
5. After all buttons have been set, re-tighten the screw in the tuning knob. Hold the knob firmly while tightening this screw.
6. The push buttons should now be labeled with their proper call letters in the spaces provided above the push buttons. Call letter sheets are provided with your receiver.
7. In using the push button tuner, be sure to push the button all the way down, otherwise the desired station will not be tuned in.

MISCELLANEOUS PARTS

CABINETS

Part No.	Description	List Price
116699	Walnut	$3.75
116731	Ivory (Sprayed)	4.50

CABINET BACKS

Part No.	Description	List Price
116719	Walnut	.14
116723	Ivory	.14

FELT PADS (Cabinet feet)

Part No.	Description	List Price
113588	Walnut and colors—3/16"	.06
113592	Ivory—3/16"	.06

KNOBS — TUNING

Part No.	Description	List Price
113531	Ivory	.30
114711	Walnut	.26

KNOBS — VOLUME

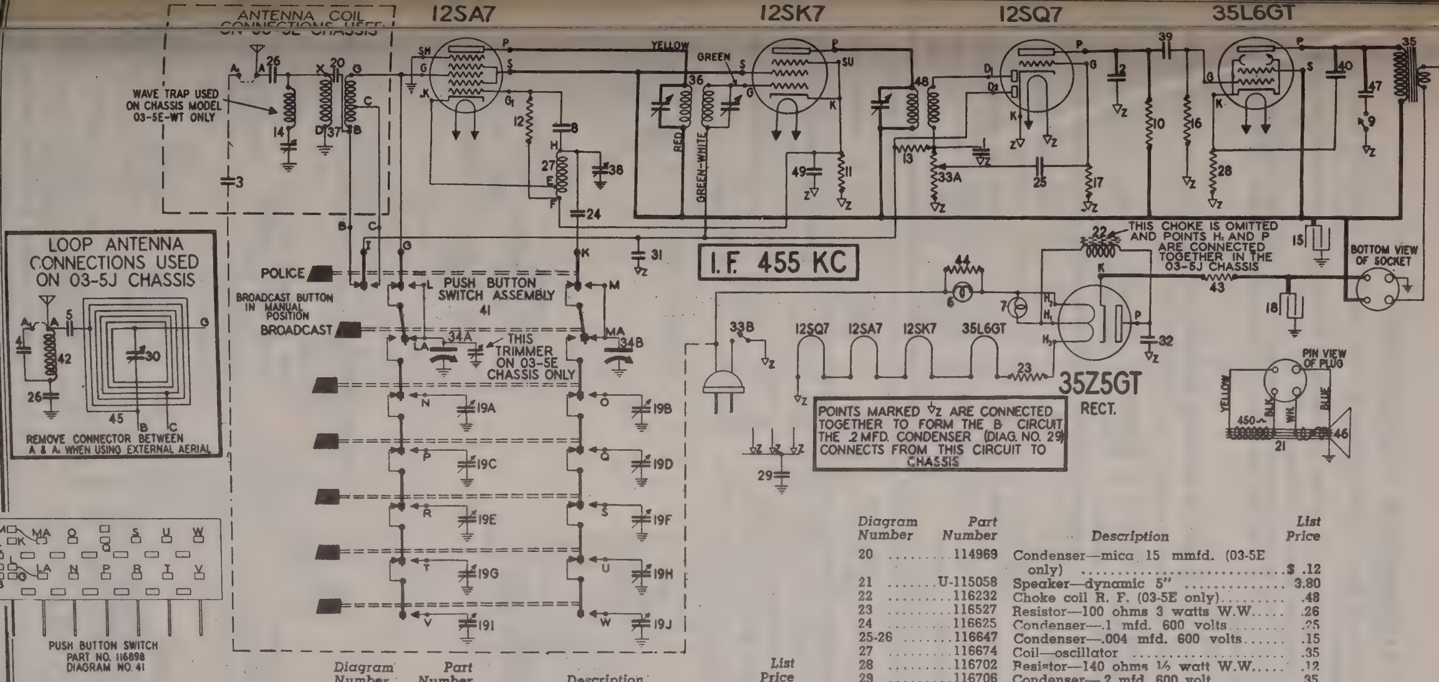
Part No.	Description	List Price
113574	Ivory	.18
114712	Walnut	.18

PUSH BUTTON TIPS

Part No.	Description	List Price
113529	Ivory	.05
114710	Walnut	.05

STEWART WARNER CORP.

CHASSIS 03-5E, 03-5J
Schematic


12SA7
12SK7
12SQ7
35L6GT
ANTENNA COIL CONNECTIONS USED ON 03-5E CHASSIS
WAVE TRAP USED ON CHASSIS MODEL 03-5E-WT ONLY
YELLOW
GREEN
RED
GREEN-WHITE
I.F. 455 KC
THIS CHOKE IS OMITTED AND POINTS H, AND P ARE CONNECTED TOGETHER IN THE 03-5J CHASSIS
BOTTOM VIEW OF SOCKET
PIN VIEW OF PLUG
YELLOW
BLK
WH
BLUE
450~
POLICE
BROADCAST BUTTON IN MANUAL POSITION
BROADCAST
PUSH BUTTON SWITCH ASSEMBLY 41
THIS TRIMMER ON 03-5E CHASSIS ONLY
35Z5GT RECT.
POINTS MARKED ▽Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT THE .2 MFD. CONDENSER (DIAG. NO. 29) CONNECTS FROM THIS CIRCUIT TO CHASSIS
LOOP ANTENNA CONNECTIONS USED ON 03-5J CHASSIS
REMOVE CONNECTOR BETWEEN A & A₁ WHEN USING EXTERNAL AERIAL
PUSH BUTTON SWITCH PART NO. 116898 DIAGRAM NO. 41

LETTERS ON TERMINALS OF COIL AND SWITCH PICTORIALS CORRESPOND TO LETTERS ON DIAGRAM.

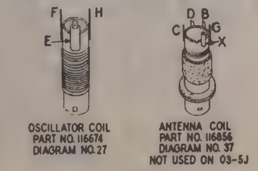

F
H
E
D B
C
G
X
OSCILLATOR COIL PART NO. 116674 DIAGRAM NO. 27
ANTENNA COIL PART NO. 116856 DIAGRAM NO. 37 NOT USED ON 03-5J

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd. (2 used on 03-5J)	$0.20
4-5	85061	Condenser—mica 51 mmfd. 03-5J only	.15
6-7	85296	Lamp—dial 6 to 8 volt .15 amps.	.16
8	85394	Condenser—mica 510 mmfd.	.25
9	88054	Switch—tone control	.30
10	110553	Resistor—carbon 220,000 ohms 1/4 watt	.12
11	110560	Resistor—carbon 100 ohms 1/4 watt	.12
12	110565	Resistor—22,000 ohms 1/4 watt	.12
13	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12
14	112796	Wave Trap with trimmer (03-5E-WT only)	.50
15	112898	Condenser—electrolytic 16 mfd. 150 volt	.50
16	112971	Resistor—insulated 470,000 ohms 1/4 watt	.15
17	112975	Resistor—carbon 10 meg. 1/4 watt	.12
18	113472	Condenser—electrolytic 40 mfd. 150 volt	.56
19A to 19E.	114964	Condenser—Push button trimmer for 03-5E	2.25
	116963	Condenser—Push button trimmer for 03-5J	2.25
20	114969	Condenser—mica 15 mmfd. (03-5E only)	$ .12
21	U-115058	Speaker—dynamic 5"	3.80
22	116232	Choke coil R. F. (03-5E only)	.48
23	116527	Resistor—100 ohms 3 watts W.W.	.26
24	116625	Condenser—.1 mfd. 600 volts	.25
25-26	116647	Condenser—.004 mfd. 600 volts	.15
27	116674	Coil—oscillator	.35
28	116702	Resistor—140 ohms 1/2 watt W.W.	.12
29	116706	Condenser—.2 mfd. 600 volt	.35
30	116781	Condenser—trimmer (03-5J only)	.22
31-32	116819	Condenser—.05 mfd. 600 volt	.20
33A-33B	116834	Volume control—1 meg. (with switch)	1.10
34A-34B	116836	Condenser—tuning for 03-5E	2.80
	116961	Condenser—tuning for 03-5J	3.20
35	116846	Transformer—output	1.00
36	116848	Transformer—1st I.F.	1.05
37	116856	Coil—antenna—03-5E only	.60
38	116879	Condenser—trimmer 5 to 50 mmfd.	.15
39-40	116893	Condenser—paper .02 mfd. 600 volt	.15
41	116898	Push button switch	3.30
42	116933	Antenna choke coil 03-5J only	.35
	116961	Condenser—tuning for 03-5J	3.20
	116963	Trimmer condenser strip (push button) 03-5J	2.25
43	116967	Resistor 25 ohms 1 watt W.W.	.16
44	116968	Resistor—40 ohms 2 watts W.W.	.86
45	116969	Loop antenna 03-5J only	.90
46	U-116982	Cone & voice coil for U-115058 speaker	1.55
47	116984	Condenser—.04 mfd. 600 volt	.20
48	117798	Transformer—2nd I.F.	1.20
49	118206	Condenser—.25 mfd. 600 volt	.35

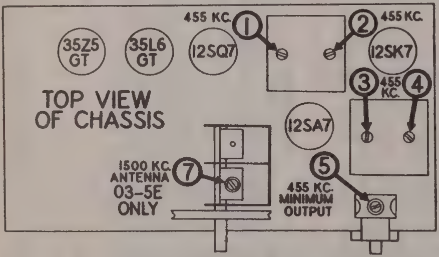
CHASSIS 03-5E,03-5J
Alignment,Voltage
Trimmers,Socket

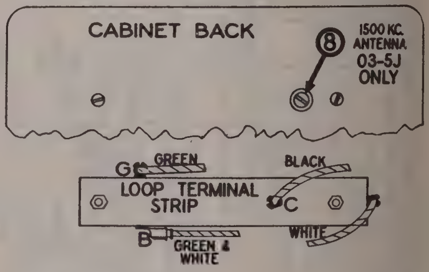
STEWART WARNER CORP.

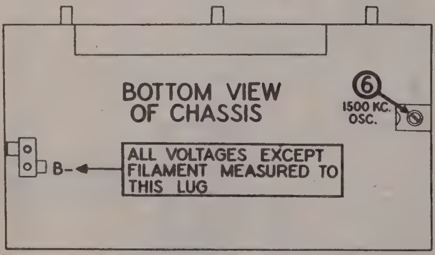
ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil or using a .1 mfd. condenser in series, connect from the 35L6GT output tube pla to B— as shown on bottom view of chassis.
2. Connect the ground lead of the signal generator through a .25 MFD condenser to the B— lug as shown on bottom view of chassi
3. Turn the volume control to maximum position and push the "Broadcast" button in.
4. The pointer should be in a horizontal position when the gang condenser is in full mesh. If it is not, it will be necessary to remov the dial window by pushing out the clips holding it in place and setting the pointer to the correct position. Be sure that the dia face is in the correct position when this is done.
5. On the 03-5E chassis, remove connector between A and A_1.
6. On the 03-5J chassis, connect the loop making sure the wires are connected to their proper clips on the loop terminal strip and mak sure A is connected to A_1.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Stator lug on large section of variable condenser	455 KC	Any point where it does not affect signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	Antenna Terminal "A"	455 KC	Any point where it does not affect signal	5 Used on 03-5E-WT only	Wave Trap	Adjust for minimum output using a strong generator signal.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for maximum output.
On the 03-5E and 03-5E-WT Chassis only, proceed with this step:						
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC	Tune to 1500 KC Generator Signal	7 03-5E and 03-5E-WT only	Broadcast Antenna (Shunt)	Adjust for maximum output.
On the 03-5J chassis, remove the output meter leads, replace the chassis in the cabinet and replace the cabinet back and loop assembly being sure to connect the loop properly as shown below. Replace connector between terminal A and A_1. Then make the following adjustment.						
Place lead from Sig. Generator close to the loop.		1500 KC	Tune to 1500 KC Generator Signal	8 03-5J only	Broadcast Antenna (Shunt)	Adjust for maximum output by ear.





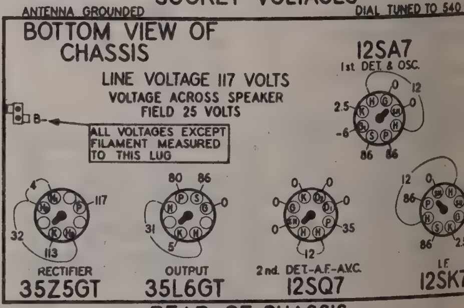


ANTENNA SYSTEM

A built-in line antenna is incorporated in the 03-5E chassis models. The 03-5J uses a loop antenna. Both sets have terminals so that an external antenna may be used. To connect an external antenna to either of these sets, remove the connector between A and A_1 and connect the antenna to the terminal marked A. Do not make any connection to the terminal marked A_1.

It should not be necessary to change the setting of the trimmer on the 03-5J cabinet back when connecting or removing an external antenna if the set has been properly aligned.

SOCKET VOLTAGES

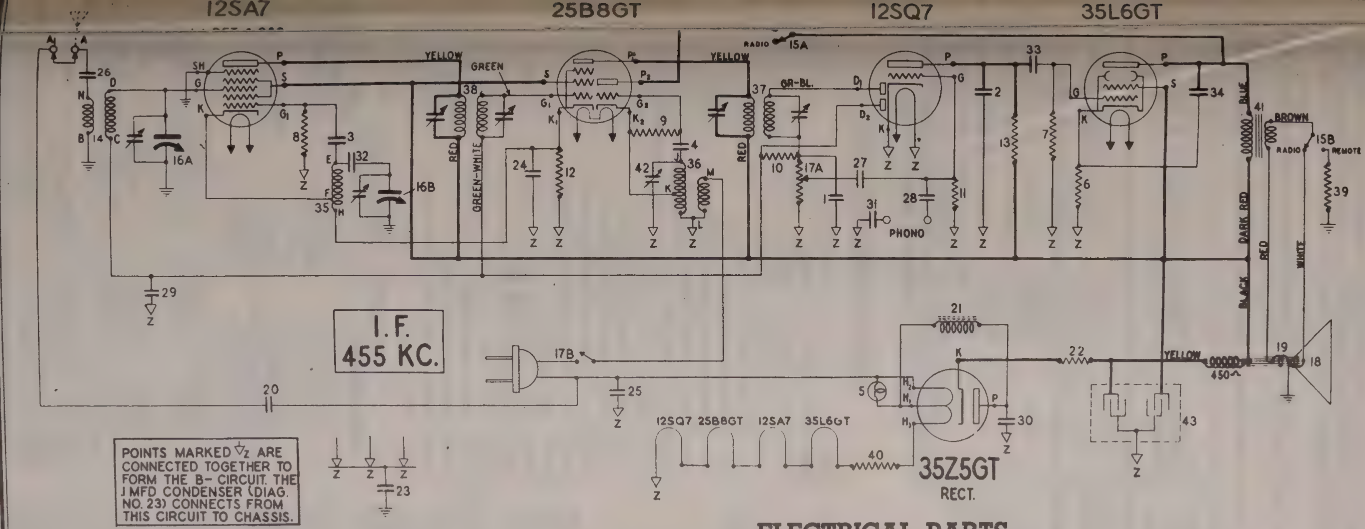


REAR OF CHASSIS

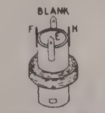
Use a high resistance Voltmeter of at least 1000 ohms per v

STEWART-WARNER CORP.

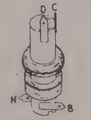
MODELS 03-5K1 to 03-5K9
Magician, Ch. 03-5K
Schematic



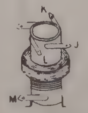
POINTS MARKED ∇_Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .1 MFD CONDENSER (DIAG. NO. 23) CONNECTS FROM THIS CIRCUIT TO CHASSIS.



OSCILLATOR COIL
DIAGRAM NO 35
PART NO 117352



ANTENNA COIL
DIAGRAM NO. 14
PART NO 113449



REMOTE OSC COIL
DIAGRAM NO 36
PART NO 117359

NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica, 260 mmfd.	$0.20
3-4	83783	Condenser—mica, 110 mmfd.	.20
5	85296	Lamp—dial, 6 to 8 volt, .15 amps.	.16
6	88460	Resistor—wire wound, 150 ohms, ½ watt	.12
7	110559	Resistor—carbon, 470,000 ohms, ¼ watt	.12
8	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
9	110566	Resistor—carbon, 33,000 ohms, ¼ watt	.12
10-11	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
12	110590	Resistor—carbon, 180 ohms, ¼ watt	.12
13	110591	Resistor—carbon, 680,000 ohms, ¼ watt	.12
14	113449	Coil—antenna	.78
15A-15B	114141	Switch D.P.D.T.	.44
16A-16B	114870	Condenser—variable gang	2.85
17A-17B	114879	Volume control—1 megohm; with switch	.96
18	R-114886	Cone and voice coil for R-115066 speaker	1.00
19	R-115066	Speaker—dynamic, 4 inch (with output trans.)	$4.30
20	116224	Condenser—mica, 260 mmfd., 500 volt	.15
21	116232	R. F. Choke	.48
22	116479	Resistor—wire wound, 33 ohms, 3 watts	.20
23-24	116625	Condenser—.1 mfd., 600 volt	.25
25	116640	Condenser—.01 mfd., 600 volt	.15
26-27-28	116647	Condenser—.004 mfd., 600 volt	.15
29-30-31	116819	Condenser—.05 mfd., 600 volt	.20
32-33-34	116893	Condenser—.02 mfd., 600 volt	.15
35	117352	Coil—oscillator	.38
36	117359	Coil—for remote control oscillator	.60
37	117384	Transformer—2nd I.F.	1.10
38	117385	Transformer—1st I.F.	1.25
39	117394	Resistor—5 ohm, 1 watt, W.W.	.16
40	117395	Resistor—20 ohm, 1 watt, W.W.	.16
41	R-117484	Transformer — output for R-115066 speaker	1.50
42	117558	Condenser—trimmer, 50 mmfd. max. cap.	.25
43	117559	Condenser—electrolytic, 30-30 mfd., 150 volt	1.20

MODELS 03-5K1 to 03-5K9
Alignment,Voltage,Socket
Trimmers,Notes

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

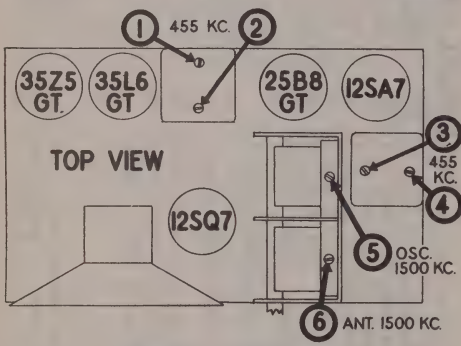
1. Connect the output meter across the voice coil or, using a .1 mfd. condenser in series, connect between the 35L6GT plate and B- terminal shown on voltage chart.

2. Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line m be grounded in the signal generator. If oscillation or hum occurs, connect the ground lead of the signal generator through a mfd. condenser to B— as shown on the Voltage Chart.

3. Remove the connector between terminals A and A_1, also turn the volume control to the maximum volume position and keep it in thi position throughout the entire alignment procedure.

4. Push the black sliding button on the rear of the chassis to the left (viewed from the rear). This is the position labeled "RADIO.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Trimmer lug on front section of variable condenser	455 KC.	Any point where it does not affect the signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then repeat adjustment.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC.	1500 KC.	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal "A"	1500 KC.	Tune to 1500 KC. Generator Signal	6	Broadcast Antenna (Shunt)	Adjust for Maximum Output.



FOR ADJUSTMENT OF TRIMMER ON BACK OF CHASSIS, REFER TO FOURTH PARAGRAPH, UNDER HEADING "REMOTE OPERATION."

REMOTE OPERATION

The Stewart-Warner "Magician," in addition to being a high grade radio receiver, can be used to control one or more radios in the home. This is accomplished by using the triode section of the 25B8GT tube as a radio frequency oscillator and modulating the output of this oscillator with the audio frequency output of the 35L6GT tube. The D. P. D. T. switch (diagram No. 15) located on the rear of the chassis, switches the output of the 35L6GT to the speaker in the "RADIO" position, and to the remote oscillator in the "REMOTE" position.

The modulated radio frequency signal of the remote oscillator, is coupled to the power line by means of the coil, diagram No. 36. Any radio receiver in the home with a line antenna can tune in this signal. Any station tuned in with the "Magician" will be heard on the controlled receiver. The volume may be controlled with the volume control on the "Magician."

The volume control on the controlled receiver should be set to between one half and three quarters of the maximum volume position. Usually it should be turned up as far as possible without encountering excessive hum. Frequently operation can be improved or hum and noise reduced by reversing the power line plugs of the "Magician" or the controlled receiver.

The frequency of the remote oscillator can be varied from approximately 540 to 800 KC. by means of the trimmer on the back of the chassis. The frequency is set to 540 KC. at the factory, but sometimes it may be desirable to change this slightly by adjusting the slotted screw located on the back of the chassis. This adjustment must be changed if the controlled receiver does not tune to 540 KC., or if there is a station you wish to hear near 540 or 1080 KC. It is also useful for reducing whistles, although it is perfectly normal for the controlled receiver to whistle when the "Magician" is tuned to its own control frequency or to a harmonic of that frequency.

Phonograph operation may be had on either direct or remote operation by connecting the leads from a record playing to the "PHONO" terminals, turning the volume control to minimum volume position with current on, and controlling the volume by means of the volume control on the record player.

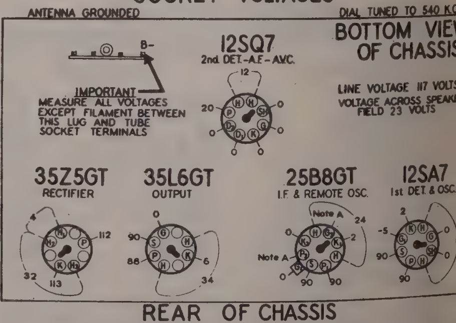
LINE ANTENNA ADAPTER

Any type of radio may be controlled by the "Magician," but if it does not have a line antenna, a Stewart-Warner Line Antenna Attachment Unit (Part No. 117643) should be used. The Line Antenna Attachment Unit allows any standard receiver to operate either with or without an external antenna. The Line Antenna Attachment Unit is also useful in isolating other radios which have a large buffer condenser and thus effectively short circuit the remote control signal on the power line. A Line Antenna Attachment Unit connected to each radio in the home will improve remote operation to a great extent.

MISCELLANEOUS PARTS

Part Number	*Description*	*List Pric*
117405	Back—cabinet for 03-5K3	$0.0
117412	Back—cabinet for 03-5K1	.0
114950	Cabinet for 03-5K1 (Walnut)	2.0
116338	Cabinet for 03-5K3 (Ivory)	2.7
112745	Clip—coil mounting	.0
85321	Connector—for internal antenna	.0
113565	Decal. (Stewart-Warner)	.0
117414	Decal. (Magician)	.0
116556	Insulator—pilot light	.1
114867	Knob—volume for 03-5K3 (Red)	.0
114973	Knob—tuning for 03-5K3 (Red)	.4
114933	Knob—volume for 03-5K1 (Walnut)	.1
114975	Knob—tuning for 03-5K1 (Walnut)	.4
116485	Pad—asbestos	.0
85040	Screw—No. 6 Hex. Hd. Per C	.3
83624	Screw—No. 8 Hex. Hd.	.0
116592	Shield—tube	.1
114876	Socket—octal base	.1
114982	Socket—for dial lamp	.2
117383	Terminal Strip (A-A_1, and Phono)	.2
117411	Trimount Stud	.0

SOCKET VOLTAGES

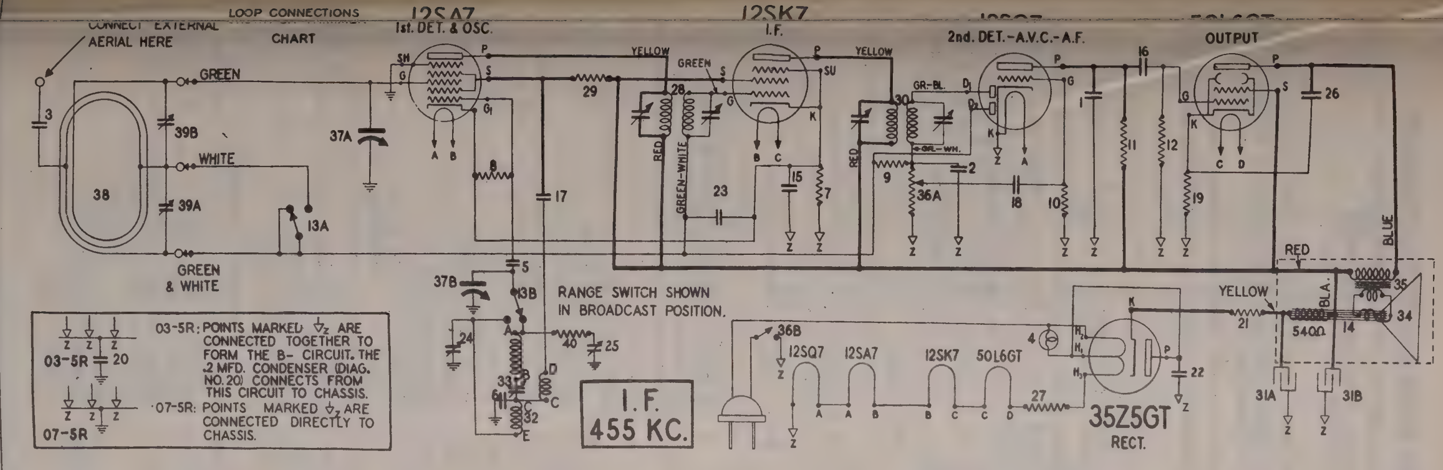


NOTE A: With switch No. 15 in "REMOTE" position, there will b small negative voltage on G_2 and a positive reading of 88 volts or

Use a High Resistance Voltmeter of at Least 1000 Ohms per Volt

STEWART-WARNER CORP.

MODELS 03-5R1,03-5R3 to 03-5R6
Ch.03-5R;07-5R1,07-5R3 to 07-5R6
Chassis 07-5R
Schematic,Voltage



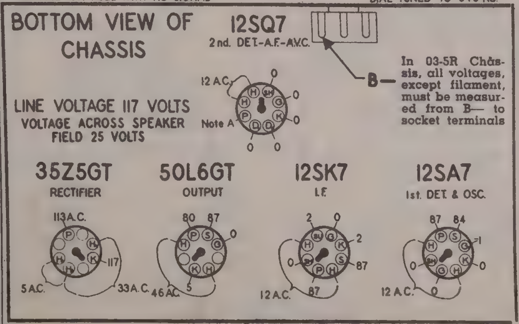
03-5R: POINTS MARKED ▽z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .2 MFD. CONDENSER (DIAG. NO. 20) CONNECTS FROM THIS CIRCUIT TO CHASSIS.

07-5R: POINTS MARKED ▽z ARE CONNECTED DIRECTLY TO CHASSIS.

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC.



In 03-5R Chassis, all voltages, except filament, must be measured from B— to socket terminals

LINE VOLTAGE 117 VOLTS
VOLTAGE ACROSS SPEAKER FIELD 25 VOLTS

Use a High Resistance Voltmeter of at Least 1000 Ohms per Volt.

NOTE A: Only a small voltage will be indicated on this plate when using a meter of 1000 ohms per volt.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	83783	Condenser—mica 110 mmfd.	.20
4	85296	Lamp bulb—dial (Mazda 51)	.16
5	85563	Condenser—mica 26 mmfd.	.15
6	89275	Condenser—mica .002 mfd.	.40
	110556	Resistor—330 ohms 1/4 watt	.12
7	110560	Resistor—carbon 100 ohms 1/4 watt	.12
8	110564	Resistor—carbon 100,000 ohms 1/4 watt	.12
9-10	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12
11	110591	Resistor—carbon 680,000 ohms 1/4 watt	.12
12	112993	Resistor—carbon 470,000 ohms 1/10 watt	.12
13A-13B	114141	Switch—D.P.D.T.	.44
14	R-115081	Speaker—dynamic (4")	4.25
15	116625	Condenser—.1 mfd. 600 volt	.25
16-17	116640	Condenser—.01 mfd. 600 volt	.15
18	116647	Condenser—.004 mfd. 600 volt	.15
19	116702	Resistor—140 ohms 1/2 watt Wire Wound	.12
20	116706	Condenser—.2 mfd. 600 volt (Omitted on 07-5R)	.35
21	116752	Resistor—33 ohms 1 watt Wire Wound	.15
22-23	116819	Condenser—.05 mfd. 600 volt	.20
24-25	116879	Condenser—trimmer 5 to 50 mmfd.	.15
26	116883	Condenser—.02 mfd. 600 volt	.15
27	117395	Resistor—20 ohms 1 watt	.16
28	118614	Transformer—1st I.F.	1.10
29	118803	Resistor—(insulated)—680 ohms 1/4 watt	.12
30	118903	Transformer—2nd I.F.	1.10
31A-31B	118911	Condenser—Electrolytic—20—20 mfd., 150 Volts	.75
32A-32B-32C	119653	Coil—oscillator (chassis not stamped with letter on back)	$0.52
	119784	Coil—oscillator (chassis stamped with "S" on back)	.52
33	118919	Condenser—padding	.40
34	R-118959	Cone & Voice coil for R-115081 speaker	1.50
35	R-118960	Transformer—output for R-115081 speaker	1.00
36A-36B	119413	Volume control—1 meg. (with switch)	1.10
37A-37B	119005	Condenser—variable tuning (with drum)	2.70
38	119119	Loop antenna assembly, without trimmers (03-5R4 to 03-5R6) (07-5R4 to 07-5R6) only (chassis not stamped with letter on back)	.75
	119786	Loop antenna assembly, without trimmers (03-5R4 to 03-5R6) (07-5R4 to 07-5R6) (chassis stamped "S" on back)	.75
	119309	Loop antenna (03-5R1 & 07-5R1) (03-5R3 07-5R3) chassis not stamped with letter	.80
	119769	Loop antenna (03-5R1 & 07-5R1) (03-5R3 & 07-5R3) (chassis stamped "S" on back)	.80
39A-39B	119122	Loop trimmers complete with antenna terminal (03-5R4 to 03-5R6) (07-5R4 to 07-5R6) only	.65
	119126	Trimmer condenser assembly (03-5R1 to 03-5R3) (07-5R1 to 07-5R3) only	.35
40	110556	Resistor—330 ohms 1/4 watt	.12
	119653	Oscillator coil (for chassis not stamped with letter on back)	.52
	119784	Oscillator coil (for chassis stamped "S" on back)	.52

MODELS 03-5R1,03-5R3 to 03-5R6
07-5R1,07-5R3 to 07-5R6
Alignment,Trimmers,Socket

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE FOR 03-5R and 07-5R CHASSIS

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 455 KC to 7 MC are required.

1. Connect the output meter across the voice coil or, using a .1 mfd. condenser in series, connect as follows:
   MODEL 03-5R: Between the 50L6GT plate and B— terminal shown on voltage chart.
   MODEL 07-5R: Between the 50L6GT plate and chassis.
2. Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator. If oscillation or hum occurs in the model 03-5R, connect the ground lead of the signal generator through a .25 mfd. condenser to B— as shown on the Voltage Chart.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Be sure the loop is connected as shown below and that IT IS IN THE SAME RELATIVE POSITION IT OCCUPIES WHEN IN THE CABINET.
5. The pointer should be set to 540 KC with gang in full mesh.

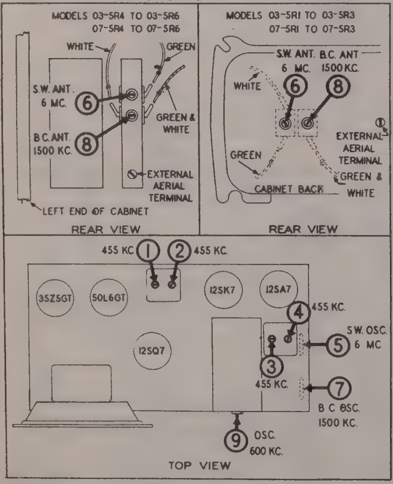
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
400 OHM Carbon Resistor	External Aerial Terminal	6 MC	Foreign	6 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	External Aerial Terminal	6 MC	Foreign	Tune to 6 MC Generator Signal	6*	Foreign Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*NOTE: After chassis and loop are in cabinet, realign trimmer No. 6 at 6 MC. then trimmer No. 8 at 1500 KC. The generator lead placed near the loop will usually give sufficient signal.

FASTENING DIAL WINDOW

If the dial window on a plastic cabinet comes loose, it can easily be fastened in place with speaker cement after removing the chassis from cabinet.

Before fastening the window, it is advisable to roughen the surface of the cabinet with a file or rough sandpaper so that the cement will adhere properly.

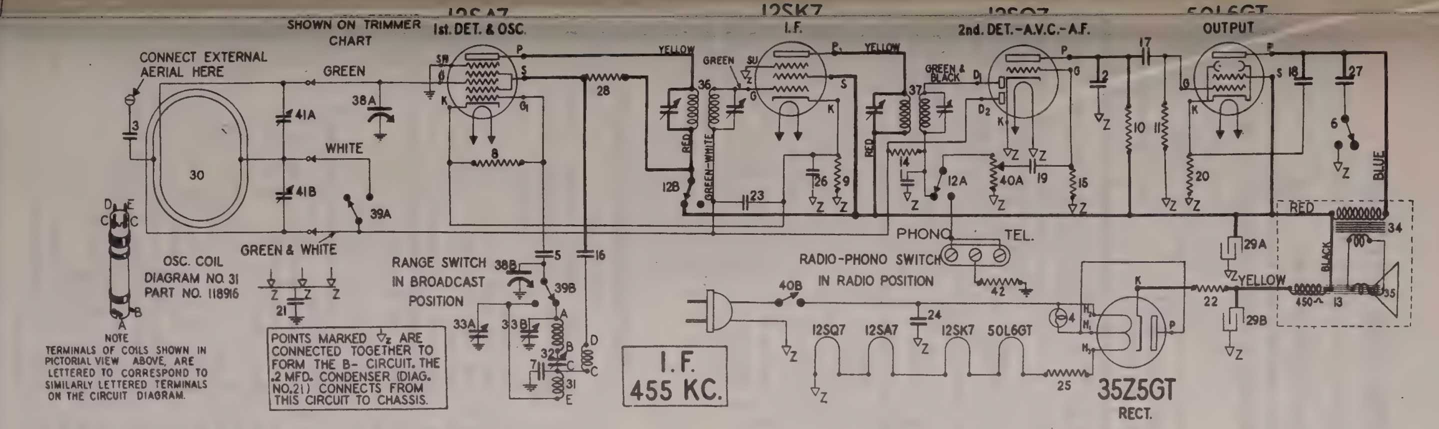


MISCELLANEOUS PARTS LIST

Part No.	Description	List Price
112745	Clip—coil mounting	$0.01
116948	Cord—dial (supplied in 6 ft. lengths)	.18
118990	Dial scale (Chassis not stamped with letter on back)	.07
119771	Dial scale (Chassis stamped "S" on back)	.07
119047	Dial window	.15
119011	Pointer	.06
83624	Screw—self tapping 8x¼	.01
85040	Screw—No. 6 Hex. Hd. Per C	.35
118953	Shaft—tuning	.15
116690	Socket—small octal base	.12
119008	Socket—pilot light	.22
111981	Spring—for dial cord tension	.03
	CABINETS	
119036	Cabinet (walnut) complete with dial window (03-5R1, 07-5R1)	2.25
119038	Cabinet (ivory) complete with dial window (03-5R3, 07-5R3)	3.00
119150	Cabinet (03-5R4, 07-5R4)	7.20
119151	Cabinet (03-5R5, 07-5R5)	9.60
119152	Cabinet (03-5R6, 07-5R6)	9.60
	CABINET BACKS	
119384	Cabinet back (walnut) with ant. term. and trimmers (03-5R1, 07-5R1)	.90
119385	Cabinet back (ivory) with ant. term. and trimmer (03-5R3, 07-5R3)	.90
119172	Cabinet back only (03-5R4, 07-5R4)	1.30
119173	Cabinet back only (03-5R5, 07-5R5)	1.30
	KNOBS	
119013	Knob (walnut) (03-5R1, 07-5R1)	.10
119058	Knob (red) (03-5R3, 07-5R3)	.10
119175	Knob (tan) (03-5R4, 07-5R4) (03-5R5, 07-5R5) (03-5R6, 07-5R6)	.10

STEWART WARNER CORP.

MODELS 03-5S1,03-5S2
Chassis 03-5S
Schematic,Voltage



NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEW ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

POINTS MARKED ▽z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .2 MFD. CONDENSER (DIAG. NO. 21) CONNECTS FROM THIS CIRCUIT TO CHASSIS.

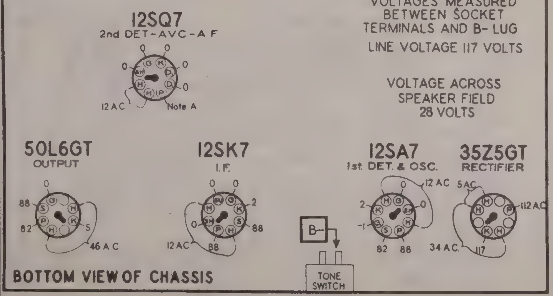
SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- LUG
LINE VOLTAGE 117 VOLTS

VOLTAGE ACROSS SPEAKER FIELD 28 VOLTS



REAR OF CHASSIS

Use a High Resistance Voltmeter of at Least 1000 Ohms per Volt.

NOTE A: The reading on this plate will be small because of the high resistance of resistor No. 10.

ELECTRICAL PARTS

Diagram Number	*Part Number*	*Description*	*List Price*
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	83783	Condenser—mica 110 mmfd.	.20
4	85296	Lamp—dial 6 to 8 volt (Mazda 51)	.16
5	85563	Condenser—mica 26 mmfd.	.15
6	88054	Switch—tone control	.30
7	89275	Condenser—mica .002 mfd.	.40
8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9	110560	Resistor—carbon 100 ohms ¼ watt.	.12
10	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
11	112993	Resistor—carbon 470,000 ohms 1/10 watt	.12
12A-12B	114141	Switch—D.P.D.T. (Radio-Phono)	.44
13	R-115085	Speaker—dynamic (5")	4.00
14-15	116090	Resistor—insulated 3.3 megohms ¼ watt	.15
16-17-18	116640	Condenser—.01 mfd. 600 volt	.15
19	116647	Condenser—.004 mfd. 600 volt	.15
20	116702	Resistor—140 ohms ½ watt wire wound	.12
21	116706	Condenser—.2 mfd. 600 volt	.35
22	116752	Resistor—33 ohms 1 watt wire wound	.15
23-24	116819	Condenser—.05 mfd. 600 volt	.20
25	117395	Resistor—20 ohms 1 watt	.16
26	118206	Condenser—.25 mfd. 600 volts	.35
27	118487	Condenser—.07 mfd. 600 volts	.25
28	118803	Resistor—insulated 680 ohms ¼ watt	.12
29A-29B	118911	Condenser—electrolytic—20-20 mfd. 150 volt	.75
30	118915	Cabinet back and loop antenna complete (03-5S1)	1.65
	119145	Cabinet back and loop antenna complete (03-5S2)	1.65
31	118916	Coil—oscillator	.52
32	118919	Condenser—padding	.40
33A-33B	118920	Trimmer strip (2 sect.)	.30
34	R-118995	Transformer—output for R-115085 speaker	1.00
35	R-118999	Cone & Voice coil for R-115085 speaker	1.70
36	119042	Transformer—1st I.F.	1.10
37	119081	Transformer—2nd I.F.	1.00
38A-38B	119084	Gang condenser & push button unit	3.80
39A-39B	119085	Range switch	.50
40A-40B	119086	Volume control—1 meg. (with switch)	1.00
41A-41B	119126	Condenser—trimmer for loop antenna	.35
42	110553	Resistor—220,000 ohms ¼ watt (on underwriters' approved sets only).	.12

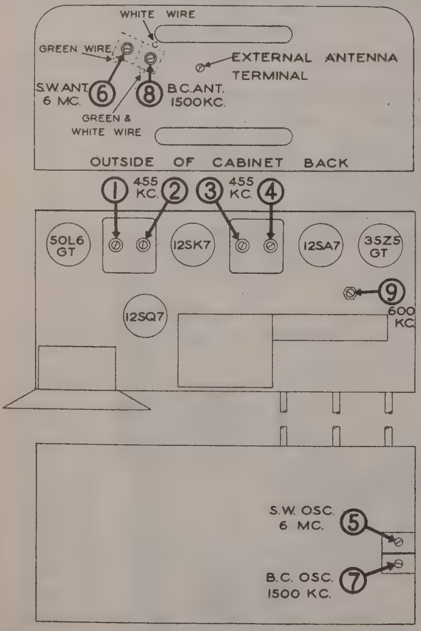
STEWART-WARNER CORP.

ALIGNMENT PROCEDURE FOR 03-5S CHASSIS

1. Connect the output meter across the voice coil or from the plate of the 50L6GT output tube to B— through a .1 mfd. condenser (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis through a .25 mfd. condenser.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Be sure the loop is properly connected at all times, AND THAT IT IS IN THE SAME RELATIVE POSITION TO THE CHASSIS AS WHEN IN THE CABINET.
5. Set the dial pointer to read 540 KC. with the gang in full mesh.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Green Wire Lead to Loop	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
400 OHM Carbon Resistor	Antenna Terminal on Cabinet Back	6 MC	Foreign	6MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal on Cabinet Back	6 MC	Foreign	Tune to 6MC Generator Signal	6*	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
200 MMFD. Mica Condenser	Antenna Terminal on Cabinet Back	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal on Cabinet Back	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal on Cabinet Back	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series Pad)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*After chassis and loop are in cabinet, realign trimmer No. 6 at 6 MC. then trimmer No. 8 at 1500 KC., using a weak signal. The signal generator lead placed near the loop will usually give sufficient signal.

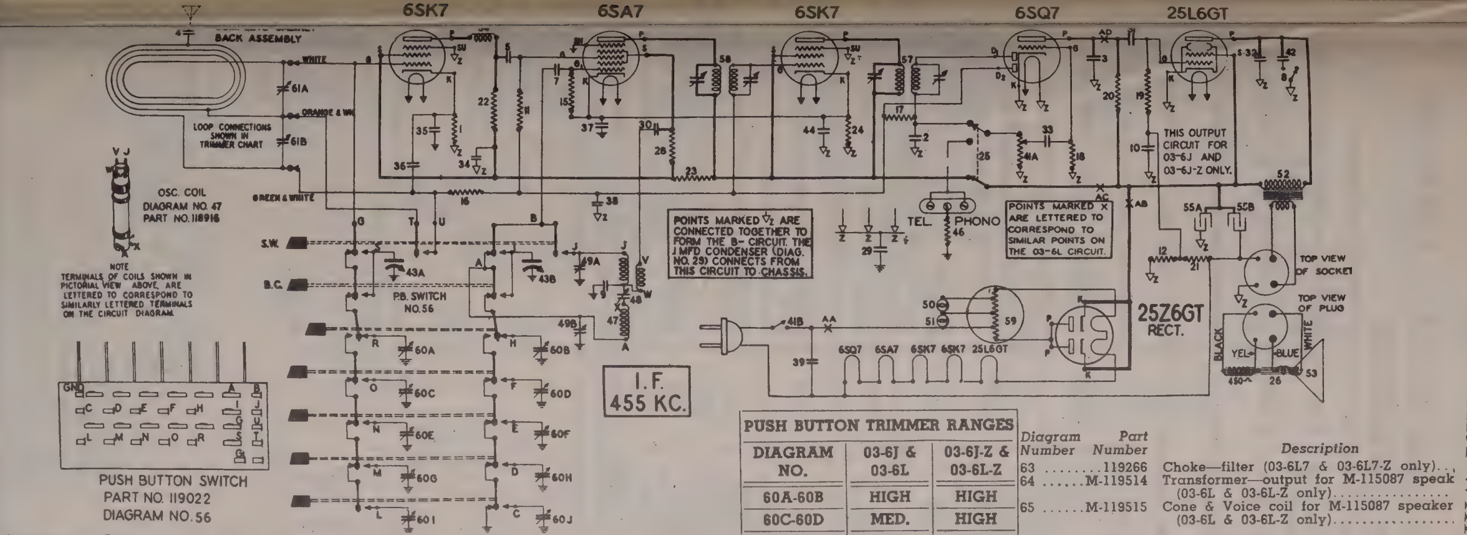


MISCELLANEOUS PARTS

Part Number	*Description*	*List Price*
118915	Cabinet Back assembly complete (03-5S1)	$1.65
119145	Cabinet Back assembly complete (03-5S2)	1.65
119129	Call tabs & instruction sheets	.40
112745	Clip—coil mounting	.01
112764	Clip—dial scale retaining	.01
113178	Cord—dial—(supplied in 4 ft. lgths)	.30
119090	Dial scale	.12
119044	Escutcheon—push button	.38
118913	Knob—Range switch, tuning, or volume	.10
118929	Pointer shaft & pulley	.12
119088	Pointer	.12
119089	Push button	.12
84214	Retaining ring for shafts or dial drum	.02
81145	Retaining ring for drive shaft . . . Per C	.50
113672	Rubber grommet (on tuning shaft)	.02
83624	Screw—self tapping 8x¼	.01
85040	Screw—No. 6 Hex. Hd. . . . Per C	.35
114914	Screw for mounting escutcheon . . . Per Dz.	.15
116690	Socket—small octal base	.12
116793	Socket—for pilot light	.40
113177	Spring—dial cord tension	.09
119187	Spring for push button tuner	.05
119186	Strap (fabric), including rivets, and washers for push button tuner	.08
84412	Terminal strip—(Phono-Tele.)	.03
118931	Tuning shaft	.15
111456	Washer—spring washer . . . Per C	.50
116530	Washer for back of knobs	.005
116414	Window for dial	.25

STEWART-WARNER CORP.

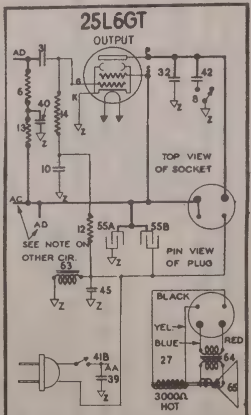
MODELS 03-6J1,Ch.03-6J;
03-6J1-Z,Ch.03-6J-Z
03-6L7,Ch.03-6L
03-6L7-Z,Ch.03-6L-Z
Schematic


6SK7
6SA7
6SK7
6SQ7
25L6GT
BACK ASSEMBLY
WHITE
ORANGE & WH
GREEN & WHITE
LOOP CONNECTIONS SHOWN IN TRIMMER CHART
61A
61B
OSC. COIL DIAGRAM NO. 47 PART NO. 118916
NOTE TERMINALS OF COILS SHOWN IN PICTORIAL VIEW ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.
S.W.
B.C.
P.B. SWITCH NO.56
43A
43B
49A
49B
47
48
60A
60B
60C
60D
60E
60F
60G
60H
60I
60J
PUSH BUTTON SWITCH
PART NO. 119022
DIAGRAM NO. 56
I.F. 455 KC.
POINTS MARKED ▽Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .1 MFD CONDENSER (DIAG. NO. 29) CONNECTS FROM THIS CIRCUIT TO CHASSIS.
TEL.
PHONO
46
29
POINTS MARKED X ARE LETTERED TO CORRESPOND TO SIMILAR POINTS ON THE 03-6L CIRCUIT.
THIS OUTPUT CIRCUIT FOR 03-6J AND 03-6J-Z ONLY.
52
55A
55B
TOP VIEW OF SOCKET
TOP VIEW OF PLUG
BLACK
YEL
BLUE
WHITE
450Ω
26
53
25Z6GT RECT.
41B
AA
AB
AC
AD
50
51
59
39
6SQ7 6SA7 6SK7 6SK7 25L6GT

PUSH BUTTON TRIMMER RANGES		
DIAGRAM NO.	03-6J & 03-6L	03-6J-Z & 03-6L-Z
60A-60B	HIGH	HIGH
60C-60D	MED.	HIGH
60E-60F	LOW	MED.
60G-60H	LOW	MED.
60I-60J	LOW	LOW

SEE PARTS LIST BELOW FOR RANGES IN KILOCYCLES

Diagram Number	Part Number	Description	List Price
1	67981	Resistor—carbon 400 ohms ¼ watt	$0.25
2-3	83539	Condenser—mica 260 mmfd.	.20
4-5	83783	Condenser—mica 110 mmfd.	.20
6	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
7	85061	Condenser—mica 51 mmfd.	.15
8	88054	Switch—tone	.30
9	89275	Condenser—mica .002 mfd.	.40
10	110377	Condenser—10 mfd. 35 volt (03-6L & 03-6L-Z only)	.80
	116625	Condenser—.1 mfd. 600 volt (03-6J & 03-6J-Z only)	.25
11	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
12	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
13-14	110553	Resistor—carbon 220,000 ohms ¼ watt (03-6L & 03-6L-Z only)	.12
15	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
16	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
17-18	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
19	110584	Resistor—carbon 330,000 ohms ¼ watt (03-6J & 03-6J-Z only)	.12
20-21	110591	Resistor—carbon 680,000 ohms ¼ watt (03-6J & 03-6J-Z only)	.12
22	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
23	112964	Resistor—carbon 1,500 ohms ¼ watt	.15
24	112994	Resistor—carbon 220 ohms ¼ watt	.12
25	114141	Switch—D.P.D.T.	.44
26	R-115083	Speaker—dynamic (5") (03-6J & 03-6J-Z only)	4.00
27	M-115087	Speaker—dynamic (8") (03-6L7 & 03-6L7-Z)	7.50
28	116068	Resistor—carbon 680 ohms ¼ watt	.12
29	116625	Condenser—.1 mfd. 600 volt	.25
30-31-32	116640	Condenser—.01 mfd. 600 volt	.15
33	116647	Condenser—.004 mfd. 600 volt	.15
34	116706	Condenser—.2 mfd. 600 volt	.35
35 to 39	116819	Condenser—.05 mfd. 600 volt	.20
40	116819	Condenser—.05 mfd. 600 volt (03-6L & 03-6L-Z only)	$0.20
41A-41B	116834	Volume control—1 megohm (with switch)	1.10
42	116984	Condenser—.04 mfd. 600 volts	.20
43A-43B	117625	Condenser—tuning (with drum)	3.00
44	118206	Condenser—.25 mfd. 600 volts	.35
45	118290	Condenser—.5 mfd. 150 volts (03-6L & 03-6L-Z only)	.50
46	110553	Resistor—220,000 ohms ¼ watt (on Underwriters' approved sets)	.12
47	118916	Coil—oscillator	.52
48	118919	Condenser—padding	.40
49A-49B	118920	Trimmer strip (2 section)	.30
50-51	110629	Lamp—dial 6.3 volts .25 amps.	.15
52	118996	Transformer—output (03-6J & 03-6J-Z only)	1.00
53	R-118999	Cone & Voice coil for R-115083 speaker	1.70
54	119001	Coil—R. F.	.28
55A-55B	119021	Condenser—electrolytic—20-40 mfd. 150 volt	1.00
56	119022	Switch—push button	3.00
57	119024	Transformer—2nd I.F.	1.15
58	119042	Transformer—1st I.F.	1.10
59	119109	Ballast tube	.75
60A-60J	119662	Push button trimmer (Low 540 to 1000 KC)	.24
	119663	Push button trimmer (Med. 750 to 1375 KC)	.24
	119664	Push button trimmer (High 980 to 1550 KC)	.24
61A-61B	119126	Trimmer condenser—2 section	.35
62	119143	Cabinet back & loop antenna assembly (03-6J1 & 03-6J1-Z)	1.95
	119145	Loop antenna & trimmer assembly (03-6L7 & 03-6L7-Z)	1.65
63	119266	Choke—filter (03-6L7 & 03-6L7-Z only)	
64	M-119514	Transformer—output for M-115087 speak (03-6L & 03-6L-Z only)	
65	M-119515	Cone & Voice coil for M-115087 speaker (03-6L & 03-6L-Z only)	



03-6L & 03-6L-Z CONNECTIONS

MODELS 03-6J1,03-6J1-Z,03-6L7,
03-6L7-Z
Alignment,Voltage,Trimmers
Socket

STEWART-WARNER CORP.

03-6J, 03-6J-Z, 03-6L, and 03-6L-Z CHASSIS

ALIGNMENT PROCEDURE

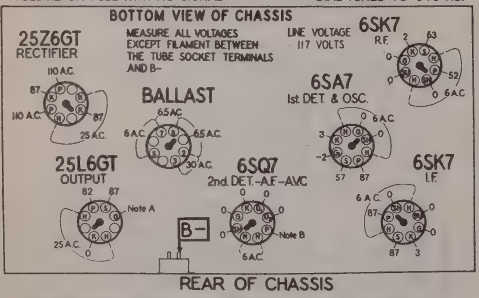
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil, or using a .1 mfd. condenser in series connect between the 25L6GT tube plate and B— as shown on the voltage chart.
2. Connect the ground lead of the signal generator through a .25 mfd. condenser to B— as shown on the voltage chart.
3. Connect the loop antenna to the radio, being sure to connect the wires to the proper receptacles on the loop antenna as shown in drawing below.
4. With the gang condenser in full mesh, the pointer should be in a horizontal position. If it is not, it should be moved to this position before alignment.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Push Button Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Lug on Rear Section of Variable Condenser	455 KC	"Broadcast" Button Pushed In	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	External Aerial Terminal	6 MC	"Short Wave" Button Pushed In	6 MC	5	Short Wave Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC, with Trimmer Screw farther out. Recheck Image.
200 MMFD. Mica Condenser	External Aerial Terminal	6 MC	"Short Wave" Button Pushed In	Tune to 6 MC Generator Signal	6*	Short Wave Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	"Broadcast" Button Pushed In	1500 KC	7*	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	"Broadcast" Button Pushed In	Tune to 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	600 KC	"Broadcast" Button Pushed In	Tune to 600 KC Generator Signal	9*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*NOTE: When making these adjustments, the loop should be in the same relative position to the chassis as when mounted in the cabinet. Adjustments 6 & 8 should be repeated after the set and loop have been replaced in the cabinet.

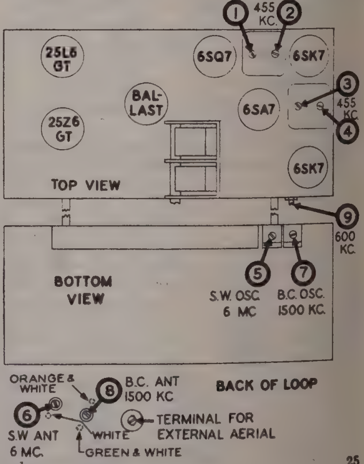
VOLUME ON FULL WITH NO SIGNAL DIAL TUNED TO 540 KC.



These readings taken using a voltmeter of 1000 ohms per volt.

NOTE A: The bias on the 25L6GT grid is: on 03-6J chassis: —4 volts measured across resistor No. 12; on 03-6L chassis: —5 volts measured across choke No. 63.

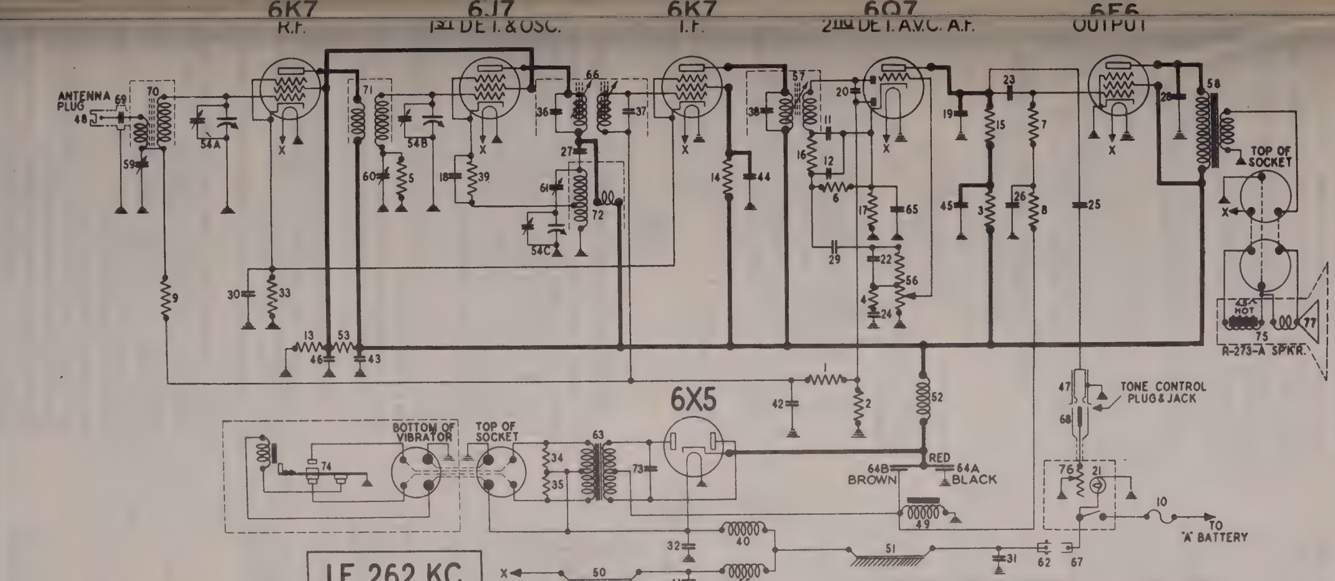
NOTE B: Due to the high resistance of resistors No. 20, 6, and 13, only a small voltage will be read at the plate of the 6SQ7 when using a voltmeter having a resistance of 1000 ohms per volt.



Part Number	Description	List Price
119168	Cabinet—plastic for 03-6J1 & 03-6J1-Z	$7.20
119143	Cabinet back & loop assembly (03-6J1 & 03-6J1-Z)	1.95
119145	Cabinet back & loop assembly (03-6L7 & 03-6L7-Z)	1.65
119171	Call tabs & instructions	.35
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
112754	Clip—dial scale retaining	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
119261	Cover plate for trimmer hole (03-6L7 & 03-6L7-Z)	.15
119120	Dial scale	.25
116810	Dial window (03-6J1 & 03-6J1-Z)	.35
119208	Dial escutcheon (03-6L7 & 03-6L7-Z)	.80
119166	Knob—push button	.08
119167	Knob—tuning or volume	.08
116902	Plate for trimmer hole (03-6J1 & 03-6J1-Z)	.12
116883	Pointer	.16
81145	Retaining ring—for drive shaft	Per C .50

STEWART-WARNER CORP.

MODEL R-1781
Schematic,Voltage



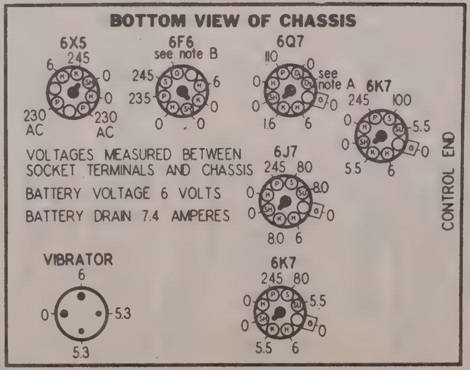


Diagram Number	Part Number	Description
1-2	83072	Carbon resistor, 510,000 ohm 1/4 watt
3-4	83080	Carbon resistor, 51,000 ohm 1/4 watt
5-6-7 8-9	83082	Carbon resistor, 260.000 ohm 1/4 watt
10	83207	Fuse, 15 ampere 25 volt
11-12	83539	Mica condenser, 260 mmfd.
13-14-15	84198	Carbon resistor, 110,000 ohm 1/4 watt
16	84238	Carbon resistor, 11,000 ohm 1/4 watt
17	84240	Carbon resistor, 4,000 ohm 1/4 watt
18	84282	Mica condenser, .001 mfd.
19-20	84370	Mica condenser, 110 mmfd.
21	85296	Dial light bulb (bayonet type)
22	85394	Mica condenser, 510 mmfd.
23	88026	Paper condenser, .02 mfd. 400 volt
24	88029	Paper condenser, .004 mfd. 400 volt
25	88030	Paper condenser, .01 mfd. 400 volt
26	88046	Paper condenser, .1 mfd. 150 volt
27	88173	Mica condenser, 50 mmfd.
28	88185	Paper condenser, .006 mfd. 600 volt
29	88189	Paper condenser, .05 mfd. 200 volt
30	88193	Paper condenser, .25 mfd. 150 volt
31-32	88195	Paper condenser, .5 mfd. 150 volt
33	88203	Carbon resistor, 600 ohm 1/4 watt
34-35	88204	Wire wound resistor, 210 ohm 1/2 watt
36-37-38	88233	Mica condenser, 110 mmfd.
39	88257	Carbon resistor, 9,500 ohm 1/4 watt
40	88289	"A" choke (in vibrator supply)
41	88298	Condenser .25 mfd. 150 volt (low loss)
42	88534	Condenser .05 mfd. 150 volt (low loss)
43-44-45	88682	Paper condenser, .1 mfd. 400 volt
46	89421	Paper condenser, .1 mfd. 200 volt
47	110078	Tone control socket
48	110087	Antenna lead receptacle
49	110149	Filter choke (iron core)
50-51	110161	Interference elimination capacitor
52	110174	Radio frequency choke
53	110186	Carbon resistor, 110,000 ohm 1/2 watt
54A to C	110300	Three gang variable condenser
55	110306	"A" choke (in filament supply)
56	110311	Volume control, 500,000 ohm
57	110312	2nd I.F. transformer
58	110313	Output transformer
59	110331	Antenna compensating condenser
60	110332	R.F. padding condenser
61	110333	Oscillator padding condenser
62	110371	"A" contact and lead assem.
63	110375	Power transformer
64A 64B	110376	Electrolytic condenser {8 mfd. sect. 4 mfd. sect.}
65	110377	Electrolytic condenser, 10 mfd. 25 volt
66	110378	1st I.F. transformer
67	110404 110444	32 inch "A" lead (standard)(from set to control hd.) 42 inch "A" lead (special)(from set to control hd.)
68	110405 110443	29 inch tone control cable (standard) 36 inch tone control cable (special)
69	110414	Paper condenser, .02 mfd. 200 volt
70	110415	Antenna coil and shield
71	110416	R.F. coil and shield
72	110417	Oscillator coil and shield
73	110431	Paper condenser, .01 mfd. 1,700 volt
74	110432	Vibrator
75	R273A	Speaker 8 inch dynamic
73	110310	Tone control (250,000 ohm)
77	110460	Speaker cone

IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt. Make allowances for battery voltage variation.

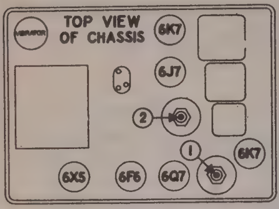
NOTE A: This voltage is 1.6 volts measured across resistor No. 17.

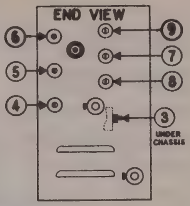
NOTE B: The grid bias of the 6F6 output tube is -14 volts measured between chassis and ungrounded filter choke terminal.

MODEL R-1781
Alignment,Trimmers,Socket

STEWART-WARNER CORP.

CHASSIS 01-6G,01-6G
Drive Cord Data





TRIMMER LOCATIONS

Trimmer Number		Alignment Frequency
1	1st I.F. transformer trimmer (top)	262 KC.
2	2nd I.F. transformer trimmer	262 KC.
3	1st I.F. transformer trimmer (bottom)	262 KC.
4	Oscillator series padder	600 KC.
5	R.F. series padder	600 KC.
6	Antenna compensator (padder)	600 KC.
7	Oscillator shunt trimmer	1400 KC.
8	R.F. Shunt trimmer	1400 KC.
9	Antenna shunt trimmer	1400 KC.

ALIGNMENT

The equipment necessary for proper alignment of this receiver consists of a good modulated oscillator, a sensitive output meter and an insulated screw driver.

The test oscillator must be accurately calibrated and its output must be adjustable to give a very weak signal which will not actuate the A.V.C. of the receiver. The insulated screw driver should be made of fibre or bakelite although a small metal blade inserted at the tip is permissible. A long blade in an insulated handle is not suitable and will prevent accurate adjustment.

An output meter with a full scale reading of four volts or less is desirable so that it can be connected directly across the voice coil terminals of the speaker. Any A.C. voltmeter with such a range will be satisfactory. If your output meter is not equipped with such a low scale, it should be connected from the plate of the output tube to chassis.

During alignment, the volume control should be turned full on and the receiver case should be in place. The front cover can be removed to permit the connection of the output meter. Keep rear cover in place.

I.F. ALIGNMENT

1— (a) Set the test oscillator to exactly 262 KC.

(b) Connect the output terminal of the oscillator to the grid of the 6J7 tube through a .1 to .5 mfd. condenser. Do not remove the grid lead from the tube.

(c) Connect the grounded output lead of the oscillator to the receiver case.

(d) Turn the gang condenser of the receiver to any point where it has no tuning effect on the 262 KC. signal.

(e) Adjust trimmers 1, 2 and 3 for maximum output. Trimmer No. 3 is located under the chassis but can be reached through a hole in the rear cover.

(f) Repeat the adjust of trimmers 1, 2 and 3.

R.F. CALIBRATION AND ALIGNMENT

This receiver employs an unusual circuit which allows the antenna, the R.F. and the oscillator circuits to be adjusted near the low frequency end of the dial in addition to the high frequency end. To get maximum sensitivity and accurate dial calibration, the following procedure must be followed exactly.

2— Low Frequency Alignment.

(a) Connect the output of the test oscillator to the antenna socket of the receiver through a 200 mmfd. (.0002 mfd.) mica condenser. This condenser must ~~not~~ be omitted or alignment will be incorrect.

(b) Connect the control head to the receiver, then turn the tuning knob until the variable condenser plates are in full mesh.

Adjust the dial calibration so that the dial pointer is on the last dial calibration mark below 550 KC. The relative position of the control head, the control shaft, and the receiver must remain unchanged until the alignment is completed.

(c) Turn the tuning knob until the dial pointer indicates that the set is tuned to 600 KC.

(d) Set the test oscillator at exactly 600 KC.

(e) Adjust trimmer No. 4 for maximum output. The adjustment of this trimmer must be made with an insulated screw driver having no more than a small metal tip.

(f) Retune the receiver to the oscillator signal.

(g) Adjust trimmers 5 and 6 for maximum output.

3—High Frequency Alignment.

(a) Tune the receiver to exactly 1400 KC. on the tuning dial.

(b) Adjust the test oscillator to exactly 1400 KC.

(c) Adjust trimmer No. 7 for maximum output.

(d) Carefully tune the receiver to the 1400 KC. oscillator signal.

(e) Adjust trimmers 8 and 9 for maximum output.

4—Final Adjustment.

(a) Repeat operations 2 (c) to (g) and 3 (a) to (e) in the same order until no further improvement in output can be made. Adjustments must be repeated at least once and if the set is badly out of alignment, a second repetition is necessary.

ANTENNA COMPENSATOR AJUSTMEN

The antenna compensator must be adjusted after the installation the receiver has been completed in order to match the receiver to antenna. If this adjustment is made for an old under-car aerial, c must be taken that the aerial and its insulators are clean and free f mud or slush which would alter the capacity and resistance. More ac rate adjustment is possible if the aerial and its insulators are was and allowed to dry before attempting adjustment.

The adjustment is to be made as follows:

(a) Carefully tune the receiver to some fairly weak signal betw 550 and 650 KC.

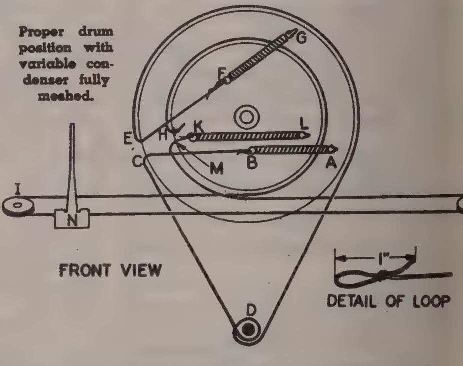
(b) Remove the chrome plated button adjacent to the antenna ja (Covering trimmer No. 6).

(c) Adjust the antenna compensator, trimmer No. 6 for maxi volume. Carefully retune the receiver to the signal, then again adj the compensator.

Do not attempt to adjust any of the other trimmers on stations this time or the entire alignment will be upset since an oscillator m be used for all adjustments except the antenna compensator.

Note: If you do not get a peak when adjusting this trimmer and if car has a built-in antenna of unusually high capacity such as an sulated running board or insulated metal roof, it will be necessary insert a special plug-in adapter in series with the antenna lead. Th adapters are made in two types and can be obtained from United Mot Service Stations. For aerials having a capacity between 400 and micro-microfarads (insulated running boards), the adapter United Mot Part No. 7231410 (marked with red band) should be used. For aerials tween 900 and 2,000 micro-microfarads (metal roof tops) their Part 1210915 should be used.

REPLACING DIAL CORDS
01-6G & 01-6G-Z



TO REPLACE THE TUNING DRIVE CORD

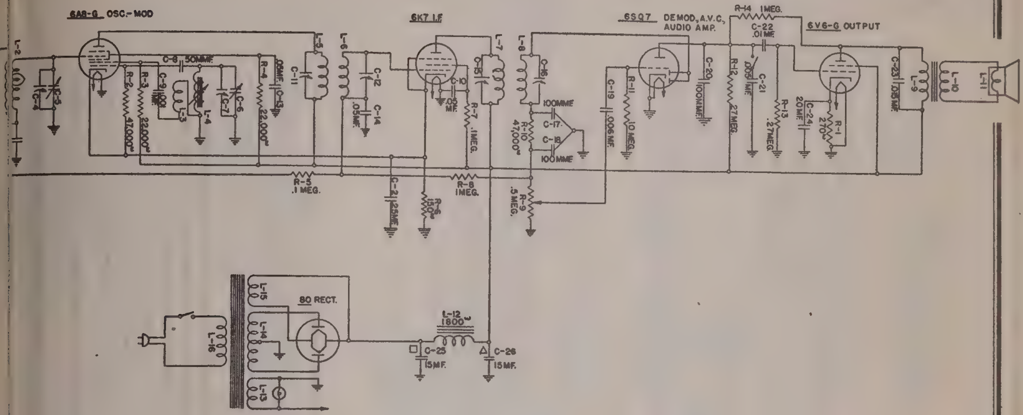
1. 25½ inches of dial drive cord (part No. 117057) are require Make a one-inch loop in each end of this cord, using a di cord clip, (part No. 114955) (See sketch above for detail loop). A knot may be tied if a slightly smaller loop is mad
2. Fasten one end of a tension spring (part No. 113177) to t loop at point B and the other end of the spring to tab A.
3. Pass the other end of the dial cord through hole C in the out drum.
4. Make one and a half turns of the cord about tuning shaft D.
5. Continue the cord counter-clockwise about the outer drum a pass it through hole E.
6. Fasten a tension spring ,(part No. 113177) to the other loop the cord at point F and fasten the spring to the tab G.

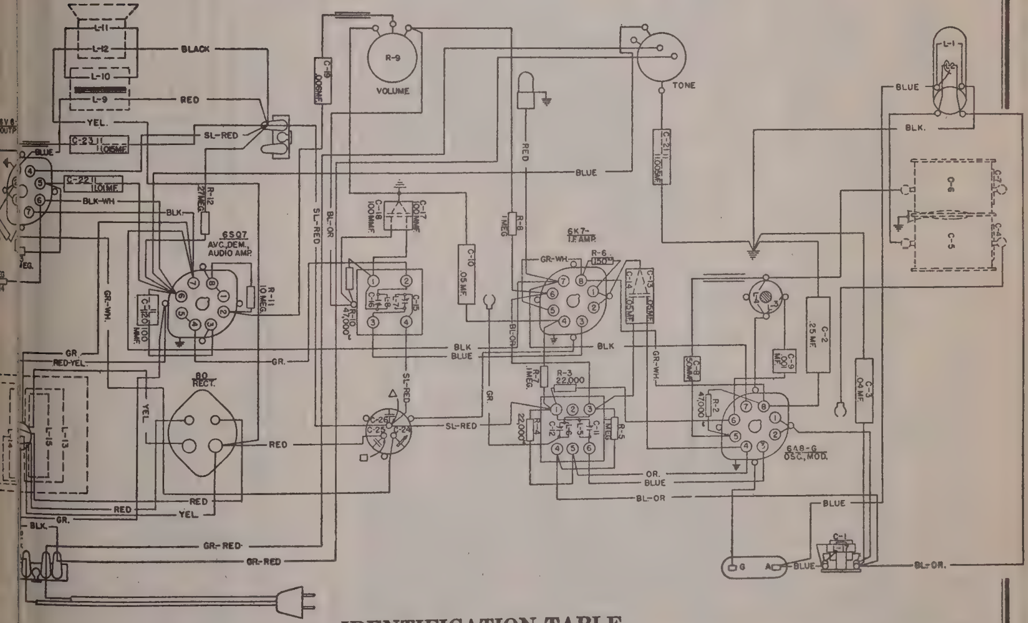
TO REPLACE THE POINTER DRIVE CORD

1. 34⅛ inches of pointer drive cord, (part No. 116948) are quired. Fasten an eyelet (part No. 88348) at a point one-h inch from one end of this cord.
2. Pass the other end of the cord outward through hole H in t smaller drum.
3. Fashion a one-inch loop at outer end of the pointer cord .(S detail of loop in illustration), using a dial cord clip (part N 114955), or tie a knot using a smaller loop.
4. Continue the cord clockwise around the smaller drum a around pulley I from the rear to the front.
5. Go from pulley I around the front of pulley J and clockwi around the smaller drum to hole M.
6. Pass the loop through hole M and fasten it to one end of tension spring (part No. 113177) at point K, the other end of t spring then being fastened to point L.
7. Clip the dial pointer to the cord. With the drum in the positi shown, and with the gang condenser in full mesh, fasten t pointer so that it is at a point 2⅛" from the left end of t brown dial plate.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 400H,400HB
400N,400NB,400S,
400SB
Schematic,Chassis
Wiring





IDENTIFICATION TABLE

Mo el	Input Power Frequency	Chassis	Cabinet	Speaker
00H	50-60 Cycles	30107	30109	30137
00HB	25-60 Cycles	30108	30109	30137
00N	50-60 Cycles	30107	30547	30137
00NB	25-60 Cycles	30108	30547	30137
00S	50-60 Cycles	30107	30548	30137
00SB	25-60 Cycles	30108	30548	30137

np Power Rating .... 37 Watts
nte mediate Frequency .... 455 Kilocycles
pe ker Voice Coil Impedance at 400 Cycles .... Approximately 5 Ohms
pe ker Field Coil Resistance .... 1800 Ohms

MODELS 400H,400HB
400N,400NB,400S
400SB
Alignment,Voltage·
Socket,Trimmers
Resistance

STROMBERG-CARLSON TEL. MFG. CO.

Take all D. C. voltage readings on the 500 volt scale except where an asterisk appears.

Take all readings with chassis operating and tuned to 1000 Kc.—no signal.

Use a line voltage of 120 volts or make allowance for the variation.

Read from indicated socket terminals to chassis base.

A. C. Voltages are indicated by italics.

Tube	*Circuit*	*Cap*	*Terminals of Sockets*								*Heater Voltages Between Heater Terminals*	
			1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts A. C.*
6A8G	Mod.—Osc.	0	0	0	+175	+82	—	+100	*6.3*	+2*	2–7	*6.3*
6K7	I. F. Amp.	0	0	0	+175	+65	+2*	—	*6.3*	+2*	2–7	*6.3*
6SQ7	Dem.—A. V. C. —Audio	—	0	0	0	0	0	+75	*6.3*	0	7–8	*6.3*
6V6G	Output	—	0	0	+160	+175	0	+75	*6.3*	+8*	2–7	*6.3*
80	Rectifier	—	+265	*255*	*255*	+265	—	—	*5*	—	1–4	*5*

*Read on lowest possible scale of voltmeter.

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to Electrolytic Capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base except when an asterisk appears.

Tube	*Circuit*	*Cap*	*TERMINALS OF SOCKETS*							
			1	2	3	4	5	6	7	8
6A8G	Mod.—Osc.	1.5M	S	S	*1800¶	*24000¶	47000¶	24000¶	S	150¶
6K7	I. F. Amp.	1.5M	S	S	*1800¶	*100000¶	150¶	1.5M	S	150¶
6SQ7	Dem.—A. V. C. —Audio	—	S	10M	S	500000¶	500000¶	*250000¶	S	S
6V6G	Output	—	S	S	*2200¶	*1800¶	300000¶	*250000¶	S	270¶
80	Rectifier	—	1M or Greater	270¶	270¶	1M or Greater	—	—	—	—

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.
*These readings should be made from indicated terminals to terminal No. 1 of the rectifier socket (type 80 tube).

Other Tests Not Shown on Chart

Antenna terminal to chassis base; 70 ohms.

Ground terminal to chassis base; "short".

Between terminals of A. C. plug; "open" with A. C. switch open; 17 ohms with A. C. switch closed.

R. F. coil tests, measured directly across R. F. coil terminals (see wiring diagram on Page 5 for location of R. F. coil terminals): L1—70 ohms; L2—4 ohms; L3—3 ohms; L4—4 ohms; L17—70 ohms.

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY.

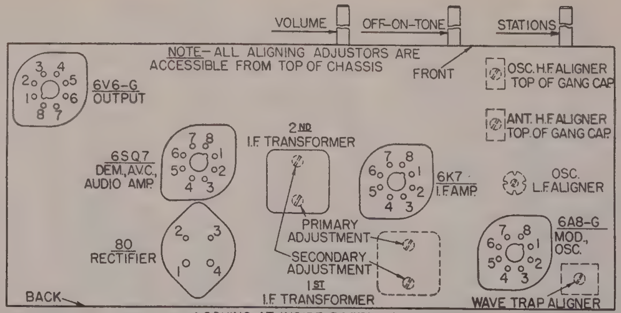
Use a good modulated signal generator (test oscillator) with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the smallest possible input from the signal generator (except when wave trap adjustments are made). A strong signal makes adjustments inaccurate.

Always have receiver volume control "full on".

Never align with tone control in bass position.

See Location Chart above for location of all the aligning adjustment screws.



LOOKING AT INSIDE BOTTOM OF CHASSIS

Location Chart

Aligning Procedure (follow this order exactly)

I. Dial Pointer Adjustment.

With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the upper black line at the low frequency end of the dial.

II. Intermediate Frequency Adjustments.

1. Tune set to extreme low frequency position. (.54 megacycles on dial scale).
2. Connect the ground terminal of the signal generator to the ground binding post of the receiver.
3. Introduce a modulated signal of 455 kilocycles, using a 0.1 microfarad capacitor in series with the lead from the signal generator to the grid cap of the 6A8G tube. (Do not remove the grid clip from this tube.)
4. Adjust the I. F. Aligners for maximum output in the following order:
   a. Secondary of Second I. F. Transformer.
   b. Primary of Second I. F. Transformer.
   c. Secondary of First I. F. Transformer.
   d. Primary of First I. F. Transformer.

III. Wave Trap Adjustment.

1. Tune set to 1,000 kilocycles.
2. Leave the ground terminal of the signal generator connected to the ground binding post of the receiver.
3. Introduce a fairly strong modulated signal of 455 kilocycles to the antenna binding post using a 200 mmf. capacitor in series with the lead from the signal generator.
4. Adjust the wave trap aligner for **minimum** signal.

IV. Radio Frequency Adjustments.

(Leave the signal generator connected in the same way as for the wave trap alignment.)

1. Set the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles.
2. Adjust the iron core in the oscillator coil for maximum signal.
3. Set the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles.
4. Adjust the two aligning capacitors on the variable capacitor for maximum signal.
5. Reset both the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles and repeat operation 2.
6. Reset both the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles and repeat operation 4.

NOTE. Operation 5 and 6 may be repeated as often as necessary to obtain maximum sensitivity.

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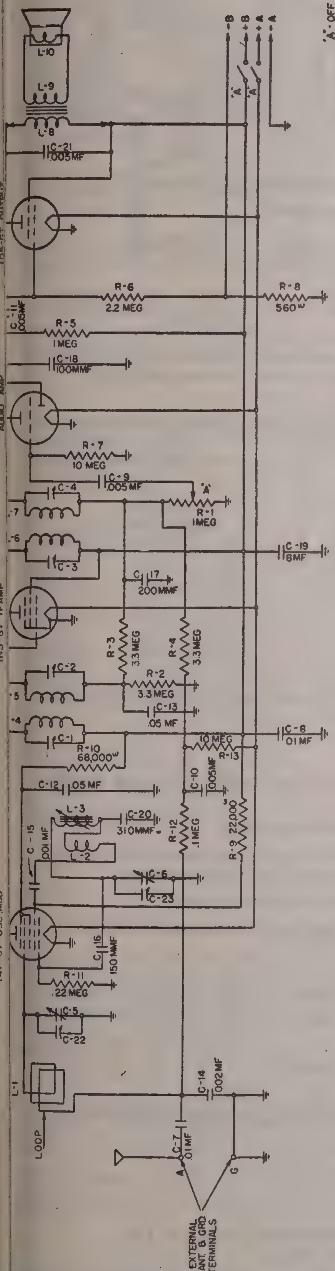
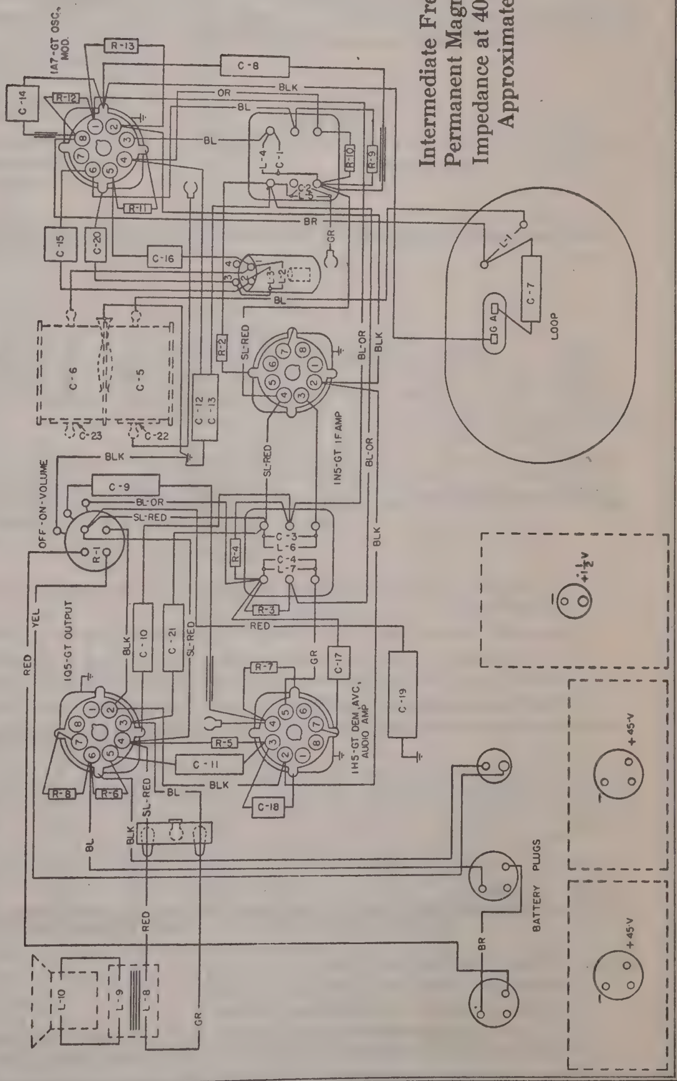
STROMBERG-CARLSON TEL. MFG. CO.

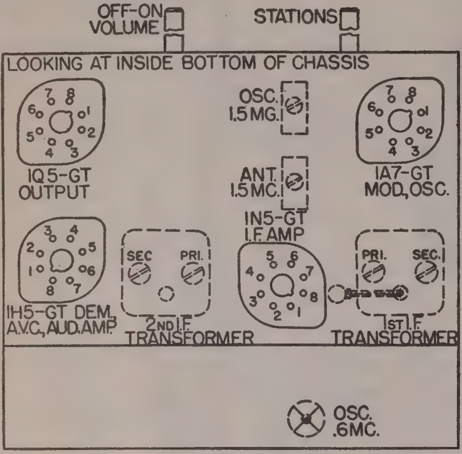
MODEL 402
Chassis 30990
Schematic
Chassis Wiring

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION OF
VOLUME VIII.

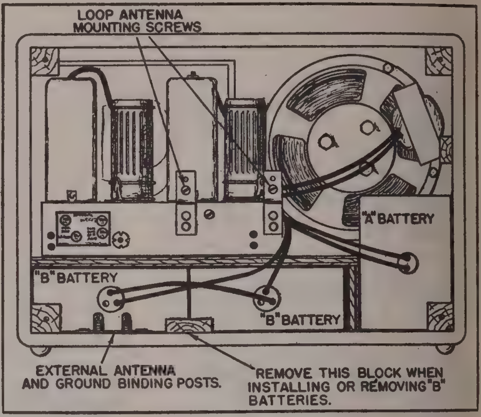
Intermediate Frequency ..... 455 Kilocycles
Permanent Magnet Speaker Voice Coil
Impedance at 400 Cycles..........
Approximately 2.5 Ohms







Location Chart



View Showing Installation of Batteries (With Back of Cabinet and Loop Antenna Removed)

			Terminals of Sockets								*Heater Voltages Between Heater Terminals*	
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts*
1A7GT	Mod.—Osc.	0	0	+1.4*	+84	+35	−3*	+58	0	0	2–7	+1.4*
1N5GT	I. F. Amp.	0	0	+1.4*	+84	+84	0	0	0	0	2–7	+1.4*
1H5GT	Dem.—A. V. C. —Audio	0	0	+1.4*	+30	0	0	0	0	0	2–7	+1.4*
1Q5GT	Output	—	0	+1.4*	+82	+84	0	+5.5*	0	0	2–7	+1.4*

***Read on lowest possible scale of voltmeter.**

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the batteries before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to Electrolytic Capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base except when an asterisk appears.

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
1A7GT	Mod.—Osc.	4M	4M	10M	1M	1M	22000¶	1M	S	4M
1N5GT	I. F. Amp.	1.5M	O	10M	1M	1M	O	O	S	O
1H5GT	Dem.—A. V. C. —Audio	10M	O	10M	3M	10M	800000¶	O	S	O
1Q5GT	Output	—	O	10M	1M	1M	2.2M	500¶	S	O

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.

Other Tests Not Shown on Chart

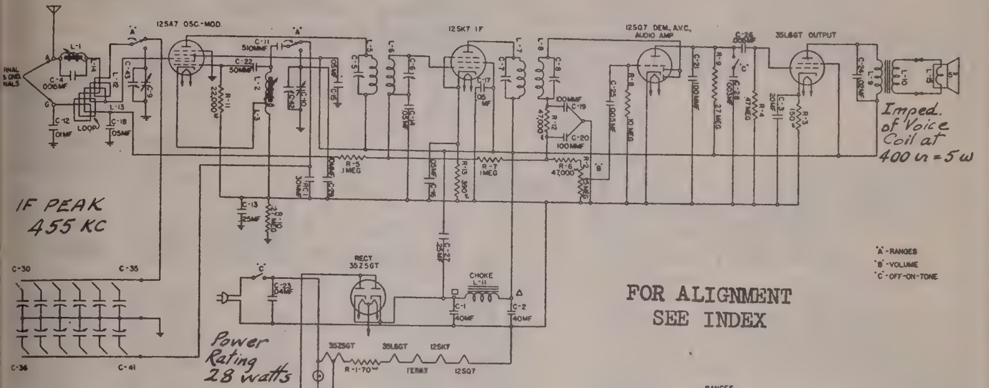
Antenna terminal to chassis base; "open".

Ground terminal to chassis base; "short".

R. F. coil tests, measured directly across R. F. coil terminals (see wiring diagram for location of R. F. coil terminals): L1—.8 ohm; L2—7 ohms; L3—3 ohms.

STROMBERG-CARLSON TEL. MFG. CO.

MODEL 405H
Schematic
Chassis Wiring

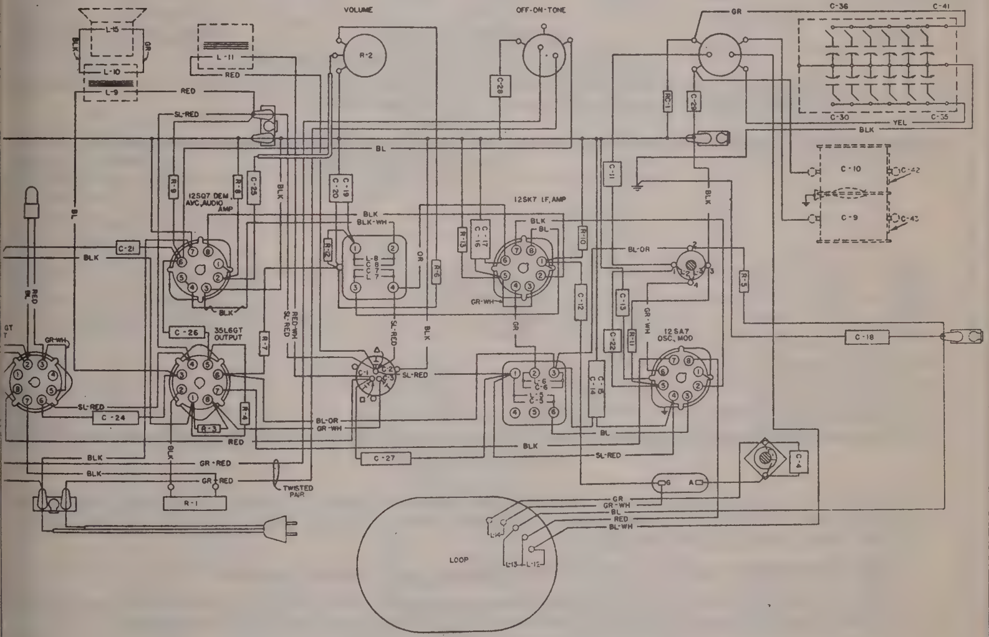


IF PEAK 455 KC

Power Rating 28 watts

Imped. of Voice Coil at 400 ω = 5 ω

FOR ALIGNMENT SEE INDEX



SPECIAL INSTRUCTIONS

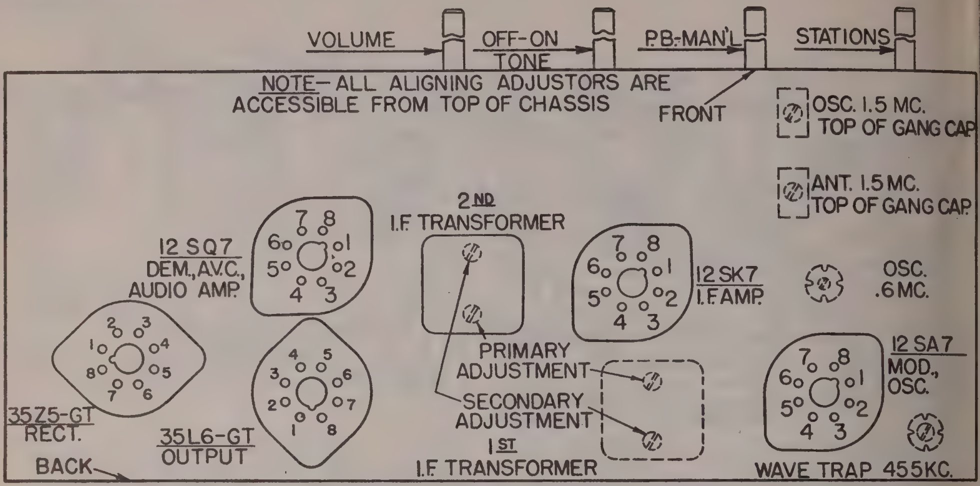
connect an external antenna and ground or to examine or replace tubes, it is necessary to nscrew the thumb screw located at the right hand side of the loop antenna, and the loop can en be swung outward on its hinge.

ways screw the loop antenna in its proper position when operating the receiver.

F Tuner Data, see that of Model 420 which is the same with the exception of item 2. In the case of Model 405-H, this should read "The stations should be arranged according to frequency with the highest frequency at the top and the lowest frequency at the bottom.

MODEL 405H
Voltage,Socket
Trimmers,Resistance

STROMBERG-CARLSON TEL. MFG. CO.



LOOKING AT INSIDE BOTTOM OF CHASSIS

A. C. Voltages are indicated by italics; when the receiver is operated from a D. C. power supply, D. C. voltages will be obtained in place of A. C. voltages shown.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts A.C.
12SA7	Mod.—Osc.	—	0	*25*	+110	+110	—30	0	*38*	0	2–7	12
12SK7	I. F. Amp.	—	0	*12*	+3*	0	+3*	+110	*25*	+110	2–7	12
12SQ7	Dem.—A. V. C. —Audio	—	0	0	0	0	0	+40	0	*12*	7–8	12
35L6GT	Output	—	0	*75*	+100	+110	0	—	*38*	+7*	2–7	35
35Z5GT	Rectifier	—	—	*120*	+115	—	+115	—	+85	+118	2–7	35

CONTINUITY TEST

CAUTION: Remove all tubes, disconnect the receiver from the power supply and short the high side of the C-1 Capacitor (Red, Red-white wires) and the heavy bus wire to the chassis base before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to Electrolytic Capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base except when an asterisk appears.

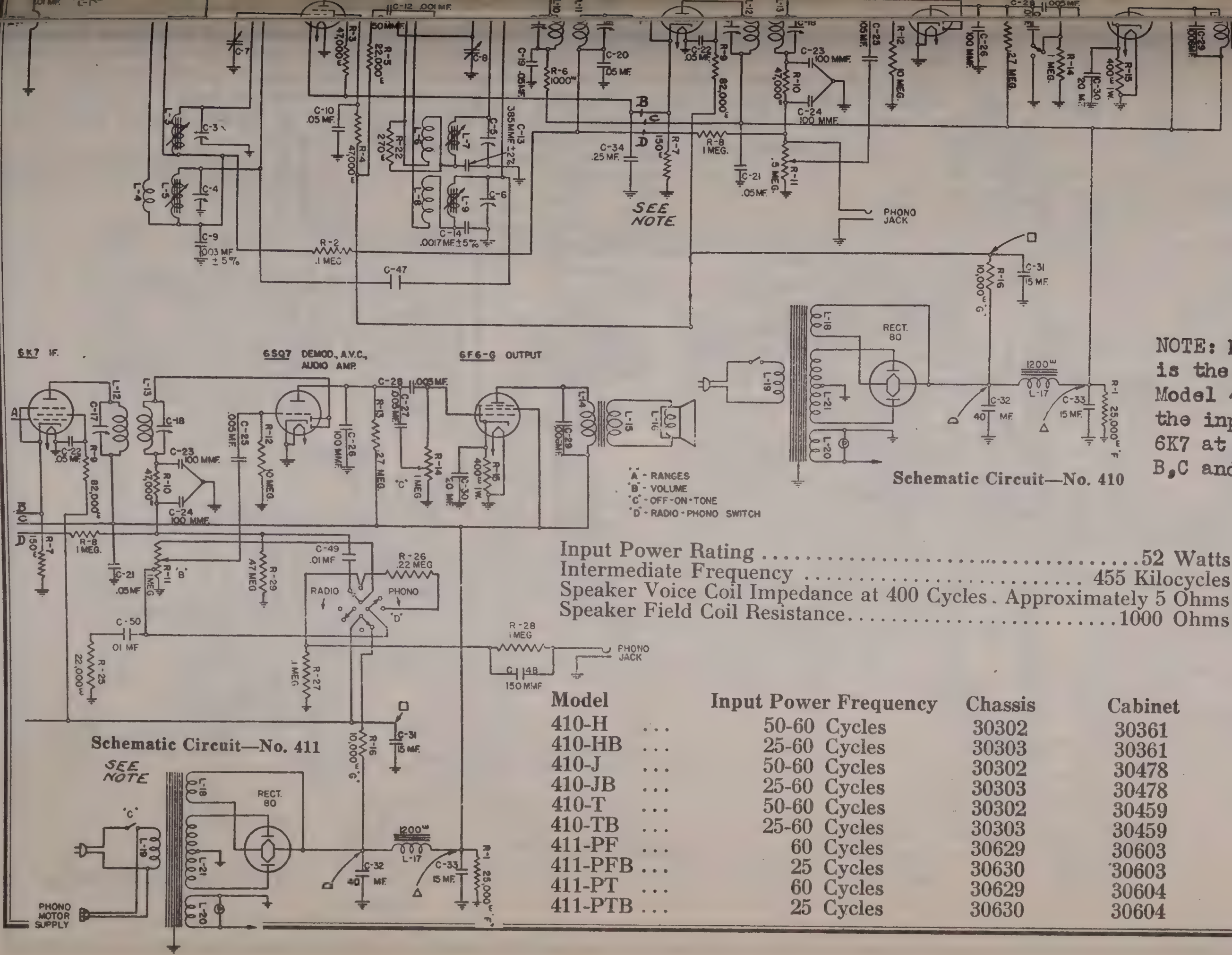
R. F. coil tests, measured directly across R. F. coil terminals (see wiring diagram for location of R. F. coil terminals): L1—1.5 ohms; L2—4 ohms; L3—3 ohms; L12—.2 ohm; L13—.3 ohm; L14—"short".

Tube	Circuit	Cap	TERMINALS OF SOCKETS 1	2	3	4	5	6	7	8
12SA7	Mod.—Osc.	—	S	O	130¶	130¶	22000¶	S	O	1.5M
12SK7	I. F. Amp.	—	S	O	390¶	1.5M	390¶	390¶	O	150¶
12SQ7	Dem.—A. V. C. —Audio	—	S	10M	S	600000¶	600000¶	270000¶	S	O
35L6GT	Output	—	S	O	200¶	130¶	550000¶	1.5M	O	150¶
35Z5GT	Rectifier	—	O	O	O	O	O	130¶	O	S

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 410H, 410HB
410J, 410JB, 410T,
410TB, 411PF, 411PFB
411PT, 411PTB



Schematic Circuit—No. 410

Schematic Circuit—No. 411

NOTE: Model 411 is the same as Model 410 up to the input of the 6K7 at points A, B, C and D.

Input Power Rating ....52 Watts
Intermediate Frequency .... 455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles . Approximately 5 Ohms
Speaker Field Coil Resistance..............................1000 Ohms

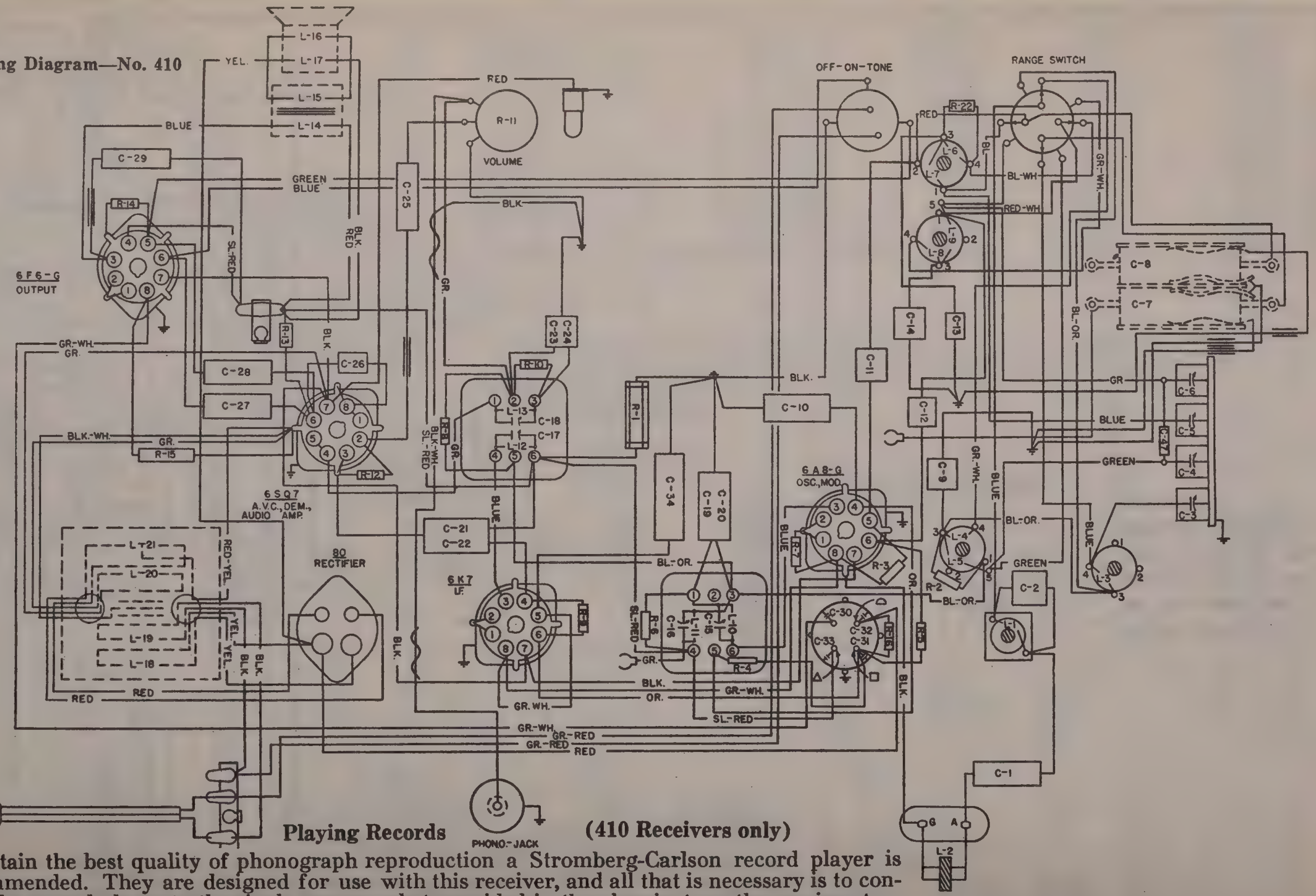
Model	Input Power Frequency	Chassis	Cabinet	Speaker
410-H ...	50-60 Cycles	30302	30361	30304
410-HB ...	25-60 Cycles	30303	30361	30304
410-J ...	50-60 Cycles	30302	30478	30304
410-JB ...	25-60 Cycles	30303	30478	30304
410-T ...	50-60 Cycles	30302	30459	30304
410-TB ...	25-60 Cycles	30303	30459	30304
411-PF ...	60 Cycles	30629	30603	30304
411-PFB ...	25 Cycles	30630	30603	30304
411-PT ...	60 Cycles	30629	30604	30304
411-PTB ...	25 Cycles	30630	30604	30304

MODELS 410H,410HB
410J,410JB.410T
410TB

STROMBERG-CARLSON TEL. MFG. CO.

Chassis Wir
Phono.Data

Wiring Diagram—No. 410



Playing Records

(410 Receivers only)

To obtain the best quality of phonograph reproduction a Stromberg-Carlson record player is recommended. They are designed for use with this receiver, and all that is necessary is to connect the record player to the single prong socket provided in the chassis, tune the receiver to a quiet place on the dial scale and proceed to operate. The volume may be controlled with the volume control at the receiver, or (if such is provided) with the volume control on the record player.

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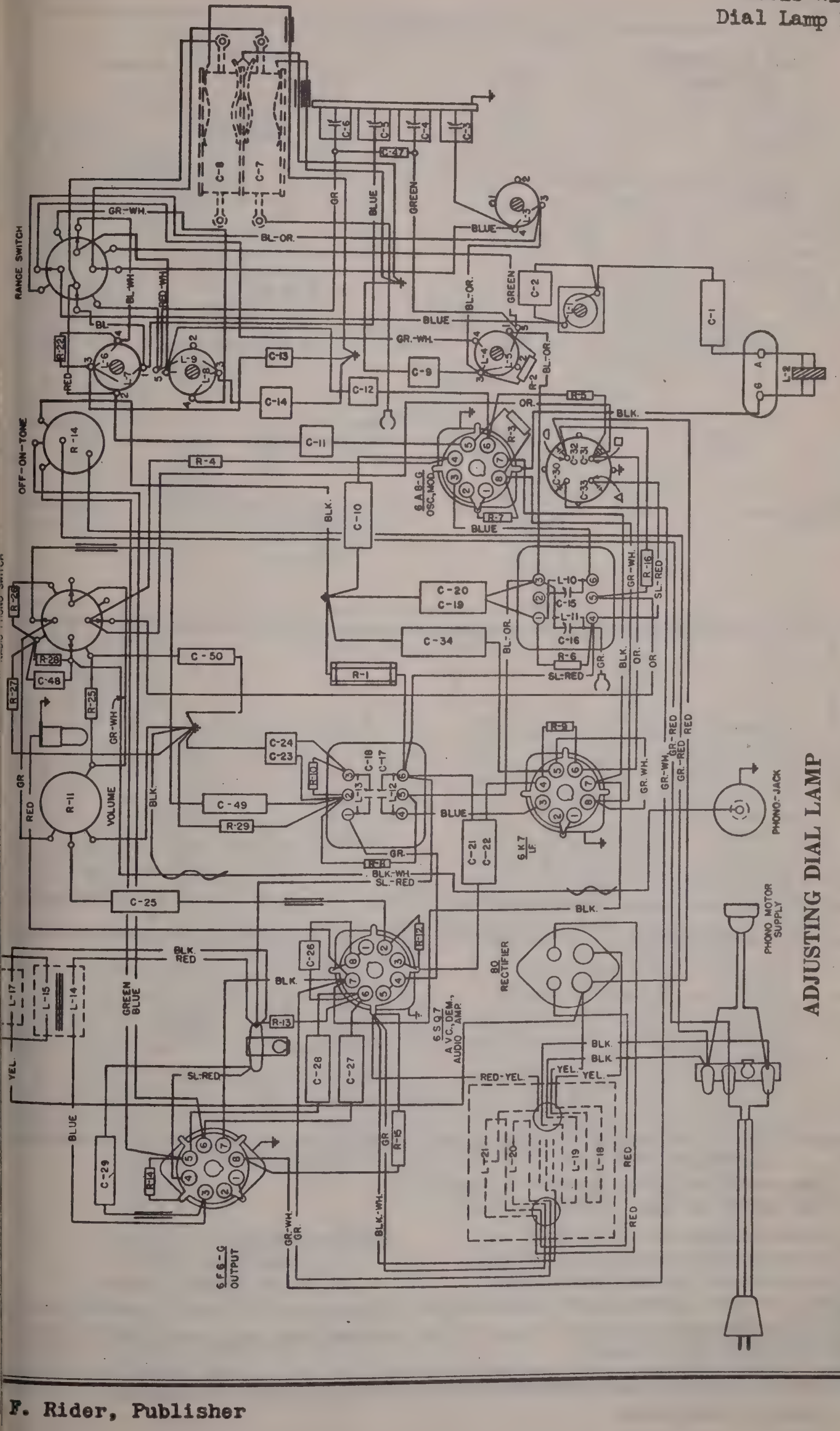
STROMBERG-CARLSON TEL. MFG. CO.

MODELS 411PF, 411PFB
411PT, 411PTB
Chassis Wiring
Dial Lamp Note



ADJUSTING DIAL LAMP

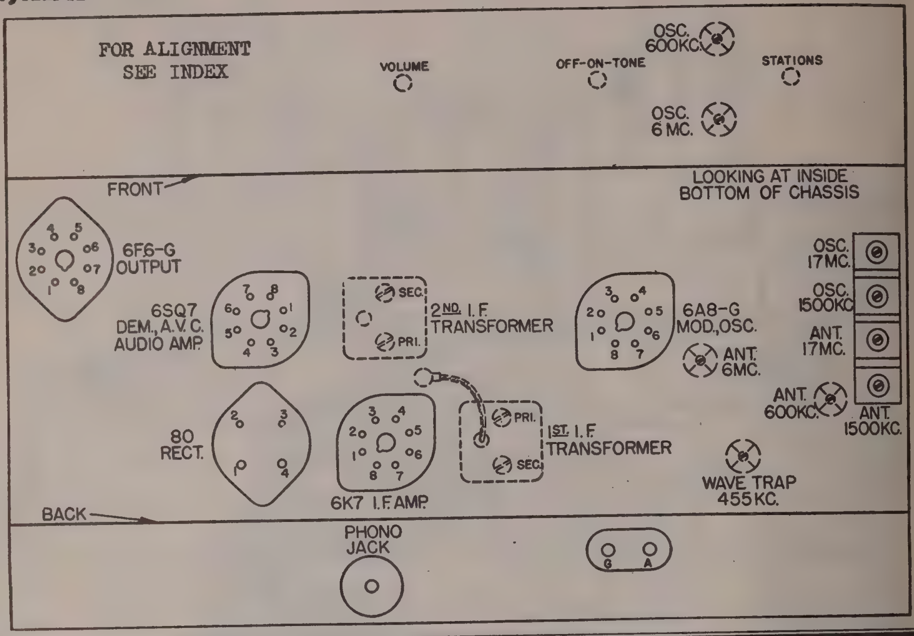
The dial on this receiver is edge lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

MODELS 410H,410HB
410J,410JB,410T
410TB,411PF,411PFB
411PT,411PTB

STROMBERG-CARLSON TEL. MFG. CO.

Voltage,Sock
Trimmers
Resistance



Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Terminal Numbers	Volts A.C.
6A8G	Mod.—Osc.	0	0	0	+260	+100	—	+180	6.5	+3*	2–7	6.5
6K7	I. F. Amp.	0	0	0	+260	+100	+3*	+270	6.5	+3*	2–7	6.5
6SQ7	Dem.—A. V. C. —Audio	—	0	—	0	—	—	+100	6.5	0	7–8	6.5
6F6G	Output	—	0	0	+240	+260	—	—	6.5	+15	2–7	6.5
80	Rectifier	—	+330	315	315	+330	—	—	—	—	1–4	5

*Read on lowest possible scale of voltmeter.

			TERMINALS OF SOCKETS							
Tube	Circuit	Cap	1	2	3	4	5	6	7	8
6A8G	Mod.—Osc.	1.5M	S	S	26,000¶	85,000¶	50,000¶	60,000¶	S	150¶
6K7	I. F. Amp	1.5M	S	S	25,000¶	110,000¶	150¶	35,000¶	S	150¶
6SQ7	Dem.—A. V. C. —Audio	—	S	10M	S	550,000¶	550,000¶	300,000¶	S	S
6F6G	Output	—	S	S	25,000¶	25,000¶	1M	*	S	400¶
80	Rectifier	—	26,000¶	250¶	250¶	26,000¶	—	—	—	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

* Tone control in "Treble" position—1 megohm.
Tone control in "Bass" position—"short".

Other Tests Not Shown on Chart

Antenna terminal to chassis base—70 ohms.
Ground terminal to chassis base—"short".
Phono terminal to chassis base—500,000 ohms.

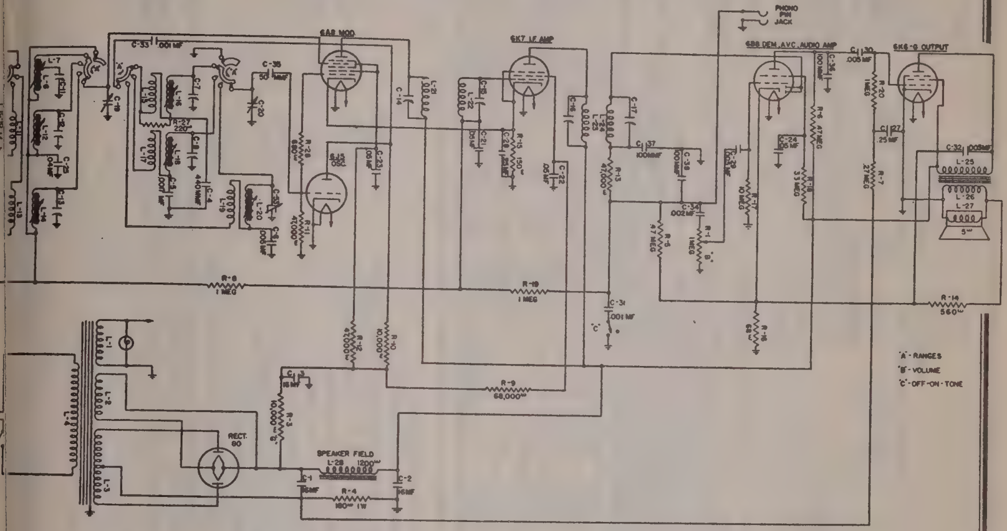
Between terminals of AC plug:
AC switch open—"open".
AC switch closed—8 ohms.
Terminals of AC plug to chassis base—"open

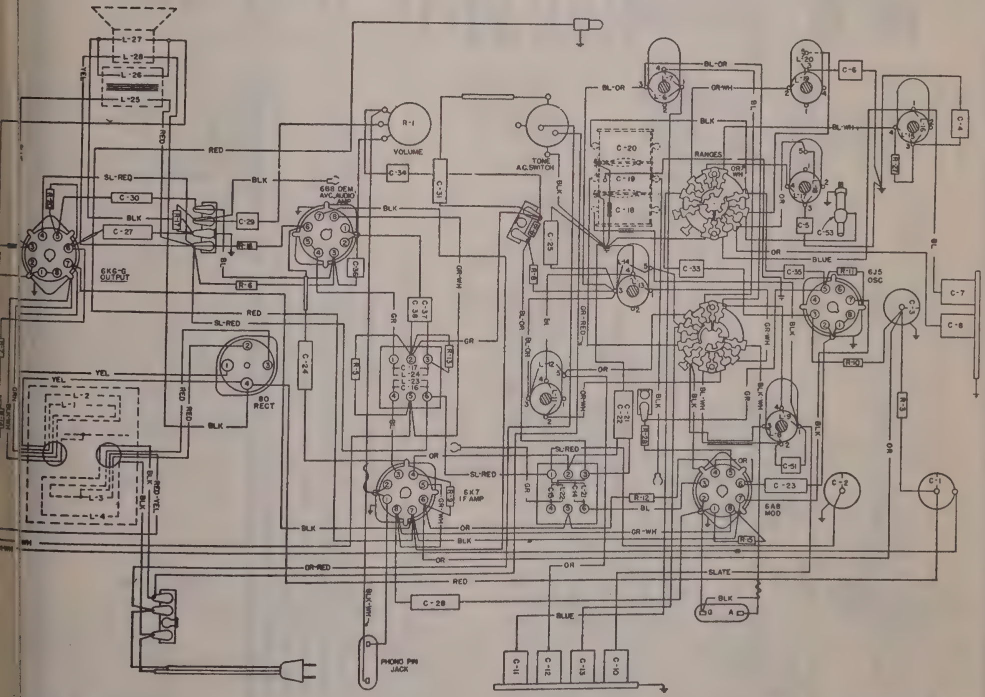
R. F. coil tests measured directly across R. F. coil terminals with range switch set in Standard Broadcast Position (A Range).
L3—3 ohms; L4—"short"; L5—"short"; L6—.5 ohm; L7—4 ohms; L8—.1 ohm; L9—"short".

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 412H,412HB
Schematic
Chassis Wiring

FOR ALIGNMENT SEE INDEX





ut ower Rating ....65 Watts
rn diate Frequency .... 455 Kilocycles
ak Voice Coil Impedance at 400 cycles.................. Approximately 5 Ohms
ak Field Coil Resistance.................................. Approximately 1200 Ohms

MODELS 412H,412HB
Voltage,Socket
Trimmers
Resistance

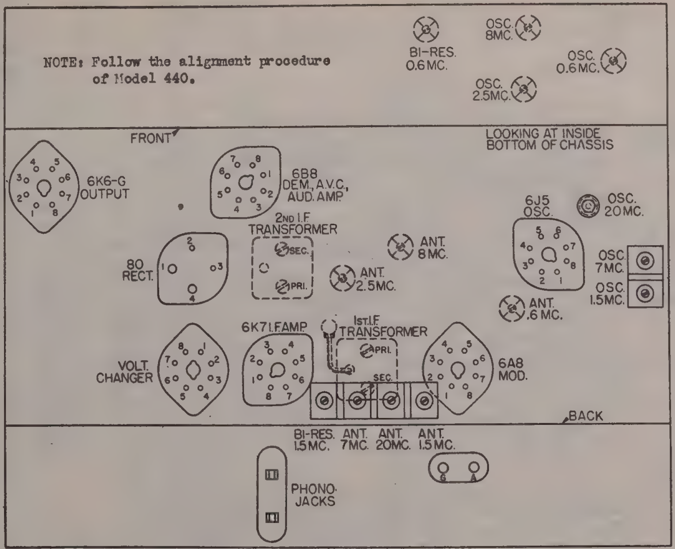
STROMBERG-CARLSON TEL. MFG. CO.

IDENTIFICATION TABLE

Model	Input Power Frequency	Chassis	Cabinet	Speaker
412-H	50-60 Cycles	30346	30589	30602
412-HB	25-60 Cycles	30347	30589	30602

SPECIFICATIONS

Voltage Rating .... Standard 50-60 Cycles; also available 25-60 Cycles
Type of Circuit .... Superheterodyne
Tuning Ranges .... 0.54 to 1.7 Mc.; 2.3 to 7.6 Mc.; 7.6 to 23 Mc.



NOTE: Follow the alignment procedure of Model 440.

Location Chart

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply and short C2 (16 mf. capacitor) to chassis base before making continuity test. Be sure to remove the "short" after continuity tests have been completed.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from the indicated terminals to chassis base unless otherwise specified.

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
6A8	Modulator	1.6M	S	S	10¶	60000¶	47000¶	60000¶	S	150¶
6J5	Oscillator	—	S	S	20000¶	O	47000¶	O	S	S
6K7	I.F. Amp.	1.5M	S	S	10¶	80000¶	150¶	10000¶	S	150¶
6B8	Dem.—A. V. C. Audio	10M	S	S	500000¶	500000¶	500000¶	3M	S	60¶
6K6G	Output	—	S	S	340¶	S	1.3M	260000¶	S	S
80	Rectifier	—	1200¶	420¶	420¶	1200¶	—	—	—	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

Other Tests Not Shown on Chart

Antenna terminal to chassis base:
Range switch set to standard broadcast position.......... 50 ohms
Range switch set to medium wave position.............. "short"
Range switch set to short wave position................. "short"
Ground terminal to chassis base.............................. "short"
Between terminals of A. C. plug:
A. C. switch open.. "open"
A. C. switch closed.. 8 ohms
Terminals of A. C. plug to chassis base....................... "open"
Phono terminals to chassis base:
Terminal nearest to the top of the chassis.................. "short"
Terminal nearest to the bottom of the chassis............ 1 megohm

R. F. coil tests measured directly across R. F. coil terminals with range switch set in standard broadcast position. (See wiring diagram on Page 6 for location of coil terminals.)

L6—1.5 ohms; L7—1 ohm; L8—50 ohms; L9—3 ohms; L11—.2 ohm; L12—.2 ohm; L13—.1 ohm; L14—short; L15—.6 ohm; L16—4 ohms; L17—.2 ohm; L18—.2 ohm; L19—.2 ohm; L20—short.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned to approximately 1000 Kc.—no signal.

Use a line voltage of 120 volts, or make allowance for any slight variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

A. C. voltages are indicated by italics.

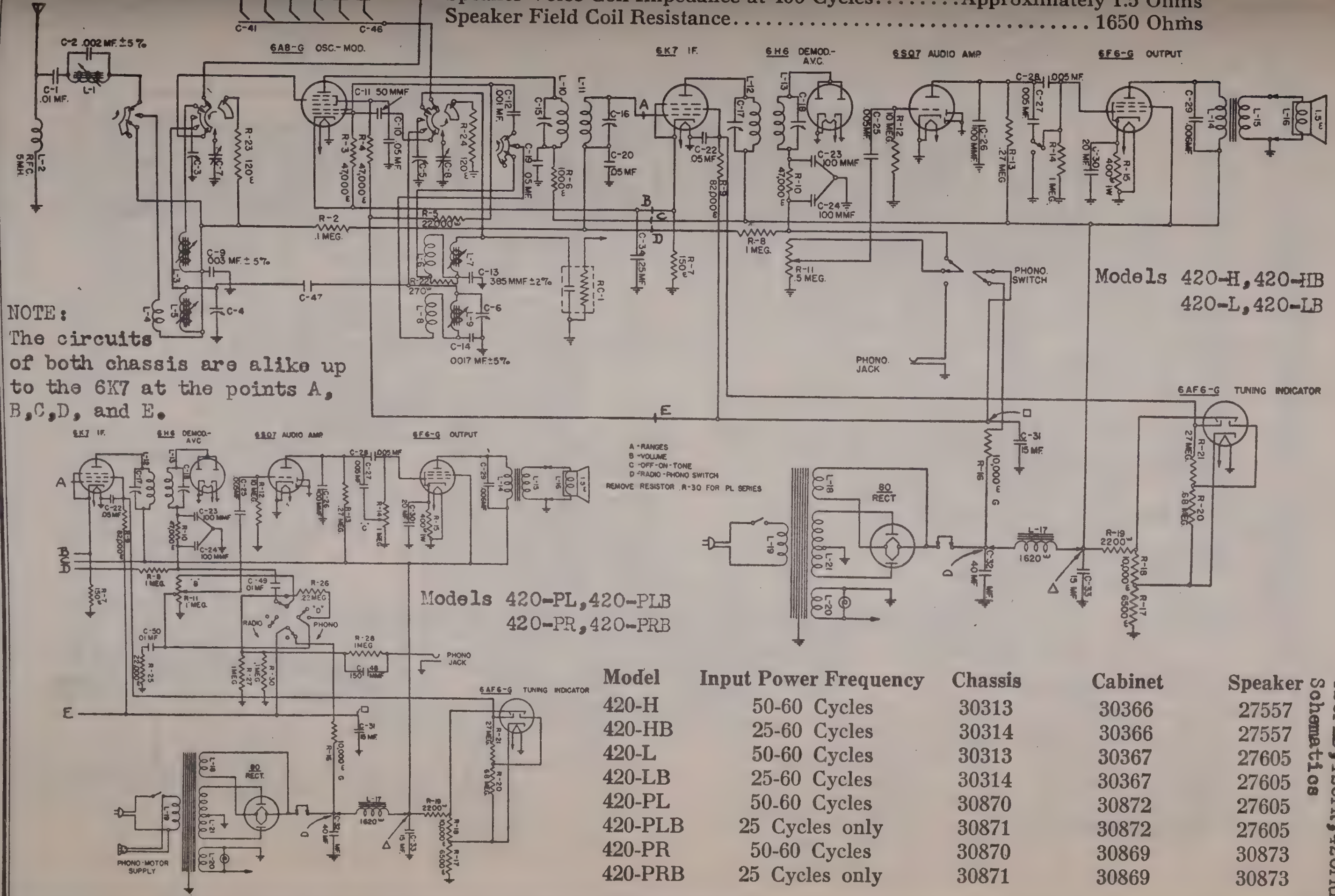
			Terminals of Sockets								*Heater Voltages Between Heater Terminals*	
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts A. C.*
6A8	Modulator	0	0	0	+255	+90	−10	+90	*6.3*	+2*	2–7	*6.3*
6J5	Oscillator	—	0	0	+150	—	−10	—	*6.3*	0	2–7	*6.3*
6K7	I. F. Amp.	0	0	0	+255	+100	+2*	—	*6.3*	+2*	2–7	*6.3*
6B8	Dem.—A. V. C. Audio	0	0	0	+60	0	0	+15	*6.3*	0	2–7	*6.3*
6K6G	Output	—	0	0	+235	+255	−1	—	*6.3*	—		
80	Rectifier	—	+345	*350*	*350*	+345	—	—	—	—	1–4	5

*Read on lowest possible scale of voltmeter.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 420H,420HB, 420L,420LB,420PL, 420PLB,420PR,420PRB Schematics

Input Power Rating ....57 Watts
Speaker Voice Coil Impedance at 400 Cycles........Approximately 1.5 Ohms
Speaker Field Coil Resistance.................................1650 Ohms



Models 420-H,420-HB
420-L,420-LB

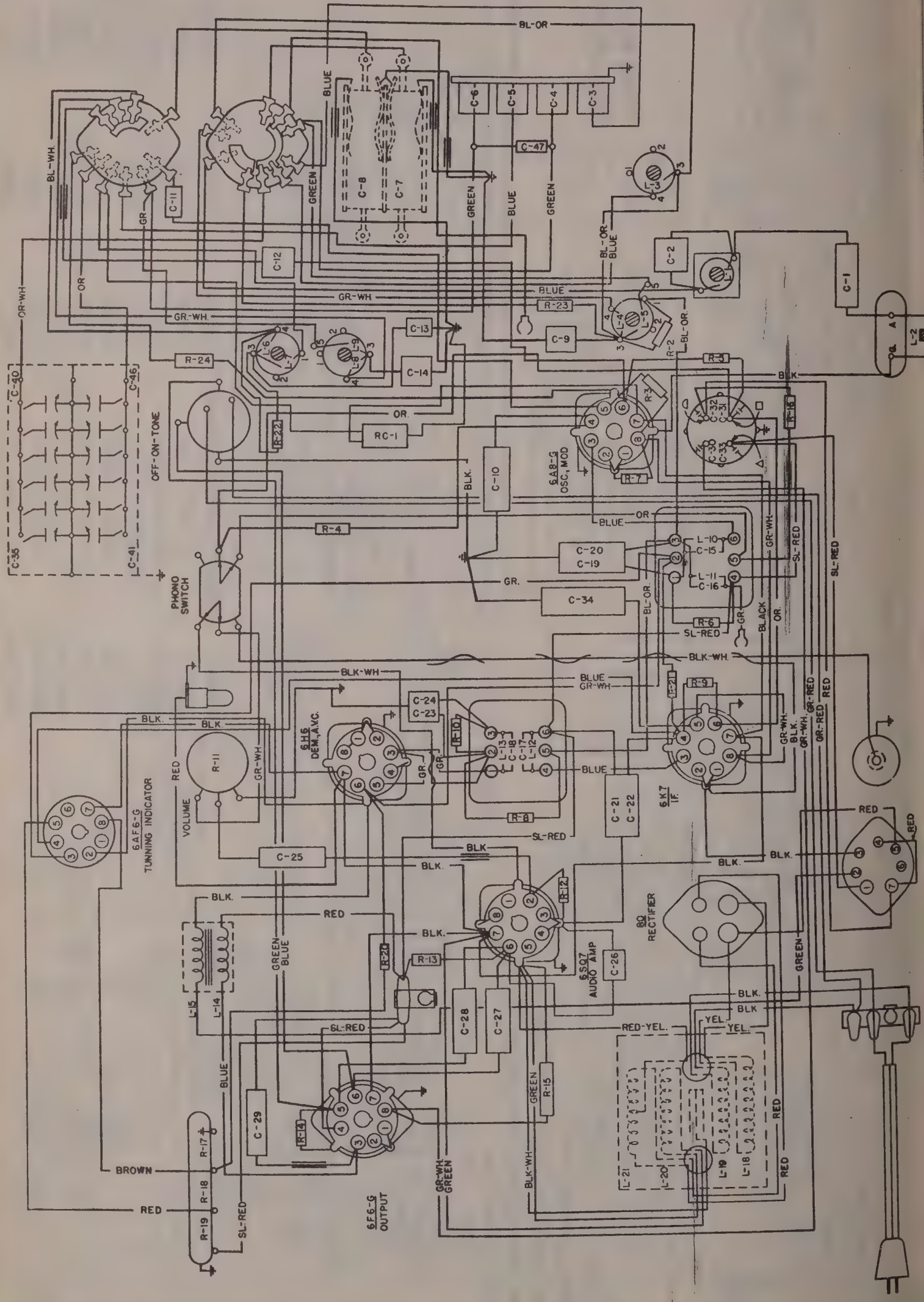
NOTE:
The circuits of both chassis are alike up to the 6K7 at the points A, B,C,D, and E.

Models 420-PL,420-PLB
420-PR,420-PRB

Model	Input Power Frequency	Chassis	Cabinet	Speaker
420-H	50-60 Cycles	30313	30366	27557
420-HB	25-60 Cycles	30314	30366	27557
420-L	50-60 Cycles	30313	30367	27605
420-LB	25-60 Cycles	30314	30367	27605
420-PL	50.60 Cycles	30870	30872	27605
420-PLB	25 Cycles only	30871	30872	27605
420-PR	50-60 Cycles	30870	30869	30873
420-PRB	25 Cycles only	30871	30869	30873

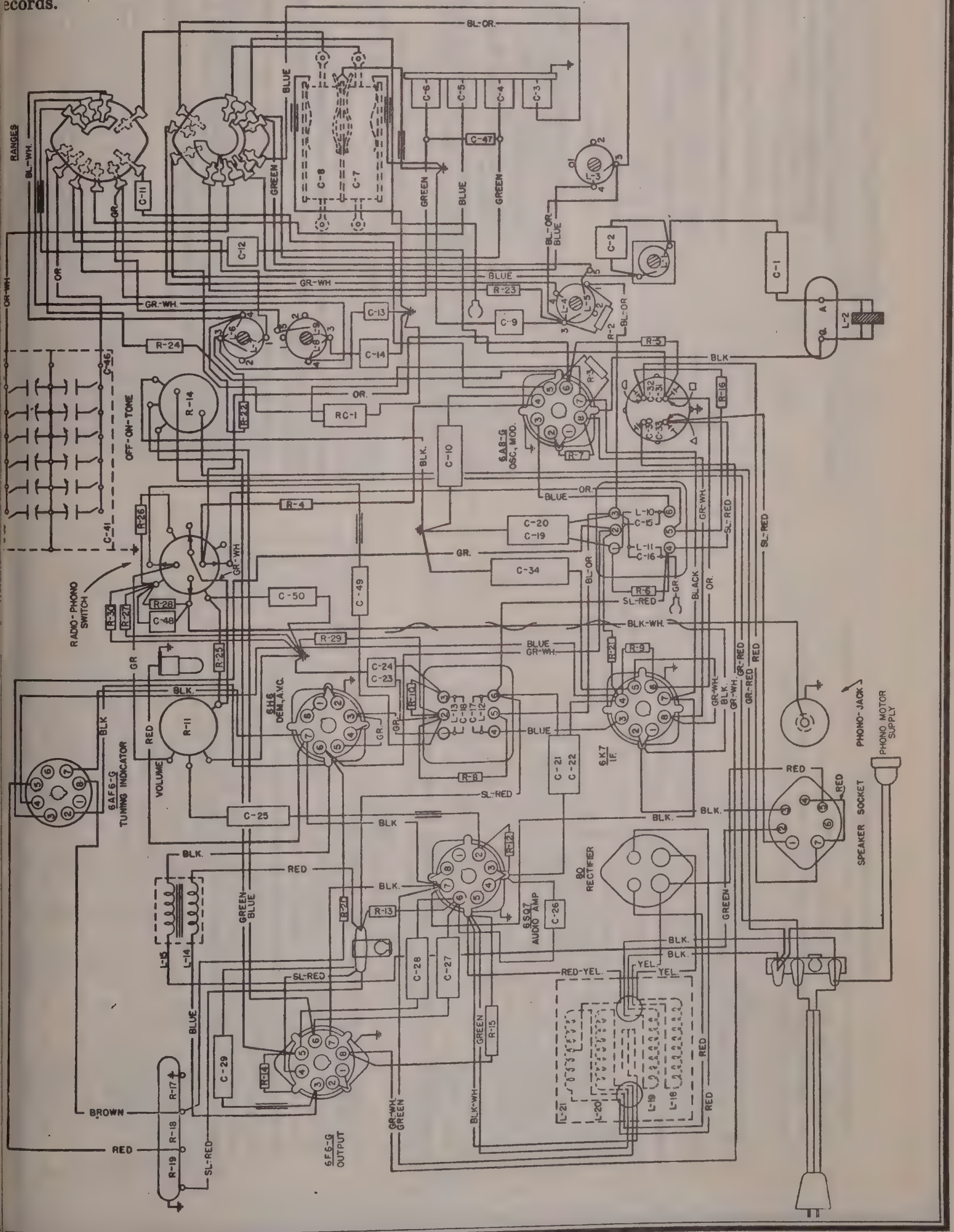
MODELS 420H,420HB
420L,420LB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



The No. 420-PR Receivers are equipped with a single record phonograph unit using a crystal ick-up in conjunction with a specially equalized circuit. The phonograph unit is designed to play he standard 10 or 12 inch 78 R.P.M. records.

The No. 420-PL Receivers are equipped with an automatic record changer using a crystal pick-p in conjunction with a specially equalized circuit. This record player shifts and plays 10 or 12 inch ecords.



MODELS 420H,420HB
420L,420LB,420PL
420PLB,420PR,420PRB
Voltage,Tuner
Resistance

STROMBERG-CARLSON TEL. MFG. CO.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc.—no signal.

Use a line voltage of 120 volts, or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart on Page 4 for position of terminals.

A. C. voltages are indicated by italics.

To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

Tube	*Circuit*	*Cap*	*Terminals of Sockets*								*Heater Voltages Between Heater Terminals*	
			1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts A.C.*
6A8G	Mod.—Osc.	0	0	0	+255	+99	—	+175	*6.3*	+2.5*	2–7	*6.3*
6K7	I. F. Amp.	0	0	0	+257	+85	+2.5*	+255	*6.3*	+2.5*	2–7	*6.3*
6H6	Dem.—A. V. C.	—	0	0	—	0	—	+60	*6.3*	0	2–7	*6.3*
6SQ7	Audio Amp.	—	0	—	0	0	0	+95	*6.3*	0	7–8	*6.3*
6F6G	Output	—	0	0	+245	+257	—	—	*6.3*	+16	2–7	*6.3*
6AF6G	Tuning Ind.	—	—	0	+80	+115	+230	—	*6.3*	+100	2–7	*6.3*
80	Rectifier	—	+365	*350*	*350*	+365	—	—	—	—	1–4	*5*

*Read on lowest possible scale of voltmeter.

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit.

When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location Chart on Page 4 for position and numbering of terminals.

Tube	*Circuit*	*Cap*	*TERMINALS OF SOCKETS*							
			1	2	3	4	5	6	7	8
6A8G	Mod.—Osc.	A	S	S	20000¶	B	50000¶	C	S	150¶
6K7	I. F. Amp.	D	S	S	18000¶	E	150¶	F	S	150¶
6H6	Dem.—A. V. C.	—	S	S	G	S	H	280000¶	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	280000¶	S	S
6F6G	Output	—	S	S	19000¶	19000¶	1M	1M	S	400¶
6AF6G	Tuning Ind.	—	O	S	250000¶	100000¶	15000¶	O	S	6000¶
80	Rectifier	—	19000¶	150¶	150¶	19000¶	—	—	—	—
—	Speaker Socket	—	19000¶	S	S	800000¶	O	O	800000¶	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

OTHER TESTS NOT SHOWN ON CHART

Note	Radio-Phono Switch Set To: Radio Position	Radio-Phono Switch Set To: Phono Position	
A	1.8M	O	Phonograph jack terminal to chassis base. Radio Phonograph switch in Radio position "open". Radio Phonograph switch in Phonograph position 500,000 ohms.
B	80,000¶	1M	Antenna terminal to chassis base 70 ohms.
C	50,000¶	1M	Ground terminal to chassis base "short".
D	1.5M	O	Between terminals of A. C. plug "open" with A. C. switch open, 7 ohms with A. C. switch closed. Terminals of A. C. plug to chassis base "open".
E	100,000¶	1M	Front terminal of Push Button Unit (orange-white wire) to chassis base. Radio Phonograph switch in Radio position 1.8M. Radio Phonograph switch in Phono position "open".
F	25,000¶	1M	Rear terminal of Push Button Unit (orange wire) to chassis base Range switch in Push Button position "open".
G	550,000¶	O	Range switch in Standard Broadcast position (A Band) 120 ohms.
H	550,000¶	O	Range switch in Short Wave position (C Band) 120 ohms.

R. F. coil tests measured directly across R. F. coil terminals with Range switch set in standard broadcast position (A Band): L3—3 ohms, L4—.2 ohms, L-5—"short", L6—.2 ohms, L7—4 ohms, L8—.2 ohms, L9—"short".

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

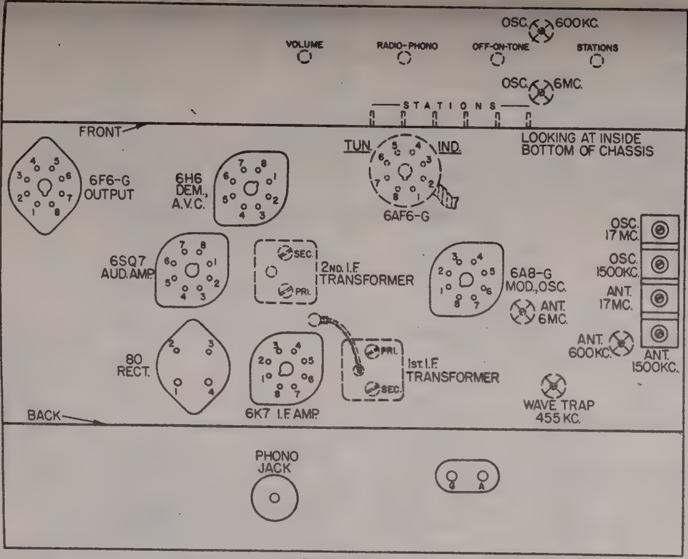
Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

1. **Remove the push button escutcheon by removing the screws and pulling downward and outward.**
2. Put the call letters of the selected stations in place above the push buttons. **The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial.** (The call letters will be found inside the envelope stapled inside or underneath the cabinet.)
3. Tune in manually the highest frequency station to be set up and note carefully the program being transmitted.
4. Turn the range switch to the push button position and push the highest frequency button, then adjust the large screw over this button until the desired program is heard. (If the proper adjusting screw cannot be reached it will be necessary to turn the station selector control until the screw is accessible through one of the holes in the pulley.)
5. After the large screw is carefully adjusted, adjust the small vernier screw for maximum closing of the tuning indicator. (Be sure the large adjusting screw does not move while turning the vernier screw.)
6. Set up the other five stations in the same manner.
7. **Recheck the adjustment of each adjusting screw.**

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 410,411
MODELS 430
Alignment



Location Chart

ALIGNING INFORMATION

Always have receiver volume control full on.
Never align with tone control in "Bass" position.
See location chart above for location of all the aligning adjustment screws.

Aligning Procedure (follow this order exactly)

I. Dial pointer adjustment.

With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the vertical line located at the extreme low frequency end of the short wave band.

II. Intermediate frequency adjustments.

1. Set the range switch to Standard Broadcast position.
2. Tune set to extreme low frequency end of the dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 Kilocycles to the grid cap of the 6A8G Tube, using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Do not remove the grid clip from this tube.)
5. Adjust the I. F. Aligners for maximum output in the following order:
    - A. Secondary of second I. F. transformer.
    - B. Primary of second I. F. transformer.
    - C. Secondary of first I. F. transformer.
    - D. Primary of first I. F. transformer.

III. Radio frequency adjustments.

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm carbon type resistor, and connect it to the antenna terminal of the chassis.
2. Set the range switch to the short-wave range position (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycles oscillator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm carbon type resistor in series with the output lead from the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the Standard Broadcast Range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 Kc.
4. Adjust the 600 Kc. oscillator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 Kc.
6. Adjust the 1500 Kc. oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operation three and four.
8. Repeat operation five and six.

IV. **Wave Trap Adjustment.**

(Leave the receiver connected in the same manner as when adjusting the Standard Broadcast Range ("A" Band)).

1. Tune set to 1000 Kc.
2. Set the signal generator frequency to 455 Kc. and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

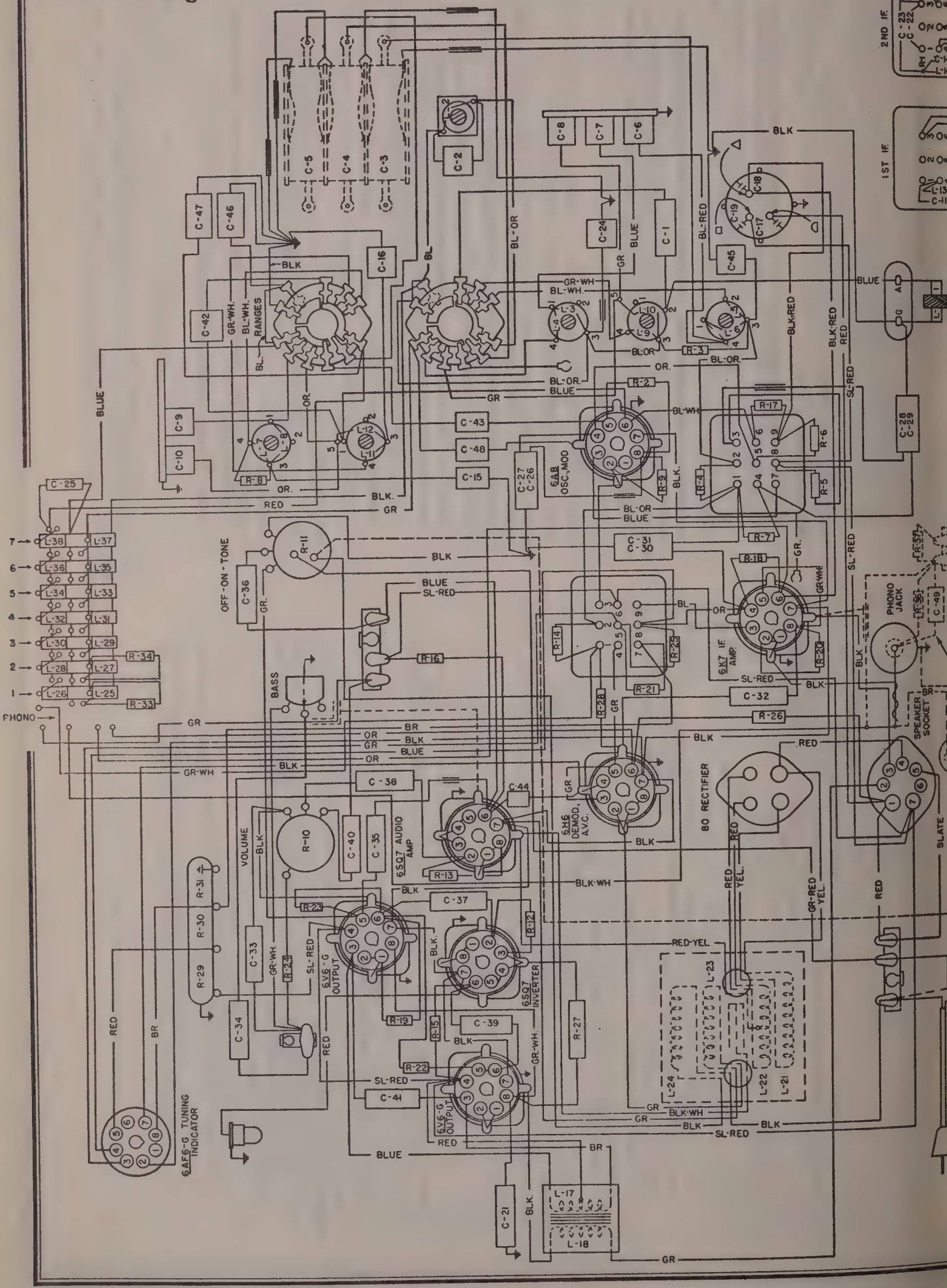
ADJUSTING DIAL LAMP

The dial on this receiver is edge lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

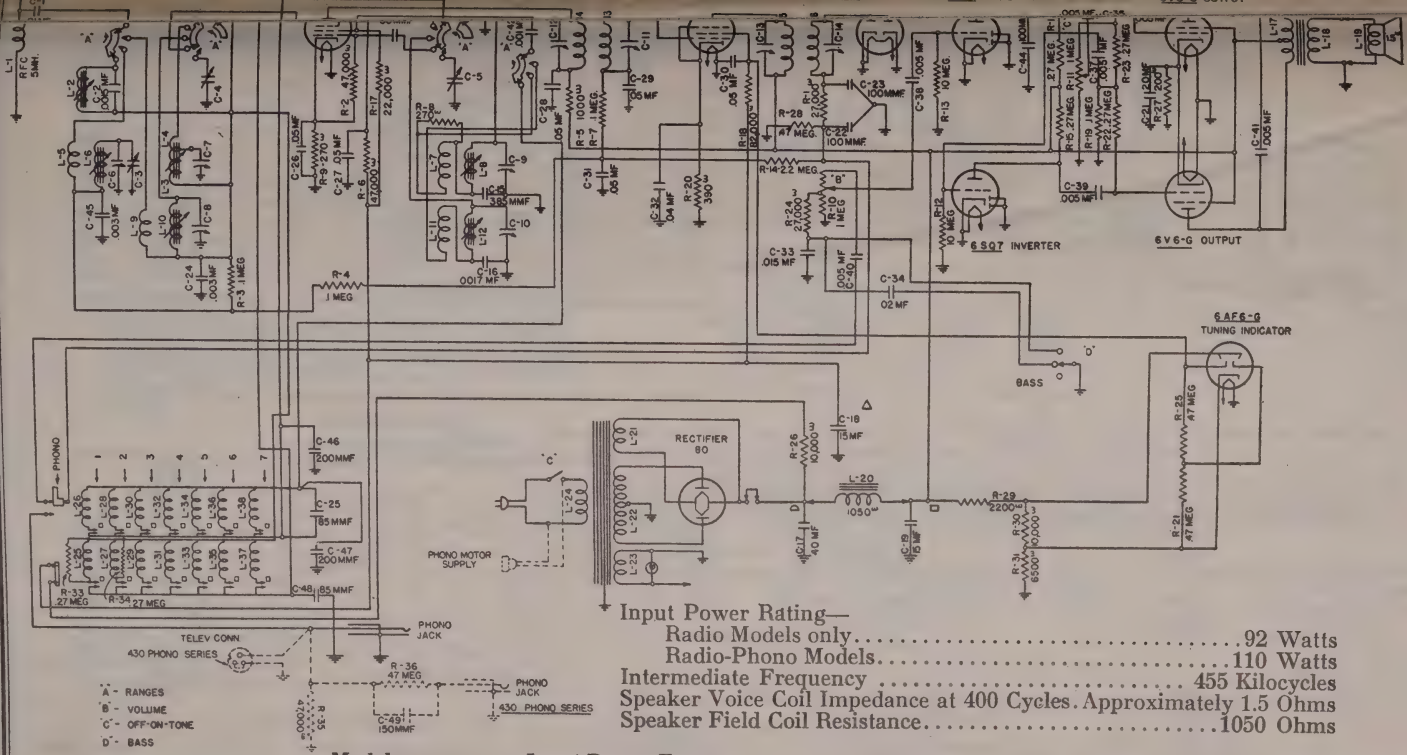
MODELS 430H,430HB
430L,430LB,430M
430MB,430PL,430PLB
430PF,430PFB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



STROMBERG-CARLSON TEL. MFG. CO.

MODELS 430H, 430HB
430L, 430LB, 430M
430MB, 430PL, 430PLB
430PF, 430PFB
Schematic



Input Power Rating—
Radio Models only.......................................92 Watts
Radio-Phono Models....................................110 Watts
Intermediate Frequency .... 455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles. Approximately 1.5 Ohms
Speaker Field Coil Resistance.............................1050 Ohms

Model	Input Power Frequency	Chassis	Cabinet	Speaker
430-H	50-60 Cycles	30317	30457	30358
430-HB	25-60 Cycles	30318	30457	30358
430-L	50-60 Cycles	30317	30104	27834
430-LB	25-60 Cycles	30318	30104	27834
430-M	50-60 Cycles	30317	30105	30359
430-MB	25-60 Cycles	30318	30105	30359
430-PL	50-60 Cycles	30867	30993	26170
430-PLB	25 Cycles only	30868	30993	26170
430-PF	50-60 Cycles	30867	30866	26171
430-PFB	25 Cycles only	30868	30866	26171

FOR ALIGNMENT AND
TUNER DATA, SEE INDEX

MODELS 430H,430HB
430L,430LB,430M
430MB,430PL,430PLB
430PF,430PFB

STROMBERG-CARLSON TEL. MFG. CO.

Voltage,Socket
Trimmers,Resists

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc.—no signal.
Use a line voltage of 120 volts, or make allowance for the variation.
Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.
Take all D. C. readings on the 500 volt scale except when an asterisk appears.
Read from indicated terminals to chassis base.
See location chart for position of terminals.
A. C. voltages are indicated by italics.
To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts A.C.*
6A8	Mod.—Osc.	0	0	0	+250	+110	−8*	+173	*6.5*	+3*	2–7	*6.5*
6K7	I. F. Amp.	0	0	0	+253	+108	+3.5*	—	*6.5*	+3.5*	2–7	*6.5*
6H6	Dem.—A. V. C.	—	0	0	0	0	0	0	*6.5*	0	2–7	*6.5*
6SQ7	Audio Amp.	—	0	0	0	0	0	+108	*6.5*	0	2–7	*6.5*
6SQ7	Audio Inv.	—	0	0	0	0	0	+108	*6.5*	0	2–7	*6.5*
6V6G	Output	—	0	0	+250	+254	0	—	*6.5*	+14.5	2–7	*6.5*
6V6G	Output	—	0	0	+250	+254	0	—	*6.5*	+14.5	2–7	*6.5*
6AF6G	Tuning Ind.	—	+90	—	—	+220	+110	+52	*6.5*	0	2–7	*6.5*
80	Rectifier	—	+382	*375*	*375*	+382	—	—	—	—	1–4	*5*
—	Speaker Socket	—	—	+382	0	0	+382	+382	—	—	—	—

*Read on lowest possible scale of voltmeter.

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.
Use a good meter capable of measuring accurately up to several megohms.
The resistances given are often approximate, owing to electrolytic capacitors in the circuit.
When this is the case, be sure to reverse the test leads and read the highest resistance.
Read from indicated terminals to chassis base unless otherwise specified.
See location Chart for position and numbering of terminals.

Tube	Circuit	Cap	TERMINALS OF SOCKETS							
			1	2	3	4	5	6	7	8
6A8	Mod.—Osc.	A	S	S	20000Ω	B	48000Ω	C	S	270Ω
6K7	I. F. Amp.	3M	S	S	19000Ω	D	390Ω	29000Ω	S	390Ω
6H6	Dem.—A. V. C.	—	S	S	50000Ω	S	50000Ω	20000Ω	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	300000Ω	S	S
6SQ7	Audio Inv.	—	S	10M	S	S	S	300000Ω	S	S
6V6	Output (E)	—	S	S	16000Ω	16000Ω	270000Ω	100000Ω	S	200Ω
6V6	Output	—	S	S	16000Ω	16000Ω	400000Ω	O	S	200Ω
80	Rectifier	—	19000Ω	100Ω	120Ω	19000Ω	—	—	—	—
6AF6G	Tun. Ind.	—	O	S	270000Ω	100000Ω	16000Ω	O	S	6500Ω
—	Speaker Socket	—	100000Ω or Greater	S	S	O	100000Ω or Greater	O	16000Ω	—

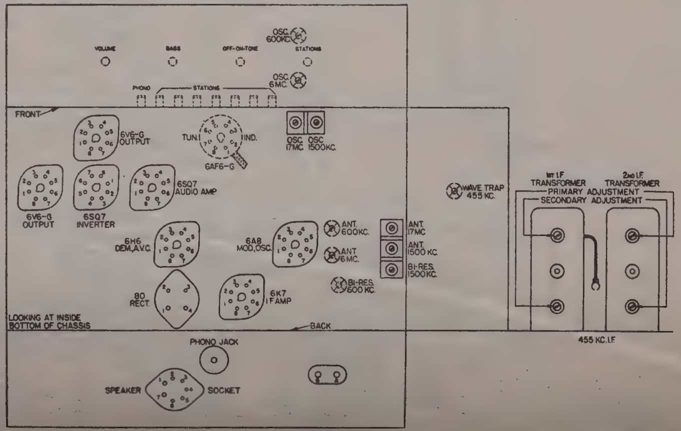
Symbols used on chart are as follows: Ω—ohms; M—megohms; S—short; O—open.

A. Push in any pre-set station button;
   Set range switch to Push Button position.......... 2.8 megohms
   Set range switch to "A" range position.......... 2.8 megohms
   Set range switch to "C" range position.......... 2.8 megohms
   Push buttons in normal position (all buttons out);
   Set range switch to Push Button position.......... "open"
   Set range switch to "A" range position.......... 2.8 megohms
   Set range switch to "C" range position.......... 2.8 megohms
B. Push in "Phono" button.......... 200,000 ohms
   Push in any pre-set station button.......... 70,000 ohms
C. Push in "Phono" button.......... 200,000 ohms
   Push in any pre-set station button.......... 50,000 ohms
D. Push in "Phono" button.......... 200,000 ohms
   Push in any pre-set station button.......... 100,000 ohms
E. 6V6 Tube Socket nearest to the front of the chassis

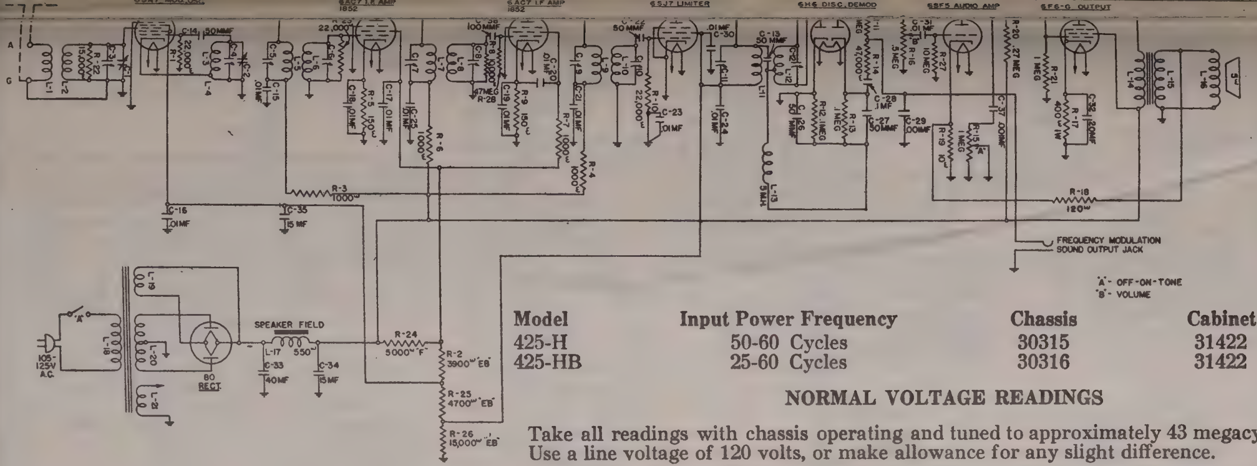
Other Tests Not Shown on Chart

Antenna terminal to chassis base.......... 75 ohms
Ground terminal to chassis base.......... "short"
Phono terminal to chassis base.......... "open"
Test between terminals of A.C. plug;
   A.C. switch open.......... "open"
   A.C. switch closed.......... 5 ohms
Terminals of A.C. plug to chassis base.......... "open"

R. F. coil tests measure directly across R. F. coil terminals with range switch in broadcast position ("A" range): L3—.8 ohm; L4—.8 ohm; L5—.1 ohm; L6—3 ohms; L7—.3 ohm; L8—4 ohms; L9—.1 ohm; L10—"short"; L11—.1 ohm; L12—"short".



Location Chart



Model	Input Power Frequency	Chassis	Cabinet	Speaker
425-H	50-60 Cycles	30315	31422	31451
425-HB	25-60 Cycles	30316	31422	31451

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned to approximately 43 megacycles—no signal. Use a line voltage of 120 volts, or make allowance for any slight difference.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt. Take all D. C. readings on the 500 volt scale except when an asterisk appears. Read from indicated terminals to chassis base. See location chart for position of terminals.

A. C. voltages are indicated by italics.

Tube	*Circuit*	*Cap*	*Terminals of Sockets*								*Heater Voltages Between Heater Terminals*	
			1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts A.C.*
6SA7	Osc. and Mod.	—	0	0	+240	+90	0	0	*6.3*	0	2–7	*6.3*
6AC7 (1852)	1st I. F. Amp.	—	0	0	0	0	+2*	+148	*6.3*	+230	2–7	*6.3*
6AC7 (1852)	2nd I. F. Amp.	—	0	0	0	0	+2*	+145	*6.3*	+230	2–7	*6.3*
6SJ7	Limiter	—	0	0	0	0	0	+50	*6.3*	+57	2–7	*6.3*
6H6	Demod. (Discr.)	—	0	0	0	0	−10*	0	*6.3*	0	2–7	*6.3*
6SF5	Audio Amp.	—	0	0	0	0	+90	+245	*6.3*	0	2–7	*6.3*
6F6G	Output	—	0	0	+230	+245	0	0	*6.3*	+15*	2–7	*6.3*
80	Rectifier	—	+300	*310*	*310*	+300	—	—	—	—	1–4	*5*

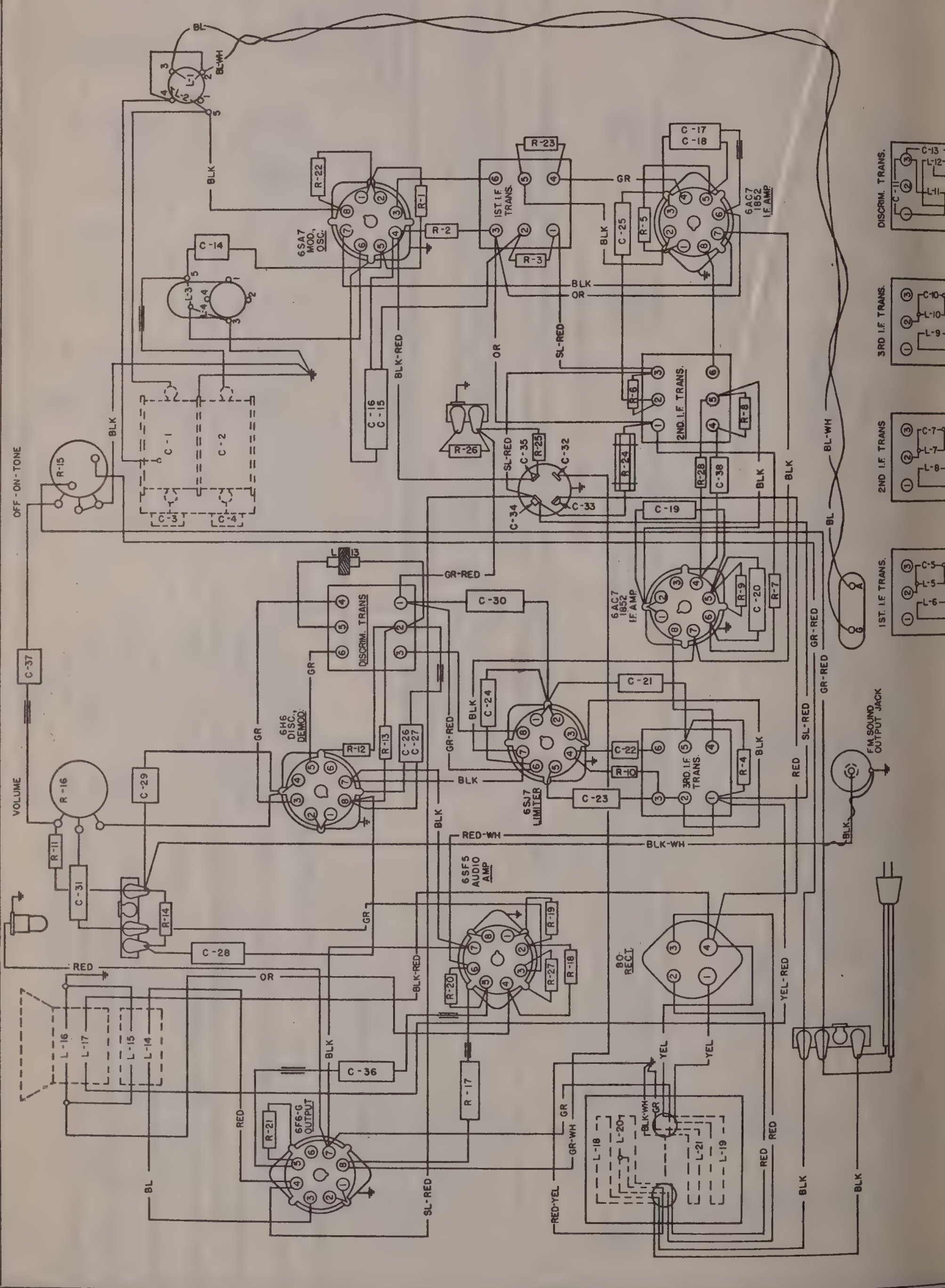
***Read on lowest possible scale of voltmeter.**

SPECIFICATIONS

Voltage Rating	105 to 125 Volts
Type of Circuit	Frequency Modulation—Superheterodyne
Tuning Range	40 to 44 Megacycles (40,000 to 44,000 Kilocycles)
Input Power Rating (120 Volt line)	79 Watts
Intermediate Frequency	2.1 Megacycles (2100 Kilocycles)
Speaker Voice Coil Impedance at 400 Cycles	Approximately 5 Ohms
Speaker Field Coil Resistance	Approximately 550 Ohms

MODELS 425H,425HB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good ohmmeter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to Electrolytic Capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance. Read from indicated terminals to chassis base.

			TERMINALS OF SOCKETS							
ube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
SA7	Osc. and Mod.	—	S	S	30000¶	20000¶	20000¶	S	S	S
AC7 (1852)	1st I. F. Amp.	—	S	S	S	2¶	150¶	27000¶	S	30000¶
AC7 (1852)	2nd I. F. Amp.	—	S	S	S	500000¶	150¶	30000¶	S	30000¶
SJ7	Limiter	—	S	S	S	20000¶	S	18000¶	S	18000¶
H6	Demod. (Discr.)	—	S	S	90000¶	S	90000¶	O	S	180000¶
SF5	Audio Amp.	—	S	10¶	10M	S	300000¶	30000¶	S	S
F6G	Output	—	S	S	30000¶	30000¶	1M	O	S	400¶
0	Rectifier	—	100¶	30000¶	30000¶	100¶	—	—	—	—

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.

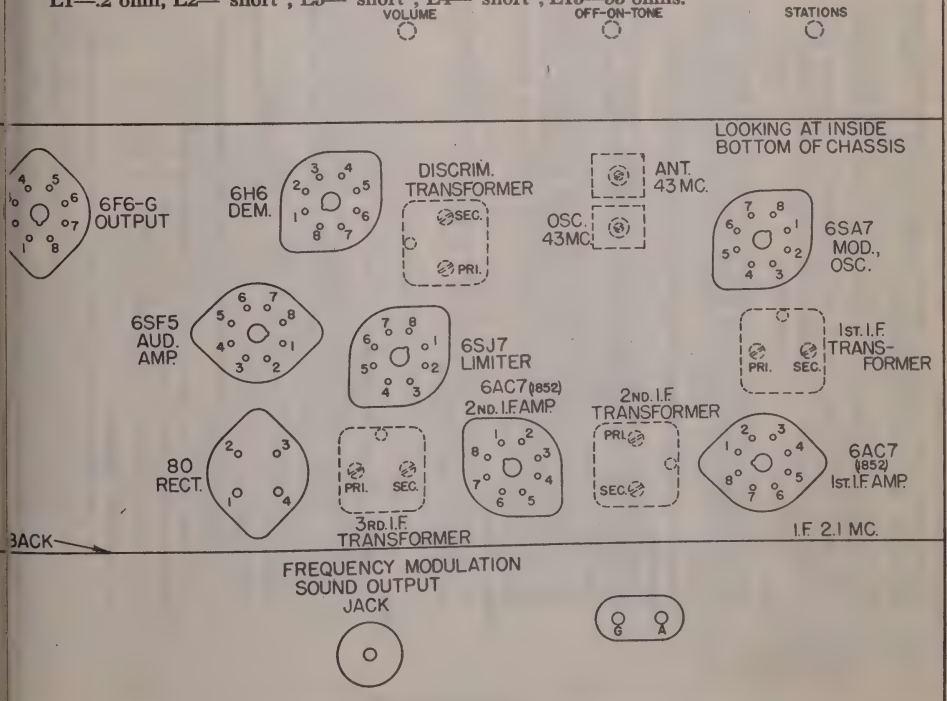
Other Tests Not Shown on Chart

ntenna terminal to chassis base....... "short"
round terminal to chassis base....... "short"
M. Sound Output Jack to chassis base 1 megohm

Terminals of A. C. plug to chassis base.. "open"
Between terminals of A. C. plug:
A. C. switch open................ "open"
A. C. switch closed............... 6 ohms

R. F. coil tests measured directly across R. F. coil terminals. (See wiring diagram for location of R. F. coil terminals.)

L1—.2 ohm, L2—"short", L3—"short", L4—"short", L13—55 ohms.



Location Chart

MODELS 425H, 425HB
Alignment, Notes

STROMBERG-CARLSON TEL. MFG. CO.

Using the 425 Receiver as a Converter

This receiver may be used as a converter so that the audio system of a good high fidelity receiver of the ordinary amplitude modulation type may be utilized to provide the type of high fidelity reception only possible with frequency modulation.

It is only necessary to connect the single pin jack on the back of the chassis (labeled Frequency Modulation Sound Output Jack) to the Phono Input of any other receiver or sound system by means of the cord provided.
In this way, the speaker of the 425 Receiver will act as a "tweeter" or treble speaker and the speaker system of the amplitude modulation receiver will serve as the bass speaker. The balance between the two speakers can be controlled by operating the two volume controls.

ACCESSORIES

Antenna

The proper antenna for frequency modulation reception will depend upon the distance from the stations which it is desired to receive. In some locations, a simple single wire antenna will be suitable but for best results, the Stromberg-Carlson No. 5-A Antenna Adapter used in conjunction with the No. 5 Antenna to which the amplitude modulation receiver is connected is recommended.

It may also be necessary to utilize a horizontal dipole type of antenna in some locations.

Playing Records

To obtain the best quality of phonograph reproduction, a Stromberg-Carlson record player is recommended. If this set is used as a converter, the phonograph should be attached to the amplitude modulation receiver in the regular way. (The installation of a simple switch will eliminate plugging and unplugging).

If this set is used as a receiver, the sound output jack may be readily converted to a phonograph in put jack by removing the black-white wire which comes from this jack from the terminal block to which it is connected and connecting it to the high side of the volume control (this is the terminal on the volume control to which resistor R-11 is attached).
After this has been done, it is only necessary to plug in a record player, tune to a quiet place on the dial and proceed to operate.

Adjusting Dial Lamp

One dial lamp is used to illuminate the dial on the No. 425 Receiver. To adjust the dial lamp for proper illumination of the dial, slide the lamp socket back and forth on its mounting bracket until maximum illumination is obtained.

ALIGNING INFORMATION

General

Never Realign Unless Absolutely Necessary.

All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. A good signal generator with variable output voltage. (All adjustments are made using an unmodulated signal.)
2. A good center "O" microammeter with 100 divisions on each side of "O".

Always have receiver volume control full on.

See location chart for location of aligning adjustment screws.

I. Discriminator Adjustment.

1. Tune the set to the extreme high frequency end of the dial (44.5 megacycles).
2. Connect the center "O" microammeter with a one megohm resistor in series across one half of the discriminator load (from ground to the junction of the two 100,000 ohm resistors R-12 and R-13).
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce an unmodulated signal of 2100 kilocycles to the grid (terminal No. 4) of the 6SJ7 limiter tube using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Approximately one volt signal is necessary.)
5. Adjust the primary of the discriminator transformer for maximum reading of the microammeter.
6. Remove the microammeter and the one megohm resistor from the junction of R-12 and R-13 resistors and connect them across the whole discriminator load (from the high side of the R-13 to ground.)
7. Adjust the secondary of the discriminator transformer for "O" reading of the microammeter.

II. Intermediate Frequency Adjustments.

Important: All intermediate frequency adjustments are made using the same unmodulated signal of 2100 kilocycles. Each I. F. stage must be adjusted independently and in the order given. **Do not make any overall adjustments after the previous stage is aligned.**

1. Disconnect the jumper wire from the low side of the limiter grid resistor (R-10) and connect the microammeter directly to this wire without using the one megohm resistor.
2. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 second I. F. tube (Terminal No. 4).
3. Adjust the secondary of the third I. F. transformer for maximum reading of the microammeter.
4. Adjust the primary of the third I. F. transformer for maximum reading of the microammeter.
5. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 first I. F. tube (Terminal No. 4).
6. Adjust the secondary of the second I. F. transformer for maximum reading of the microammeter.
7. Adjust the primary of the second I. F. transformer for maximum reading of the microammeter.
8. Disconnect the black wire to the antenna coil from the grid terminal of the 6SA7 modulator tube (terminal No. 8) and connect the output lead from the signal with the 0.1 microfarad capacitor in series to this terminal.
9. Adjust the secondary of the first I. F. transformer for maximum reading of the microammeter.
10. Adjust the primary of the first I. F. transformer for maximum reading of the microammeter.

III. Radio Frequency Adjustments.

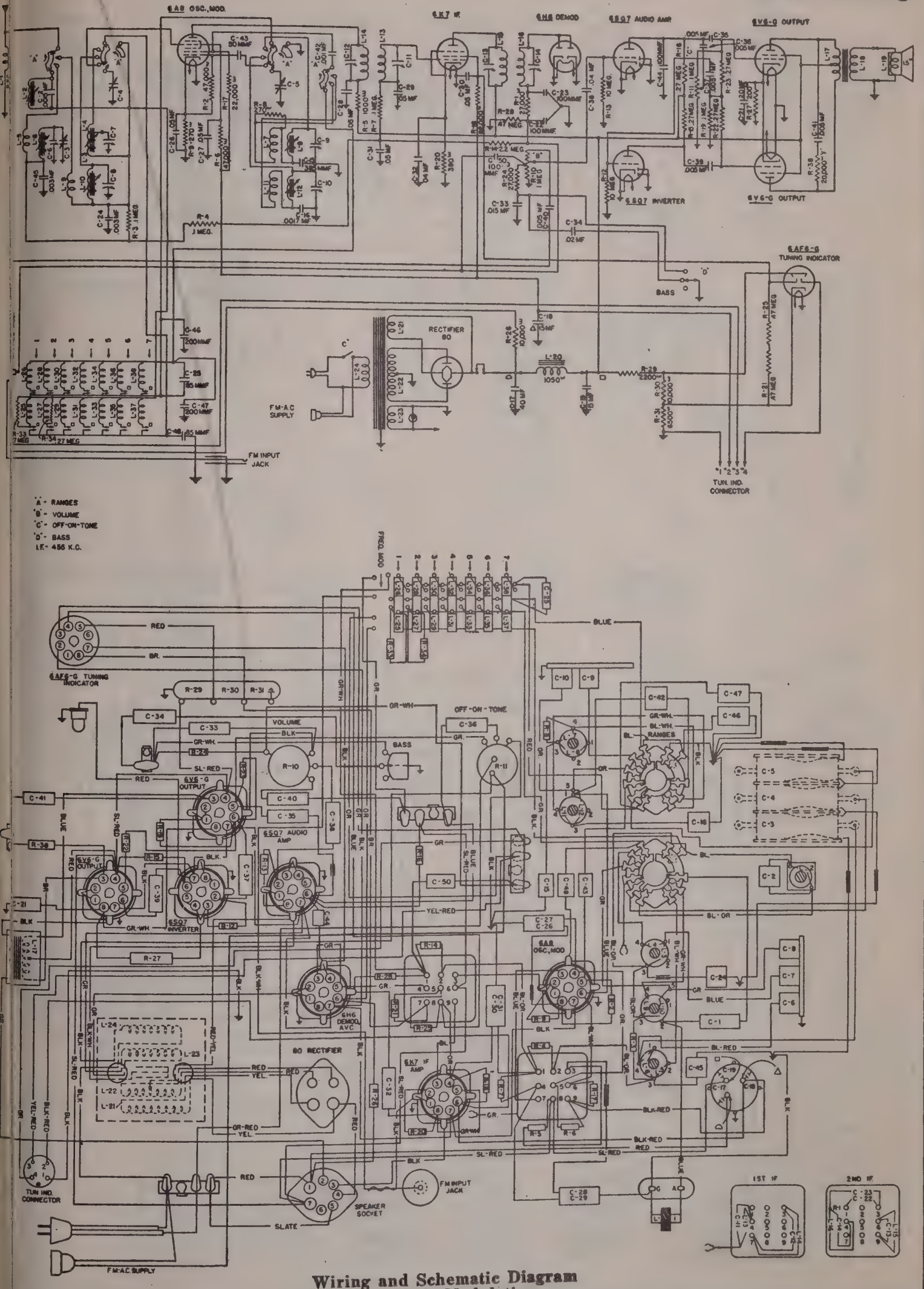
(Leave the signal generator connected to the grid of the 6SA7 tube in the same manner as when adjusting the first I. F. transformer.)

1. Set the signal generator frequency and the receiver tuning dial to 43 megacycles.
2. Adjust the oscillator aligning capacitor located on top of the gang capacitor unit for maximum reading of the microammeter.
3. Remove the output lead and the 0.1 microfarad capacitor in series with it from the grid of the 6SA7 tube and resolder in its original position the black wire which was removed from this terminal.
4. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm carbon type resistor and connect it to the antenna terminal of the receiver.
5. Adjust the antenna aligning capacitor located on top of the gang capacitor unit for maximum reading of the microammeter and, at the same time, rotate the gang tuning capacitor back and forth through resonance to obtain maximum reading on the microammeter.

   IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.
6. Re-solder the jumper wire to the low side of the limiter grid resistor (R-10).

STROMBERG-CARLSON TEL. MFG. CO.

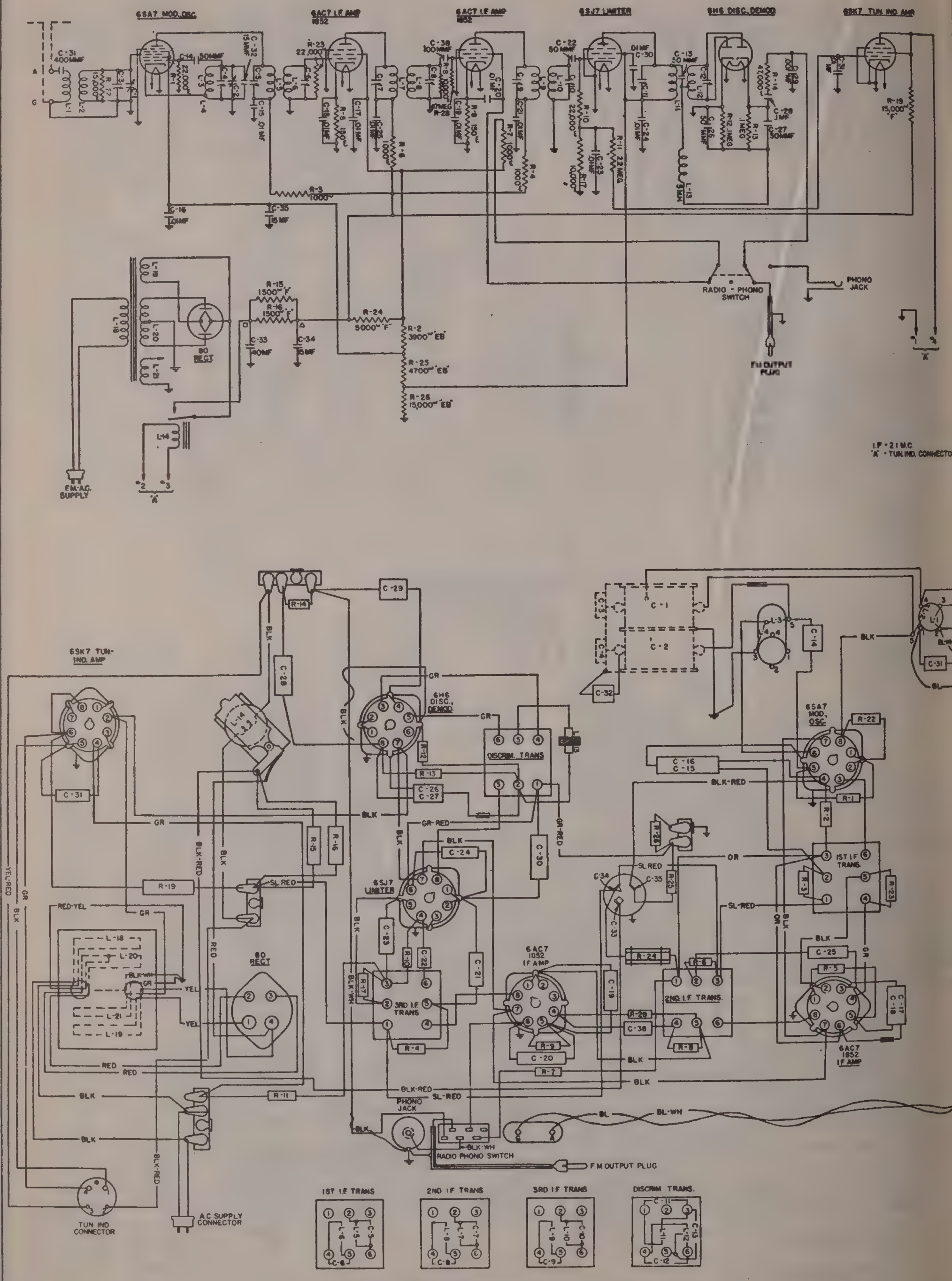
MODEL 435M
Schematic(A.M.)
Chassis Wiring



Wiring and Schematic Diagram
Amplitude Modulation

MODEL 435M
Schematic(F.M.)
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Wiring and Schematic Diagram
Frequency Modulation

STROMBERG-CARLSON TEL. MFG. CO.

MODEL 435M
Socket, Trimmers
A.M. and F.M.
Notes

Model	Input Power Frequency	Chassis	Cabinet	Speaker
435-M	50-60 Cycles	31481 Amp. Mod. 31482 Freq. Mod.	31840	30359

SPECIFICATIONS

Tuning Ranges — Frequency Modulation 40 to 44 Mc. (40,000 to 44,000 Kc.)
Short Wave 5.8 to 18 Mc. (5,800 to 18,000 Kc.)
Standard Broadcast .54 to 1.7 Mc. (540 to 1,700 Kc.)
Voltage Rating — 105 to 125 Volts
Type of Circuit — Superheterodyne with Electric Tuning
Input Power Rating — 140 Watts
Intermediate Frequency — 455 Kilocycles (Amplitude Modulation)
2.1 Megacycles (Frequency Modulation)
Speaker Voice Coil Impedance at 400 Cycles — Approximately 1.5 Ohms
Speaker Field Coil Resistance — Approximately 1050 Ohms

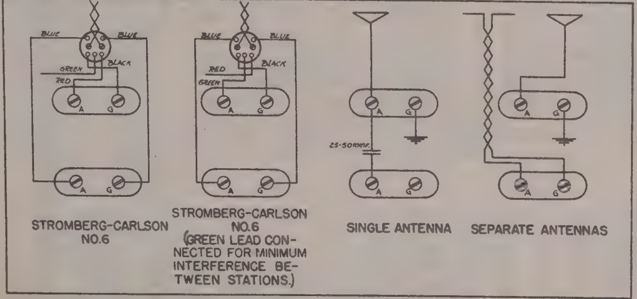
ACCESSORIES

ANTENNA. For best results use a Stromberg-Carlson No. 6 Antenna. This antenna is designed to provide improved pick-up on both the amplitude and frequency modulation bands.

If it is desired, two ordinary antennas may be used, one for amplitude modulation, which should be a straight wire "L" type antenna about 75 feet long, and one for frequency modulation. This latter antenna may be a straight wire about 40 feet in length or of the dipole type with two arms approximately 5⅓ feet in length. The dipole antenna will exhibit a marked directional effect and should be erected as high as possible above the ground and adjusted so as to receive the desired frequency modulated stations with best results.

For average reception, a single straight wire antenna may be used for both amplitude and frequency modulation.

The various types of antennas should be connected to the No. 435 Receiver as follows:



PLAYING RECORDS. To obtain the best quality of phonograph reproduction, a Stromberg-Carlson record player is recommended. They are designed for use with this receiver and all that is necessary is to connect the record player to the single prong socket provided in the chassis, operate the "Radio-Phono" switch located on the back of the chassis to "Phono" position, push in the frequency modulation button on the front of the receiver and proceed to operate. The volume and tone may be controlled with the controls at the receiver or (if such is provided), the volume control on the record player may be used.

A low impedance pick-up may be used, but a matching transformer must be placed between the phonograph pick-up and the chassis.

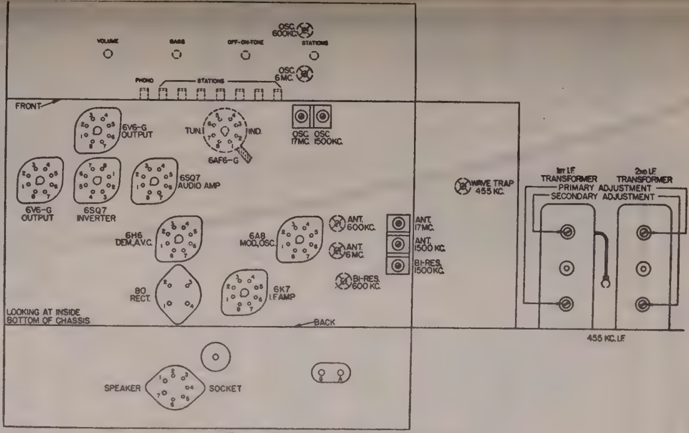
HEADSET ATTACHMENT. Headphones can be very simply attached to this receiver. Ask for Pc. No. 28303 Headset Package Assembly, which comes complete with headphones and installation instructions.

CARE OF CABINET. The finish of Stromberg-Carlson Cabinets should be protected by using Stromberg-Carlson Cabinet Polish regularly. It is available in pint cans, designated as Pc. No. 28601.

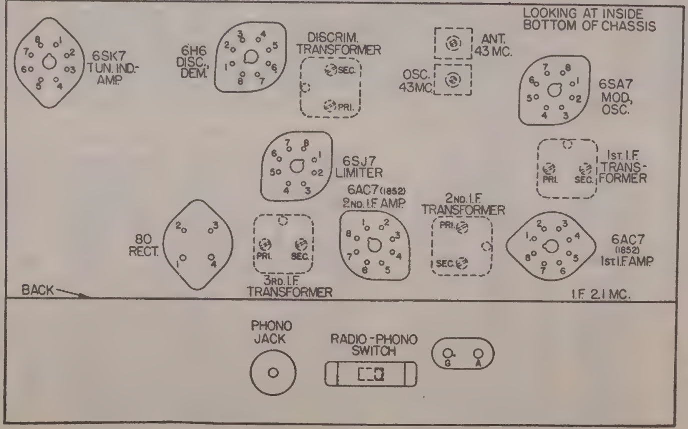
Nicks and scratches of most kinds can be repaired quickly and easily by proper use of the Pc. No. 26962 Touch-Up Kit. Complete instructions are provided with each kit.

TOOLS. Stromberg-Carlson can supply all the tools required for working on these sets. For example:

SD-29 Phillips Head Screwdriver
No. 24608 Aligning Tool
Also pliers, cutters, screwdrivers, etc.



Location Chart (Amplitude Modulation)



Location Chart—(Frequency Modulation)

STROMBERG-CARLSON TEL. MFG. CO.

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. A good signal generator with variable output voltage. (All adjustments of the frequency modulation range are made using an unmodulated signal.)
2. A good center "O" microammeter with 100 divisions on each side of "O".

Always have receiver volume control full on.

See location chart on Page 5 for location of aligning adjustment screws.

Important. Before proceeding to align the frequency modulation chassis of this receiver tune the receiver to 43 megacycles and mark this point with a pencil on the large pulley of the frequency modulation chassis. Carefully remove the drive cord from this pulley noting the relation of the point marked with the setting of the variable capacitor.

I. **Discriminator Adjustment.** (Frequency Modulation)

1. Tune the set to the extreme high frequency plates of variable capacitor all the way in.
2. Connect the center "O" microammeter with a one megohm resistor in series across one half of the discriminator load (from ground to the junction of the two 100,000 ohm resistors R-12 and R-13).
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce an unmodulated signal of 2100 kilocycles to the grid (terminal No. 4) of the 6SJ7 limiter tube using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Approximately one volt signal is necessary.)
5. Adjust the primary of the discriminator transformer for maximum reading of the microammeter.
6. Remove the microammeter and the one megohm resistor from the junction of R-12 and R-13 resistors and connect them across the whole discriminator load (from the high side of the R-13 to ground).
7. Adjust the secondary of the discriminator transformer for "O" reading of the microammeter.

II. **Intermediate Frequency Adjustments.** (Frequency Modulation)

Important: All intermediate frequency adjustments are made using the same unmodulated signal of 2100 kilocycles. Each I. F. stage must be adjusted independently and in the order given. **Do not make any overall adjustments after the previous stage is aligned.**

1. Disconnect the jumper wire from the low side of the limiter grid resistor (R-10) and connect the microammeter directly to this wire without using the one megohm resistor.
2. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 second I. F. tube (Terminal No. 4).
3. Adjust the secondary of the third I. F. transformer for maximum reading of the microammeter.
4. Adjust the primary of the third I. F. transformer for maximum reading of the microammeter.
5. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 first I. F. tube (Terminal No. 4).
6. Adjust the secondary of the second I. F. transformer for maximum reading of the microammeter.
7. Adjust the primary of the second I. F. transformer for maximum reading of the microammeter.
8. Disconnect the black wire to the antenna coil from the grid terminal of the 6SA7 modulator tube (terminal No. 8) and connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to this terminal.
9. Adjust the secondary of the first I. F. transformer for maximum reading of the microammeter.
10. Adjust the primary of the first I. F. transformer for maximum reading of the microammeter.

III. **Radio Frequency Adjustments.** (Frequency Modulation)

(Leave the signal generator connected to the grid of the 6SA7 tube in the same manner as when adjusting the first I. F. transformer.)

1. Set the signal generator frequency and the receiver tuning dial to 43 megacycles.
2. Adjust the oscillator aligning capacitor located on top of the gang capacitor unit for maximum reading of the microammeter.
3. Remove the output lead and the 0.1 microfarad capacitor in series with it from the grid of the 6SA7 tube and resolder in its original position the black wire which was removed from this terminal.
4. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm carbon type resistor and connect it to the antenna terminal of the receiver.
5. Adjust the antenna aligning capacitor located on top of the gang capacitor unit for maximum reading of the microammeter and, at the same time, rotate the gang tuning capacitor back and forth through resonance to obtain maximum reading on the microammeter.

IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.

6. Re-solder the jumper wire to the low side of the limiter grid resistor (R-10).

IV. **Intermediate Frequency Adjustments.** (Amplitude Modulation)

1. Set the range switch to Standard Broadcast position.
2. Tune set to extreme low frequency end of the dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 Kilocycles to the grid cap of the 6A8 Tube, using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Do not remove the grid clip from this tube.)
5. Adjust the I. F. Aligners for maximum output in the following order:
   A. Secondary of second I. F. transformer.
   B. Primary of second I. F. transformer.
   C. Secondary of first I. F. transformer.
   D. Primary of first I. F. transformer.

V. **Radio Frequency Adjustments.** (Amplitude Modulation)

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm carbon type resistor, and connect it to the antenna terminal of the chassis.
2. Set the range switch to the short-wave range (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycles oscillator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm carbon type resistor in series with the output lead from the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the Standard Broadcast Range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 Kc.
4. Adjust the 600 Kc. oscillator, Bi-Resonator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 Kc.
6. Adjust the 1500 Kc. oscillator, Bi-Resonator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

VI. **Wave Trap Adjustment.**

(Leave the receiver connected in the same manner as when adjusting the Standard Broadcast Range (A Band)).

1. Tune set to 1000 Kc.
2. Set the signal generator frequency to 455 Kc. and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

FEATURES

SPECIAL CIRCUITS. A tuning indicator having two apertures is used in this receiver. One aperture will operate when tuning stations in the standard broadcast and short-wave ranges and the other aperture will operate when tuning stations in the frequency modulation range. Stations should be tuned for maximum closing of the tuning indicator.

Iron core coils are used in the standard broadcast and short-wave ranges to provide greater accuracy of alignment. In addition a thernal drift compensator is included in the circuit. The audio system employs a special inverter push-pull circuit designed to provide excellent fidelity. The power transformer has an electro-static shield to reduce line noises to a minimum and the chassis is thoroughly shielded throughout.

AUTOMATIC TUNING. An adjustable iron core coil type of automatic tuning is employed and the stations may be easily located by properly utilizing the concentric adjusting screws provided. A special tool identified as SD-70 Screwdriver will help materially in setting up the automatic tuning.

MANUAL TUNING. Important. When tuning stations manually in the Standard Broadcast or Short Wave ranges be sure that the push button designated "Freq. Mod." is not pushed in.

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis into which a record player may be plugged and a switch is provided next to it for switching from "Radio" to "Phonograph".

TELEVISION. Switching to phonograph also makes the audio amplifier and loud speaker available for use with television receivers designed for this type of sound reproduction.

REMOVING THE CHASSIS FROM CABINET

Do not remove the chassis from the shelves; instead, remove the chassis and shelf assembly by taking out the six wood screws from the top shelf and the four wood screws from the bottom shelf, thus removing chassis and shelves as a unit.

ADJUSTING DIAL LAMP

The dial on this receiver is edge lighted, and for proper illumination it is very **important** that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

1. Remove the dial escutcheon by removing the screws and pulling downward and outward.
2. Put the call letters of the selected stations in place above the push buttons. **The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial.** (The call letters will be found inside the envelope stapled inside or underneath the cabinet.)
3. Tune in manually the highest frequency station to be set up and note carefully the program being transmitted.
4. Turn the range switch to the push button position and push the highest frequency button.
5. Using a very small screwdriver adjust the slot in the inner screw until it coincides with the slot in the outer screw.
6. Using a larger screwdriver, adjust both screws at the same time until the desired station is tuned in as well as possible.
7. Using the small screwdriver again, adjust the small inner screw for maximum closing of the tuning indicator. (Be sure the outer screw does not move while adjusting the inner screw.) **Operations 5, 6 and 7 can be greatly simplified by using Stromberg-Carlson SD-70 Adjusting Tool which is a double screwdriver designed to fit both of these screws at the same time.**
8. Set up the other stations in the same manner.
9. Recheck the adjustment of each adjusting screw.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc. or 43 Mc.—no signal.

Use a line voltage of 120 volts, or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart on Page 5 for position of terminals.

A. C. voltages are indicated by italics.

To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

AMPLITUDE MODULATION CHASSIS

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
6A8	Mod. and Osc.	0	0	0	+250	+110	—8*	+173	*6.3*	+3*
6K7	I. F. Amp.	0	0	0	+253	+108	+4*	—	*6.3*	+4*
6H6	Dem. and A. V. C.	—	0	0	0	0	0	0	*6.3*	0
6SQ7	Audio Amp.	—	0	0	0	0	0	+108	*6.3*	0
6SQ7	Audio Inv.	—	0	0	0	0	0	+108	*6.3*	0
6V6G	Output	—	0	0	+250	+254	0	—	*6.3*	+14
6V6G	Output	—	0	0	+250	+254	0	—	*6.3*	+14
6AF6G	Tuning Indicator	—	—	0	+52	+110	+220	—	*6.3*	+90
80	Rectifier	—	+382	*375*	*375*	+382	—	—	—	—
—	Speaker Socket	—	—	+382	0	0	+382	+382	—	—
			FREQUENCY MODULATION CHASSIS							
6SA7	Mod. and Osc.	—	0	0	+240	+90	0	0	*6.3*	0
6AC7	1st I. F. Amp.	—	0	0	0	0	+2*	+148	*6.3*	+230
6AC7	2nd I. F. Amp.	—	0	0	0	0	+2*	+145	*6.3*	+230
6SJ7	Limiter	—	0	0	0	0	0	+50	*6.3*	+57
6H6	Demod. (Discr.)	—	0	0	0	0	—10*	0	*6.3*	0
6SK7	Tun. Ind. Amp.	—	0	0	0	0	0	+275	*6.3*	+275
80	Rectifier	—	+300	*310*	*310*	+300	—	—	—	—

***Read on lowest possible scale of voltmeter**
5 volts AC between terminals 1 and 4 of rectifier sockets (No. 80 tube)

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests of the amplitude modulation chassis.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart for position and numbering of terminals.

AMPLITUDE MODULATION CHASSIS

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
6A8	Mod. and Osc.	3M	S	S	20000¶	200000¶	48000¶	200000¶	S	270¶
6K7	I. F. Amp.	3M	S	S	19000¶	200000¶	390¶	200000¶	S	390¶
6H6	Dem.—A. V. C.	—	S	S	500000¶	S	500000¶	20000¶	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	300000¶	S	S
6SQ7	Audio Inv.	—	S	10M	S	S	S	300000¶	S	S
6V6G	Output (A)	—	S	S	16000¶	16000¶	270000¶	100000¶	S	200¶
6V6G	Output	—	S	S	16000¶	16000¶	400000¶	O	S	200¶
6AF6G	Tun. Ind.	—	O	S	O	200000¶	16000¶	O	S	6500¶
80	Rectifier	—	19000¶	100¶	120¶	19000¶	—	—	—	—
—	Speaker Socket	—	100000¶ or Greater	S	S	O	100000¶ or Greater	O	16000¶	—
			FREQUENCY MODULATION CHASSIS							
6SA7	Osc. and Mod.	—	S	S	30000¶	20000¶	20000¶	S	S	S
6AC7	1st. I. F. Amp.	—	S	S	S	3¶	150¶	24000¶	S	30000¶
6AC7	2nd I. F. Amp.	—	S	S	S	500000¶	150¶	B	S	30000¶
6SJ7	Limiter	—	S	S	S	32000¶	S	15000¶	S	15000¶
6H6	Demod. (Discr.)	—	S	S	100000¶	S	100000¶	O	S	200000¶
6SK7	Tun. Ind. Amp.	—	S	S	S	2.2M	S	40000¶	S	40000¶
80	Rectifier	—	29000¶	250¶	250¶	29000¶	—	—	—	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open

A. 6V6G tube socket nearest to the front of the chassis

B. Radio-Phono switch in "Radio" position ---------- 24,000 ohms
Radio-Phono switch in "Phono" position ---------- "open"

**Other Tests Not Shown on Chart
(Amplitude Modulation Chassis)**

Antenna terminal to chassis base----	75 ohms
Ground terminal to chassis base-----	"short"
Audio connector socket to chassis base ----------	"open"
Between terminals of A. C. plug:	
A. C. switch open----------	"open"
A. C. switch closed----------	5 ohms
Terminals of A. C. plug to chassis base ----------	"open"

R. F. coil tests measured directly across R. F. coil terminals with range switch in standard broadcast position. ("A" Range)

L3—.8 ohm; L4—.8 ohm; L5—.1 ohm; L6—3 ohms; L7—.3 ohm; L8—4 ohms; L9—.1 ohm; L10—"short"; L11—.1 ohm; L12—"short".

**Other Tests Not Shown on Chart
(Frequency Modulation Chassis)**

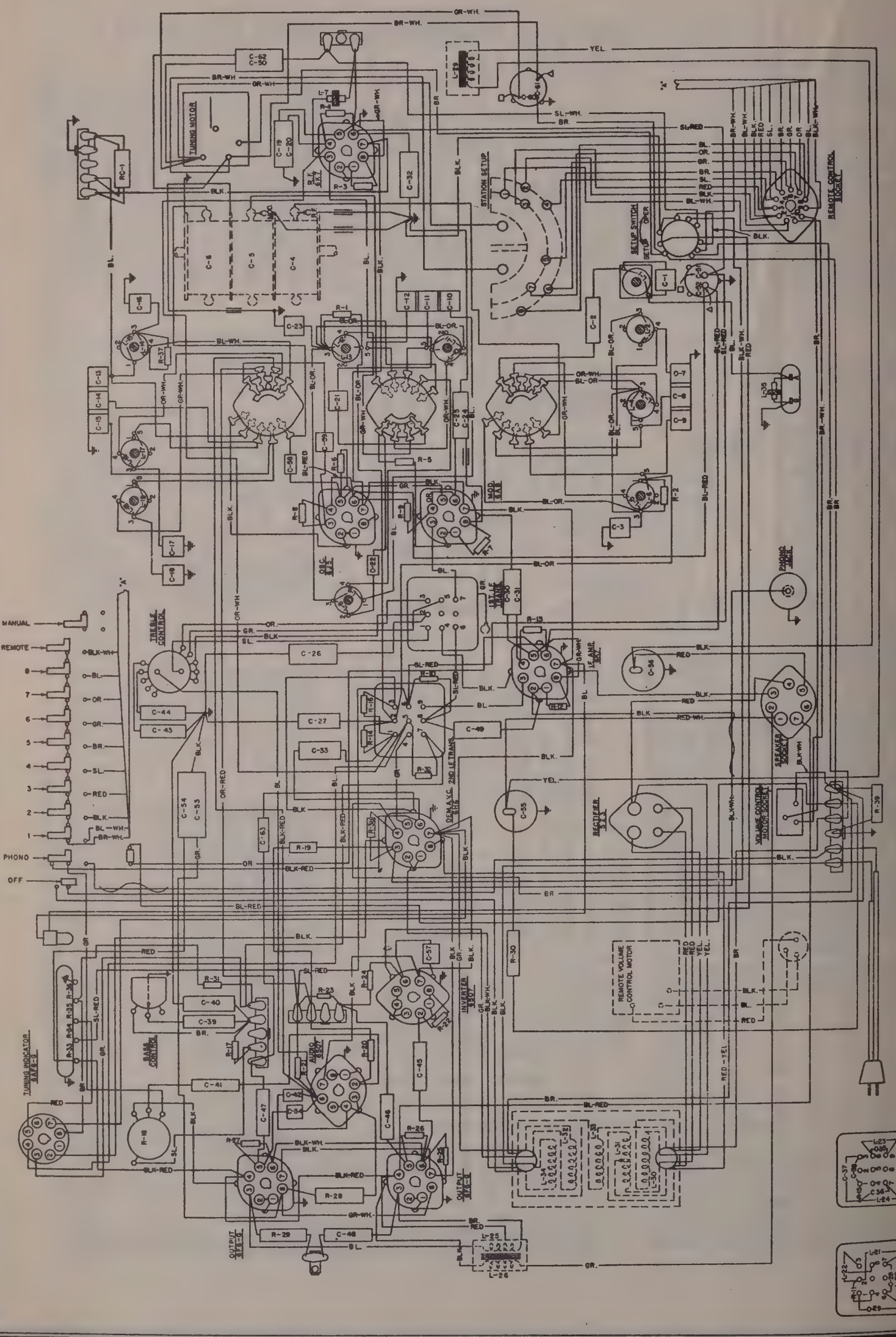
Antenna terminal to chassis base----	"open"
Ground terminal to chassis base-----	"short"
Phono jack to chassis base----------	"open"
Terminals of A. C. plug to chassis base	"open"
Between terminals of A. C. plug-----	9 ohms
Relay socket to chassis base:	
Terminal No. 1----------	40,000 ohms
Terminal Nos. 2 and 3----------	"open"
Terminal No. 4----------	"short"
Audio connector plug to chassis base:	
Prong of plug----------	"open"
Shield of plug----------	"short"
Between prong of audio connector plug and contact of phono jack:	
Radio-Phono switch in "Phono" position ----------	"short"
Radio-Phono switch in "Radio" position ----------	"open"

R. F. coil tests measured directly across R. F. coil terminals.

L1 — .2 ohm; L2 — "short"; L3 — "short"; L4—"short"; L13—55 ohms.

MODELS 450M,450MB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Model	Input Power Frequency	Chassis	Cabinet	Speaker
450-M	50-60 Cycles	30162	30164	27504

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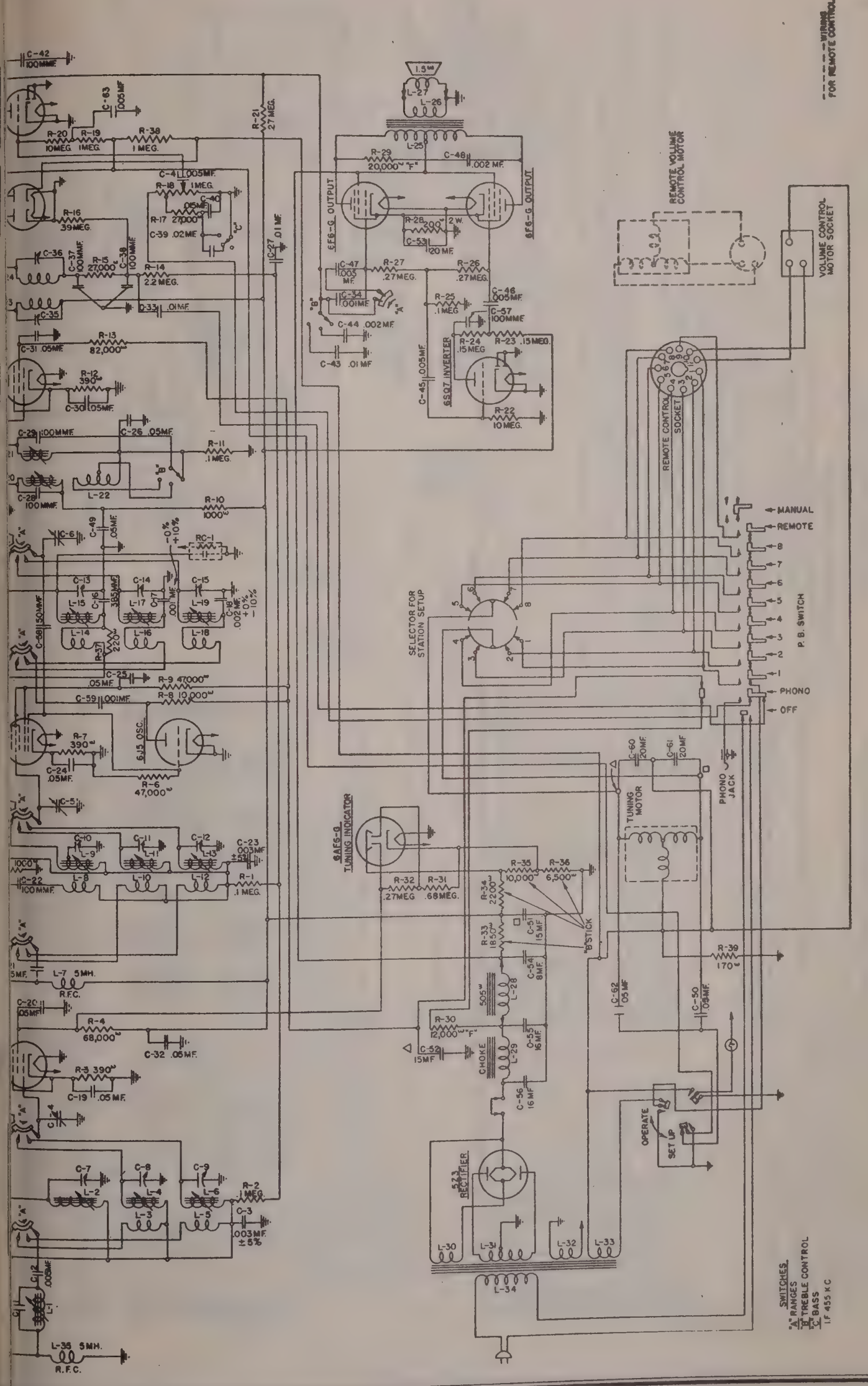
STROMBERG-CARLSON TEL. MFG. CO.

MODELS 450M,450MB
Schematic



Input Power Rating........................120 Watts
Intermediate Frequency.........................455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles.........Approximately 1.5 Ohms
Speaker Field Coil Resistance...........................505 Ohms

MODELS 450M,450MB
Voltage,Alignment
Socket,Trimmers
Resistance

STROMBERG-CARLSON TEL. MFG. CO.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc.—no signal.
Use a line voltage of 120 volts, or make allowance for the variation.
Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.
Take all D. C. readings on the 500 volt scale except when an asterisk appears.
Read from indicated terminals to chassis base.
A. C. voltages are indicated by italics.
To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

Tube	Circuit	Cap	*Terminals of Sockets* 1	2	3	4	5	6	7	8	*Heater Voltages Between Heater Terminals* *Socket Terminal Numbers*	*Volts A.C.*
6K7	R. F. Amp.	0	0	0	+250	+106	+3*	—	*6.5*	+3*	2-7	*6.5*
6A8	Modulator		0	0	+250	+96	−20*	+96	*6.5*	+2*	2-7	*6.5*
6J5	Oscillator	0	0	0	+156	—	−20*	—	*6.5*	0	2-7	*6.5*
6K7	I. F. Amp.	0	0	0	+250	+100	+3*	—	*6.5*	+3*	2-7	*6.5*
6H6	Demodulator	—	0	0	0	0	0	—	*6.5*	0	2-7	*6.5*
6F5	Audio Inv.	0	0	0	—	+136	—	—	*6.5*	0	2-7	*6.5*
6F5	Audio Amp.	0	0	0	—	+159	—	—	*6.5*	0	2-7	*6.5*
6F6	Output	—	0	0	+316	+322	0	—	*6.5*	+21*	2-7	*6.5*
6F6	Output	—	0	0	+316	+322	0	—	*6.5*	+21*	2-7	*6.5*
6AF6G	Tun. Ind.	—	0	0	+100	+106	+225	—	*6.5*	+90	2-7	*6.5*
5Z3	Rectifier	—	+410	*400*	*400*	+410	—	—	—	—	1-4	*5*
Speaker Socket		—	+400	0	+410	+410	+410	—	*310*	—		

***Read on lowest possible scale of voltmeter.**

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit.

When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from the indicated terminals to chassis base unless otherwise specified.

Tube	*Circuit*	*Cap*	*TERMINALS OF SOCKETS* 1	2	3	4	5	6	7	8
6K7	R. F. Amp.	2.7M	S	S	20,000¶	80,000¶	390¶	20,000¶	S	390¶
6A8	Modulator	2.7M	S	S	20,000¶	80,000¶	47,000¶	80,000¶	S	390¶
6J5	Osc.	—	S	S	42,000¶	32,000¶	47,000¶	32,000¶	S	S
6K7	I. F. Amp.	100,000¶	S	S	20,000¶	*	390¶	**	S	390¶
6H6	Demodulator	—	S	S	1M	190¶	470,000¶	1M	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	280,000¶	S	S
6SQ7	Audio Inv.	—	S	10M	S	S	S	320,000¶	S	S
6F6G	Output	—	S	S	20,000¶	20,000¶	390,000¶	100,000¶	S	190¶
6F6G	Output	—	S	S	20,000¶	20,000¶	390,000¶	100,000¶	S	190¶
5Z3	Rectifier	—	22,000¶	500¶	500¶	22,000¶	—	—	—	—
6AF6G	Tun. Ind.	—	O	S	250,000¶	80,000¶	17,000¶	O	S	7,000¶
Speaker Socket	—	—	.5M or Greater	S	S	O	.5M or Greater	O	17,000¶	—

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.

* Push "Phono" button in—"open".
Push "Manual" button in—100,000 ohms.

** Push "Phono" button in—"open".
Push "Manual" button in—32,000 ohms.

Other tests not shown on chart

Test from phono jack on back of chassis base;
Push "Phono" button in—1 megohm.
Push "Manual" button in—"open".

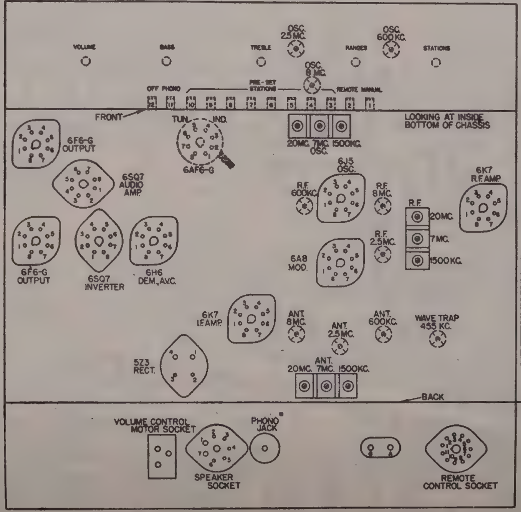
Antenna terminal to chassis base—70 ohms.

Ground terminal to chassis base—"short".

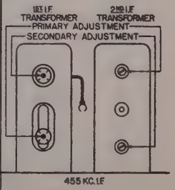
Test between terminals of A. C. plug;
Push "Off" button in—"open".
Push "Manual" button in—3 ohms.
Terminals of A. C. plug to chassis base—"open".

R. F. coil tests measured directly across R. F. coil terminals with range switch set in standard position (A Band).

L1—1 ohm, L2—3 ohms, L3—.2 ohm, L4—.2 ohm, L5—.2 ohm, L6—"short", L7—70 ohms, L8—"short", L9—1 ohm, L10—.2 ohm, L11—.3 ohm, L12—.5 ohm, L13—.1 ohm, L14—.5 ohm, L15—4 ohms, L16—.2 ohm, L17—.3 ohm, L18—.2 ohm, L19—.2 ohm.

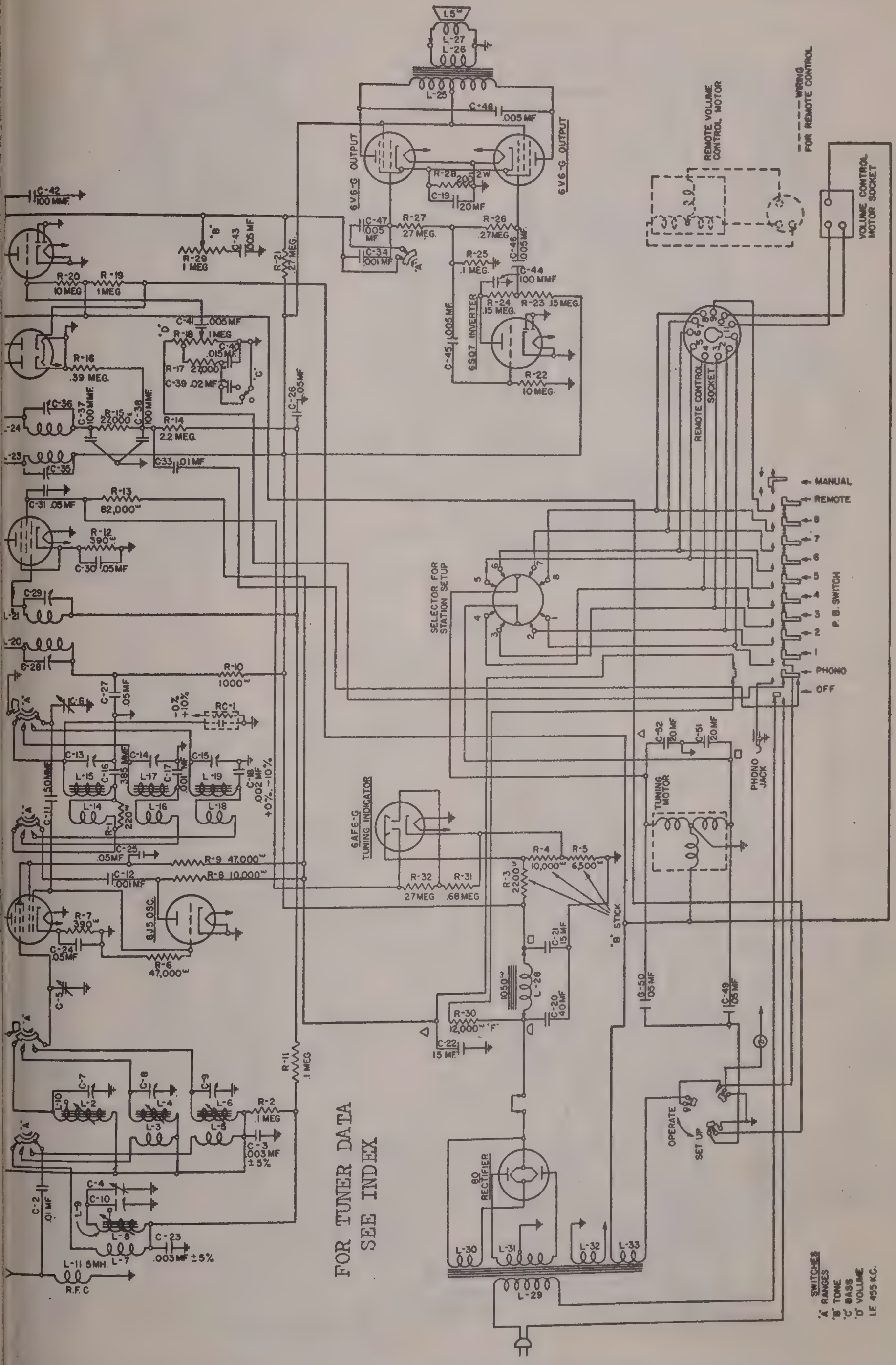


NOTE: Follow alignment procedure for Model 440, noting the addition of the R-F trimmers in the Model 450.
Adjust wave-trap trimmer for minimum output.



STROMBERG-CARLSON TEL. MFG. CO.

MODELS 440M,440MB
Schematic

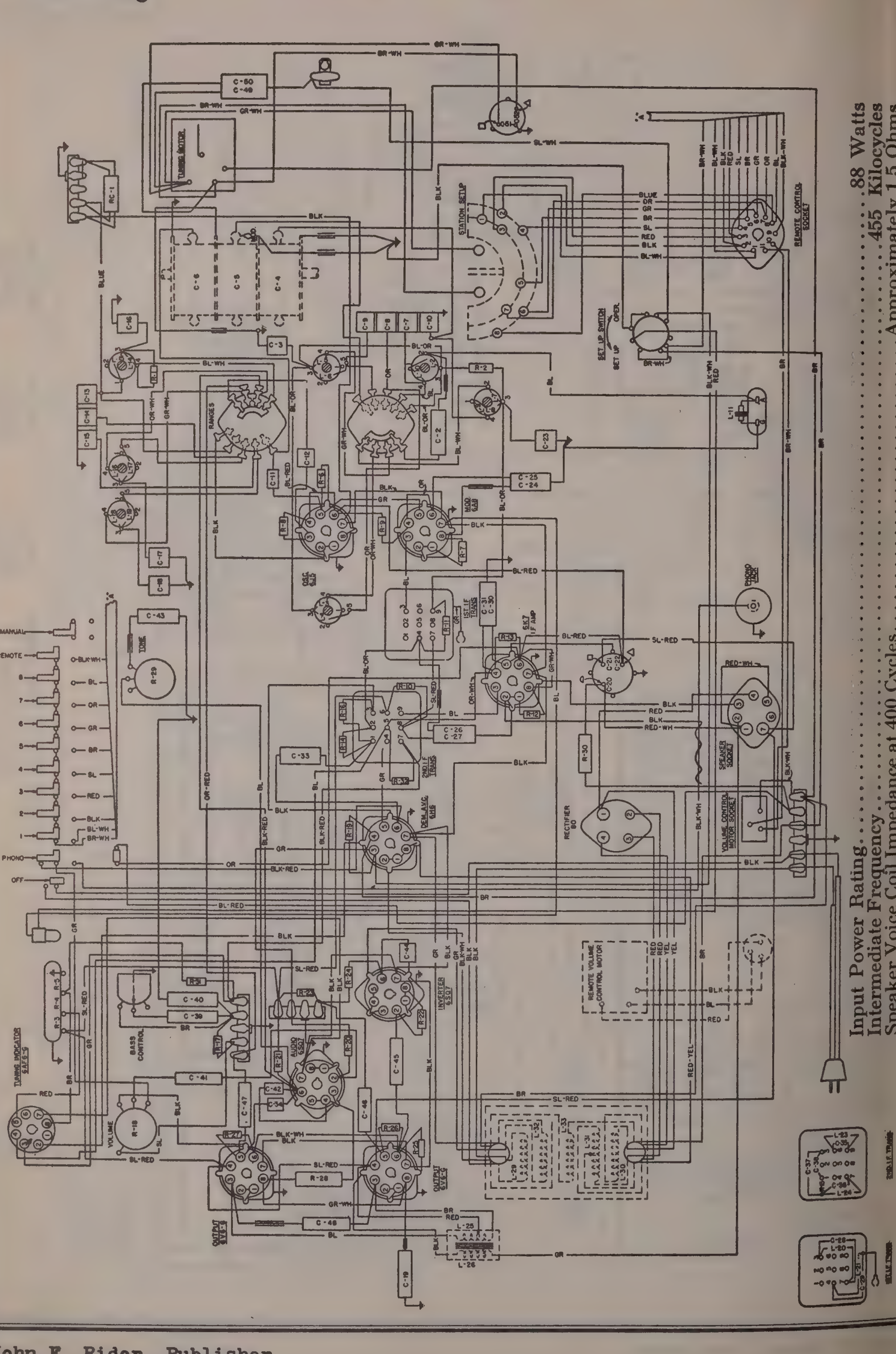


FOR TUNER DATA
SEE INDEX

Model	Input Power Frequency	Chassis	Cabinet	Speaker
440-M	50-60 Cycles	30319	30360	26170
440-MB	25-60 Cycles	30320	30360	26170

MODELS 440M, 440MB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Input Power Rating.........................88 Watts
Intermediate Frequency....................455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles..........Approximately 1.5 Ohms

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc.—no signal.

Use a line voltage of 120 volts, or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

A. C. voltages are indicated by italics.

To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

Tube	Circuit	Cap	Terminals of Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Heater Terminals: Socket Terminal Numbers	Volts A.C.
6A8	Modulator	0	0	0	+260	+95	—	+95	*6.5*	+2*	2–7	*6.5*
6J5	Oscillator	—	0	0	+160	—	—	+230	*6.5*	0	2–7	*6.5*
6K7	I. F. Amp.	0	0	0	+260	+95	+3*	+230	*6.5*	+3*	2–7	*6.5*
6H6	Dem.—A. V. C.	—	0	0	—	—	—	—	*6.5*	0	2–7	*6.5*
6SQ7	Audio Amp.	—	0	0	0	0	0	+100	*6.5*	0	7–8	*6.5*
6SQ7	Audio Inv.	—	0	0	0	0	0	+95	*6.5*	0	7–8	*6.5*
6V6	Output	—	0	0	+255	+260	—	—	*6.5*	+14*	2–7	*6.5*
6V6	Output	—	0	0	+255	+260	—	—	*6.5*	+14*	2–7	*6.5*
6AF6G	Tun. Ind.	—	—	0	+70	+100	+230	—	*6.3*	+100	2–7	*6.3*
80	Rectifier	—	+380	*385*	*385*	+380	—	—	—	—	1–4	*5*
—	Speaker											
	Socket	—	+390	0	0	+390	+390	—	+265	—	—	—

*Read on lowest possible scale of voltmeter.

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit.

When this is the case, be sure to reverse the test leads and read the highest resistance.

Tube	Circuit	Cap	TERMINALS OF SOCKETS 1	2	3	4	5	6	7	8
6A8	Modulator	2.7 M.	S	S	20,000¶	80,000¶	47,000¶	80,000¶	S	390¶
6J5	Oscillator	—	S	S	41,000¶	31,000¶	47,000¶	31,000¶	S	S
6K7	I. F. Amp.	2.5 M.	S	S	19,000¶	A	390¶	B	S	390¶
6H6	Dem.—A. V. C.	—	S	S	C	3¶	410,000¶	1 M.	S	S
6SQ7	Audio Amp.	—	S	10 M.	S	S	S	290,000¶	S	S
6SQ7	Audio Inv.	—	S	10 M.	S	S	S	320,000¶	S	S
6V6G	Output	—	S	S	17,000¶	17,000¶	370,000¶	100,000¶	S	200¶
6V6G	Output	—	S	S	17,000¶	17,000¶	370,000¶	100,000¶	S	200¶
6AF6G	Tun. Ind.	—	O	S	250,000¶	150,000¶	16,000¶	O	S	6,500¶
80	Rectifier	—	17,000¶	110¶	120¶	17,000¶	—	—	—	—
—	Speaker Socket	—	8,000¶	S	S	O	8,000¶	O	20,000¶	—

Symbols used are as follows: ¶—ohms; M—megohms; S—short; O—open.

A. Push "Phono" button in—380,000 ohms.
Push "Manual" button in—100,000 ohms.

B. Push "Phono" button in—380,000 ohms.
Push "Manual" button in—32,000 ohms.

C. Set up switch to "Set-Up" position—Short.
Set up switch to "Operate" position—110,000 ohms.

Other tests not shown on chart

Test from phono jack on back of chassis base;
Push "Phono" button in—1 megohm.
Push "Manual" button in—"open".

Antenna terminal to chassis base—70 ohms.

Ground terminal to chassis base—"short".

Test between terminals of A. C. plug;
Push "Off" button in—"open".
Push "Manual" button in—3 ohms.
Terminals of A. C. plug to chassis base—"open".

R. F. coil tests measured directly across R. F. coil terminals with range switch set in standard position (A Band).

L1—1 ohm, L2—1.5 ohms, L3—.2 ohm, L4—2 ohms, L5—.1 ohm, L6—"short", L7—.1 ohm, L8—2 ohms, L9—1.5 ohms, L10—.2 ohm, L14—.5 ohm, L15—4 ohms, L16—.2 ohm, L17—.3 ohm, L18—.2 ohm, L19—"short".

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

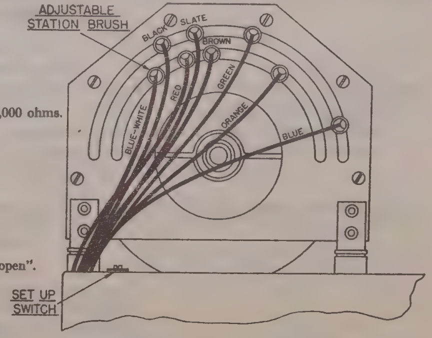
Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

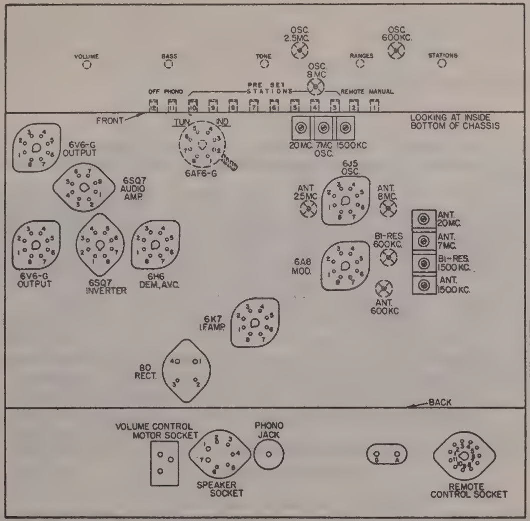
1. Put the call letters of the selected stations in place above the push buttons. **The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial.** (The call letters will be found inside the envelope stapled inside or underneath the cabinet).
2. Set the "Treble" control in normal position.
3. Turn the set-up switch (located on the base just back of the brush and commutator assembly) to the set-up position. (The slot in the screw should point toward "set-up").
4. Push the button of the highest frequency station to be set up (button No. 3) and then tune in that station manually. **Be sure the station is exactly "in tune" by tuning carefully and watching the cathode ray indicator.**
5. Slide the brush to which the blue wire is connected until it is over the slot in the commutator. Then adjust it very carefully until the pilot light goes out. This indicates exact adjustment.
6. Repeat operations 4 and 5 for each station. Work from right to left or from the higher to the lower frequencies in accordance with the table below:

Push Button No.	Purpose	Color of wire on brush	
1	Manual	—	
2	Remote	—	
3	Highest frequency station	Blue	See diagram
4	Next lower frequency station	Orange	
5	Next lower frequency station	Green	
6	Next lower frequency station	Brown	
7	Next lower frequency station	Slate	
8	Next lower frequency station	Red	
9	Next lower frequency station	Black	
10	Lowest frequency station	Blue White	
11	Phonograph		
12	Off		

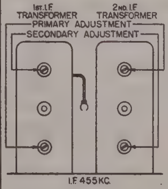
7. Turn the set-up switch back to the "Operate" position.
8. Check the operation of all the push buttons to be sure that each has been accurately set up. If it is necessary to readjust any of the buttons, follow the procedure given above.



Showing Adjustable Station Brushes and Set Up Switch.



Location Chart



ALIGNING INFORMATION

NEVER ALIGN UNLESS ABSOLUTELY NECESSARY.

Use a good modulated signal generator (test oscillator) with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments inaccurate.

Always have receiver volume control full on.

Never align with tone control in "Bass" position.

See location chart above for location of all the aligning adjustment screws.

Aligning Procedure (follow this order exactly)

I. Dial pointer adjustment.
   With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the vertical line located at the extreme low frequency end of the short-wave band.

II. Intermediate frequency adjustments.
   1. Push in the "Manual" push button.
   2. Set the range switch to Standard Broadcast position.
   3. Tune set to extreme low frequency end of the dial.
   4. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
   5. Introduce a modulated signal of 455 Kilocycles to the grid cap of the 6A8G Tube, using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Do not remove the grid clip from this tube.)
   6. Adjust the I. F. Aligners for maximum output in the following order:
      A. Secondary of second I. F. transformer.
      B. Primary of second I. F. transformer.
      C. Secondary of first I. F. transformer.
      D. Primary of first I. F. transformer.

III. Radio frequency adjustments.

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm carbon type resistor, and connect it to the antenna terminal of the chassis.
2. Set the range switch to the short-wave range position (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 8 megacycles.
4. Adjust the 8 megacycle oscillator and antenna iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 20 megacycles.
6. Adjust the 20 megacycle oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

Medium Wave Range (B Band)

1. Leave the receiver connected in the same manner as when adjusting the Short-Wave Range (C Band).
2. Set the range switch to the medium wave range position (B Band).
3. Set the signal generator frequency and the receiver tuning dial to 2.5 megacycles.
4. Adjust the 2.5 megacycle oscillator and antenna iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 7.0 megacycles.
6. Adjust the 7 megacycle oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operation three and four.
8. Repeat operation five and six.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm carbon type resistor in series with the output lead from the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the Standard Broadcast Range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 Kc.
4. Adjust the 600 Kc. oscillator, bi-resonator and antenna iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 Kc.
6. Adjust the 1500 Kc. oscillator, bi-resonator and antenna aligning capacitors for maximum signal.
7. Repeat operation three and four.
8. Repeat operation five and six.

ADJUSTING DIAL LAMP

The dial on this receiver is edge lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

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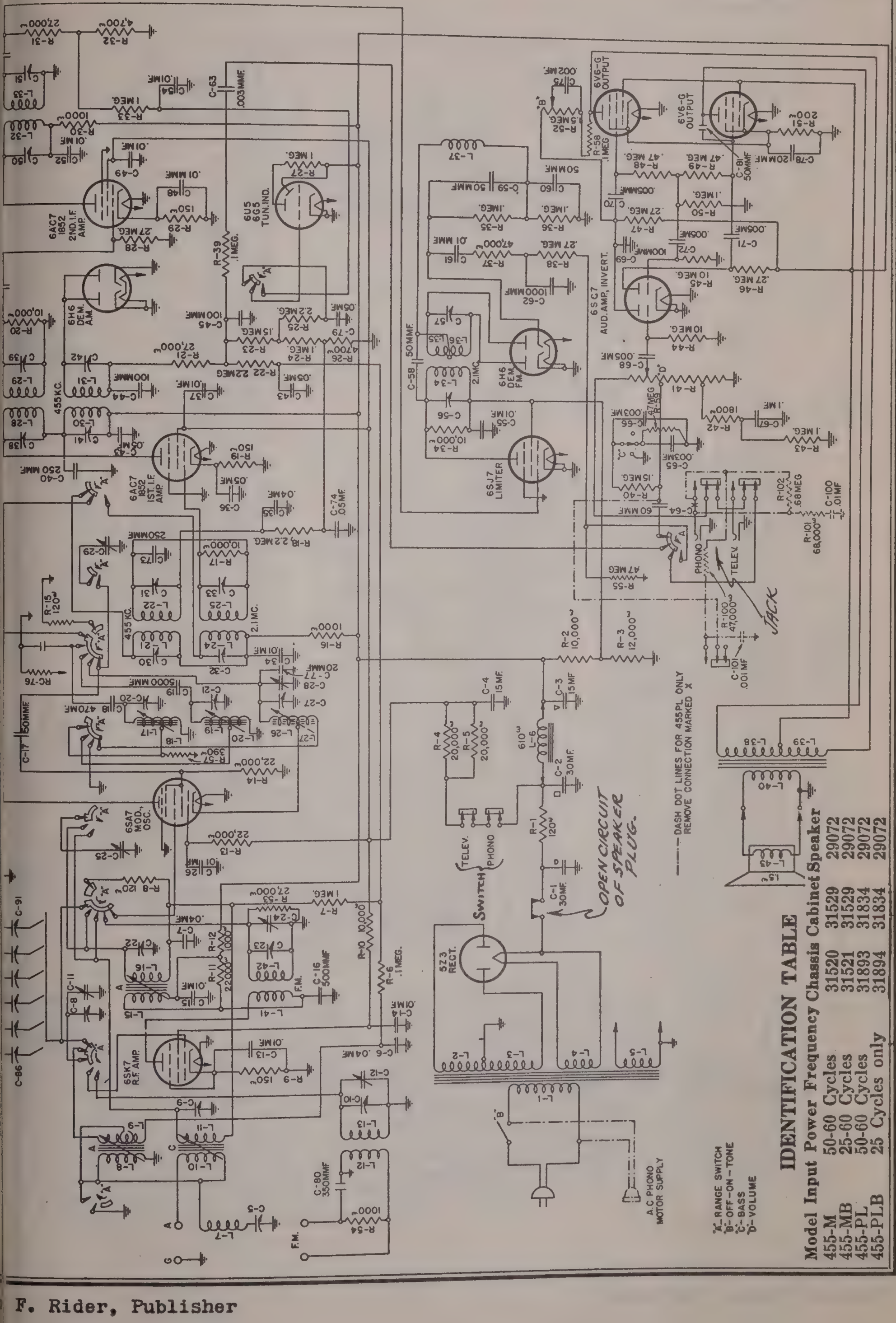
MODELS 455M,455MB
455PL,455PLB
Schematic



IDENTIFICATION TABLE

Model	Input Power Frequency	Chassis	Cabinet	Speaker
455-M	50-60 Cycles	31520	31529	29072
455-MB	25-60 Cycles	31521	31529	29072
455-PL	50-60 Cycles	31893	31834	29072
455-PLB	25 Cycles only	31894	31834	29072

MODELS 455M, 455MB
455PL, 455PLB
Chassis Wiring

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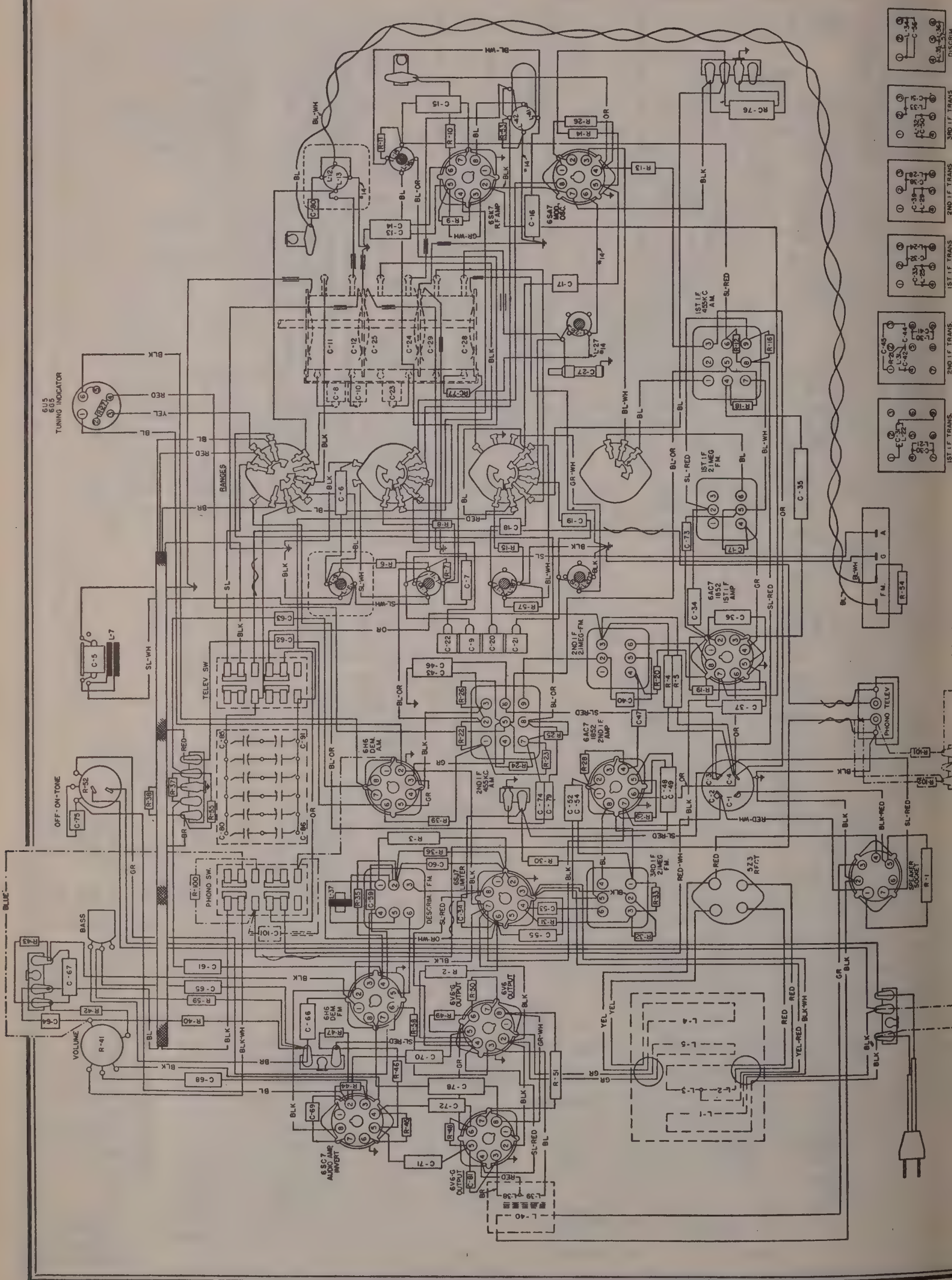


STROMBERG-CARLSON TEL. MFG. CO.

MODELS 455M, 455MB
455PL, 455PLB
Alignment, Trimmers
Socket, Notes

ALIGNING INFORMATION

NEVER ALIGN UNLESS ABSOLUTELY NECESSARY

All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary. If **alignment is attempted it will not be successful unless the instructions which follow are adhered to exactly.**

The following equipment will be required:

1. Standard signal generator and output meter.
2. Microammeter "0" to 200 microamps.
3. Center "0" Microammeter with 100 divisions on each side of "0". See location chart on page — for location of all aligners.

ALIGNING PROCEDURE (follow this order exactly).

I. **Discriminator adjustment** (Frequency Modulation)
   1. Tune the set to the extreme high frequency end of the dial (44.5 megacycles).
   2. Connect the center "0" microammeter with a one megohm resistor in series across one half of the discriminator load (from ground to the junction of the two 100,000 ohm resistors R-35 and R-36).
   3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
   4. Introduce an unmodulated signal of 2100 kilocycles to the grid (terminal No. 4) of the 6SJ7 limiter tube using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Approximately one volt signal is necessary.)
   5. Adjust the primary of the discriminator transformer for maximum reading of the microammeter.
   6. Remove the microammeter and the one megohm resistor from the junction of R-35 and R-36 resistors and connect them across the whole discriminator load (from the high side of the R-35 to ground).
   7. Adjust the secondary of the discriminator transformer for "0" reading of the microammeter.

II. **Intermediate frequency adjustments** (Frequency Modulation)

   Important: All intermediate frequency adjustments are made using the same unmodulated signal of 2100 kilocycles. Each I. F. stage must be adjusted independently and in the order given. **Do not make any overall adjustments after the previous stage is aligned.**

   1. Disconnect the ground side of the limiter grid resistor (R-32) and connect the "0" to 200 microammeter in series with it and ground.
   2. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 second I. F. tube (Terminal No. 4).
   3. Adjust the secondary of the third I. F. transformer for maximum reading of the microammeter.
   4. Adjust the primary of the third I. F. transformer for maximum reading of the microammeter.
   5. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 first I. F. tube (Terminal No. 4).
   6. Adjust the secondary of the second I. F. transformer for maximum reading of the microammeter.
   7. Adjust the primary of the second I. F. transformer for maximum reading of the microammeter.
   8. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6SA7 modulator tube (Terminal No. 8).
   9. Adjust the secondary of the first I. F. transformer for maximum reading of the microammeter.
   10. Adjust the primary of the first I. F. transformer for maximum reading of the microammeter.

III. **Radio frequency adjustments** (Frequency Modulation)
   1. Set the signal generator frequency and the receiver tuning dial to 40 megacycles.
   2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the F. M. antenna terminal farthest from the end of the antenna and ground terminal strip.
   3. Connect the ground lead to the other F. M. terminal on the antenna and ground terminal strip.
   4. Adjust the oscillator 40 megacycles core aligner for maximum signal.
   5. Set the signal generator frequency and the receiver tuning dial to 43 megacycles.
   6. Adjust the oscillator shunt aligner for maximum signal.
   7. Adjust the R. F. and antenna aligners for maximum signal on the "0" to 200 microammeter **maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.**
   8. Remove both meters from the circuits and resolder the 4700 ohm resistor R-32 in its original position to terminal No. 2 on the third I. F. transformer.

IV. **Intermediate frequency adjustments** (Amplitude Modulation)

   Adjustment of second I. F. transformer.
   1. Set the range switch to standard broadcast position.
   2. Turn the volume control "full on".
   3. Replace the 100 ohm resistor in series with the output lead from the signal generator with a 0.1 microfarad capacitor and connect it to the grid of the 6AC7 first I. F. tube (Terminal No. 4).
   4. Connect the ground terminal of the signal generator to the ground terminal of the receiver.
   5. Introduce a modulated signal of 455 kilocycles to the grid of the 6AC7 first I. F. tube.
   6. Adjust the second I. F: transformer aligners for maximum signal in the following order:
      a. Secondary of second I. F. transformer.
      b. Primary of second I. F. transformer.

   Adjustment of first I. F. transformer.
   1. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 Modulator Tube (Terminal No. 8).
   2. Adjust the first I. F. transformer aligners for maximum signal in the following order:
      a. Secondary of first I. F. transformer.
      b. Primary of first I. F. transformer.

V. **Radio Frequency adjustments** (Amplitude Modulation)

   Short Wave Range (C Band)
   1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm resistor and connect it to the Amplitude Modulation antenna terminal on the back of the chassis.
   2. Set the range switch to the short-wave range position (C Band).
   3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
   4. Adjust the 6 megacycle "oscillator" and "antenna" iron cores for maximum signal.
   5. Set the signal generator and the receiver tuning dial to 17 megacycles.
   6. Adjust the 17 megacycles "oscillator" and "antenna" aligning capacitors for maximum signal.
   7. Repeat operations 3 and 4.
   8. Repeat operations 5 and 6.

   Standard Broadcast Range (A Band)
   1. Replace the 400 ohm resistor in series with the output lead of the signal generator with a 200 micro-microfarad capacitor.
   2. Set the range switch to the standard broadcast range (A Band).
   3. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
   4. Adjust the 600 kilocycle "oscillator", "R. F." and "Antenna" iron cores for maximum signal.
   5. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
   6. Adjust the 1500 kilocycle "oscillator", "R. F." and "Antenna" aligning capacitors for maximum signal.
   7. Repeat operations 3 and 4.
   8. Repeat operations 5 and 6.

VI. **Wave trap adjustment.** (Leave the receiver connected in the same manner as when adjusting the standard broadcast range) (A Band).
   1. Set the receiver's tuning dial to 1000 kilocycles.
   2. Set the signal generator frequency to 455 kilocycles and introduce a fairly strong modulated signal to the receiver.
   3. Adjust the wave trap aligner for minimum signal.

   IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.

ACCESSORIES

ANTENNA. For best results use a Stromberg-Carlson No. 6 Antenna. This antenna is designed to provide improved pick-up on both the amplitude and frequency modulation bands.

If it is desired, two ordinary antennas may be used, one for amplitude modulation, which should be a straight wire "L" type antenna about 75 feet long, and one for frequency modulation. This latter antenna may be a straight wire about 40 feet in length or of the dipole type with two arms approximately

PLAYING RECORDS. To obtain the best quality of phonograph reproduction a Stromberg-Carlson record player is recommended. They are designed for use with this receiver, and all that is necessary is to connect the record player to the single prong socket provided in the chassis and proceed to operate. The volume and tone may be controlled with the controls at the receiver, or (if such is provided) the volume control on the record player may be used.

A low impedance pick-up may also be used, but a matching transformer must be placed between the phonograph pick-up and the chassis.

HEADSET ATTACHMENT. Headphones can be very simply attached to this receiver. Ask for Pc. No. 5½ feet in length. The dipole antenna will exhibit a marked directional effect and should be erected as high as possible above the ground and adjusted so as to receive the desired frequency modulated stations with best results.

For average reception, a single straight wire antenna may be used for both amplitude and frequency modulation.

The various types of antennas should be connected to the No. 455 Receiver as follows:

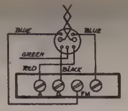
28303 Headset Package Assembly, which comes complete with headphones and installation instructions.

CARE OF CABINET. The finish of Stromberg-Carlson Cabinets should be protected by using Stromberg-Carlson Cabinet Polish regularly. It is available in pint cans, designated as Pc. No. 28601.

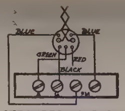
Nicks and scratches of most kinds can be repaired quickly and easily by proper use of the Pc. No. 26962 Touch-Up Kit. Complete instructions are provided with each kit.

TOOLS. Stromberg-Carlson can supply all the tools required for working on these sets. For example:

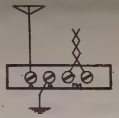
SD-29 Phillips Head Screwdriver
No. 24608 Aligning Tool
Also pliers, cutters, screwdrivers, etc.



STROMBERG-CARLSON
NO. 6



STROMBERG-CARLSON
NO. 6
UTILIZING TAP TO
REDUCE INTERFERENCE
ON BROADCAST RANGE.

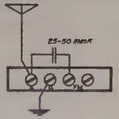


SEPARATE
ANTENNAS

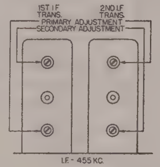
ADJUSTING DIAL LAMP

The dial on this receiver is edge-lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

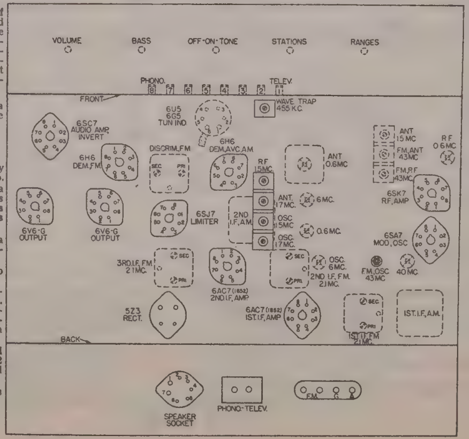
To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.



SINGLE
ANTENNA



Location Chart.



SPECIFICATIONS

Tuning Ranges	Frequency Modulation 40 to 44 Mc. (40,000 to 44,000 Kc.) Short-wave 5.8 to 18 Mc. (5800 to 18,000 Kc.) Standard Broadcast .54 to 1.7 Mc. (540 to 1700 Kc.)
Input Power Rating—	
Radio Models only	125 Watts
Radio-Phono Models	145 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 2.1 Megacycles (Frequency Modulation)
Speaker Field Coil Resistance—Approximately	610 Ohms
Speaker Voice Coil Impedance at 400 Cycles—Approximately	1.5 Ohms

NORMAL VOLTAGE READINGS

Take all voltage readings with chassis operating and tuned manually to 1000 kilocycles—no signal.

Use a line voltage of 125 volts or make allowance for any slight variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt. Take all D. C. readings on the 500 volt scale except when an asterisk appears. Read from indicated terminals to chassis base. See location chart for position of terminals.

A. C. voltages are indicated by italics.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6K7	R. F. Amp.	0	*6.3*	+0.6*	0	+0.6	+95	0	+125
6SA7	Modulator and Oscillator	0	0	+125	+115	−8	0	*6.3*	0
6AC7 (1852)	1st I. F. Amp. (A. M.—F. M.)	0	0	0	0	+3*	+140	*6.3*	+240
6AC7 (1852)	2nd I. F. Amp. (F. M.)	0	0	0	0	+2*	+140	*6.3*	+240
6SJ7	Limiter (F. M.)	0	0	0	0	0	+100	*6.3*	+100
6H6	Demodulator (A. M.)	0	*6.3*	0	0	0	—	0	0
6H6	Demodulator (F. M.)	0	*6.3*	0	0	0	—	0	0
6SC7	Audio Amp. and Audio Inv.	0	+60	0	0	+75	0	0	*6.3*
6V6G	Output	0	*6.3*	+240	+240	0	—	0	0
6V6G	Output	0	*6.3*	+240	+240	0	—	0	—
6U5	Tuning Indicator	0	0	+240	+20	0	*6.3*	—	—
5Z3	Rectifier	+360	*355*	*355*	+360	—	—	—	—
	Speaker Socket	+340	0	0	+360	+360	—	+240	—

*Read on lowest possible scale of voltmeter

FEATURES

GENERAL. This is a twelve-tube, three-gang, three-range receiver, designed for the reception of both amplitude and frequency modulated stations.

The chassis is of the fortified type, with bails provided for ease in handling and servicing. Eight button capacitor type automatic tuning is provided, and six favorite stations may be set up on the automatic tuning unit. The other two buttons are for switching to phonograph or television. Tone is adjusted by a variable tone control and the dial is of the slide rule type edge-lighted to provide clear visibility without glare.

Provision is made for a record player to be used with all models not already equipped with phonograph mechanism without additional wiring. The No. 455 Phonograph Models are equipped with an automatic record changer, using a crystal pick-up in conjunction with a specially equalized circuit. This record player shifts and plays either 10 or 12 inch records.

The chassis is designed to provide excellent sensitivity and fidelity and the power output is exceptionally good.

FREQUENCY MODULATION: The "Armstrong Wide-Swing Frequency Modulation System" used in this receiver is an outstanding development in radio.

The Federal Communications Commission has established five channels between 40 and 44 megacycles for frequency modulated transmitting stations. Since this is a comparatively high frequency, the distance over which reception is possible is limited.

SPECIAL CIRCUITS. A tuning indicator having two apertures, one for strong signals and one for weak signals, is used with this receiver. One aperture will close with a signal of approximately 100,000 microvolts, and the other will not close even with a two-volt signal.

Iron core coils are used in the broadcast and short-wave ranges to provide greater accuracy of alignment.

The audio system employs a special push-pull inverter system, designed to provide very good fidelity. The power transformer has an electrostatic shield to reduce line noise to a minimum, and the chassis is thoroughly shielded throughout.

AUTOMATIC TUNING. A substitution capacitor type of tuning is employed, and stations may be easily located using only one adjusting screw. Furthermore, each adjusting screw is provided with a vernier to make accurate adjustments possible.

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis of all receivers not already equipped with phonograph mechanism, into which a record player may be plugged and a push button is provided on the front of the receiver for switching from "Radio" to "Phonograph".

TELEVISION. A jack is provided on the back of the chassis and a push button is provided on the front of the receiver for television operation. This makes the audio amplifier and loud-speaker system available for use with television receivers designed for this type of sound reproduction.

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart on Page 3 for position and numbering of terminals.

A. Range switch in push button position ………… "Open"
Range switch in standard broadcast position ………… 3 Megohms

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6SK7	R. F. Amp.	S	S	150¶	A	150¶	B	S	25000¶
6SA7	Mod. and Osc.	S	S	25000¶	B	20000¶	S	S	C
6AC7 (1852)	1st I. F. Amp. (A. M.—F. M.)	S	S	S	2M	150¶	B	S	20000¶
6AC7 (1852)	2nd I. F. Amp. (F. M.)	S	S	S	270000¶	150¶	B	S	25000¶
6H6	Demodulator (A.M.)	S	S	280000¶	S	280000¶	300000¶	S	S
6H6	Demodulator (F.M.)	S	S	100000¶	200000¶	100000¶	100000¶	S	S
6SJ7	Limiter	S	S	S	30000¶	S	12000¶	S	12000¶
6SC7	Audio Amp. and Audio Inv.	S	270000¶	10M	10M	270000¶	S	S	S
6V6G	Output	S	S	20000¶	20000¶	570000¶	100000¶	S	200¶
6V6G	Output	S	S	20000¶	20000¶	570000¶	100000¶	S	200¶
6U5	Tuning Indicator	S	1M	D	20000¶	S	S	—	—
5Z3	Rectifier	25000¶	50¶	50¶	25000¶	—	—	—	—
—	Speaker Socket	200000¶ or Greater	S	S	O	200000¶ or Greater	O	25000¶	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

Range switch in short-wave position ………… "Open"
Range switch in frequency modulation position ………… "Short"

B. Push in phono button ………… 1 Megohm or greater
Push in television button ………… 1 Megohm or greater

C. Range switch in push button position ………… 2 Megohms
Range switch in standard broadcast position ………… 2 Megohms
Range switch in short-wave position ………… 2 Megohms
Range switch in frequency modulation position ………… "Short"

D. Range switch in push button position ………… 2 Megohms
Range switch in standard broadcast position ………… 2 Megohms
Range switch in short-wave position ………… 2 Megohms
Range switch in frequency modulation position ………… 1 Megohm

Other tests not shown on chart
Phono jack to chassis base:
Push in phono button ………… 1.5 Megohms
Push in any pre-set station button ………… "Open"
Television jack to chassis base:
Push in television button ………… 1.5 Megohms
Push in any pre-set station button ………… "Open"
Antenna terminal to chassis base:
Range switch in push button position ………… 75 Ohms
Range switch in standard broadcast position ………… 75 Ohms
Range switch in short-wave position ………… "Short"
Range switch in frequency modulation position ………… 75 Ohms
Ground terminal to chassis base ………… "Short"
Frequency modulation antenna and ground tests:
Between F. M. terminals ………… 1,000 Ohms
F. M. terminal nearest the end of the terminal strip to chassis base ………… 1,000 Ohms
F. M. terminal farthest from the end of the terminal strip to chassis base ………… "Short"
Terminals of A. C. plug to chassis base ………… "Open"
Between terminals of A. C. plug:
A. C. switch in "On" position ………… 2 Ohms
A. C. switch in "Off" position ………… "Open"

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

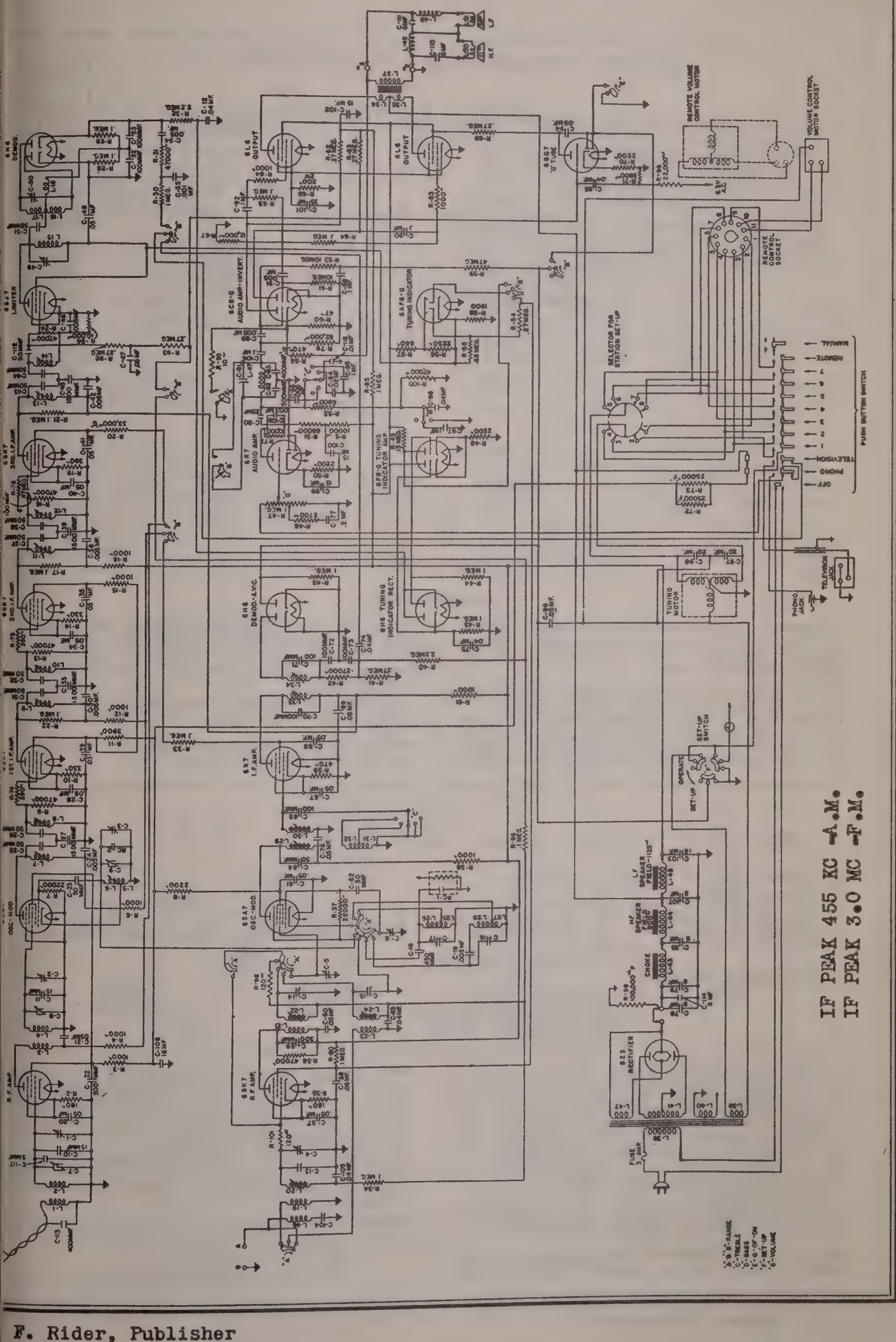
Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

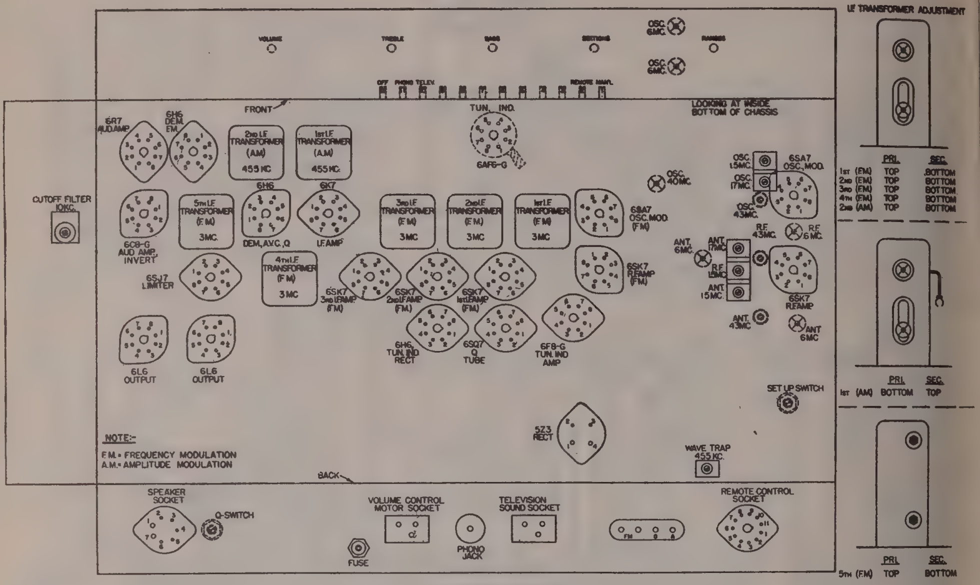
1. Remove the dial escutcheon by removing the screws and pulling downward and outward.
2. Put the call letters of the selected stations in place **above the push buttons. The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency** at the left, just as on the dial. (The call letters will be found inside the envelope stapled inside or underneath the cabinet.)
3. Tune in manually the highest frequency station to be set up and note carefully the program being transmitted.
4. Turn the range switch to the push button position and push the highest frequency button, then adjust the large screw over this button until the desired program is heard.
5. After the large screw is carefully adjusted, adjust the small vernier screw for maximum closing of the tuning indicator. (Be sure the large adjusting screw does not move while turning the vernier screw.)
6. **Set up the other five stations in the same manner.**
7. **Recheck the adjustment of each adjusting screw.**

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 480M,480MB
Schematic



IF PEAK 455 KC -A.M.
IF PEAK 3.0 MC -F.M.



Location Chart

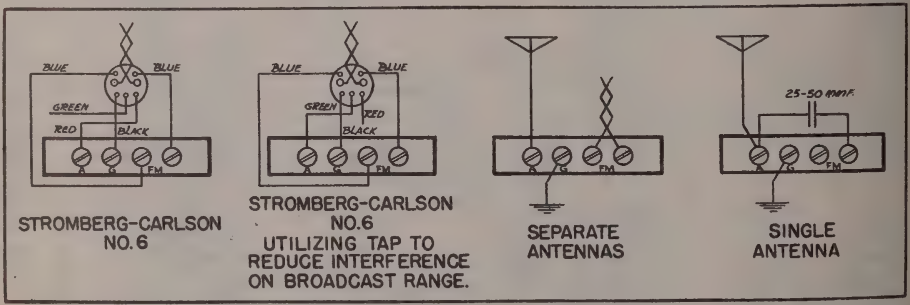
ACCESSORIES

ANTENNA. For best results use a Stromberg-Carlson No. 6 Antenna. This antenna is designed to provide improved pick-up on both the amplitude and frequency modulation bands.

If it is desired, two ordinary antennas may be used, one for amplitude modulation, which should be a straight wire "L" type antenna about 75 feet long, and one for frequency modulation. This latter antenna may be a straight wire about 40 feet in length or of the dipole type with two arms approximately 5½ feet in length. The dipole antenna will exhibit a marked directional effect and should be erected as high as possible above the ground and adjusted so as to receive the desired frequency modulated stations with best results.

For average reception, a single straight wire antenna may be used for both amplitude and frequency modulation.

The various types of antennas should be connected to the No. 480 Receiver as follows:



PLAYING RECORDS. To obtain the best quality of phonograph reproduction a Stromberg-Carlson record player is recommended. They are designed for use with this receiver, and all that is necessary is to connect the record player to the single prong socket provided in the chassis and proceed to operate. The volume and tone may be controlled with the controls at the receiver, or (if such is provided) the volume control on the record player may be used.

A low impedance pick-up may also be used, but a matching transformer must be placed between the phonograph pick-up and the chassis.

HEADSET ATTACHMENT. Headphones can be very simply attached to this receiver. Ask for Pc. No. 28303 Headset Package Assembly, which comes complete with headphones and installation instructions.

CARE OF CABINET. The finish of Stromberg-Carlson Cabinets should be protected by using Stromberg-Carlson Cabinet Polish regularly. It is available in pint cans, designated as Pc. No. 28601.

Nicks and scratches of most kinds can be repaired quickly and easily by proper use of the Pc. No. 26962 Touch-Up Kit. Complete instructions are provided with each kit.

TOOLS. Stromberg-Carlson can supply all the tools required for working on these sets. For example:

SD-29 Phillips Head Screwdriver
No. 24608 Aligning Tool
Also pliers, cutters, screwdrivers, etc.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 480M,480MB
Tuner Data

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be local or favorite stations which give good reception at all times. Frequency Modulated Stations, as well as Amplitude Modulation Stations, may be set up on the push buttons by simply using the appropriate button determined by the position of the Frequency Modulated Station on the dial.

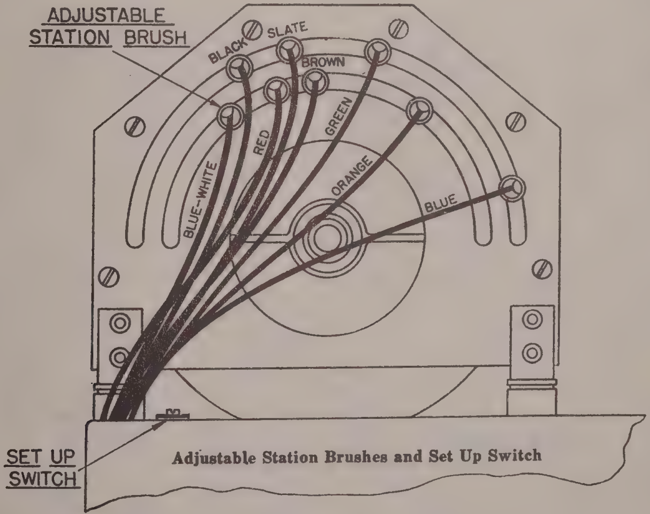
Set up stations in the daytime to avoid unnecessary interference.

Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

Seven stations may be set up for push buttons located on the front of the receiver and eight stations may be set up on the remote control unit. The same seven stations which were set up for the buttons on the front of the receiver must also be used on the remote control unit and the eighth station which is chosen for the remote control unit must be of a lower frequency than any of the other stations which have been set up.

1. Put the call letters of the selected stations in place above the push buttons. **The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial.** (The call letters will be found inside the envelope stapled inside or underneath the cabinet).
2. Remove the metal escutcheon and transparent strip from the remote control unit. Put the station call letters in place so that the station having the highest frequency is nearest to the volume control buttons and then in successive order according to frequency. Replace the metal escutcheon, transparent strip and three screws. (The call letters for the remote control unit are included in the P-31424 Remote Control Package Assembly.)
3. Set the "Treble" control in normal position.
4. Turn the set-up switch (located on the base just back of the brush and commutator assembly) to the set-up position. (The slot in the screw should point toward "set-up").
5. Push the button of the highest frequency station to be set up (button No. 3) and then tune in that station manually. **Be sure the station is exactly "in tune" by tuning carefully and watching the cathode ray indicator.**
6. Slide the brush to which the blue wire is connected until it is over the slot in the commutator. Then adjust it very carefully until the pilot light goes out. This indicates exact adjustment.
7. Repeat operations 4 and 5 for each station. Work from right to left or from the higher to the lower frequencies in accordance with the table below:
8. Turn the set-up switch back to the "Operate" position.
9. Check the operation of all the push buttons to be sure that each has been accurately set up. If it is necessary to readjust any of the buttons, follow the procedure given above.



Adjustable Station Brushes and Set Up Switch

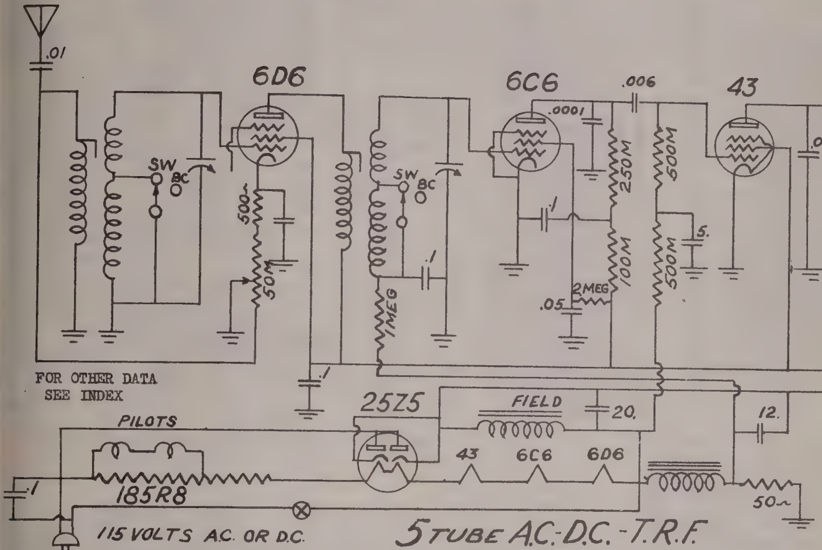
Push Button No.	Purpose	Color of wire on brush
1	Manual	—
2	Remote	—
3	Highest frequency station	Blue
4	Next lower frequency station	Orange
5	Next lower frequency station	Green
6	Next lower frequency station	Brown
7	Next lower frequency station	Slate
8	Next lower frequency station	Red
9	Lowest frequency station on receiver	Black
10	Telev. button on receiver Lowest frequency button on remote control unit	Blue White
11	Phonograph	
12	Off	

See diagram of adjustable brushes and set-up switch.

M EL 7-Tube AC-DC
S erhet.
Sc ematic,Socket
A gnment,Trimmers

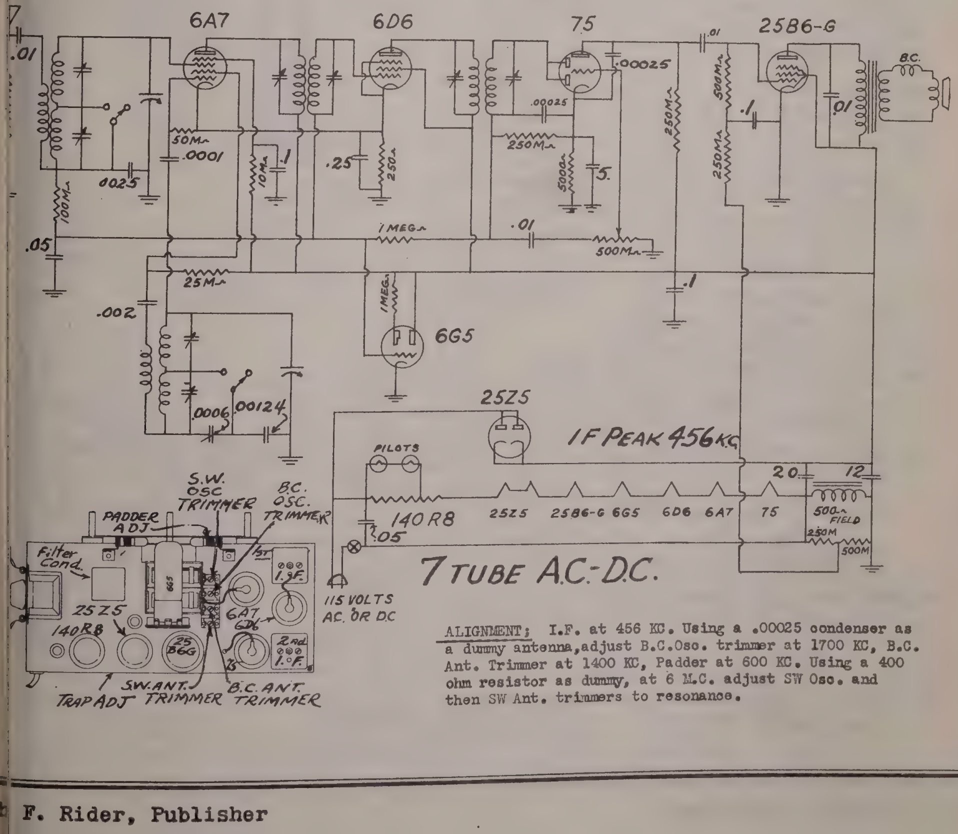
TRAV-LER RADIO & TELEVISION CORP.

MODEL 5-Tube TRF
Schematic



FOR OTHER DATA
SEE INDEX

5 TUBE A.C.-D.C.-T.R.F.

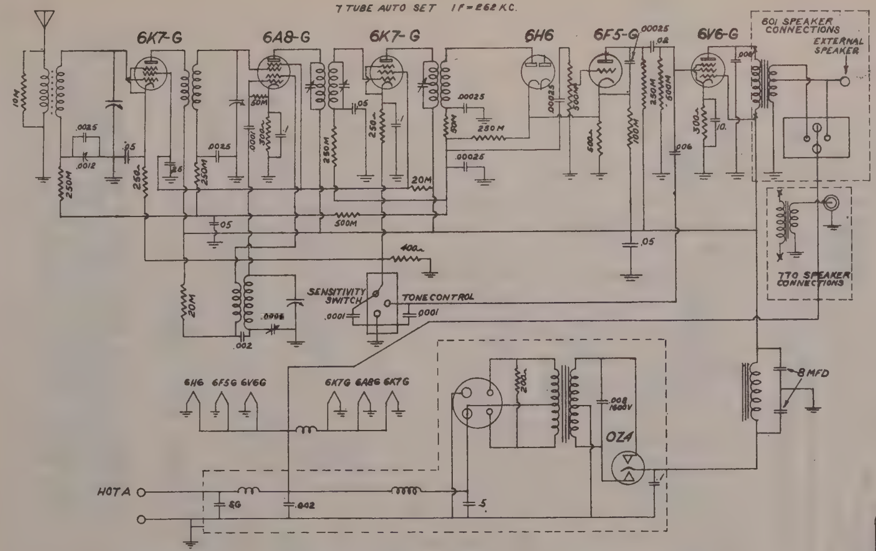


7 TUBE A.C-D.C.

ALIGNMENT; I.F. at 456 KC. Using a .00025 condenser as a dummy antenna,adjust B.C.Osc. trimmer at 1700 KC, B.C. Ant. Trimmer at 1400 KC, Padder at 600 KC. Using a 400 ohm resistor as dummy, at 6 M.C. adjust SW Osc. and then SW Ant. trimmers to resonance.

MODEL 7-Tube Auto
Schematic, Socket
Trimmers, Alignment
Voltage

TRAV-LER RADIO & TELEVISION CORP.



ALIGNMENT INSTRUCTIONS

1. Set variable condenser with rotor plates in open position. Set signal generator to 262 kc., connect generator lead to grid cap of 6A8G using a .1 mfd., condenser as a dummy antenna. Adjust IF trimmers for maximum output, reducing signal generator output as signal increases.

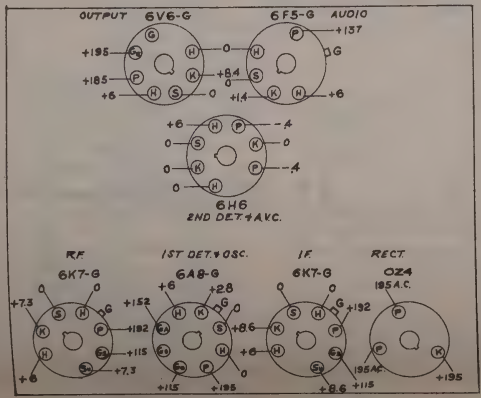
2. Set signal generator to 1620 kc.,connecting generator lead to antenna lead on set using a .00025 condenser as dummy antenna. Rotate oscillator trimmer until signal is picked up. Set generator to 1400 kc., pick up signal by rotating variable condenser then adjust RF and antenna trimmers for maximum signal, reducing generator output as speaker signal increases. Set signal generator to 600 kc.,rotate variable condenser to pickup signal then adjust for maximum sensitivity by rotating oscillator padder while rocking variable condenser.

3. Recheck alignment adjustments at 1620 and 1400 kc.

4. When set is installed, antenna circuit may be tracked to car antenna by adjusting antenna padder located just below antenna socket.

ELIMINATION OF MOTOR NOISES FOR EXCEPTIONAL CASES:

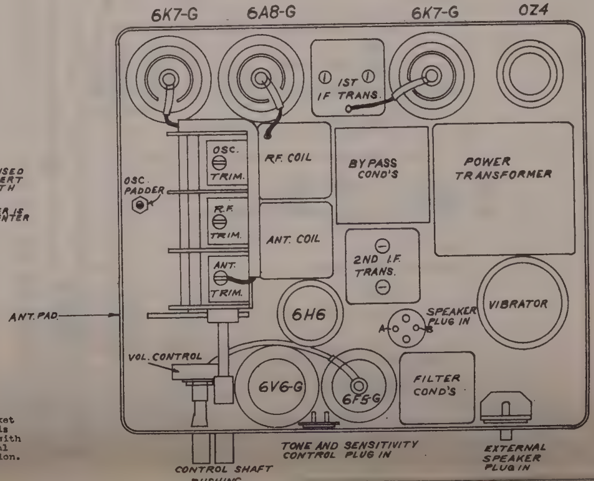
A later type of car will require less attention then one which is loosened at body joints. The elimination of the generator ripple which is distinguished by a high pitched whirring sound is accomplished by means of a condenser from generator cutout to ground. In the case of a roof antenna a condenser should be connected from a point on the lead that connects to the dome light, as it passes through the left or right hand channel of the car to ground. Make sure that the shielding is continuous from the end of the antenna cable to as far up to the aerial proper as possible. Large diameter shielding is preferred. In stubborn cases use a distributor suppressor. This is inserted in the distributor head or in the ignition coil spout or any place along the high tension lead. In some cases where motors are mounted on rubber it is necessary to bond the engine to the chassis by means of heavy metal braiding.



Botton view of 7-tube auto set showing socket positions and voltages from socket terminals to ground. All voltage measurements taken with volume control at maximum and with no signal applied. Sensitivity switch in "OFF" position. Use volt-meter of 1000 ohms per volt.

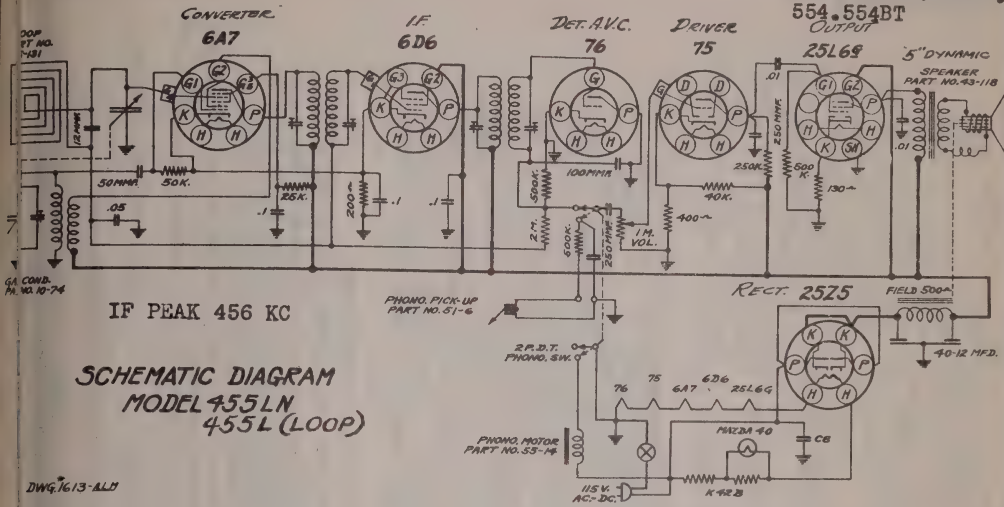
NOTE:
WHEN EXTERNAL SPEAKER IS USED WITH INTERNAL SPEAKER, INSERT INTERNAL SPEAKER PLUG WITH CENTER PRONG AT-B-

WHEN ONLY INTERNAL SPEAKER IS USED INSERT PLUG WITH CENTER PRONG AT-A-



TRAV-LER RADIO & TELEV. CORP.

MODEL 336
MODELS 455L,455LN
MODELS 553,553BT,
554,554BT



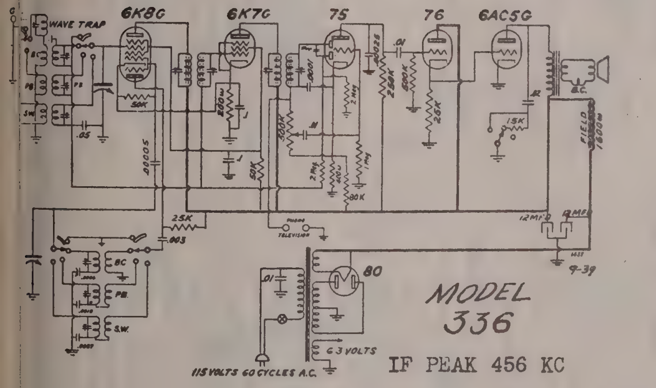
IF PEAK 456 KC

SCHEMATIC DIAGRAM
MODEL 455LN
455L (LOOP)

DWG. 1613-ALM

MODELS 455L (Loop), 455 LN
ALIGNMENT

IF 456 KC. RF (Use single loop of wire 5 or 6 inches in diameter about 8 inches from receiver loop) Adjust Osc. and Ant. trimmers at 1400 KC for Max. Output.

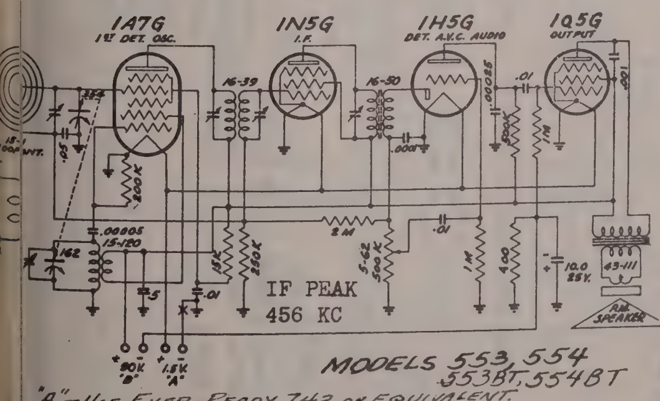


MODEL
336

IF PEAK 456 KC

MODEL 336
ALIGNMENT

IF - 456 KC. Adjust B.C. Osc. at 1720 KC; B.C. R.F. and Ant. Trimmers at 1400 KC, Pad at 600 KC; Check at 1400 KC. INT.Adjust P.B. Osc. at 6700; P.B. Ant. and R.F. trimmers at 6000 KC; Check at 2200 KC. S.W. Adjust S.W. Osc. at 24.5 MC, S.W. Ant. and R.F. trimmers at 22 MC.; Check at 8 MC. (Use a standard all wave dummy antenna if available)



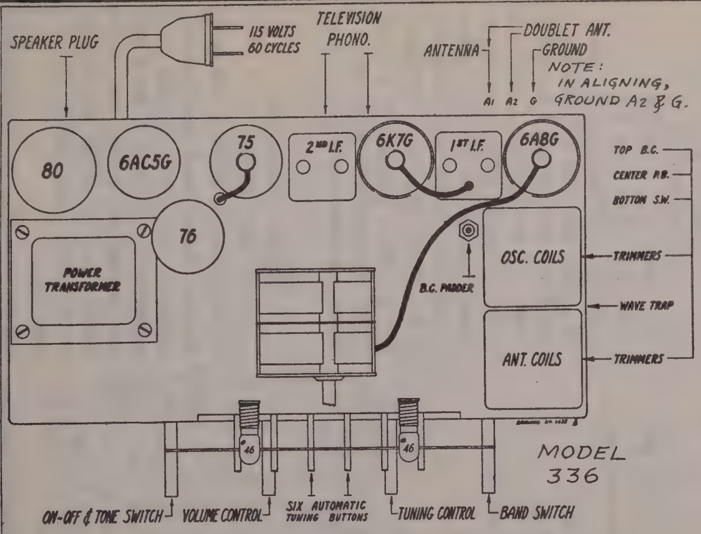
IF PEAK
456 KC

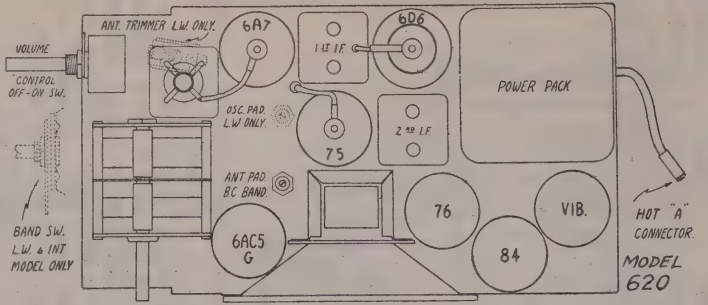
MODELS 553, 554
553BT, 554BT

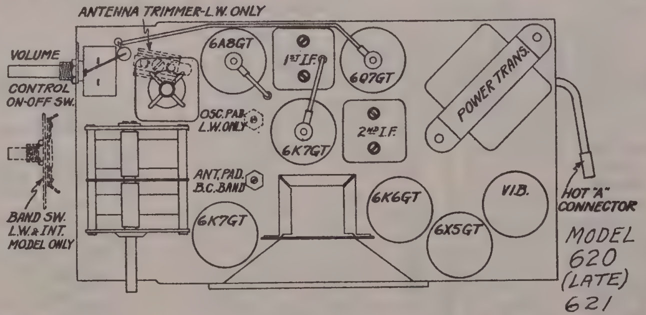
"A"-Use Ever-Ready 742 or equivalent.
"B"- " (2) " " 762 " "

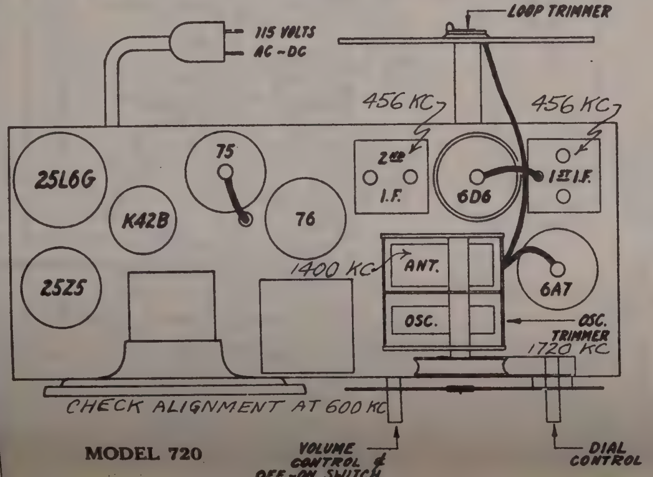
MODELS 553,554.
ALIGNMENT

IF - 456 KC. R.F. (Use a signal loop near and parallel to receiver loop. Receiver loop should be close to installed position) Adjust Osc. at 1720 KC, Ant. at 1400 KC and check at 600 KC.









PUSH BUTTON OPERATION

Applies to Models 336, 539M, 570B, 576, 576B, 801.

Six Push Button Station Selectors are incorporated in this receiver. Each button may be adjusted to select any station or frequency in the Broadcast Band. To adjust each button, perform the following operations:

1. Tune in a desired station with the Selector knob.
2. Twist the Push Button you want set up for this station, to the left about one full turn to loosen the mechanism.
3. Push this button in as far as it will go, while still holding the Selector knob firmly so the station will not be detuned.
4. With the button pressed all the way in, twist it to the right until it is tight and then release it.

Follow this procedure with the other five buttons, setting each for a different station.

Now, when any Push Button is pressed, the station for which that button is set, should appear perfectly tuned in. If it is not perfectly tuned, repeat the above procedure until satisfactory results are obtained.

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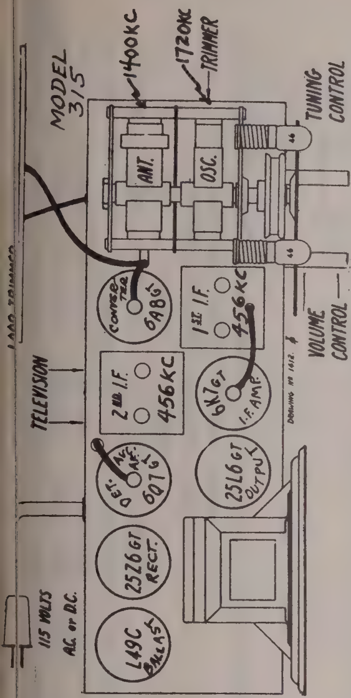
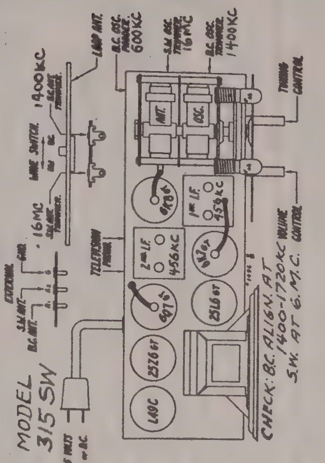
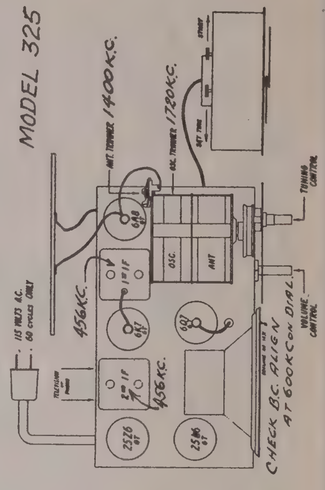
TRAV-LER RADIO & TELEV. CORP.

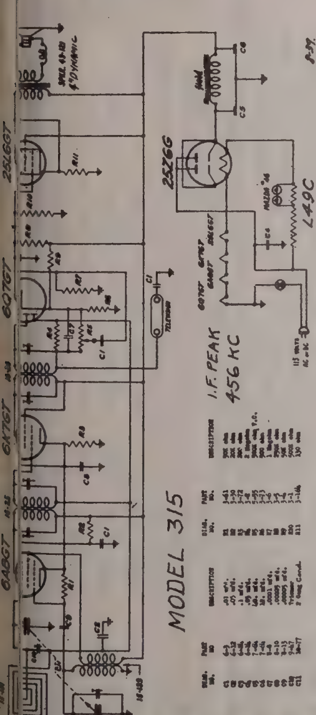
MODEL 315
MODEL 315SW
MODEL 325

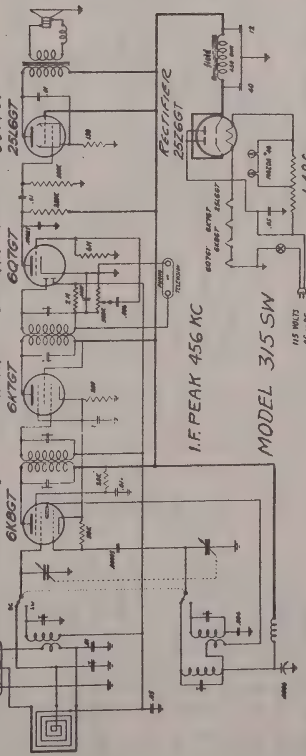


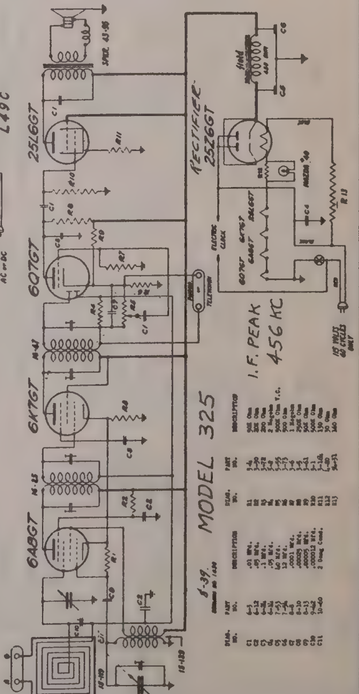




CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

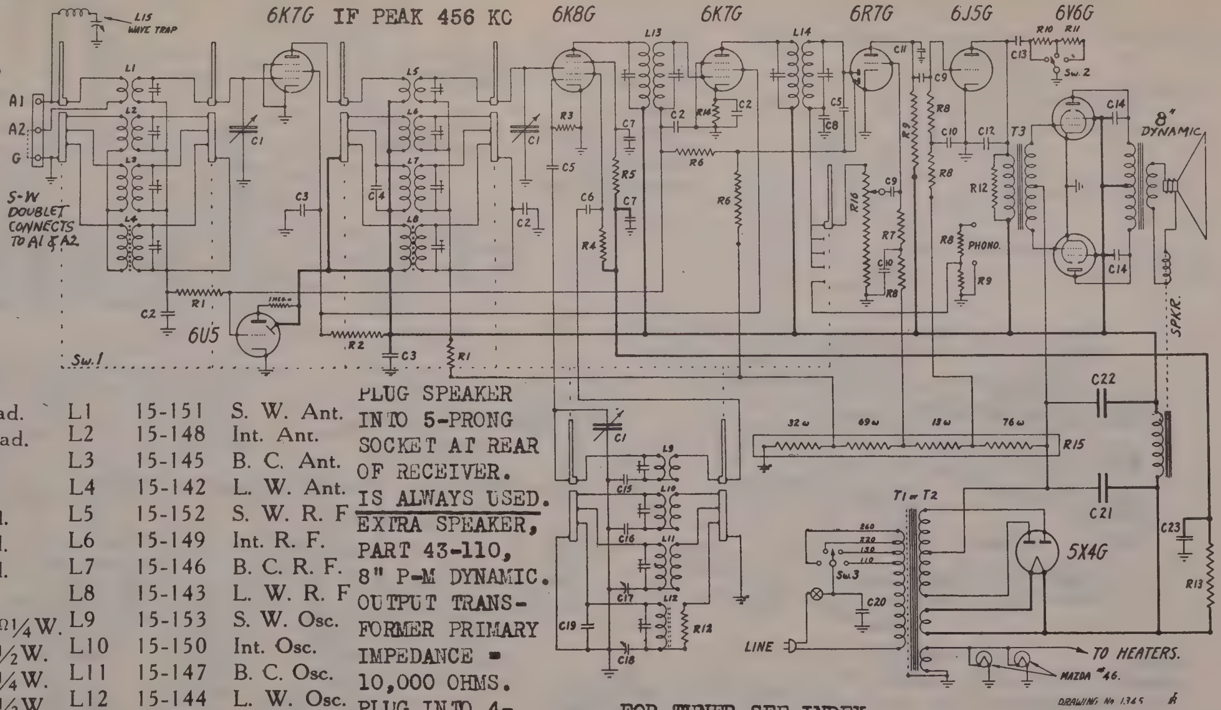






MODEL 539M
Schematic,Alignment

TRAV-LER RADIO & TELEV. CORP.



C1	10-62	Tuning Condenser
C2	6-12	.05
C3	6-26	.1
C4	8-19	.00003
C5	8-13	.00005
C6	6-36	.003
C7	6-14	.05
C8	8-8	.0001
C9	6-3	.01
C10	6-24	.1
C11	8-10	.00025
C12	8-1	.001
C13	6-11	.03
C14	6-53	.003
C15	8-47	.0087
C16	8-7	.0018
C17	9-27	B.C. Pad.
C18	9-14	L.W. Pad.
C19	8-33	.00005
C20	6-4	.01
C21	7-49	25 mfd.
C22	7-51	20 mfd.
C23	7-66	16 mfd.
R1	3-5	250KΩ¼W.
R2	3-169	75KΩ½W.
R3	3-4	50KΩ¼W.
R4	3-8	25KΩ½W.
R5	3-170	30KΩ1 W.
R6	3-2	2KΩ¼W.
R7	3-6	1KΩ¼W.
R8	3-1	500KΩ¼W.
R9	3-17	100KΩ¼W.
R10	3-3	5KΩ¼W.
R11	3-14	10KΩ¼W.
R12	3-29	25KΩ¼W.
R13	3-168	12KΩ1 W.
R14	3-13	300Ω¼W.
R15	4-15	Resistor Strip

L1	15-151	S. W. Ant.
L2	15-148	Int. Ant.
L3	15-145	B. C. Ant.
L4	15-142	L. W. Ant.
L5	15-152	S. W. R. F
L6	15-149	Int. R. F.
L7	15-146	B. C. R. F.
L8	15-143	L. W. R. F
L9	15-153	S. W. Osc.
L10	15-150	Int. Osc.
L11	15-147	B. C. Osc.
L12	15-144	L. W. Osc.
L13	16-39	I. F. Input
L14	16-40	I. F. Output
L15	16-53	Wave Trap.
T1	11-53	Power Trans. 50-60 Cy. 110 to 260 V.
T2	11-52	Power Trans. 115 V. 60 Cy.
T3	12-18	A. F. Tran. P. P. Input
Sw1	14-53	Wave Switch.
Sw2	14-48	Tone Switch.
Sw3	14-56	Line Voltage Switch
Spkr	43-93	Speaker 850ΩField.

PLUG SPEAKER INTO 5-PRONG SOCKET AT REAR OF RECEIVER. IS ALWAYS USED. EXTRA SPEAKER, PART 43-110, 8" P-M DYNAMIC. OUTPUT TRANSFORMER PRIMARY IMPEDANCE = 10,000 OHMS. PLUG INTO 4-PRONG SOCKET AT REAR.

FOR TUNER SEE INDEX

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.
I.F. signal on 6K8G grid thru 0.1 mf.
Dial at 1720 KC. Peak at 456 KC.

		TRIM	TRIM	PAD	
	DUMMY *	ANT.,RF	OSC.**	OSC.	CHECK
LONG WAVE	200 MMF	320 KC	365 KC	200 KC	320 KC
BROADCAST	200 MMF	1400 KC	1750 KC	600 KC	1400 KC
SHORT WAVE	400 OHMS	22 MC	24.5 MC	---	8 MC

* Use Standard All Wave Dummy if available.

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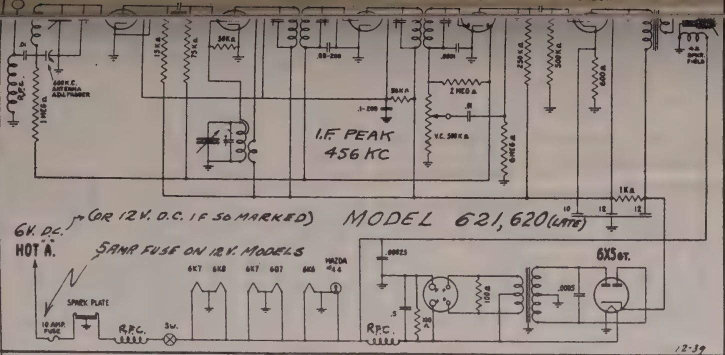
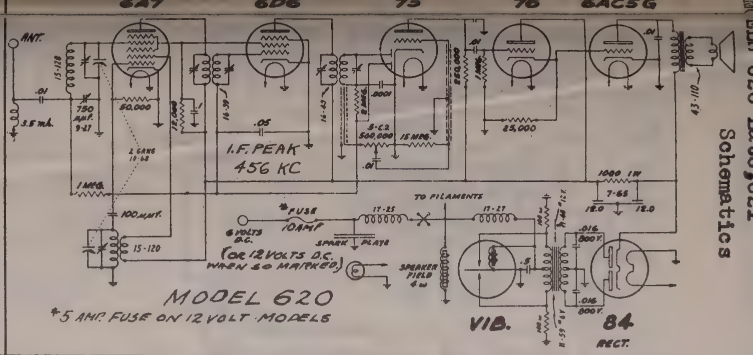
MODELS See Below
Schematics, Alignment

TRAV-LER RADIO & TELEV. CORP

EL 620 Early
ELS 620 Late,621
Schematics



MODEL 621, 620(LATE)

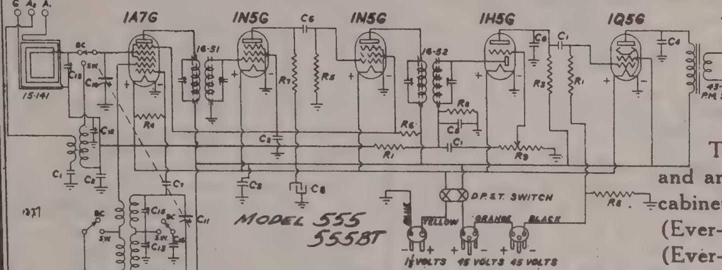


MODEL 620

*5 AMP. FUSE ON 12 VOLT MODELS

ALIGNMENT FOR MODELS 555, 555BT, 556, 556BT, 1555, 1555BT.
Peak IF trimmers at 456 KC. B.C. Shunt Osc.-1400 KC, B.C. Pad-600 KC. Check at 1400 KC, then with back cover in place, B.C. Loop Ant. at 1400 KC, B.C. Pad at 600KC. Check at 1400 K.C. (2BAND SETS- SW Trimmers at 16MC.

The batteries are installed in the compartment below the radio chassis and are accessible by removing the four screws which hold the back of the cabinet in place. The batteries include one 1.5 volt "A" plug-in type, (Ever-Ready No. 742 or equivalent) and two 45 volt "B" plug-in type. (Ever-Ready No. 762 or equivalent).

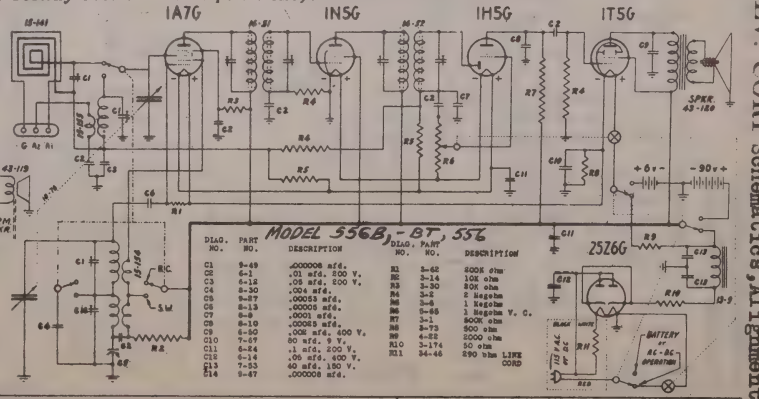


MODEL 555
555BT

PARTS LIST ⟶
FOR MODELS
555, 555B, 1555, 1555BT

DIAG. NO.	DESCRIPTION	PART NO.
C1	.01 Mfd. 200 W. V.	6-1
C2	.05 Mfd. 200 W. V.	6-12
C3	.1 Mfd. 200 W. V.	6-24
C4	.002 Mfd. 400 W. V.	6-50
C5	.0001 Mfd.	8-8
C6	.00025 Mfd.	8-10
C7	.00005 Mfd.	8-13
C8	8. Mfd. 150 W. V.	7-56
C9	.00053 Mfd. Padder	9-27
C10	.00035 Mfd. Var. Cond.)	10-76
C11	.00035 Mfd. Var. Cond.)	10-76
C13, C12	.000008 Mfd. Trimmer	9-49

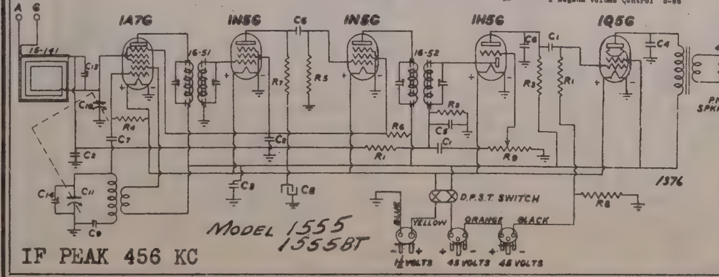
DIAG. NO.	DESCRIPTION	PART NO
C15	.000008 Mfd. Trimmer	9-47
C16	.004 Mfd. Mica Cond	8-30
C14	.000012 Mfd. Trimmer	9-45
R1	2 Megohm	3-2
R2	1 Megohm	3-6
R3	500K Ohm	3-1
R4	200K Ohm	3-62
R5	75K Ohm	3-51
[illegible]	30K Ohm	3-26
[illegible]	10K Ohm	3-14
[illegible]	350 Ohm	3-176
[illegible]	1 Megohm Volume Control	5-65



MODEL 556B, -BT, 556

DIAG. NO.	PART NO.	DESCRIPTION
C1	9-49	.000008 mfd.
C2	6-1	.01 mfd. 200 V.
C3	6-12	.05 mfd. 200 V.
C4	8-30	.004 mfd.
C5	9-27	.00053 mfd.
C6	8-13	.00005 mfd.
C7	8-8	.0001 mfd.
C8	8-10	.00025 mfd.
C9	6-50	.002 mfd. 400 V.
C10	7-67	80 mfd. 9 V.
C11	6-24	.1 mfd. 200 V.
C12	6-14	.05 mfd. 400 V.
C13	7-53	40 mfd. 150 V.
C14	9-47	.000008 mfd.

DIAG. NO.	PART NO.	DESCRIPTION
R1	3-62	200K ohm
R2	3-14	10K ohm
R3	3-30	30K ohm
R4	3-2	2 Megohm
R5	3-6	1 Megohm
R6	5-65	1 Megohm V. C.
R7	3-1	500K ohm
R8	3-73	500 ohm
R9	4-22	2000 ohm
R10	3-174	50 ohm
R11	34-46	290 ohm LINE CORD



MODEL 1555
1555BT

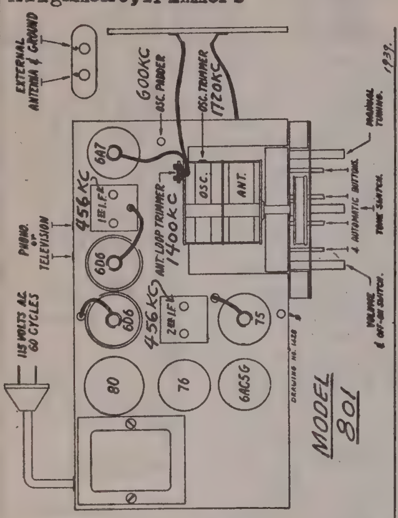
IF PEAK 456 KC

MODELS 576,576B
Schematic,Socket
Alignment,Trimmers

TRAV-LER RADIO & TELEV. CORP.

MODEL 720
Schematic

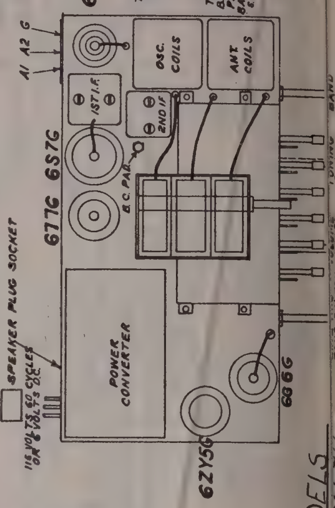
MODEL
Schema
Chassi
Alignm

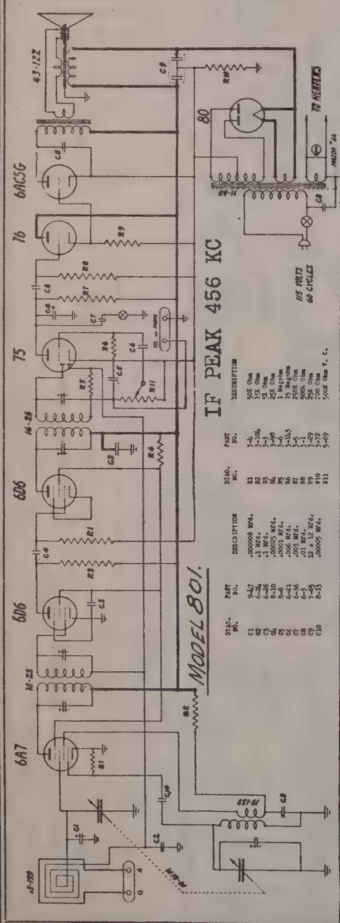


MODEL
801

ALIGNMENT FREQUENCIES
(Use standard all wave dummy antenna
if available)
IF - 456 KC. B.C. Osc.-1720 KC, B.C.
Band Pass - 1400 KC., B.C. Ant.-1400KC,
B.C.Pad-600 KC. Check band at 1400 KC.
INT.-Osc.-6.6MC, Ant.- 6.0 MC; Check
Band at 2.2 MC. S.W. Osc.-24.5 MC;
Ant.-22 MC. Check Band at 8 MC.
S.W. Doublet Antenna:- Connect to A1
and A2; Connect G to Ground.

MODELS
576,576B.

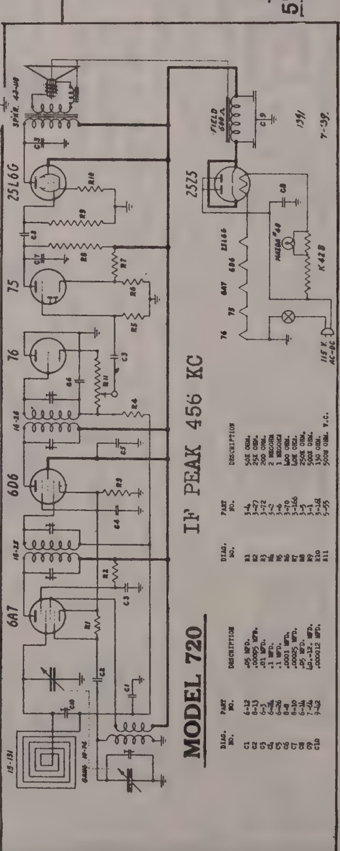




IF PEAK 456 KC

DIAG. NO.	PART NO.	DESCRIPTION
C1	9-47	.000008 Mfd.
C2	6-24	.1 Mfd.
C3	6-26	.1 Mfd.
C4	8-10	.00025 Mfd.
C5	8-8	.0001 Mfd.
C6	6-21	.006 Mfd.
C7	6-36	.003 Mfd.
C8	6-3	.01 Mfd.
C9	7-45	12 x 12 Mfd.
C10	8-13	.0005 Mfd.

DIAG. NO.	PART NO.	DESCRIPTION
R1	3-4	50K Ohm
R2	3-104	15K Ohm
R3	3-3	5K Ohm
R4	3-90	25K Ohm
R5	3-6	1 Megohm
R6	3-143	15 Megohm
R7	3-5	250K Ohm
R8	3-1	500K Ohm
R9	3-29	25K Ohm
R10	3-72	200 Ohm
R11	5-69	500K Ohm V. C.

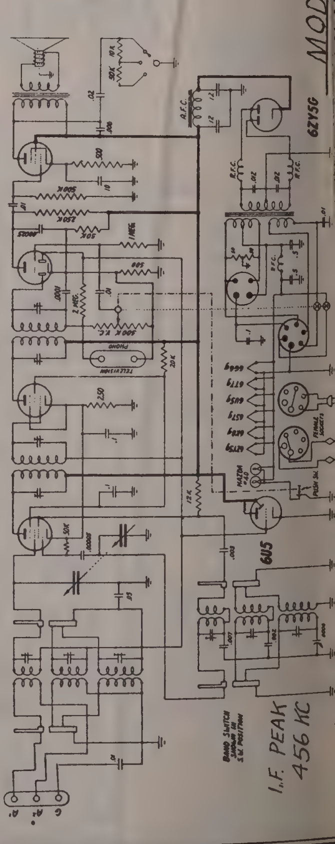


MODEL 720

IF PEAK 456 KC

DIAG. NO.	PART NO.	DESCRIPTION
C1	6-12	.05 MFD.
C2	8-13	.0005 MFD.
C3	6-3	.01 MFD.
C4	6-24	.1 MFD.
C5	6-26	.1 MFD.
C6	8-8	.0001 MFD.
C7	8-10	.00025 MFD.
C8	6-14	.05 MFD.
C9	7-44	40.-12. MFD.
C10	9-42	.000012 MFD.

DIAG. NO.	PART NO.	DESCRIPTION
R1	3-4	50K OHM.
R2	3-27	25K OHM.
R3	3-72	200 OHM.
R4	3-2	2 MEGOHM
R5	3-6	1 MEGOHM
R6	3-70	400 OHM.
R7	3-166	40K OHM.
R8	3-5	250K OHM.
R9	3-1	500K OHM.
R10	3-14	130 OHM.
R11	5-55	500M OHM. V.C.



I.F. PEAK
456 KC

MODELS

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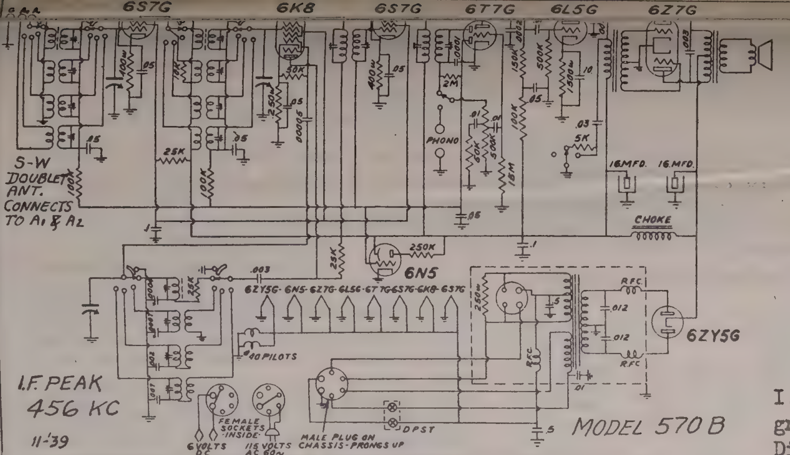
TRAV-LER RADIO & TELEV. CORP.

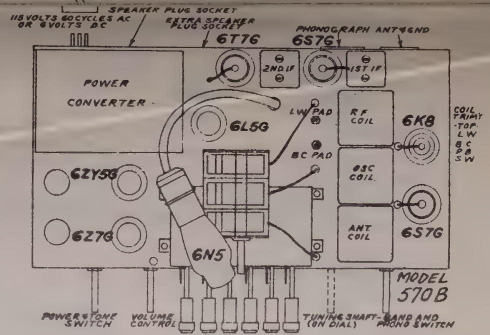
MODEL 570B
MODELS 1556,1556B
1556BT



I.F PEAK 456 KC

11-'39

MODEL 570 B



FOR
TUNER
DATA
SEE
INDEX

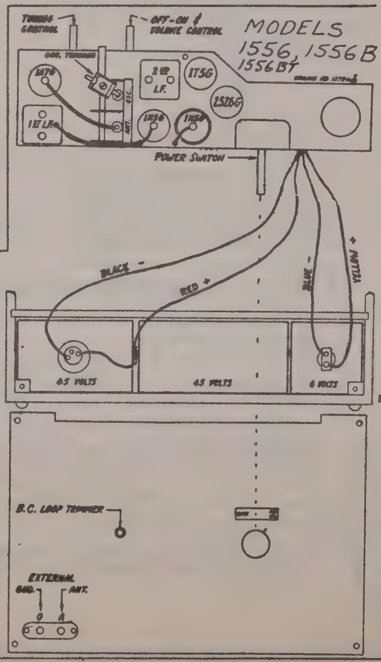
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

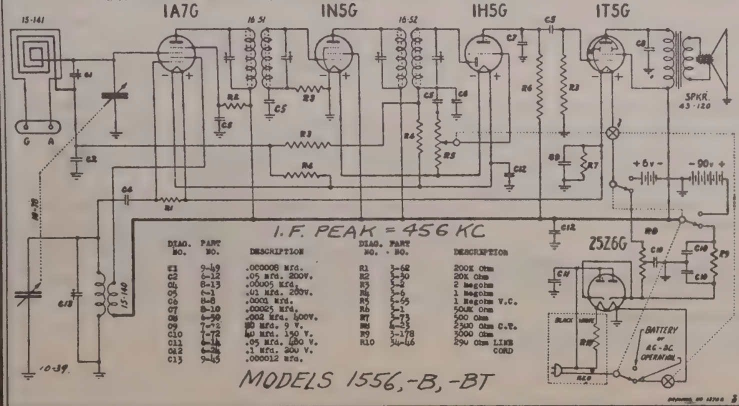
BAND	DUMMY①	ANT.,RF	②TRIM OSC.	PAD OSC.	CHECK
LONG WAVE	200 MMF	320 KC	362 KC	200 KC	320 KC
BROADCAST	200 MMF	1400 KC	1720 KC	600 KC	1400 KC
INTERMEDIATE	400 OHMS	6 MC	6.7 MC	---	2.2 MC
SHORT WAVE	400 OHMS	22 MC	24.5 MC	---	8 MC

I.F. signal on 6K8 grid thru 0.1 mf. Dial at 1720 KC. Peak at 456 KC.

① Use Standard All Wave Dummy if available.

② With variable condenser fully open.





I.F. PEAK = 456 KC

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	9-49	.000008 Mfd.	R1	3-62	200K Ohm
C2	6-12	.05 Mfd. 200V.	R2	3-30	20K Ohm
C4	8-13	.00005 Mfd.	R3	3-2	2 Megohm
C5	6-1	.01 Mfd. 200V.	R4	3-6	1 Megohm
C6	8-8	.0001 Mfd.	R5	5-55	1 Megohm V.C.
C7	8-10	.00025 Mfd.	R6	3-1	500K Ohm
C8	6-30	.002 Mfd. 400V.	R7	3-73	500 Ohm
C9	7-72	40 Mfd. 9 V.	R8	4-23	2300 Ohm C.T.
C10	7-72	40 Mfd. 150 V.	R9	3-178	3000 Ohm
C11	6-14	.05 Mfd. 400 V.	R10	34-46	290 Ohm LINE CORD
C12	6-24	.1 Mfd. 200 V.			
C13	9-45	.000012 Mfd.			

MODELS 1556,-B,-BT

ALIGNMENT

I.F.-Dial at 1500 KC. Generator leads thru 0.1 mf to 1A7G grid and to chassis. Peak at 456 KC.

R.F.-Generator leads as above. Trim osc. at 1400 KC. Fasten back cover; Generator loosely coupled, trim loop for max. at 1400.

MODELS 570B,576
576B
Conversion Data
MODELS 620,621
Alignment,Tuner

TRAV-LER RADIO & TELEV. CORP.

ANTENNA CONNECTION

The shielded antenna lead supplied with the radio is plugged into the receptacle provided in the underside of the radio. The other end is connected to the lead from the antenna and taped so the connection cannot touch the cable shield or any metal part of the car. If the automobile has a built-in antenna, the lead should be found behind the dash, extending from the right or left-hand corner post. It is important that this lead be cut and connected to the shielded set lead as close to the corner post as possible, to eliminate antenna pickup of motor noise.

On cars where it is necessary to install an antenna, a "fish-pole" type, an "over-the-roof" type, or a "under-the-running board" type, may be used. Two antennas, one mounted under each running board, are recommended for the best reception, as the noise on the radio will increase as the size of the antenna decreases.

The lead from the antenna should be shielded, direct, and as short as is practical. It should not be twisted around any part of the car, and should not lead thru the motor compartment. All connections should be clean, tight, soldered, and insulated with tape. The antenna must never touch any part of the car.

ANTENNA MATCHING ADJUSTMENT

As the sizes and types of antennas vary considerably, it is necessary to adjust the radio to "match" the antenna used. To do this, tune in a station, accurately, at roughly 600 kilocycles, reduce the volume of the set, pry out the plug on the underside of the set, insert a screw driver, and turn for maximum output. Replace the plug when this has been accomplished, and the radio is ready to operate efficiently on any station.

MOTOR NOISE ELIMINATION

To eliminate motor noise, a condenser and a suppressor are supplied with the radio. The condenser is mounted on the generator with its lead connected to the terminal of the generator output on the generator side rather than on the battery side. The heavy insulated lead in the center of the distributor cap is pulled out, the suppressor inserted in its place, and the heavy lead inserted in the end of the suppressor.

This, with the antenna installed properly will eliminate motor noise in most cars. In some of the older cars it may be necessary to install a condenser similar to the generator condenser, bolted to the dash or a good ground, with the lead connected to the ammeter with the set battery lead. When a built-in roof antenna is used, a condenser should be connected to the dome light lead where it passes through the right or left hand post to the roof. The condenser should be bolted to grounded metal.

PUSH BUTTON ADJUSTMENT

Six push button station selectors are incorporated in this receiver, and each may be set to select any frequency or station within the range of the set.

To adjust each button, follow these instructions.

1. With the set in operation, tune in any station the push button is to be set for, with the right hand tuning knob.

2. Keep a firm grip on the tuning knob so the station will not be detuned, and turn the push button about one turn to the left to loosen the mechanism. Press the button all the way in and turn it to the right until it is tight.

Repeat these operations with the other five buttons, setting each for a different station. Insert the correct call letter tab into the space provided in the panel just above the push buttons.

MODELS 620, 621

TECHNICAL INSTRUCTIONS

A good output meter should be used in all alignment adjustments. This meter should be of the high resistance A.C. type, with a low range scale of 2.5 or 3 volts. The leads are connected across the voice coil terminals of the speaker.

I. F. ALIGNMENT

Set the variable condenser at minimum capacity, (dial pointer at ①1560 K.C.). Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the ②6A7, with the tube's grid lead still in place.

Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K.C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing the signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.

R. F. ALIGNMENT

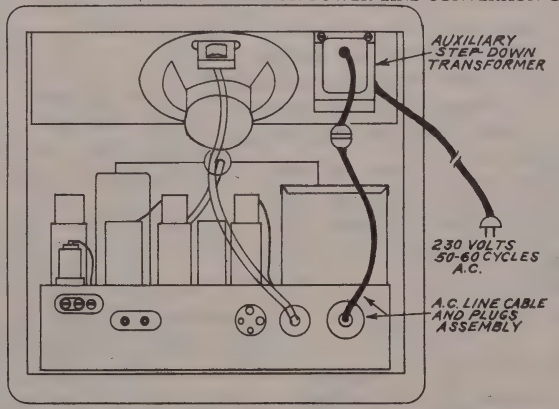
With the variable condenser still full open, set the generator to ①1560 K.C. Connect the generator lead to the antenna lead through a .0001 mfd. condenser as dummy antenna. Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.

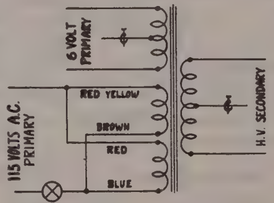
①1550 for 620 (1940),621.
②6A8GT in .. .. ..

INSTRUCTIONS FOR POWER LINE CONVERSION OF BATTERY MODELS 570B 576,576B

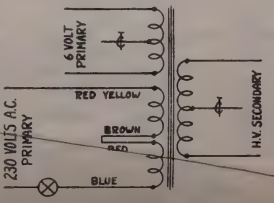

AUXILIARY STEP-DOWN TRANSFORMER
230 VOLTS 50-60 CYCLES A.C.
A.C. LINE CABLE AND PLUGS ASSEMBLY

WARNING

These radios must never be used on a D.C. power line at either 115 or 230 volts, or on any A.C. power line Frequency, except 50 or 60 cycles. Any attempt to do so will result in a burned out transformer.



115 VOLT PRIMARY CONNECTIONS



230 VOLT PRIMARY CONNECTIONS

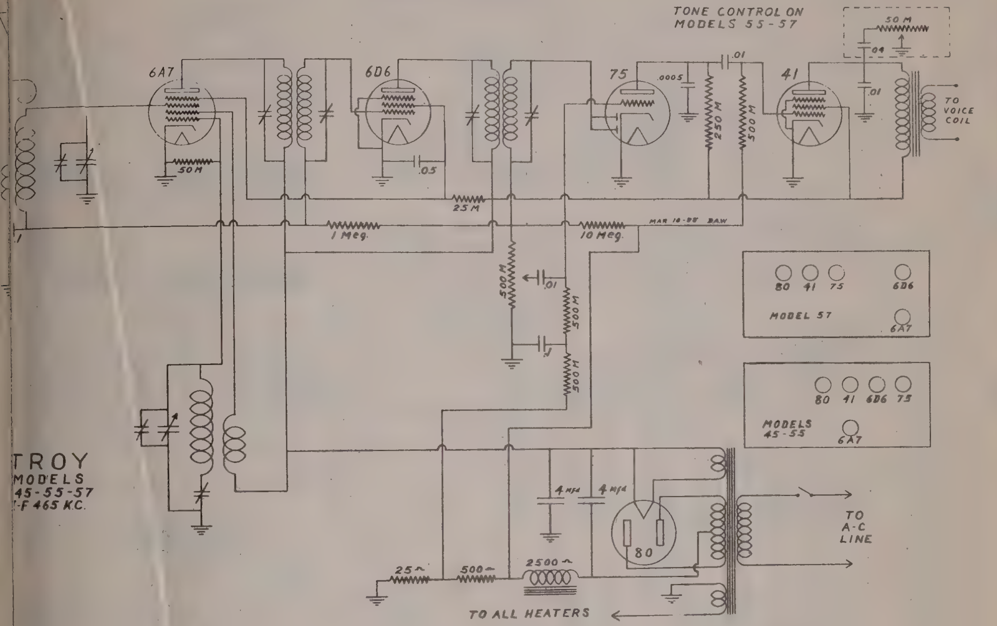
The standard battery model radios, are equipped with a special type power transformer so that these radios may be operated from either a 6 volt storage battery, or a 115 volt, 50 or 60 cycles A.C. power line.

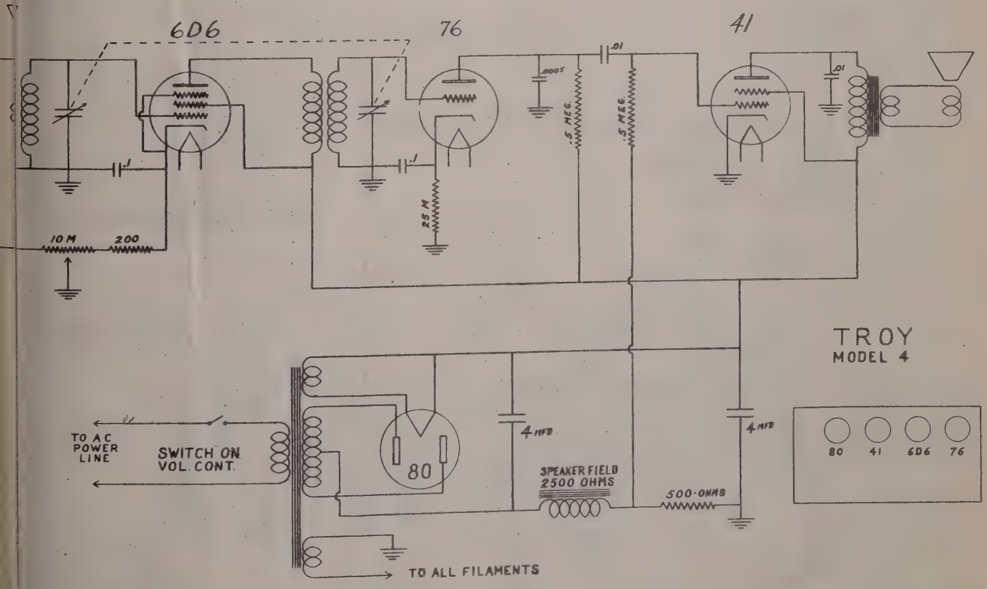
To adapt these radios to operate from a 230 volt, 50 or 60 cycles A.C. power line, a special auxiliary step-down transformer has been developed. This transformer, Part Number 11-62, is used to reduce 230 volts to 115 volts, for normal operation. Under no circumstances may either of these models be used to operate from 230 volts A.C. without this step-down transformer.

The auxiliary transformer is mounted inside the radio cabinet on the speaker board with 1/2 inch wood screws. The cable and plugs assembly supplied with the radio for 115 volts A.C. line operation, is connected to the power plug at the rear of the radio, and the other end plugged into the female receptacle provided on the auxiliary transformer. The male plug on the long transformer cable is then plugged into a 230 volts A.C. outlet.

TROY RADIO & TELEV. CO.

MODEL 4 Revised
MODELS 45,55,57
Revised
Schematics, Socket



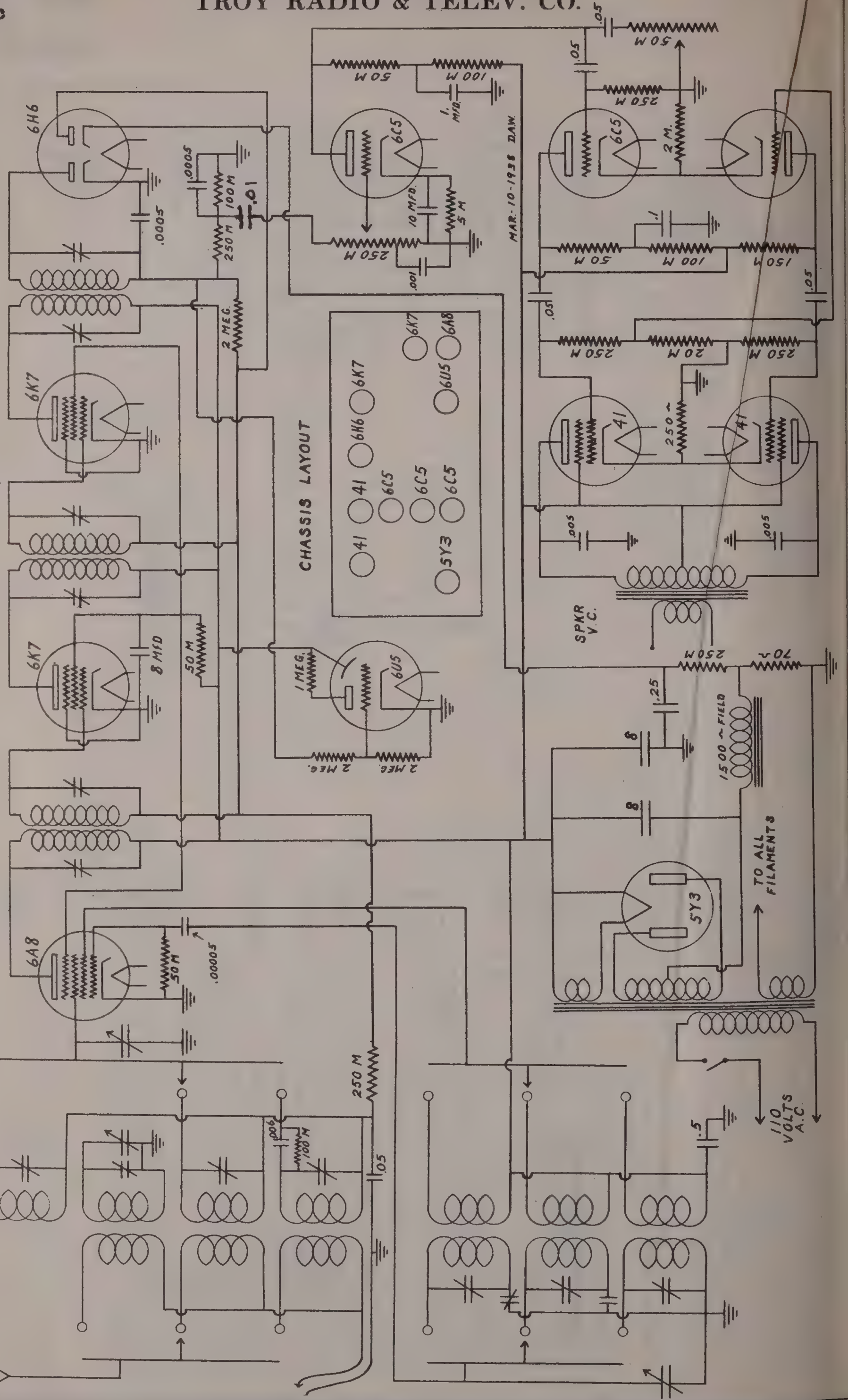


MODEL 113
Schematic
Socket

TROY RADIO & TELEV. CO.

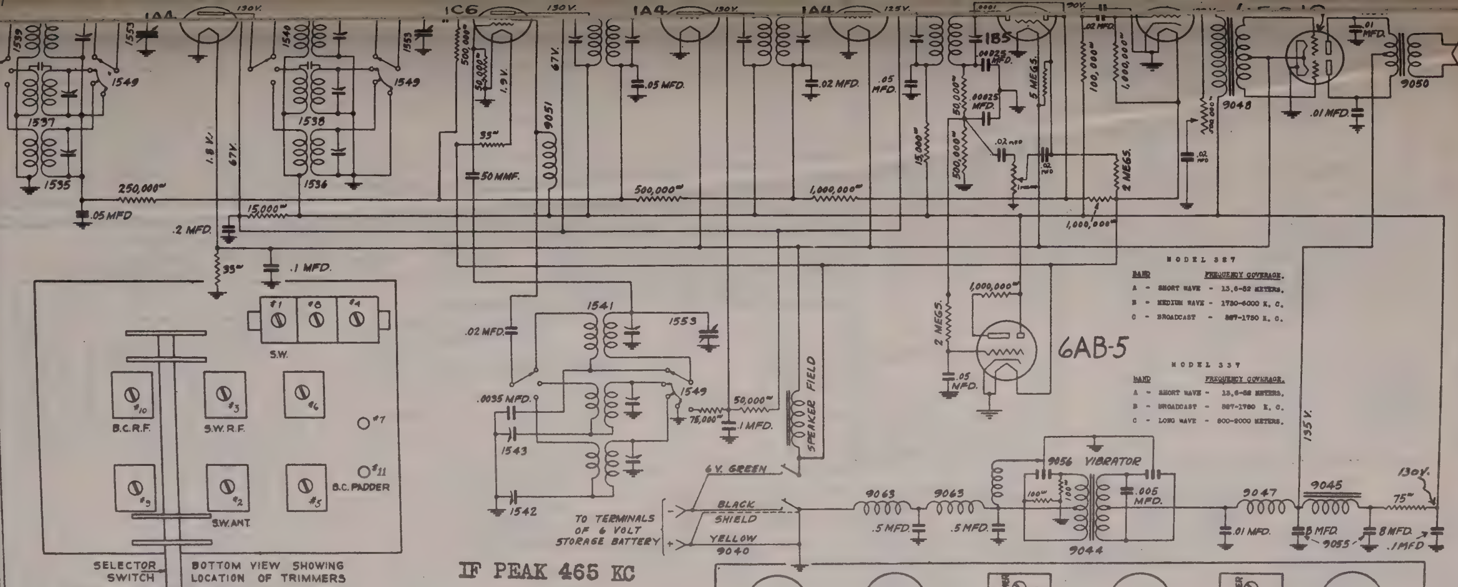
TROY MODEL 113

NOTE - in aligning highest frequency band use low image of oscillator Intermediate and Broadcast bands align normally.



ULTRAMAR MFG. CORP.

MODELS 327,337
Schematic,Socket,Voltage Alignment,Trimmers

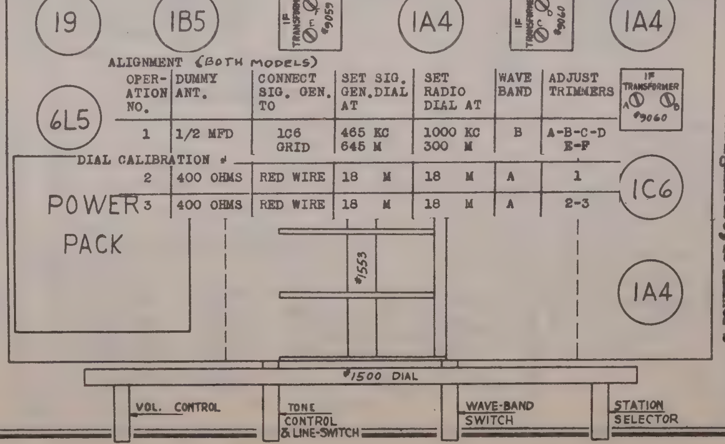


MODEL 327

BAND		FREQUENCY COVERAGE.
A -	SHORT WAVE -	13,6-52 METERS.
B -	MEDIUM WAVE -	1730-6000 K. C.
C -	BROADCAST -	527-1750 K. C.

MODEL 337

BAND		FREQUENCY COVERAGE.
A -	SHORT WAVE -	13,6-52 METERS.
B -	BROADCAST -	527-1760 K. C.
C -	LONG WAVE -	800-2000 METERS.



ALIGNMENT (BOTH MODELS)

OPERATION NO.	DUMMY ANT.	CONNECT SIG. GEN. TO	SET SIG. GEN. DIAL AT	SET RADIO DIAL AT	WAVE BAND	ADJUST TRIMMERS
1	1/2 MFD	1C6 GRID	465 KC 645 M	1000 KC 300 M	B	A-B-C-D E-F
DIAL CALIBRATION ♯						
2	400 OHMS	RED WIRE	18 M	18 M	A	1
3	400 OHMS	RED WIRE	18 M	18 M	A	2-3

IF PEAK 465 KC

PROCEDURE MODEL 327

4	400 OHMS	RED WIRE	5000 KC 60 M	B	4-5-6	
5	400 OHMS	RED WIRE	2000 KC 150 M	B	7	ROCK VAR. COND.
6	400 OHMS	RED WIRE	REPEAT OPERATION FOUR			
7	250 MMFD	RED WIRE	1500 KC 200 M	C	8-9-10	
8	250 MMFD	RED WIRE	600 KC 500 M	C	11	ROCK VAR. COND.
9	250 MMFD	RED WIRE	REPEAT OPERATION SEVEN			

PROCEDURE MODEL 337

4	250 MMFD	RED WIRE	1500KC 200 M	B	4-5-10	
5	250 MMFD	RED WIRE	600 KC 500 M	B	11	ROCK VARIABLE CONDENSER
6	250 MMFD	RED WIRE	REPEAT OPERATION FOUR			
7	250 MMFD	RED WIRE	900 M	C	8-9-6	
8	250 MMFD	RED WIRE	1800M	C	7	ROCK VAR. COND.
9	250 MMFD	RED WIRE	REPEAT OPERATION SEVEN			

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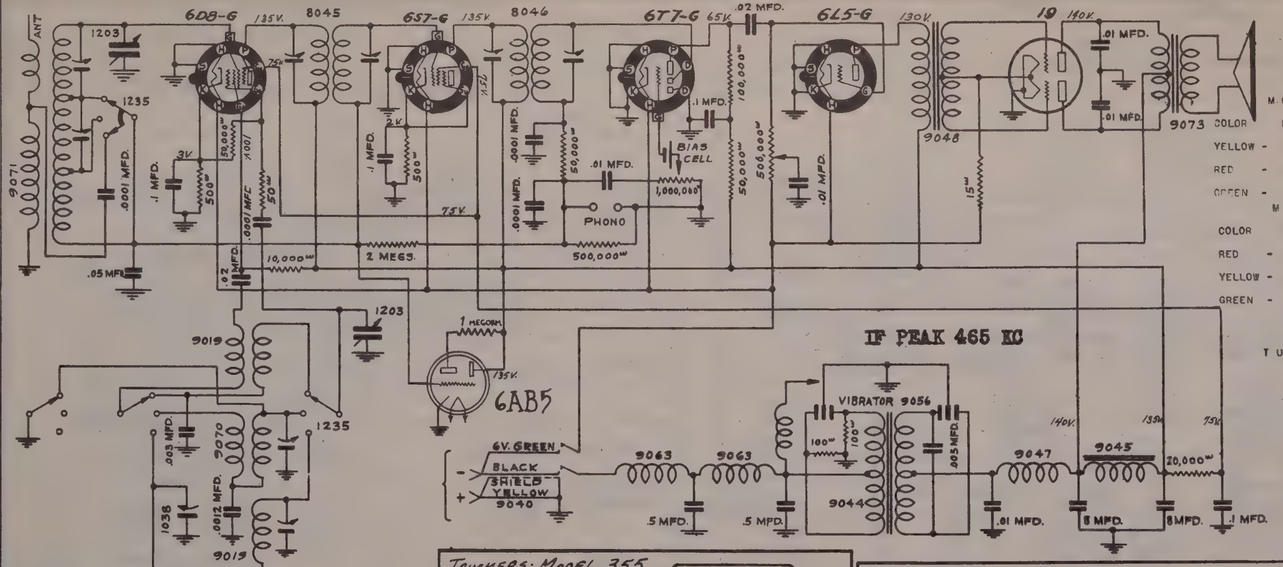
MODELS 345,355
Schematic,Socket,Voltage
Alignment,Trimmers

ULTRAMAR MFG. CORP.



IF PEAK 465 KC

MODEL 345

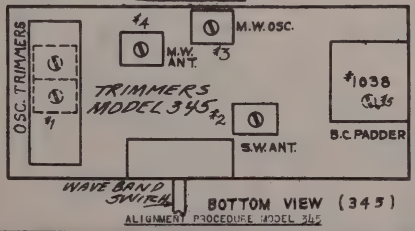
COLOR		BAND		FREQUENCY COVERAGE
YELLOW	-	C	- -	526-1600 K. C.
RED	-	B	- -	1680-5700 K. C.
GREEN	-	A	- -	16.3-52 METERS.

MODEL 355

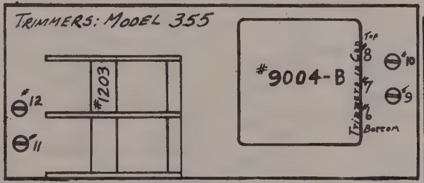
COLOR		BAND		FREQUENCY COVERAGE
RED	-	C	- -	800-2000 METERS
YELLOW	-	B	- -	187-570 METERS
GREEN	-	A	- -	16.3-52 METERS.

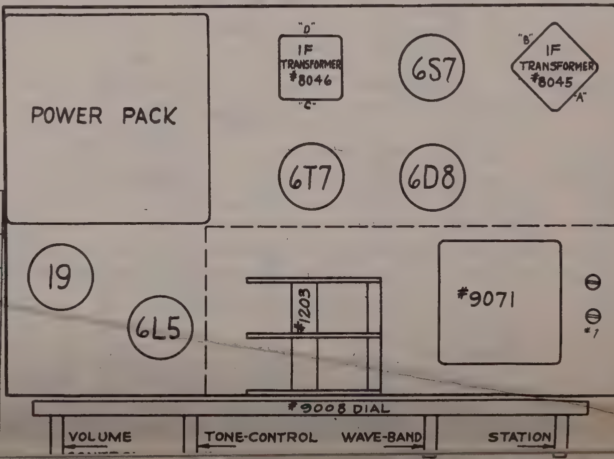
TUBE SYMBOLS

H - HEATER
K - CATHODE
S - SHELL OF TUBE
D - DIODE PLATE
P - PLATE
G - SIGNAL GRID
GS - SCREEN GRID
SU - SUPPRESSOR GRID
GO - OSCILLATOR GRID
GA - OSCILLATOR ANODE
T - TARGET



BOTTOM VIEW (345)





ALIGNMENT PROCEDURE MODEL 345

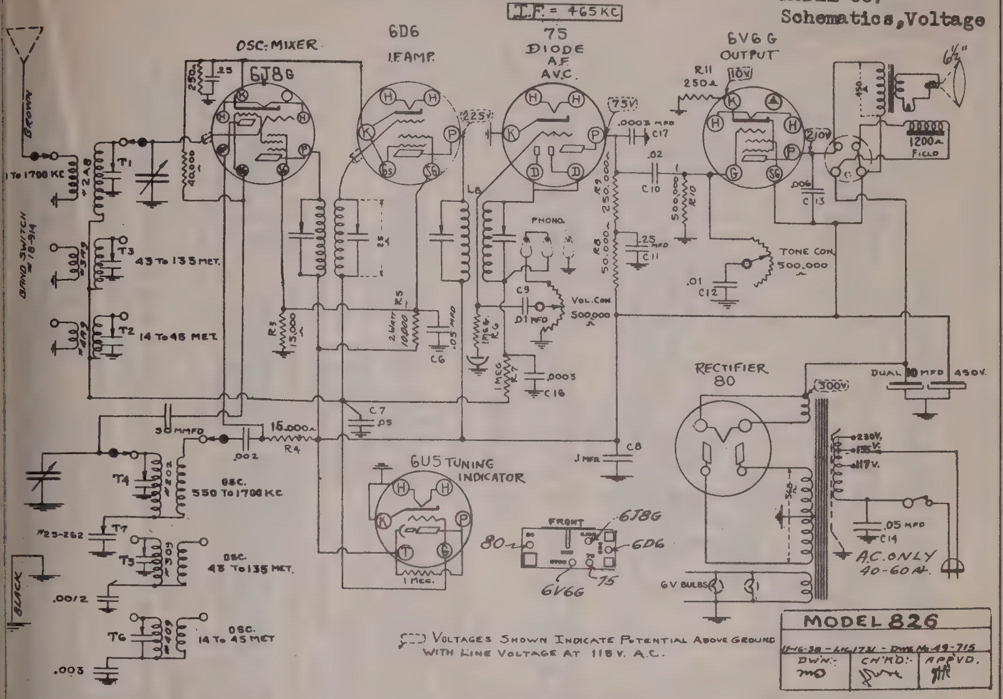
OPERATION NO.	DUMMY ANT.	CONNECT SIG.GEN. TO	SIG.GEN. DIAL AT	RADIO DIAL AT	BAND	ADJUST TRIMMERS
1	1/2 MFD.	6D8G GRID	465 KC.	1000 KC.	C YELLOW	A-B-C-D (I.F.)
2	400 OHMS	RED WIRE	20 M.	20 M.	A GREEN	2*
3	400 OHMS	RED WIRE	5000 KC.	5000 KC.	B RED	3-4
4	250 MMFD.	RED WIRE	1400 KC.	1400 KC.	C YELLOW	1
5	250 MMFD.	RED WIRE	600 KC.	600 KC.	C YELLOW	5*

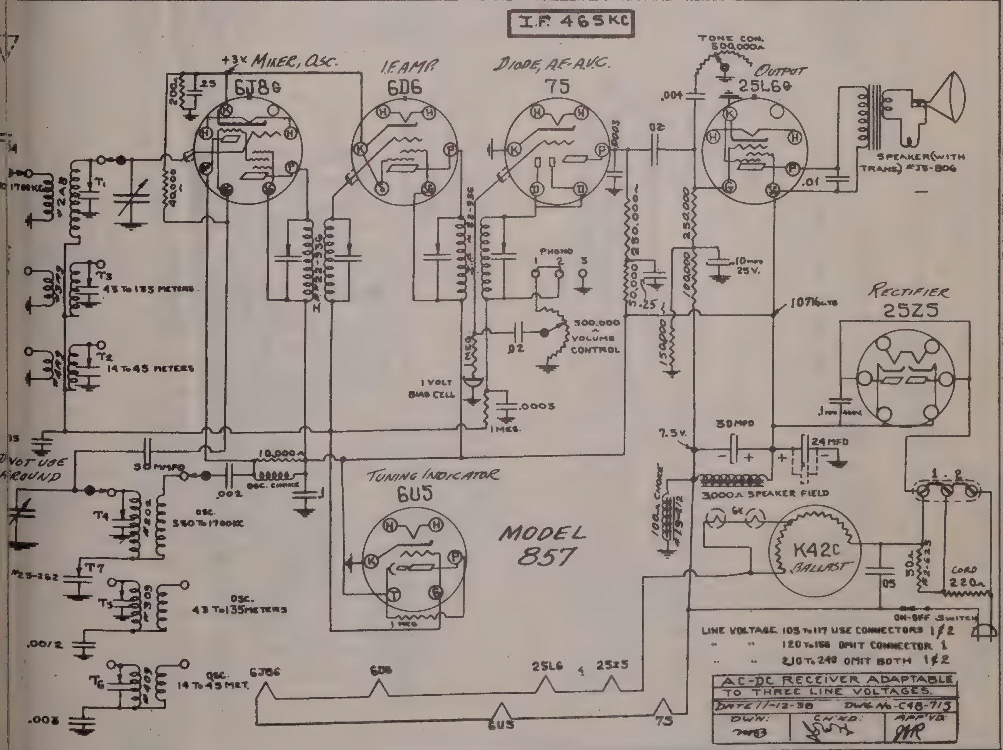
ALIGNMENT PROCEDURE MODEL 355

OPERATION NO.	DUMMY ANT.	CONNECT SIG.GEN. TO	SIG.GEN. DIAL AT	RADIO DIAL AT	BAND	ADJUST TRIMMERS
1	1/2 MFD.	6D8-G GRID	465 KC.	1000 KC.	B YELLOW	A-B-C-D (I.F.)
2	400 OHMS	RED WIRE	20 M.	20 M.	A GREEN	6*
3	250 MMFD.	RED WIRE	1400 KC.	1400 KC.	B YELLOW	9-7
4	250 MMFD.	RED WIRE	600 KC.	600 KC.	B YELLOW	11*
5	250 MMFD.	RED WIRE	REPEAT OPERATION THREE.			
6	250 MMFD.	RED WIRE	900 M.	900 M.	C RED	10-8
7	250 MMFD.	RED WIRE	1800 M.	1800 M.	C RED	12*

ULTRAMAR MFG. CORP.

MODEL 826
MODEL 857
Schematics,Voltage





MODEL 826
MODEL 857
Alignment,Trimmers
Phono.Data

ULTRAMAR MFG. CORP.

MODEL 826

The intermediate frequency stages are tuned to 465 KC and have a sensitivity of about 27 microvolts. (for 50 milliwatt output)

The maximum output is rated at about 5 watts, and 3.5 watts undistorted.

MODEL 857

The intermediate frequency stages are tuned to 465 KC and have a sensitivity of about 27 microvolts. (for 50 milliwatt output)

The maximum output is rated at about 4-1/2 watts, and 2.4 watts undistorted.

The three line voltage ranges are obtained by use of the resistance cord, an extra resistor within the chassis, and the Ballast tube. See schematic diagram. The Ballast tube also provides necessary voltage for the two pilot lights connected in series.

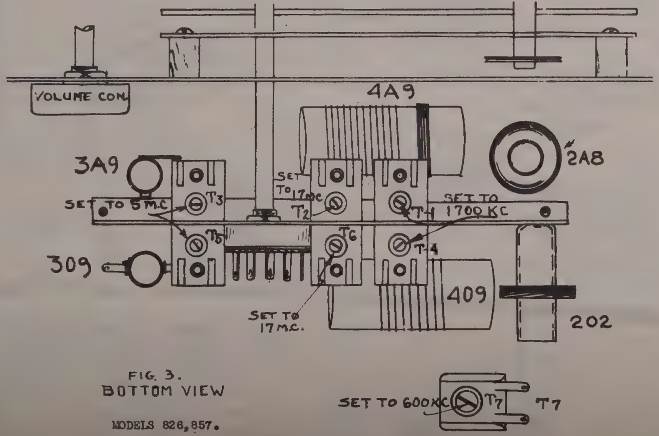


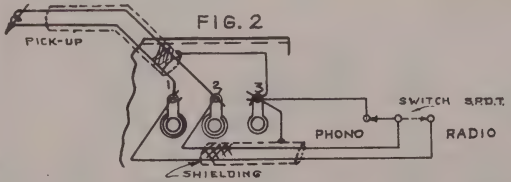
FIG. 3.
BOTTOM VIEW

MODELS 826, 857.

THE ADAPTATION OF THE SET FOR USE WITH PHONOGRAPH
MODELS 826, 857.

Out of the back of the chassis there extends three lugs labeled "Phono" 1-2-3. For phonograph use, the jumper is removed and the pick-up leads from the pick-up are connected to Nos. 1 and 2 terminals, with the overall wire shield grounded to No. 3 terminal. A single pole double throw switch may be used to change from Radio to "Phono". See Fig. 2.

FIG. 2



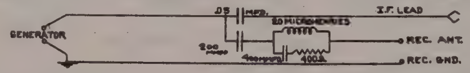
NOTE:

With certain models, the chassis is floated on cushion rubber. In shipment the chassis is tightened on corner wood strips. To release, loosen the four bottom screws, remove strips and let chassis float free.

ALIGNMENT MODELS 826, 857.

No change should be made with the I.F. or R.F. adjustments unless it is certain that such adjustments are necessary.

The following instructions are given with the assumption that the service station has the proper generator, means of measuring the output and proper input connections. The following circuit is recommended for the input from the signal generator.



See that the dial hand is straight across when the condenser is at full capacity.

After aligning the four trimmers of the IF system to 465 KC, refer to Fig. 3 showing the position of the R.F. trimmer and the frequency to which they are to be adjusted. Although the dial is calibrated in meters, there will be found on the dial extra points representing the frequency in kilocycles corresponding to the trimmer adjustments as shown in Fig. 3.

N O T E S:

Always peak the oscillator circuit first and recheck after the antenna circuit is adjusted.

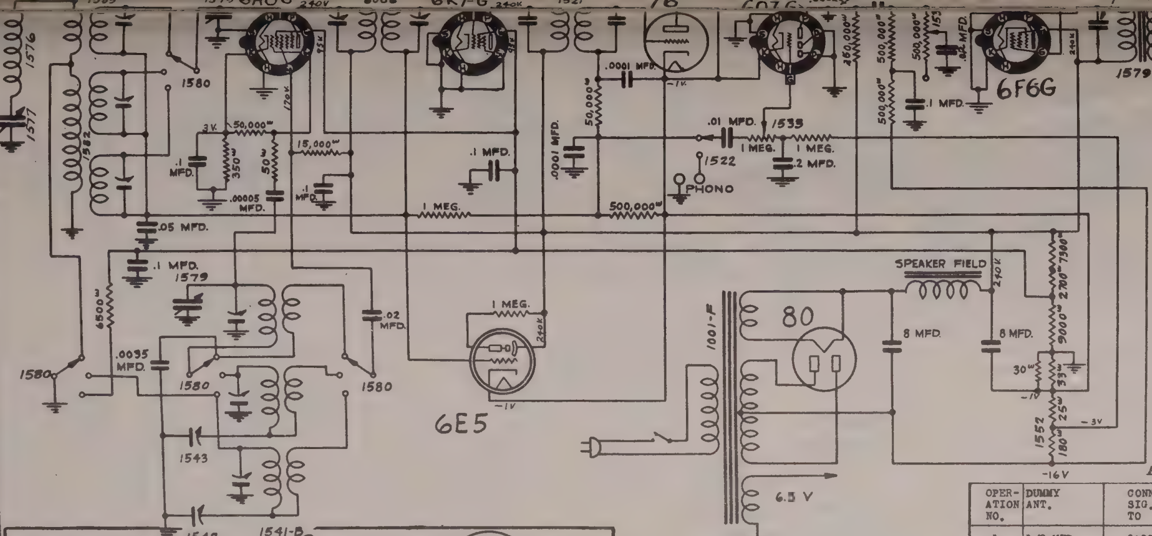
Be certain the alignment is not made at an image frequency.

Seal trimmers after final adjustment.

The normal voltages are shown on the schematic circuit taken from the various points to ground.

ULTRAMAR MFG. CORP.

MODELS 366,376
Schematic,Voltage,Socket
Alignment,Trimmers



M O D E L 3 6 6

BAND		FREQUENCY COVERAGE.
A	- SHORT WAVE	- 13.6-52 METERS.
B	- MEDIUM WAVE	- 1730-6000 K. C.
C	- BROADCAST	- 527-1750 K. C.

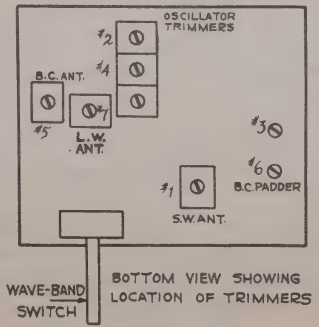
M O D E L 3 7 6

		FREQUENCY COVERAGE.
A	- SHORT WAVE	- 13.6-52 METERS.
B	- BROADCAST	- 527-1750 K. C.
C	- LONG WAVE	- 800-2000 METERS.

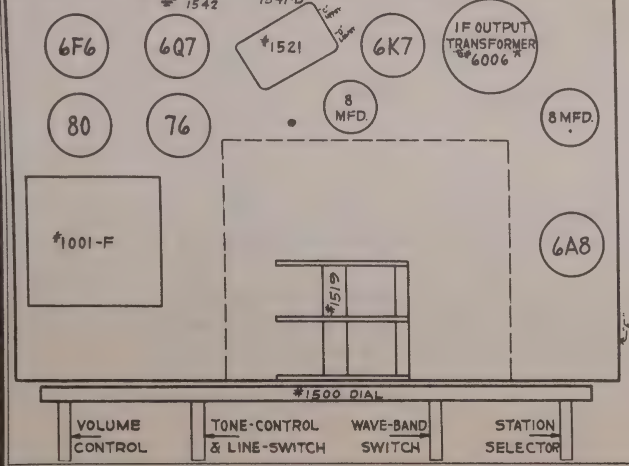
T U B E S Y M B O L S

H - HEATER
K - CATHODE
S - SHELL OF TUBE
D - DIODE PLATE
P - PLATE
G - SIGNAL GRID
GS - SCREEN GRID
SU - SUPPRESSOR GRID
GO - OSCILLATOR GRID
GA - OSCILLATOR ANODE
T - TARGET

IF PEAK 465 KC



BOTTOM VIEW SHOWING LOCATION OF TRIMMERS



ALIGNMENT PROCEDURE

OPER-ATION NO.	DUMMY ANT.	CONNECT SIG.GEN. TO	SET SIG. GEN.DIAL AT	SET RADIO DIAL AT	WAVE BAND	ADJUST TRIMMERS
1	1/2 MFD	6A8G GRID	465 KC 645 M	1000 KC 300 M	C	A-B-C-D (I.F.)
2	.00025 MFD	RED WIRE	465 KC 645 M	600 KC 500 M	C	E*
3	400 OHM	RED WIRE	18 M	18 M	A	1●

MODEL 366 ONLY

4	400 OHM	RED WIRE	5 MC 60 M	5 MC 60 M	B	2
5	400 OHM	RED WIRE	2 MC 150 M	2 MC 150 M	B	3●
6	400 OHM	RED WIRE	REPEAT OPERATION FOUR			
7	.00025 MFD	RED WIRE	1500 KC 200 M	1500 KC 200 M	C	4-5
8	.00025 MFD	RED WIRE	600 KC 500 M	600 KC 500 M	C	6●
9	.00025 MFD	RED WIRE	REPEAT OPERATION SEVEN			

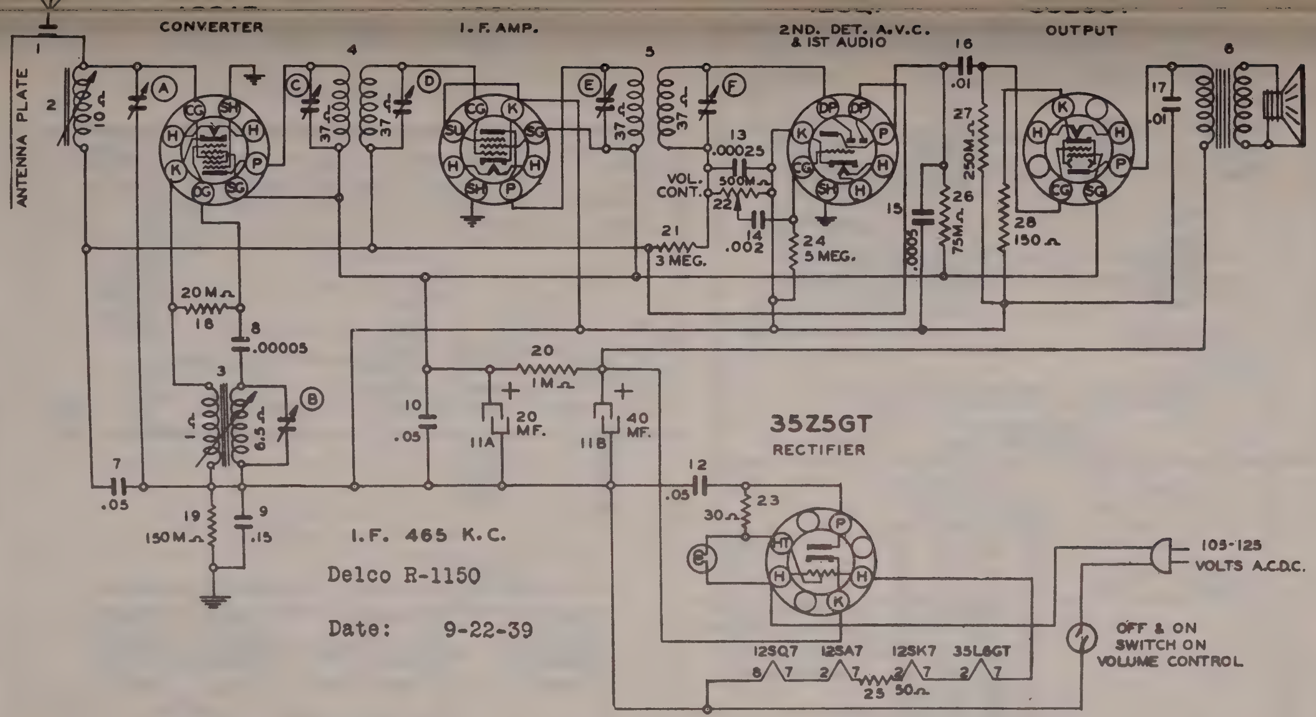
MODEL 376 ONLY

4	400 OHM	RED WIRE	1500 KC 200 M	1500 KC 200 M	B	2-5
5	400 OHM	RED WIRE	600 KC 500 M	600 KC 500 M	B	6●
6	400 OHM	RED WIRE	REPEAT OPERATION FOUR			
7	.00025 MFD	RED WIRE	900 M	900 M	C	4-7
8	.00025 MFD	RED WIRE	1800 M	1800 M	C	3●
9	.00025 MFD	RED WIRE	REPEAT OPERATION SEVEN			

*WAVE TRAP ADJ. FOR LOWEST OUTPUT ●ROCK VARIABLE CONDENSER

UNITED MOTORS SERVICE INC.

MODEL R1150
Schematic



I.F. 465 K.C.

Delco R-1150

Date: 9-22-39

GENERAL: The Delco Model R-1150 is a five tube table model AC-DC Superheterodyne receiver with permeability tuning and a 4" P.M. speaker.

ANTENNA: A capacity type plate antenna is used on this radio, which also serves as the back cover plate for the radio. For reception of local or powerful nearby stations no other antenna is usually required. This antenna is not directional, however, noise or weak reception will result if the back of the radio is placed against metal objects. A clip is provided for capacitively coupling an outside antenna to the receiver.

MODEL R1150
Voltage,Socket
Chassis,Trimmers

UNITED MOTORS SERVICE INC.

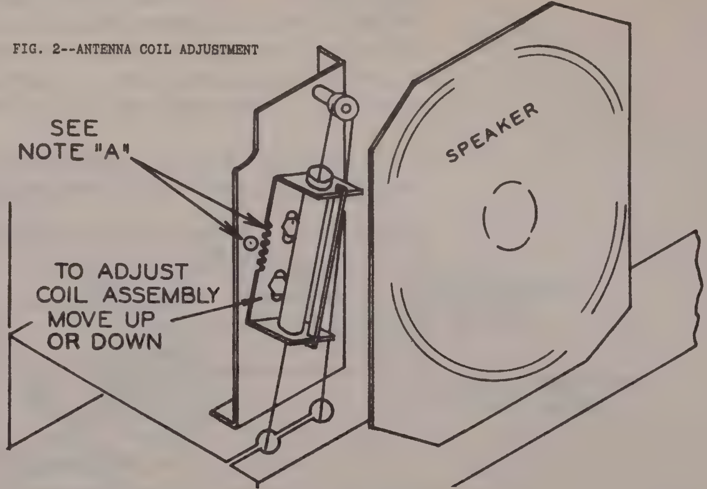
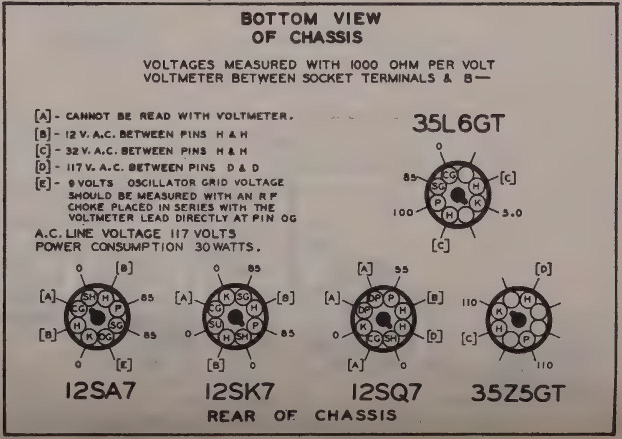


FIG. 2--ANTENNA COIL ADJUSTMENT



BOTTOM VIEW
OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & B—

[A] - CANNOT BE READ WITH VOLTMETER.
[B] - 12 V. A.C. BETWEEN PINS H & H
[C] - 32 V. A.C. BETWEEN PINS H & H
[D] - 117 V. A.C. BETWEEN PINS D & D
[E] - 9 VOLTS OSCILLATOR GRID VOLTAGE SHOULD BE MEASURED WITH AN R F CHOKE PLACED IN SERIES WITH THE VOLTMETER LEAD DIRECTLY AT PIN OG

A.C. LINE VOLTAGE 117 VOLTS
POWER CONSUMPTION 30 WATTS.

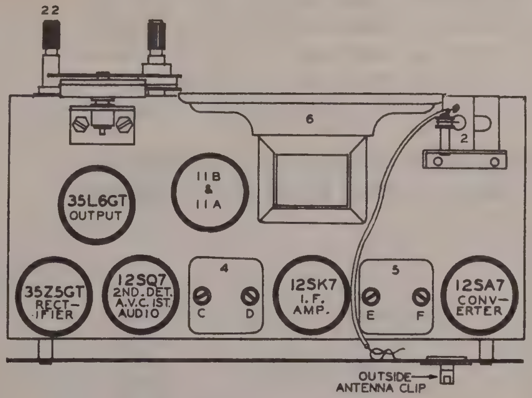


FIG. 4--PARTS LAYOUT--Top View

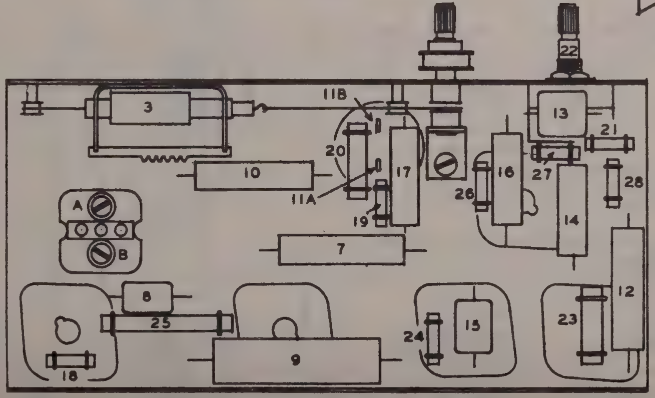


FIG. 5--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE INC.

MODEL R1150
Alignment
MODELS R1151,R1152
Voltage,Chassis
Socket,Trimmers

CIRCUIT ALIGNMENT MODEL R1150

If realignment is found necessary, the circuits can be properly adjusted only by using a calibrated test oscillator or a signal generator and an output meter. The chassis should be removed from the cabinet for alignment.

1. Aligning I-F Stages at 465 Kilocycles

   (a) Connect the ground lead of the signal generator to B-.

   (b) Connect the signal lead of the signal generator to the antenna plate of the receiver through a .1 mfd. condenser.

   (c) Connect the output meter from plate to screen grid of the 35L6GT output tube.

   (d) Adjust the trimmers on the 2nd I-F coil and then the 1st I-F coil (Illus. C-D-E-F, Fig. 4) for maximum output.

2. Aligning at 1720 Kilocycles

   (a) Leave the signal generator leads connected as before.

   (b) Rotate the tuning control knob to the high frequency end of the dial. (Iron cores should extend 1 9/32" from edge of windings.)

   (c) Set the signal generator to exactly 1720 K.C.

   (d) Adjust the oscillator trimmer (Illus. B, Fig. 5) for maximum output.

   (e) Disconnect the signal lead of the signal generator from the back plate and connect to the antenna terminal of the receiver through a .0002 mfd. condenser.

   (f) Adjust the antenna trimmer (Illus. A, Fig. 5) for maximum output.

3. Aligning at 1400 Kilocycles

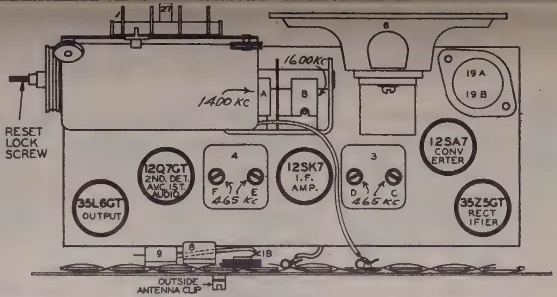
   (a) Set the signal generator to 1400 K.C.

   (b) Rotate the tuning control knob until this signal is tuned in with maximum output.

   (c) Adjust the position of the antenna coil (Fig. 2) until maximum output is obtained.

NOTE: (A.) To adjust the position of the antenna or oscillator coils, insert one edge of the blade of a screwdriver in the hole in the chassis plate and engage the blade in the gear teeth of the coil form (Fig. 2).

   (d) Repeat the adjustment of the antenna trimmer at 1720 K.C. and the antenna coil at 1400 K.C. until no further increase in output can be obtained.



CONVENTIONAL ALIGNMENT FIG. 3--PARTS LAYOUT--Top View
SEE SPECIAL SECTION VOL.VIII

MODELS R1151,R1152

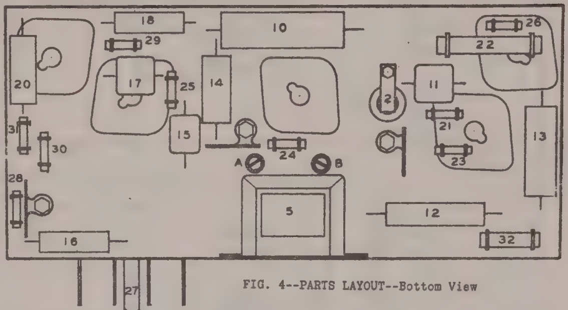
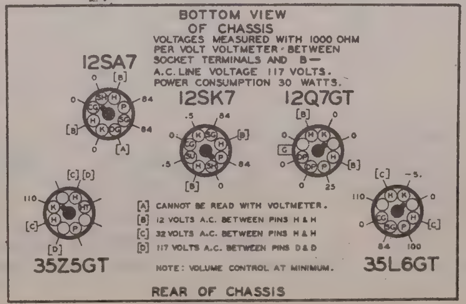
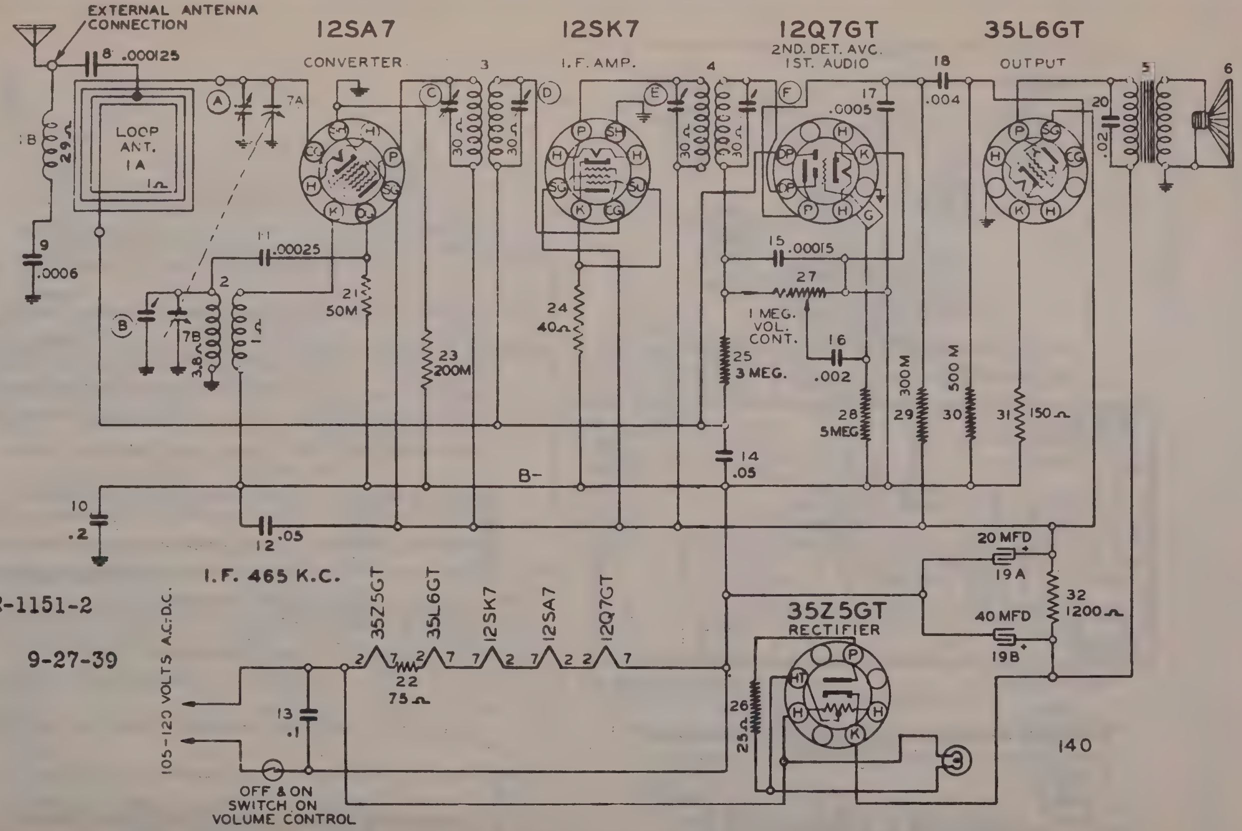


FIG. 4--PARTS LAYOUT--Bottom View


BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—
A.C. LINE VOLTAGE 117 VOLTS.
POWER CONSUMPTION 30 WATTS.
12SA7
12SK7
12Q7GT
35Z5GT
35L6GT
[A] CANNOT BE READ WITH VOLTMETER.
[B] 12 VOLTS A.C. BETWEEN PINS H & H
[C] 32 VOLTS A.C. BETWEEN PINS H & H
[D] 117 VOLTS A.C. BETWEEN PINS D & D
NOTE: VOLUME CONTROL AT MINIMUM.
REAR OF CHASSIS
84
.5
25
110
100
-5.

MODELS R1151,1152
Schematic

UNITED MOTORS SERVICE INC.



Delco R-1151-2

Date: 9-27-39

GENERAL: The Delco Models R-1151 and R-1152 are five-tube, AC-DC superheterodyne receivers with mechanical push-button tuning and 5" P.M. speakers.

ANTENNA: A loop antenna is built inside the back cover of these radios. This type of antenna is somewhat directional, therefore, the radio should be tried in different positions to determine the position which will produce the best reception.

MODEL R1153
Schematic

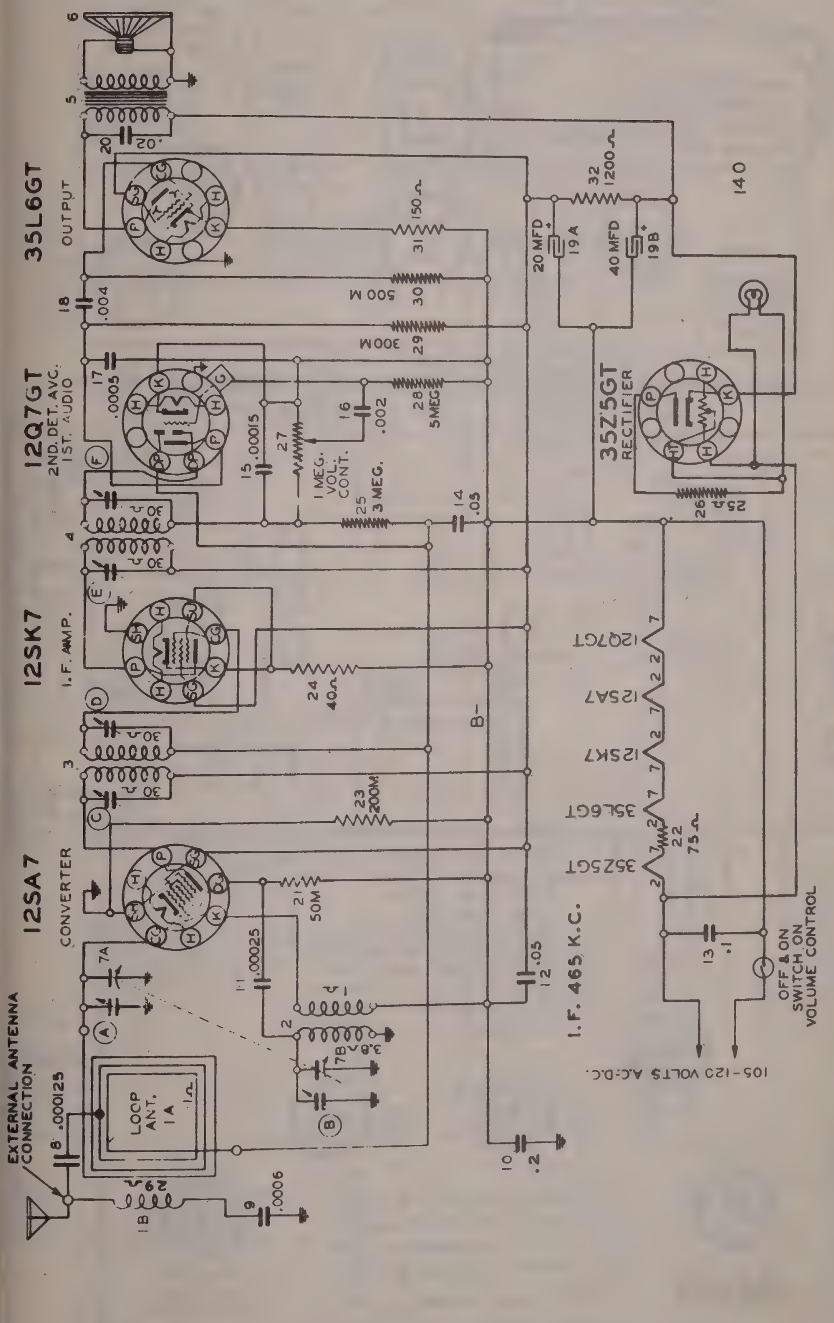


Fig. 2--DELCO MODEL R-1153 CIRCUIT DIAGRAM

Delco R-1153

Date: 9-27-39

MODEL R1153
Voltage,Chassis
Socket,Trimmers
Alignment

UNITED MOTORS SERVICE INC.

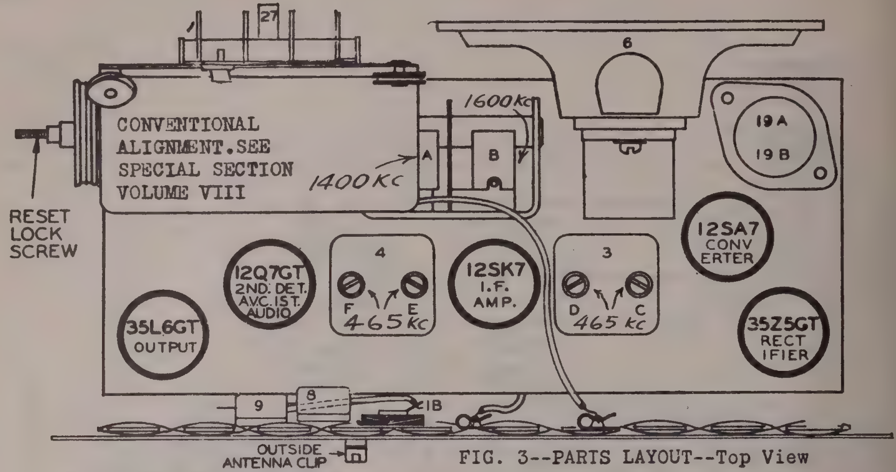


FIG. 3--PARTS LAYOUT--Top View

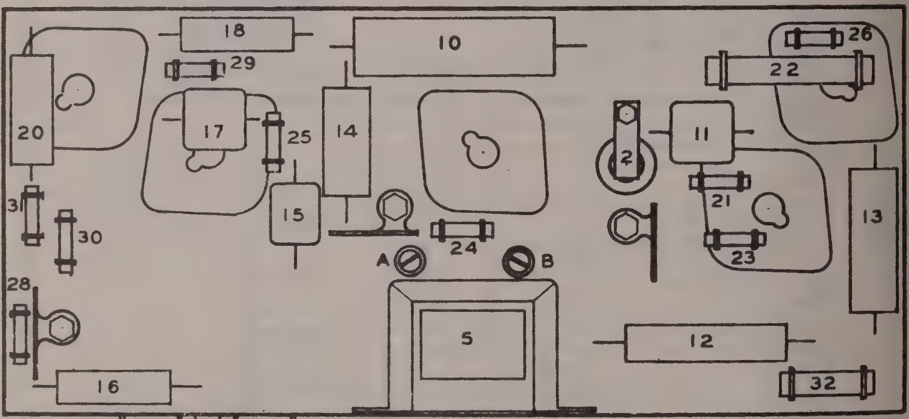
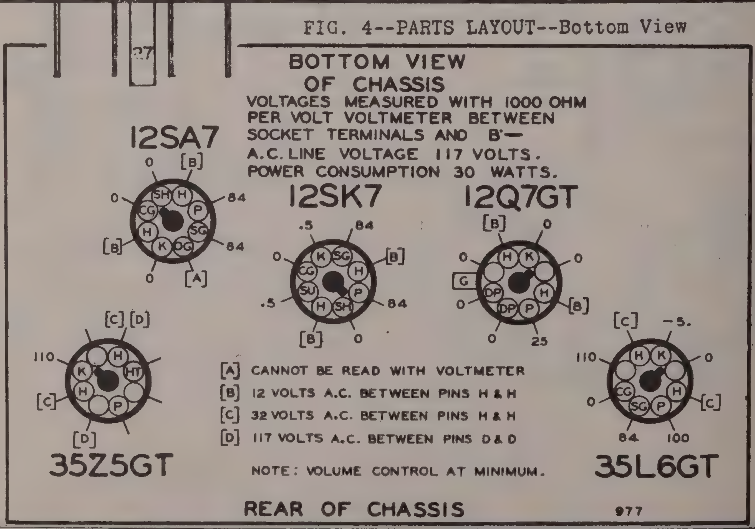


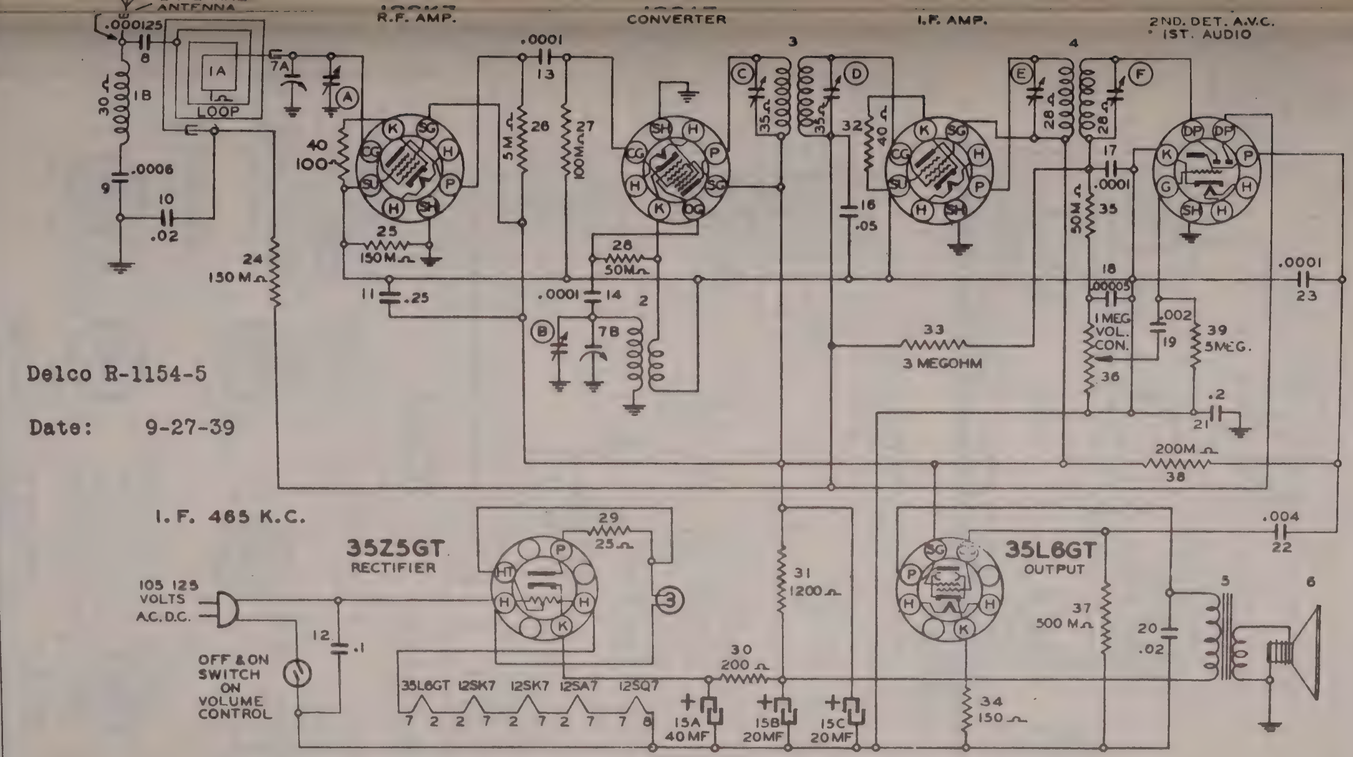
FIG. 4--PARTS LAYOUT--Bottom View


27
BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—
A.C. LINE VOLTAGE 117 VOLTS.
POWER CONSUMPTION 30 WATTS.
12SA7
0
[B]
0
84
84
[B]
0
[A]
SH
H
P
SG
OG
K
H
CG
12SK7
.5
84
0
[B]
84
.5
[B]
0
K
SG
H
P
SH
H
SU
CG
12Q7GT
[B]
0
0
0
G
0
[B]
0
25
H
K
H
P
DP
DP
[C]
[D]
110
[C]
[D]
H
HT
K
H
P
35Z5GT
[A] CANNOT BE READ WITH VOLTMETER
[B] 12 VOLTS A.C. BETWEEN PINS H & H
[C] 32 VOLTS A.C. BETWEEN PINS H & H
[D] 117 VOLTS A.C. BETWEEN PINS D & D
NOTE: VOLUME CONTROL AT MINIMUM.
[C]
-5.
110
0
0
[C]
84
100
H
K
H
P
SG
CG
35L6GT
REAR OF CHASSIS
977

CONVENTION
ALIGNMENT
SPEC. SECT
VOLUME VII

UNITED MOTORS SERVICE INC.

MODELS R1154,R1155
Schematic



Delco R-1154-5

Date: 9-27-39

I. F. 465 K.C.

GENERAL: The Delco Models R-1154 and R-1155 are six-tube table models, AC-DC superheterodyne receivers with mechanical push-button tuning built-in loop antennas, and 5" P.M. speakers.

ANTENNA: A loop antenna is built inside the back cover of these radios. This type of antenna is somewhat directional, therefore, the radio should be tried in different positions to determine the position which will produce the best reception.

MODELS R1154,R1155
Voltage,Chassis
Socket,Trimmers
Alignment

UNITED MOTORS SERVICE INC.

CONVENTIONAL
ALIGNMENT.SE
SPECIAL SECT
VOLUME VIII

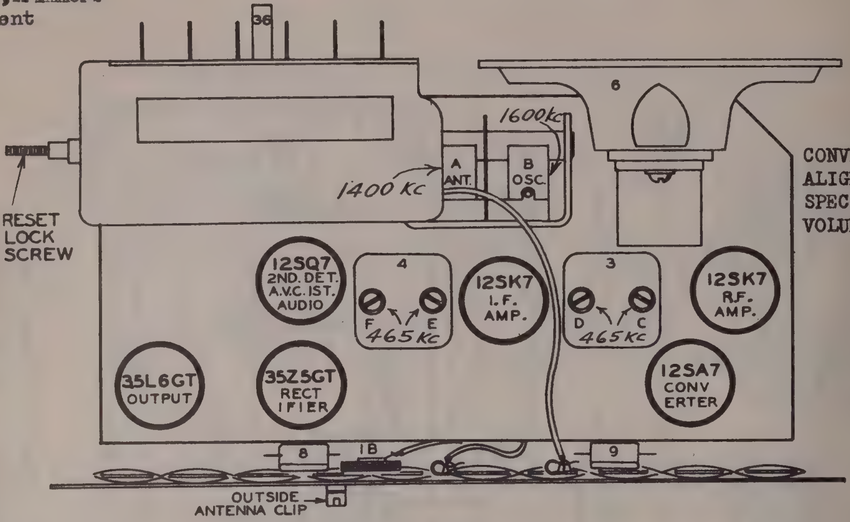


FIG. 3--PARTS LAYOUT--Top View

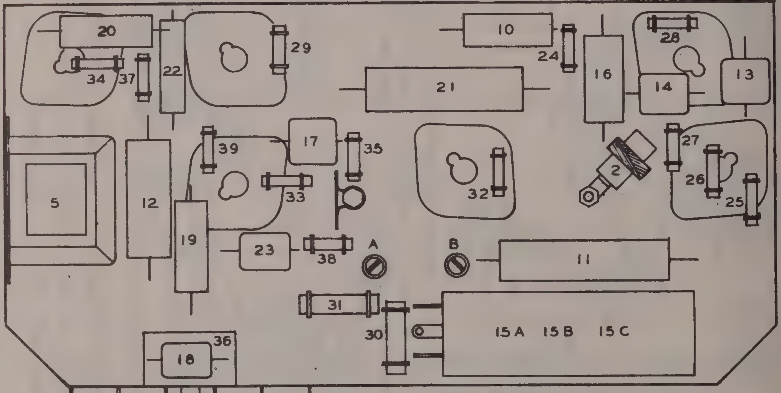
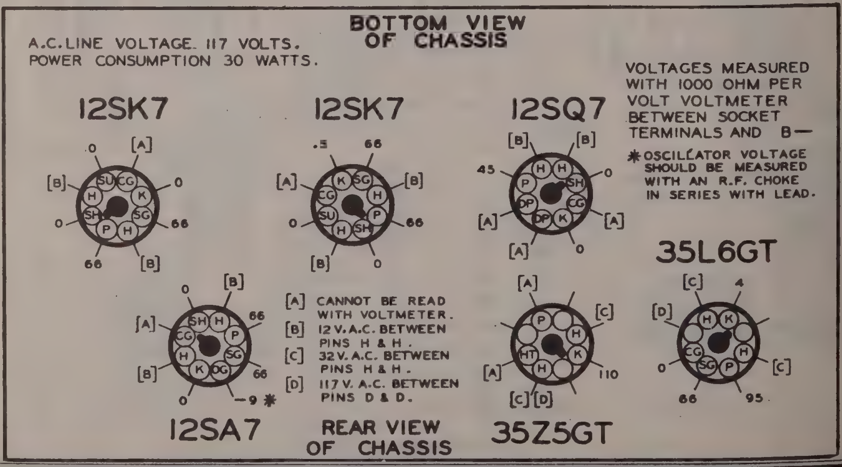


FIG. 4--PARTS LAYOUT--Bottom View



A.C. LINE VOLTAGE 117 VOLTS.
POWER CONSUMPTION 30 WATTS.

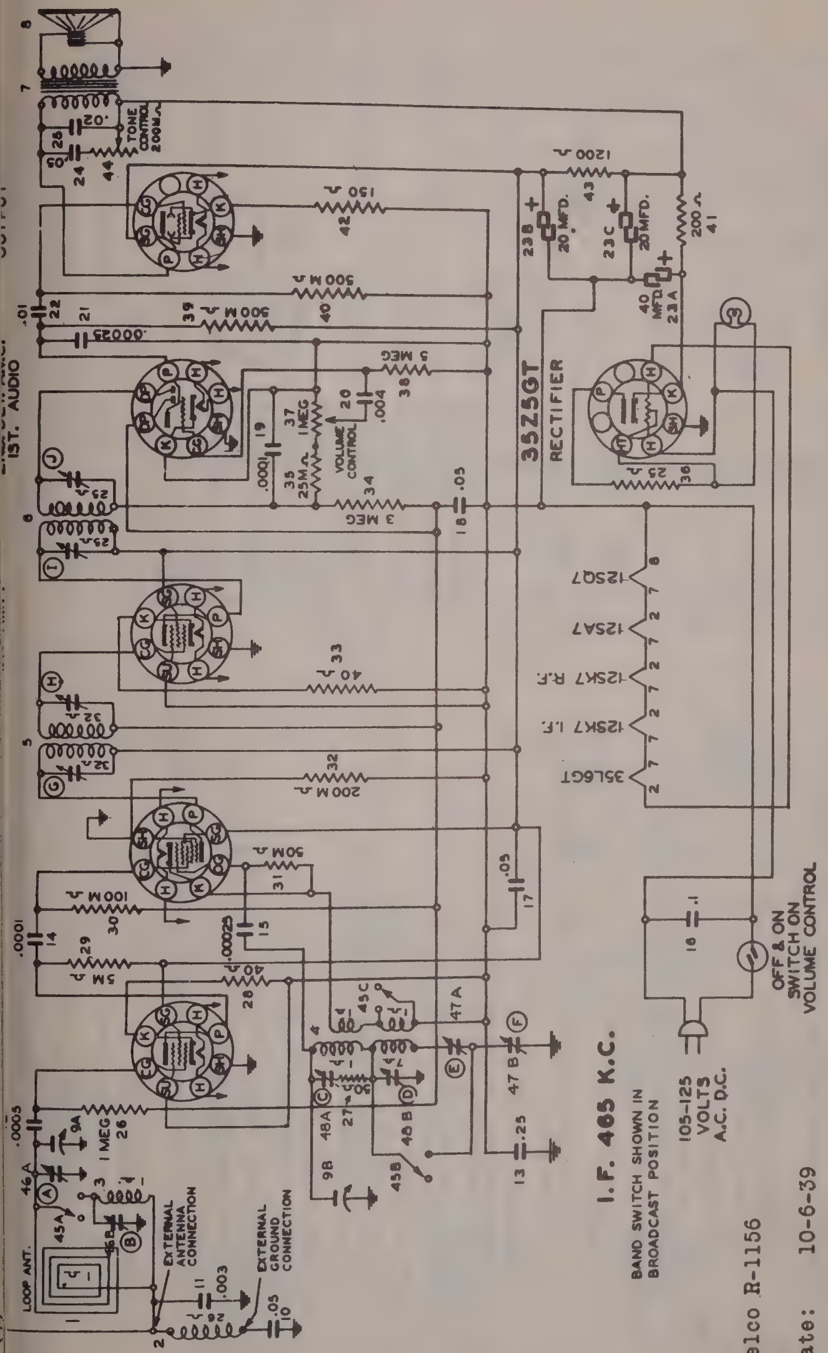
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

* OSCILLATOR VOLTAGE SHOULD BE MEASURED WITH AN R.F. CHOKE IN SERIES WITH LEAD.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 12 V.A.C. BETWEEN PINS H & H.
[C] 32 V.A.C. BETWEEN PINS H & H.
[D] 117 V. A.C. BETWEEN PINS D & D.

UNITED MOTORS SERVICE INC.

MODEL R1156
Schematic



I.F. 465 K.C.

BAND SWITCH SHOWN IN BROADCAST POSITION

105-125 VOLTS A.C. D.C.

Delco R-1156

Date: 10-6-39

MODEL R1156
Alignment
Trimmers

UNITED MOTORS SERVICE INC.

1. Aligning I-F Stages at 465 Kilocycles

   (a) Connect the ground lead of the signal generator to the B- terminal of the receiver. (Pin #6, 35L6GT tube)

   (b) Connect the signal lead of the signal generator to the grid of the 12SK7 I-F tube through a 1. mfd. condenser.

   (c) Connect the output meter across the primary of the output transformer.

   (d) Leave the loop connected to the radio and held in back of the chassis in the same position and distance from the chassis as when both units are mounted in the cabinet.

   (e) Set the signal generator to exactly 465 K.C.

   (f) With the band switch in the Broadcast position, the volume control on full and the rotor plates of the condenser gang completely out of mesh, adjust the trimmers on the second I-F coil (Illus. I & J, Fig. 3) for maximum output.

   (g) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.

   (h) Adjust the trimmers on the first IF coil (Illus. G & H, Fig. 3) for maximum output.

2. Aligning at 4050 Killocycles

   (a) Connect the signal lead of the signal generator to the antenna clip of the receiver through a .002 mfd. condenser.

   (b) Connect the ground lead of the signal generator to the ground clip of the receiver.

   (c) Set the signal generator to exactly 4050 K.C.

   (d) With the band switch in the short wave position and the rotor plates of the condenser gang completely out of mesh, adjust the short wave oscillator trimmer (Illus. C, Fig. 5) for maximum output.

3. Aligning at 3500 Kilocycles

   (a) Leave the signal generator connected the same as before.

   (b) Set the signal generator to 2500 K.C.

   (c) Rotate the shaft of the tuning condenser gang until this signal is tuned in with maximum output.

   (d) Adjust the short wave antenna trimmer (Illus. B, Fig. 5) for maximum output.

4. Aligning at 1650 Kilocycles

   (a) Set the signal generator to 1650 K.C.

   (b) Rotate the shaft of the tuning condenser gang until this signal is tuned in with maximum output.

   (c) Adjust the short wave oscillator series pad (Illus. F, Fig. 5) while rocking the rotor plates of the condenser gang back and forth through the signal until maximum output is obtained.

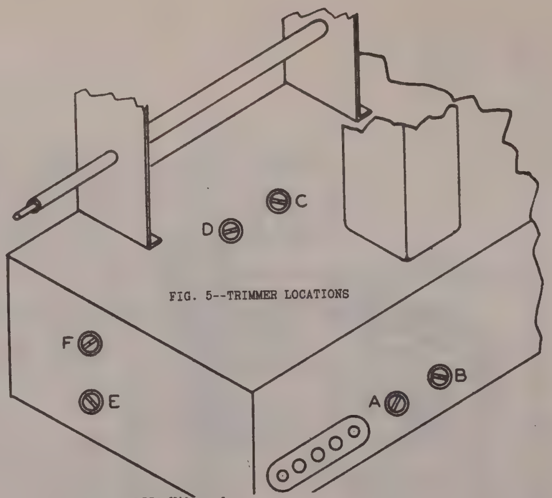


FIG. 5--TRIMMER LOCATIONS

5. Aligning at 1550 Kilocycles

   (a) Change the band switch to Broadcast position.

   (b) Set the signal generator to exactly 1550 K.C.

   (c) With the rotor plates of the condenser gang completely out of mesh, adjust the broadcast oscillator trimmer (Illus. D, Fig. 5) for maximum output.

6. Aligning at 1400 Kilocycles

   (a) Set the signal generator to 1400 K.C.

   (b) Rotate the rotor plates of the condenser gang until this signal is tuned in with maximum output.

   (c) Adjust the Broadcast antenna trimmer (Illus. A, Fig. 5) for maximum output.

7. Aligning at 600 Kilocycles

   (a) Set the signal generator to 600 K.C.

   (b) Rotate the rotor plates of the condenser gang until this signal is tuned in with maximum output.

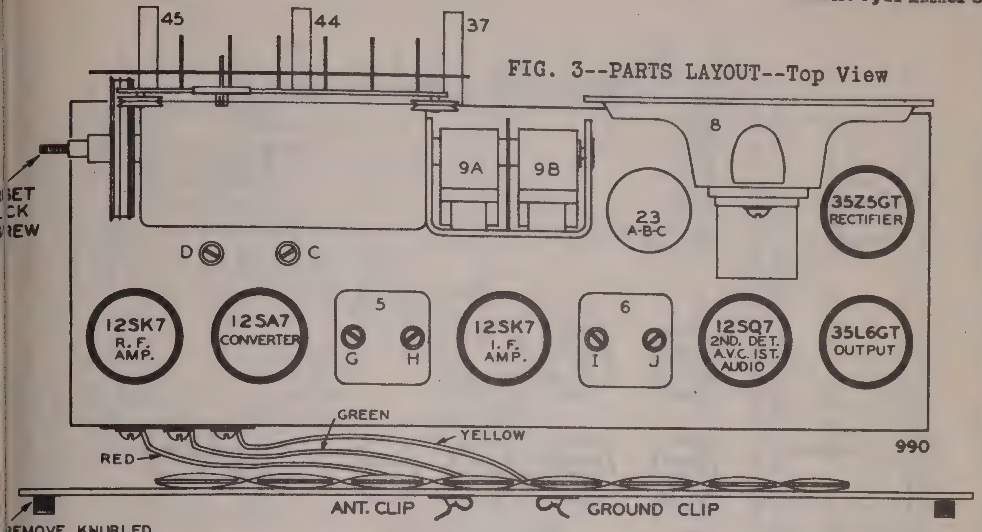
   (c) Adjust the Broadcast oscillator series pad (Illus. E, Fig. 5) while rocking the rotor plates of the condenser gang back and forth through the signal until maximum output is obtained.

NOTE: After each band is completed, repeat the procedure as a final check.

UNITED MOTORS SERVICE INC.

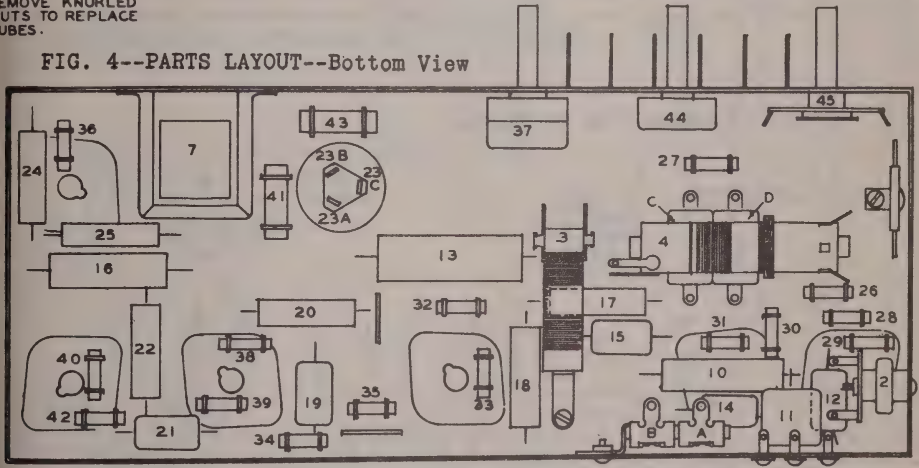
MODEL R1156
Voltage,Chassis
Socket,Trimmers

FIG. 3--PARTS LAYOUT--Top View



REMOVE KNURLED NUTS TO REPLACE TUBES.

FIG. 4--PARTS LAYOUT--Bottom View



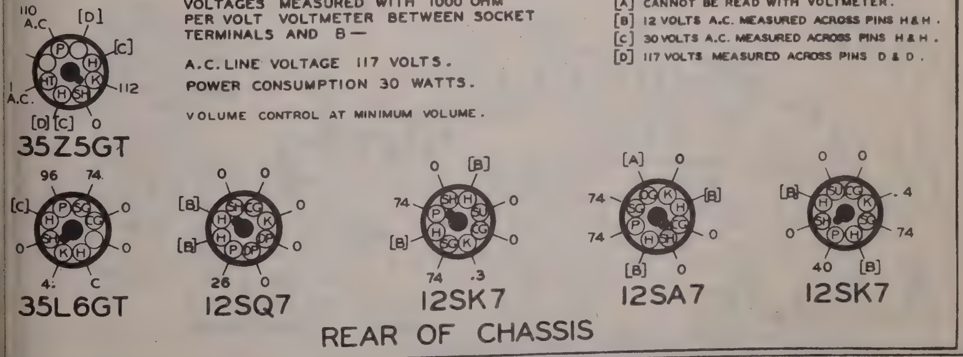
BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

A.C. LINE VOLTAGE 117 VOLTS.
POWER CONSUMPTION 30 WATTS.

VOLUME CONTROL AT MINIMUM VOLUME.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 12 VOLTS A.C. MEASURED ACROSS PINS H & H.
[C] 30 VOLTS A.C. MEASURED ACROSS PINS H & H.
[D] 117 VOLTS MEASURED ACROSS PINS D & D.



MODEL R1160
Chassis,Socket
Trimmers

UNITED MOTORS SERVICE INC.

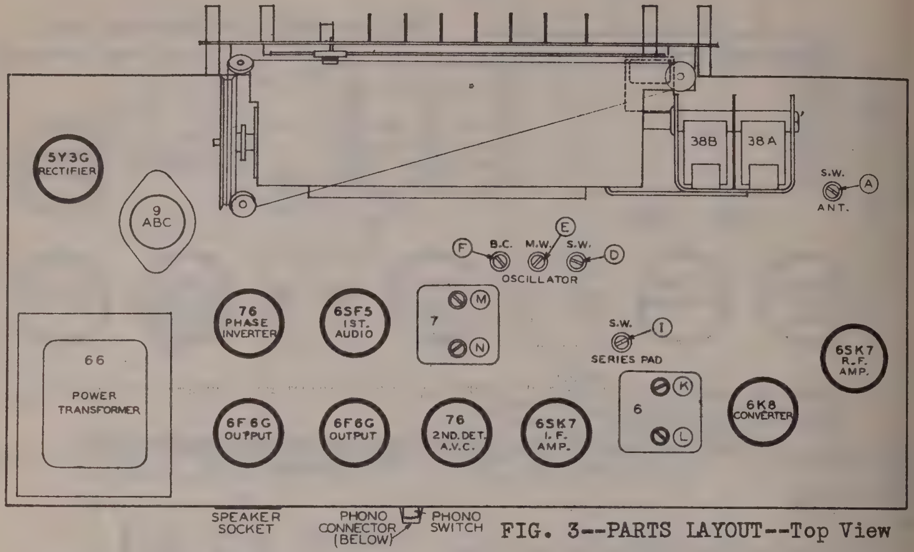
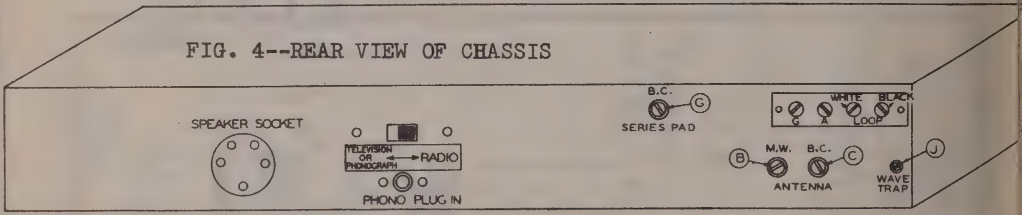


FIG. 3--PARTS LAYOUT--Top View

FIG. 4--REAR VIEW OF CHASSIS



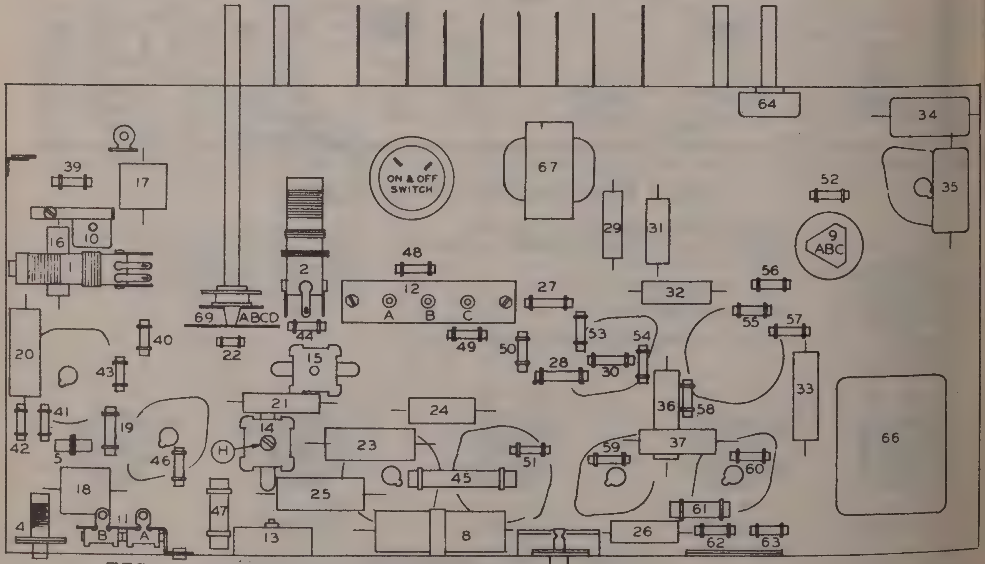


FIG. 5--PARTS LAYOUT--Bottom View

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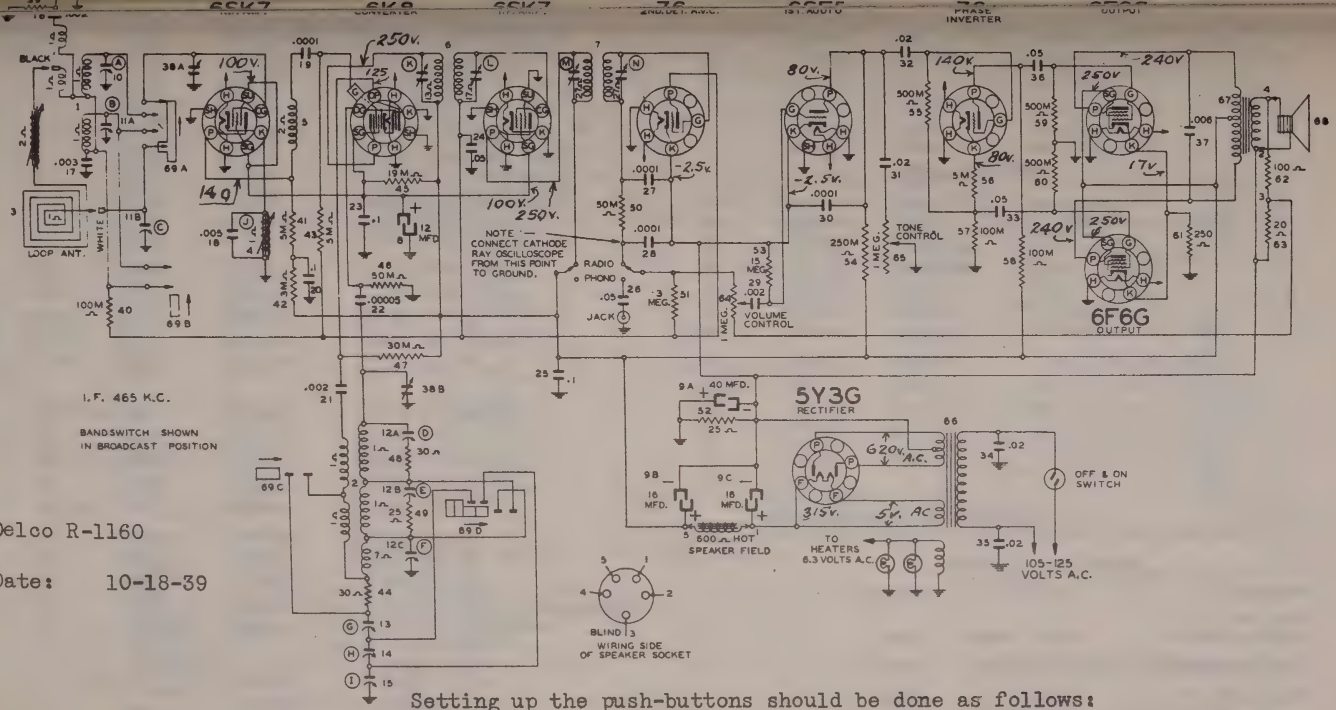
UNITED MOTORS SERVICE INC.

MODEL R1160
Schematic ,Voltage
Tuner



I.F. 465 K.C.

BANDSWITCH SHOWN IN BROADCAST POSITION

Delco R-1160

Date: 10-18-39

Setting up the push-buttons should be done as follows:

1. Pull the "reset" knob all the way out and rotate counter-clockwise until it cannot be turned any further, releasing the cams.

2. Push in on the button to be set and the manual tuning knob so that both stay latched in.

3. With knob and button held in, tune in the desired station carefully. Repeat with other buttons.

4. Pull out reset knob and turn clockwise to lock cams firmly.

UNITED MOTORS SERVICE INC.

DUMMY ANTEN	SIG.GEN. CONNECT.	SIG.GEN. FREQ.	BAND SW. POSIT.	RECE'VER DIAL SET.	TRIMMER	TRIMMER DESCRIP.	ADJUST AT
0.1 mf	6K8 Cont. grid	465 kc	B.C.		K,L,M,N	I-F.	Max.
.0002 mf	Term."A"	17 mc	S.W.	17 mc	D A	S-W Osc. S-W Ant.	Max. Max.
"	"	6 mc	"	6 mc	I	S-W Osc.Pad.	Max.
"	"	1550 kc	B.C.	Note 1	F	B-C Osc.	Max.
"	"	1500 kc	"	1500 kc	C	B-C Ant.	Max.
"	"	600 kc	"	600 kc	G	B-C Osc.Pad.	Max.
"	"	465 kc	"		J	I-F Wavetrap	MIN.
"	"	3.5 mc	Mid.Wave	3.5 mc	E B	Mid.Wave Osc. " " Ant.	Max. Max.
"	"	1550 kc	"	1550 kc	H	" " Ser.Pad.	Max.

Recheck middle wave adjustment at 3.5 mc
Recheck B-C band alignment

Note 1. Rotate tuning condenser to bring rotor plates of gang all the way out of mesh and against the high-frequency stop.

CHASSIS ELECTRICAL PARTS

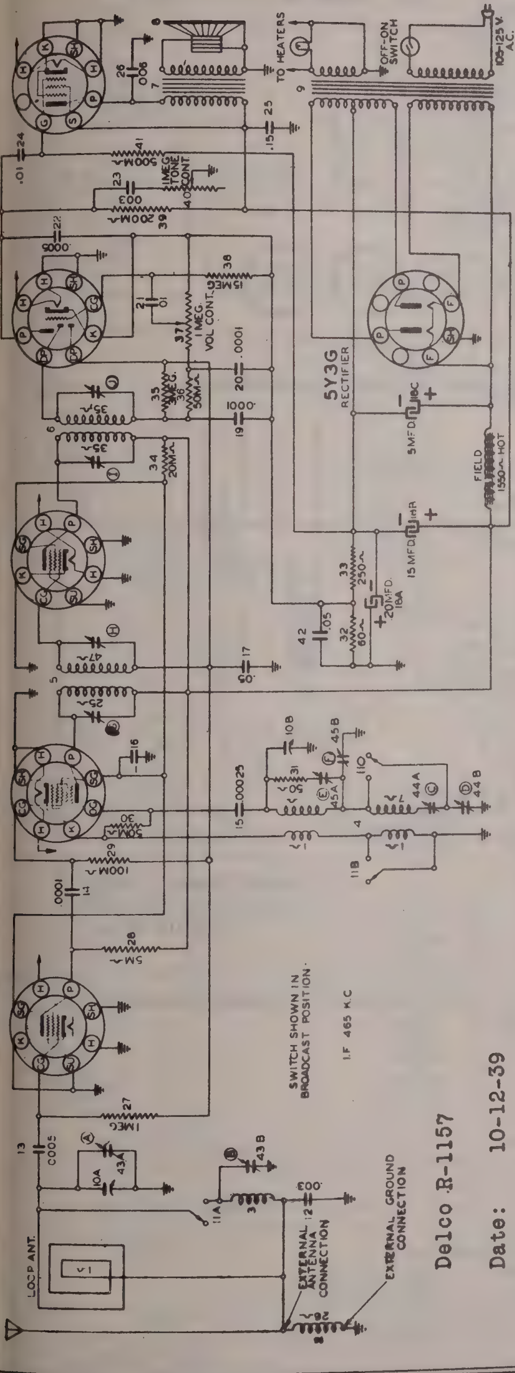
Illus. No.	Part No.	Part Name	Description
1	1214203	Coil	S.W., M.W. Antenna
2	1214234	Coil	S.W., M.W., B.C. Oscillator
3	1214204	Antenna	Loop
4	1214235	Coil	I-F Wave Trap
5	1214205	Coil	R-F
6	1214236	Coil Assy.	1st I-F
7	1214206	Coil Assy.	2nd I-F
8	1213013	Condenser	Electrolytic 12 mfd. 300 V.
9	1214207	Condenser	Electrolytic
		Section A	40 mfd. 25 V.
		Section B	16 mfd. 400 V.
		Section C	16 mfd. 450 V.
10	1214237	Condenser	Trimmer S.W. Antenna
11	1214208	Condenser	Trimmer M.W., B.C. Antenna
12	1214238	Condenser	Trimmer S.W., M.W., B.C. Oscillator
13	1214209	Condenser	Trimmer B.C. Pad
14	1214211	Condenser	Trimmer M.W. Pad
15	1214210	Condenser	Trimmer S.W. Pad
16	1209148	Condenser	Tubular .002 mfd. 800 V.
17	1210859	Condenser	Molded .003 mfd.
18	1213290	Condenser	Molded .005 mfd.
19	1210275	Condenser	Molded .0001 mfd.
20	1207908	Condenser	Tubular .1 mfd. 400 V.
21	1209148	Condenser	Tubular .002 mfd. 800 V.
22	1207625	Condenser	Molded .00005 mfd.
23	1207908	Condenser	Tubular .1 mfd. 400 V.
24	7230592	Condenser	Tubular .05 mfd. 600 V.
25	1207908	Condenser	Tubular .1 mfd. 400 V.
26	7230592	Condenser	Tubular .05 mfd. 600 V.
27-28	1210275	Condenser	Molded .0001 mfd.
29	1209148	Condenser	Tubular .002 mfd. 800 V.
30	1210275	Condenser	Molded .0001 mfd.
31-32	1212099	Condenser	Tubular .02 mfd. 600 V.
33	7230592	Condenser	Tubular .05 mfd. 600 V.
34-35	1212281	Condenser	Molded .02 mfd. 600 V.
36	7230592	Condenser	Tubular .05 mfd. 600 V.
37	7230593	Condenser	Tubular .006 mfd. 600 V.
38	1213986	Condenser	Variable 2 gang tuning
39	1210882	Resistor	Insulated 20,000 ohm 1/2 watt
4C	1209883	Resistor	Insulated 100,000 ohm 1/2 watt
41	1211066	Resistor	Insulated 5,000 ohm 1/2 watt
42	1210882	Resistor	Insulated 3,000 ohm 1/2 watt
43	1211066	Resistor	Insulated 5,000 ohm 1/2 watt
44	1213031	Resistor	Carbon 30 ohm 1/2 watt
45	7239157	Resistor	Insulated 18,000 ohm 2 watt
46	1210116	Resistor	Insulated 50,000 ohm 1/2 watt
47	1211102	Resistor	Insulated 30,000 ohm 1 watt
48-49	1213031	Resistor	Carbon 30 ohm 1/2 watt
50	1210116	Resistor	Insulated 50,000 ohm 1/2 watt
51	1211149	Resistor	Insulated 3 megohm 1/2 watt
52	1213031	Resistor	Insulated 30 ohm 1/2 watt
53	1213343	Resistor	Insulated 15 megohm 1/2 watt
54	1210117	Resistor	Insulated 250,000 ohm 1/2 watt
55	1210470	Resistor	Insulated 500,000 ohm 1/2 watt
56	1211066	Resistor	Insulated 5,000 ohm 1/2 watt
57-58	1209883	Resistor	Insulated 100,000 ohm 1/2 watt
59-60	1210470	Resistor	Insulated 500,000 ohm 1/2 watt
61	1211011	Resistor	Insulated 250 ohm 1 watt
62	1211000	Resistor	Insulated 100 ohm 1/2 watt
63	1213030	Resistor	Insulated 20 ohm 1/2 watt
64	1213540	Control	Volume - 1 megohm
65	1214212	Control	Tone - 1 megohm
66	1214239	Transformer	Power - 60 cycles
66	1214258	Transformer	Power - 25 cycles
67	1214240	Transformer	Output Speaker
68	1213871	Speaker	12" Dynamic (600 ohm field)
69	1214241	Switch	Band Change

TUNER ASSEMBLY PARTS

1214245	Diffuser	Dial Light
1212301	Button	Diffuser Snap
1214219	Pointer	Station Indicator
1213041	Carriage	Pointer
1212233	Cord	Dial String
1214123	Spring	Dial String Tension
1214220	Drum Assy.	Dial Pointer Drive
1214221	Stud	Drum and Gear

UNITED MOTORS SERVICE INC.

MODEL R1157
Schematic
Voltage



CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION OF

VOLUME VIII

BOTTOM VIEW OF CHASSIS

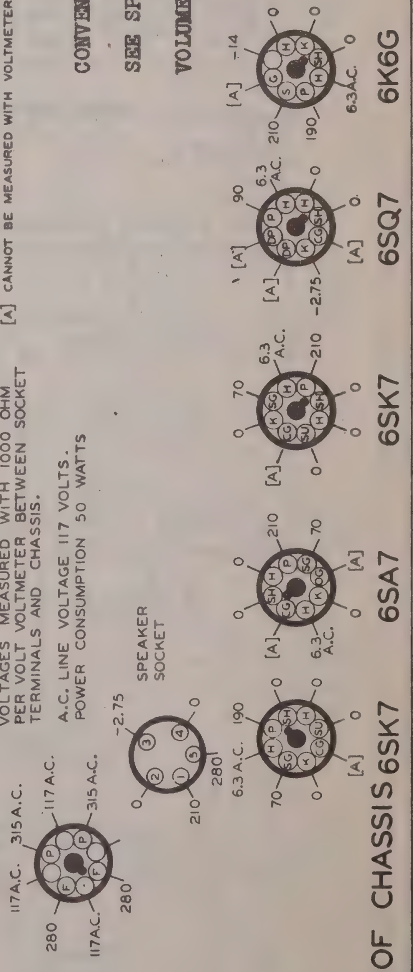
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

[A] CANNOT BE MEASURED WITH VOLTMETER

A.C. LINE VOLTAGE 117 VOLTS.
POWER CONSUMPTION 50 WATTS

Delco R-1157

Date: 10-12-39



REAR OF CHASSIS

MODEL R1157
Chassis,Socket
Alignment,Trimmers

UNITED MOTORS SERVICE INC.

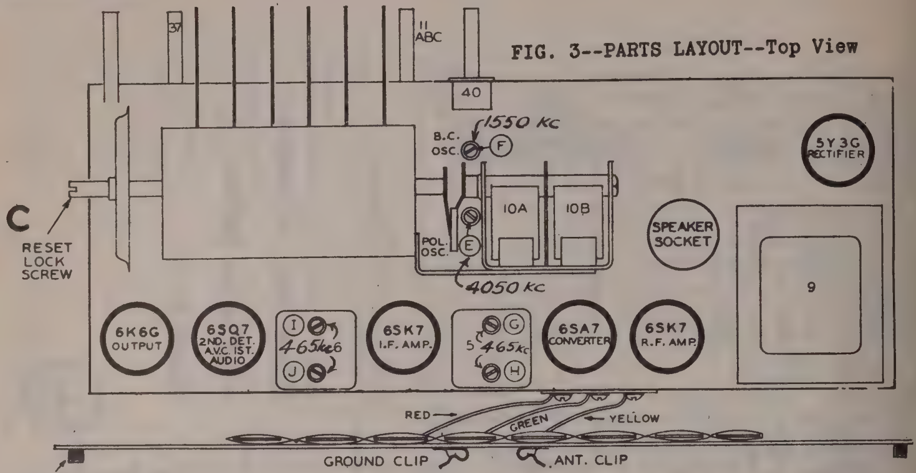
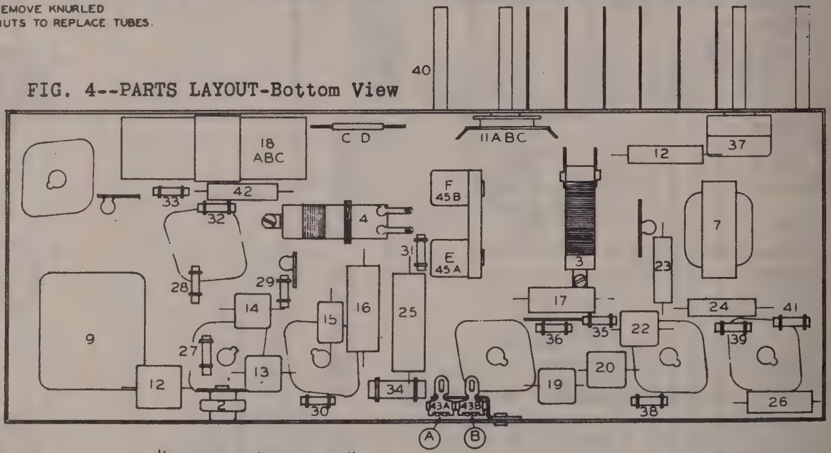
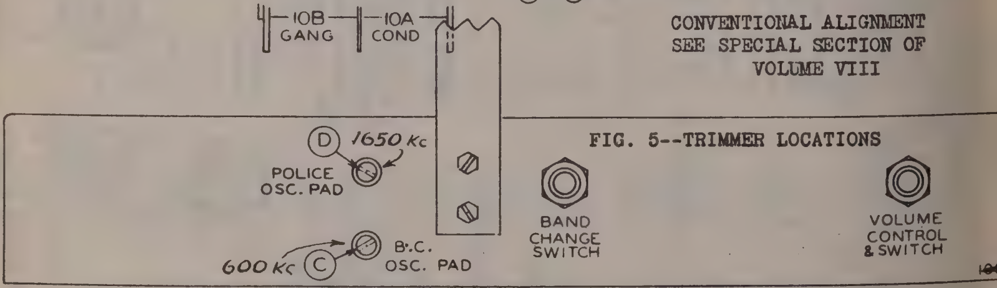


FIG. 3--PARTS LAYOUT--Top View

REMOVE KNURLED NUTS TO REPLACE TUBES.

FIG. 4--PARTS LAYOUT-Bottom View

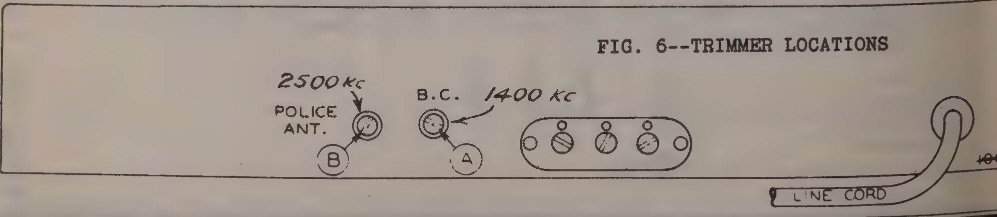




CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION OF
VOLUME VIII

FIG. 5--TRIMMER LOCATIONS

FIG. 6--TRIMMER LOCATIONS



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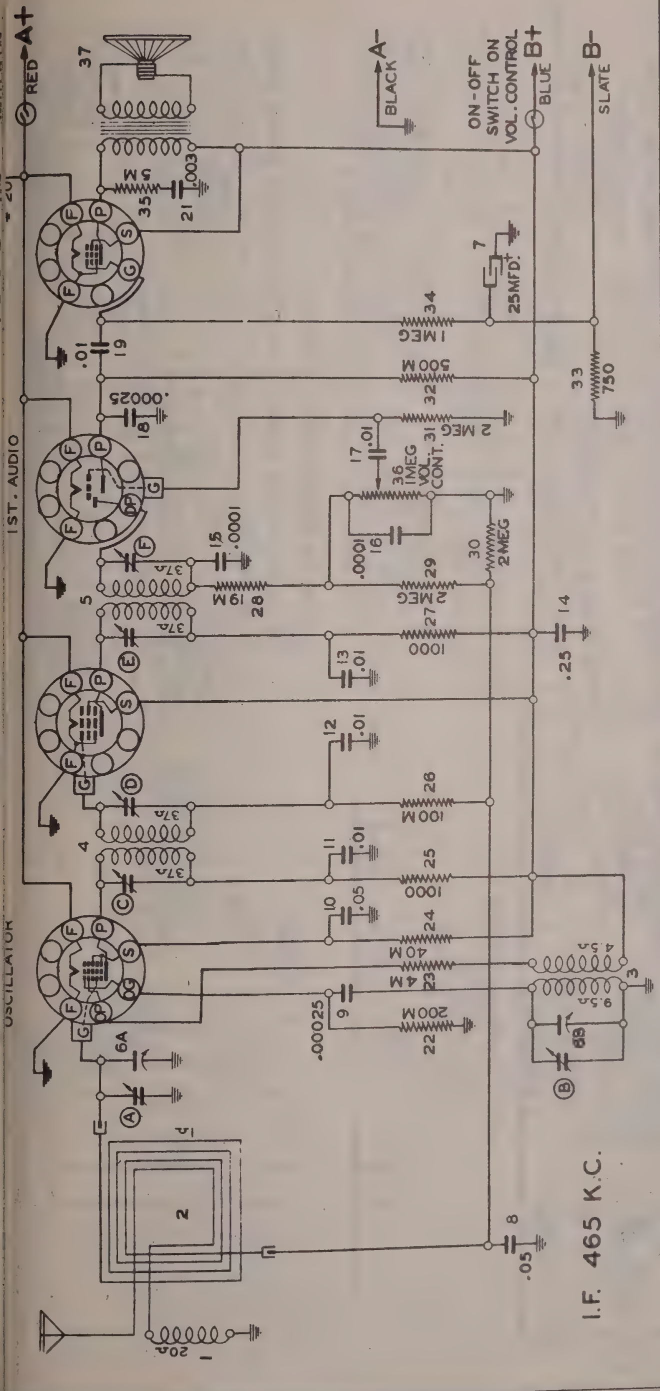
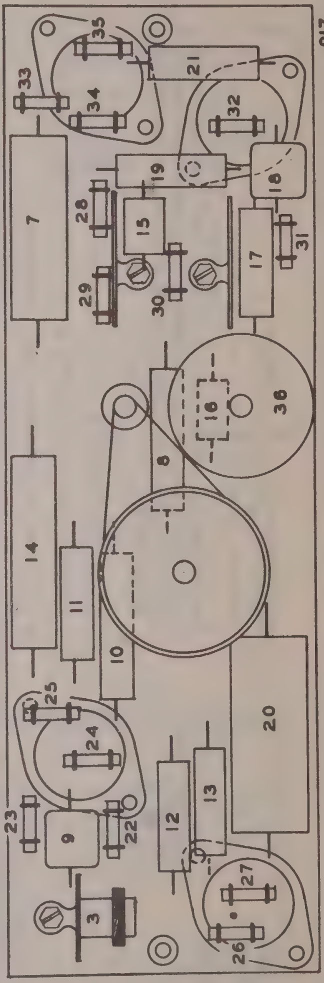
UNITED MOTORS SERVICE

MODEL R1400
Schematic
Chassis



I.F. 465 K.C.



Delco Model R-1400

Date: 7-12-39

MODEL R1400
Voltage, Socket
Alignment, Trimmers

UNITED MOTORS SERVICE INC.

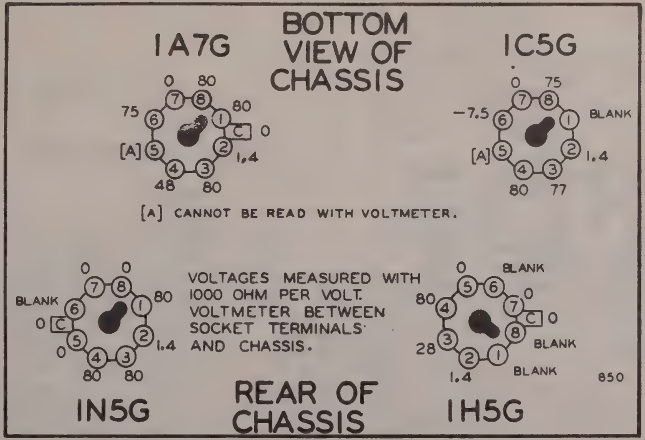


FIG. 1--TUBE SOCKET VOLTAGES

1. Aligning I-F Stages at 465 Kilocycles-

Set the signal generator to exactly 465 K.C.

Adjust the I-F trimmers C-D-E-F (Illus. 4 and 5, Fig. 4) for maximum output, using the lowest output from the signal generator which will give a readable indication on the output meter, not to exceed 50 milliwatts.

2. Aligning at 1650 Kilocycles

(a) Leave all connections the same as for I-F alignment.

(b) Set the signal generator to exactly 1650 K.C.

(c) Adjust the oscillator trimmer condenser (Illus. B, Fig. 2), for maximum output.

3. Aligning at 1400 Kilocycles

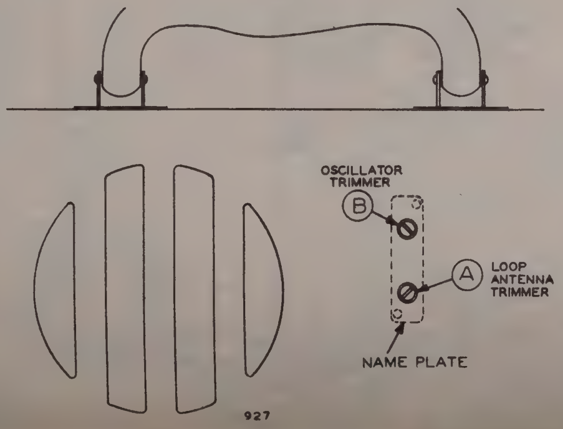
NOTE: This adjustment MUST be made with set and loop mounted and firmly attached in cabinet.

(a) Remove the 1 megohm resistor and connect loop leads to the loop antenna. (Check these clips to make sure that contacts are clean and tight.)

(b) Remove signal lead of the signal generator from the grid of the 1A7G tube and place in a position where the signal can be picked up by the loop antenna. (The signal lead of the signal generator may be connected to the metal carrier pins of the case handle and the ground lead connected to the chassis mounting screw.)

(c) Set the signal generator to 1400 K.C.

(d) Adjust the loop trimmer (Illus. "A", Fig. 2) for maximum output.



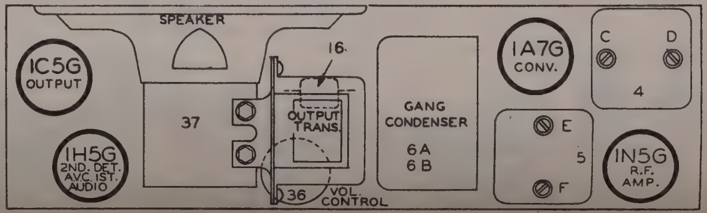
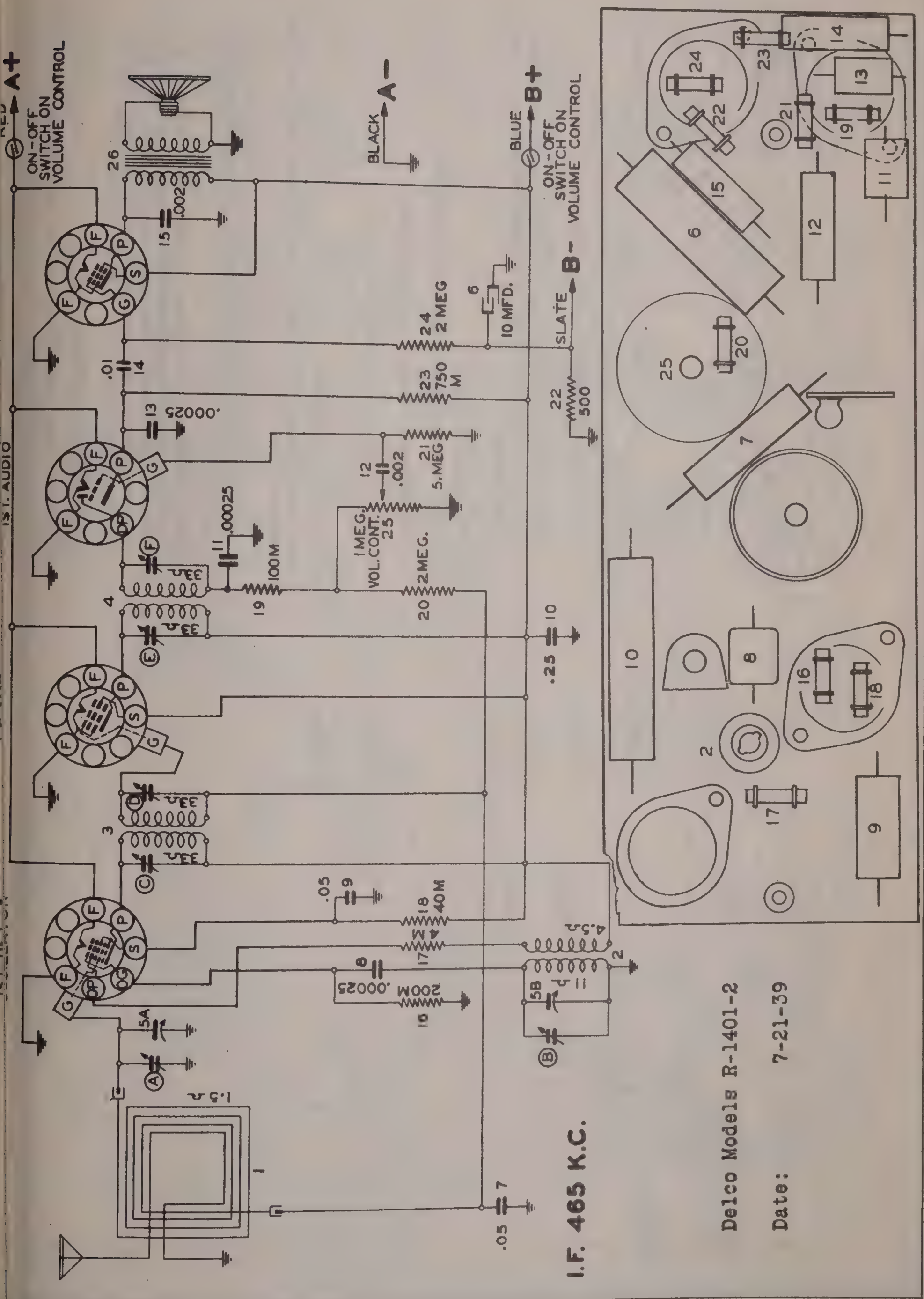


FIG 2--TRIMMER LOCATIONS

UNITED MOTORS SERVICE INC.

MODELS R1401,R1402
Schematic,Chassis



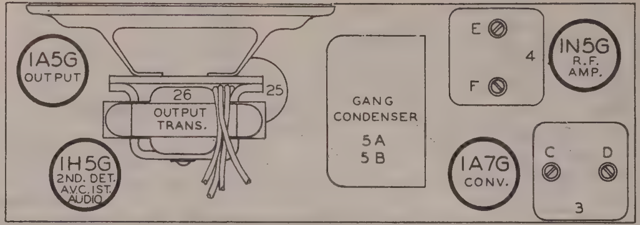
I.F. 465 K.C.

Delco Models R-1401-2

Date: 7-21-39

MODELS R1401,R1402
Voltage,Socket
Alignment,Trimmers

UNITED MOTORS SERVICE INC.



1. Aligning I-F Stages at 465 Kilocycles-

Set the signal generator to exactly 465 K.C.

Adjust the I-F trimmers C-D-E-F (Illus. 3 and 4, Fig. 4) for maximum output, using the lowest output from the signal generator which will give a readable indication on the output meter, not to exceed 50 milliwatts.

2. Aligning at 1650 Kilocycles

(a) Leave all connections the same as for I-F alignment.

(b) Set the signal generator to exactly 1650 K.C.

(c) Adjust the oscillator trimmer condenser (Illus. "B", Fig. 2), for maximum output.

3. Aligning at 1400 Kilocycles

NOTE: This adjustment MUST be made with set and loop mounted and firmly attached in cabinet.

(a) Remove the 1 megohm resistor and connect loop leads to the loop antenna. (Check these clips to make sure that contacts are clean and tight.)

(b) Remove signal lead of the signal generator from the grid of the 1A7G tube and place in a position where the signal can be picked up by the loop antenna. (The signal lead of the signal generator may be connected to the metal carrier pins of the case handle and the ground lead connected to the chassis mounting screw.)

(c) Set the signal generator to 1400 K.C.

(d) Adjust the loop trimmer (Illus. "A", Fig. 2) for maximum output.

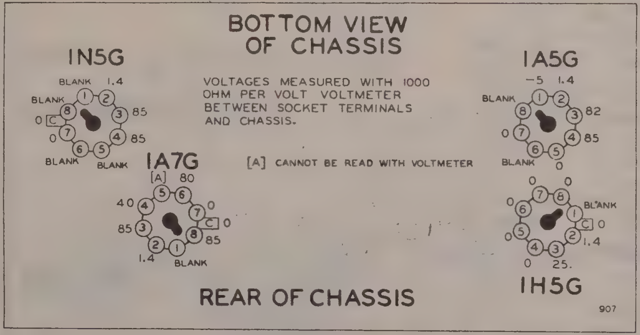


FIG. 1--TUBE SOCKET VOLTAGES

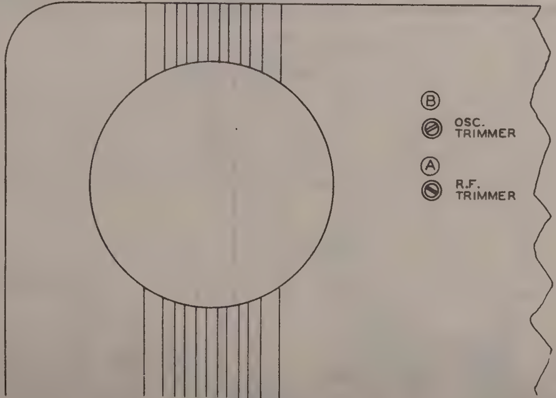
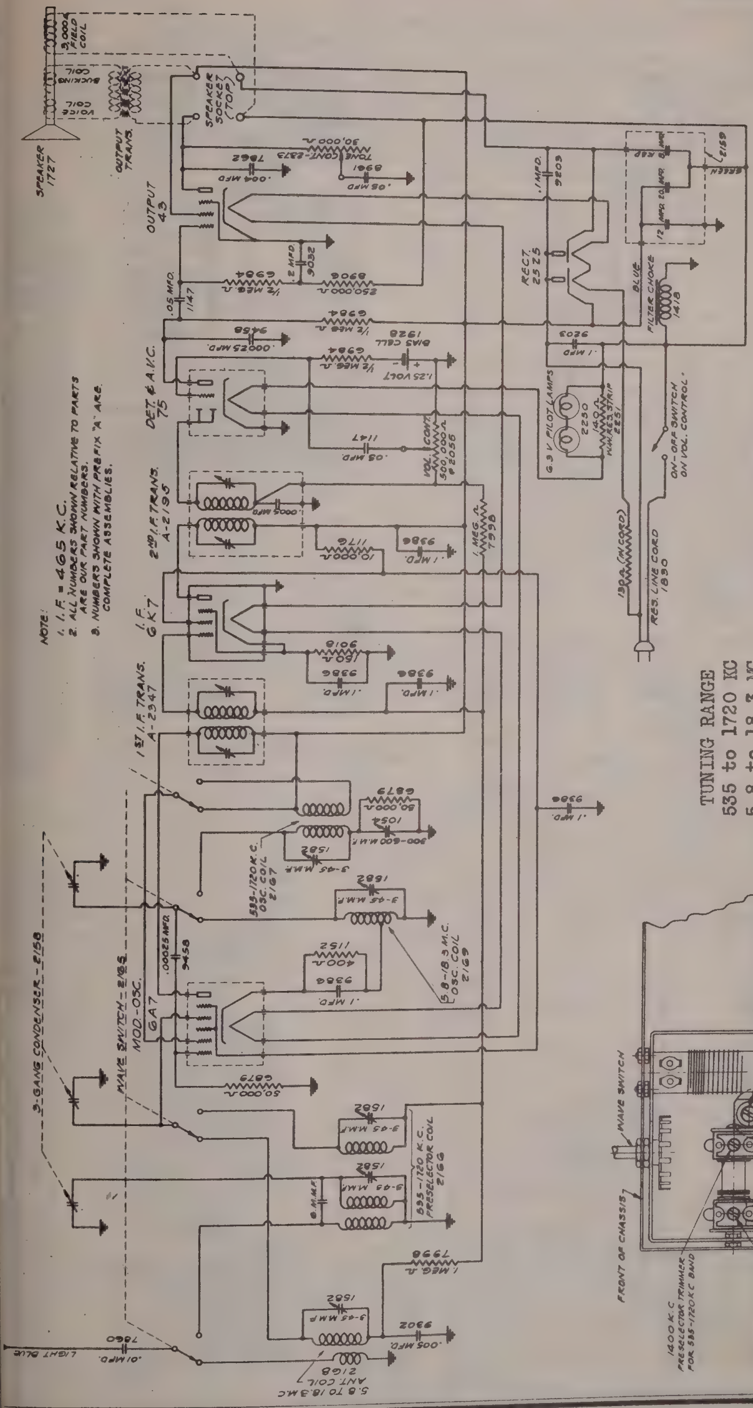
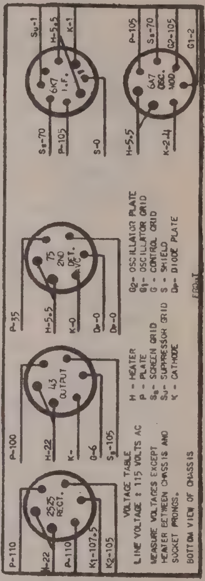


FIG 2--TRIMMER LOCATIONS

WALGREEN CO.

MODEL 22U-73
Schematic, Voltage, Socket
Alignment, Trimmers



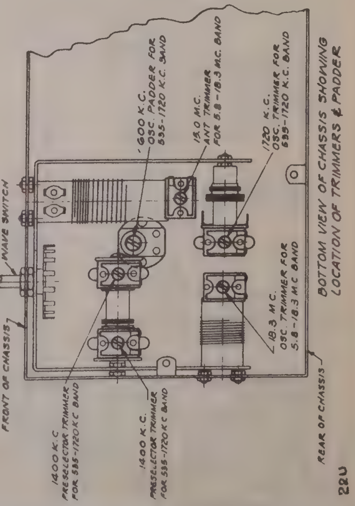


VOLTAGE TABLE
LINE VOLTAGE : 115 VOLTS AC
MEASURE VOLTAGES EXCEPT HEATER BETWEEN CHASSIS AND SOCKET PRONGS.
BOTTOM VIEW OF CHASSIS

H - HEATER
P - PLATE
Sg - SCREEN GRID
Su - SUPPRESSOR GRID
K - CATHODE
G2 - OSCILLATOR PLATE
G1 - OSCILLATOR GRID
G - CONTROL GRID
S - SHIELD
Dp - DIODE PLATE

TUNING RANGE
535 to 1720 KC
5.8 to 18.3 MC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

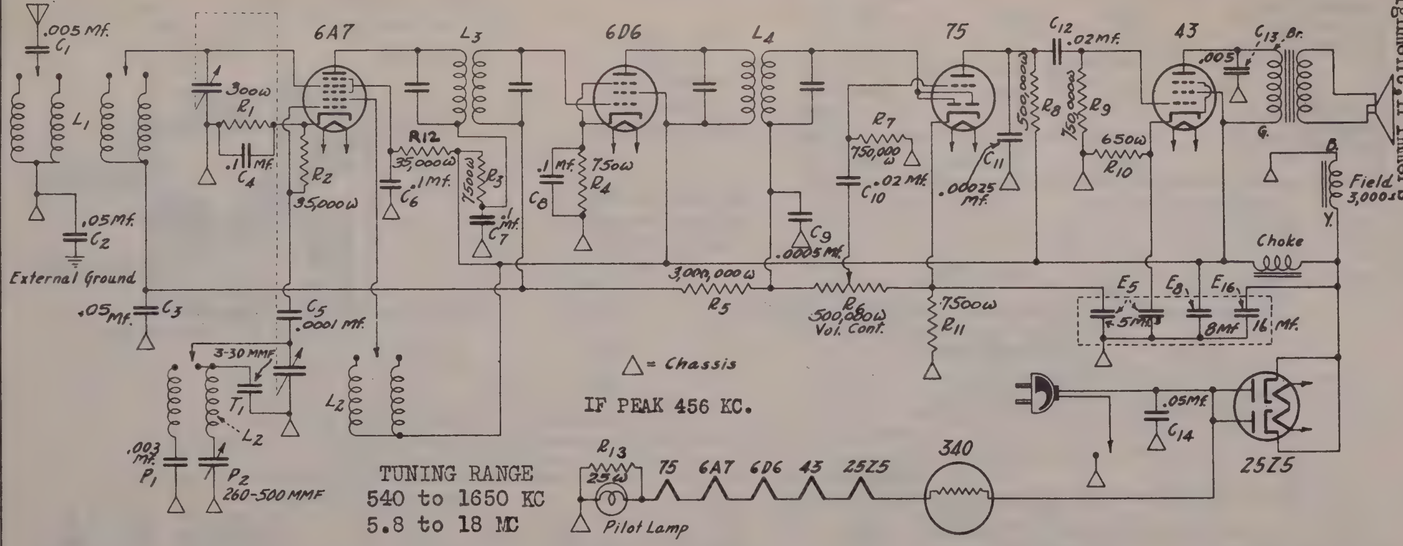

WAVE SWITCH
FRONT OF CHASSIS
600 K.C. OSC. PADDER FOR 535-1720 K.C. BAND
18.0 M.C. ANT. TRIMMER FOR 5.8-18.3 M.C. BAND
1720 K.C. OSC. TRIMMER FOR 535-1720 K.C. BAND
18.3 M.C. OSC. TRIMMER FOR 5.8-18.3 M.C. BAND
1400 K.C. PRESELECTOR TRIMMER FOR 535-1720 K.C. BAND
1400 K.C. PRESELECTOR TRIMMER FOR 535-1720 K.C. BAND
REAR OF CHASSIS
22U

BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDER

MODEL 66
Schematic
MODEL 525
Schematic,Voltage,Socket
Alignment,Trimmers

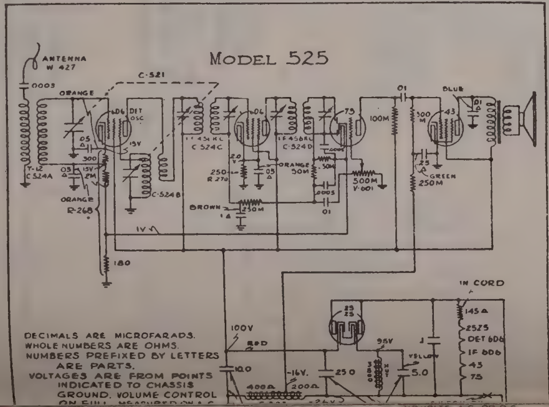
WALGREEN CO.

MODEL-66-A.C. D.C.

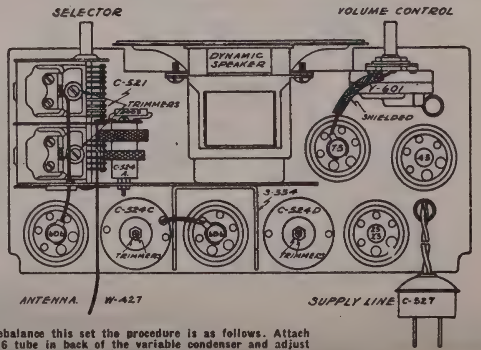


IF PEAK 456 KC.

TUNING RANGE
540 to 1650 KC
5.8 to 18 MC



Part No.	Description
C 145	.1—300 Volt Condenser........
C 155	.0005 Mica Condenser...........
C 521	Two Gang Condenser...........
C 522	.01—400 Volt Condenser.........
C 523	600 Ohm Choke Coil............
C 524A	Antenna Coil ....
C 524B	Oscillator Coil ....
C 524C	I. F. Transformer..............
C 524D	I. F. Transformer..............
C 525	5-25-10 Electrolytic Condenser...
C 525B	5-25-10 Electrolytic Condenser....
C 526	By-Pass Condenser Block.........
C 527	Special Cord and Plug..........
C 531	Dual .05 Condenser ....
C 534	Dual .1-.025 Condenser..........
K 214	Knobs ....
R 268	2480 Ohm Resister..............
R 270	250 Ohm—Wire Wound Resistor.
V 601	Volume Control ....
W427	Antenna Wire ....



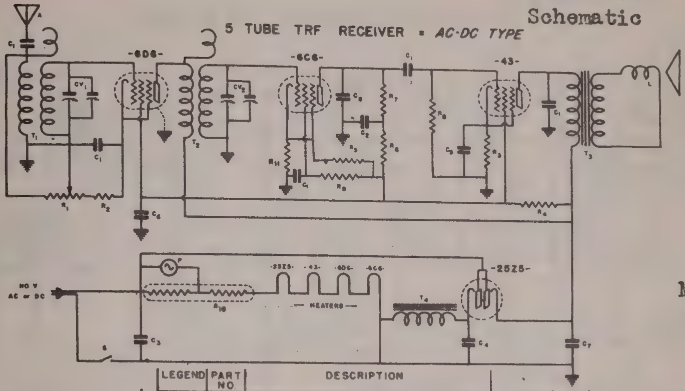
Should it be necessary, at any time, to rebalance this set the procedure is as follows. Attach a 456 kilocycle oscillator to the grid of the 6D6 tube in back of the variable condenser and adjust the trimming condensers of the I. F. transformers to maximum deflection on an output meter connected across the primary of the speaker input transformer. While adjusting these trimmers, the variable condenser should be at the maximum capacity position—at the extreme right of its rotation.

Next disconnect the antenna wire and connect an oscillator in series with a 75 mmf. condenser to the antenna coil. Rotate the condenser plates to the minimum capacity position—

IF PEAK 456 KC

WALGREEN CO.

MODEL B-66-RIS
Schematic, Voltage, Socket
Alignment, Trimmers
MODEL 200
Schematic



ALIGN AT
1500 KC

MODEL 200

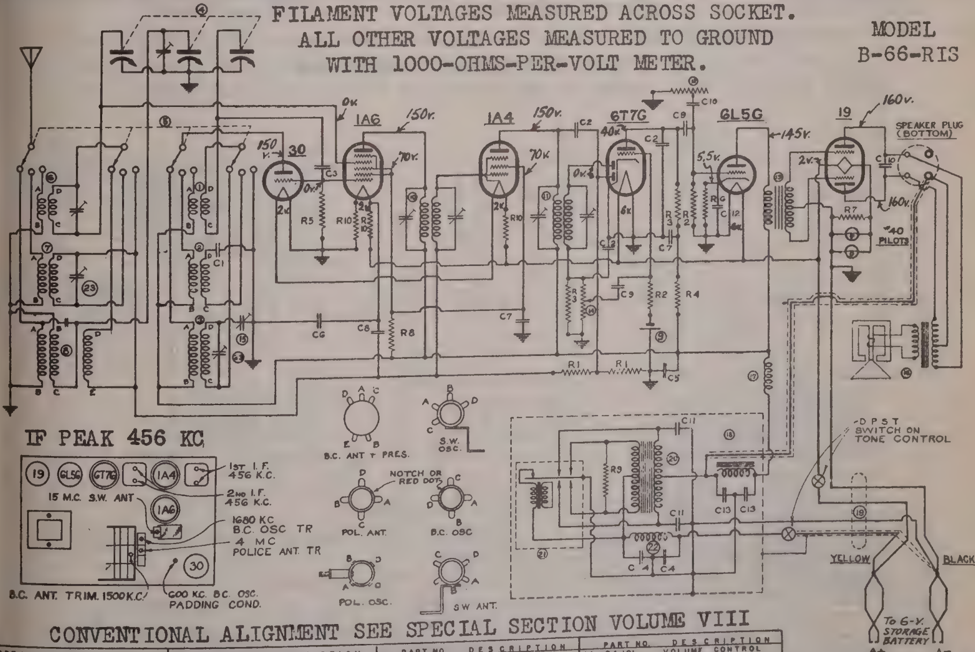
END	PART NO.	DESCRIPTION
C_1	211	.01 MFD 400 V. TUBULAR CONDENSER
C_2	216	.018 MFD 400V. TUBULAR CONDENSER
C_3	210	.1 MFD 400 V. TUBULAR CONDENSER
C_4	IN 316	4 MFD 175 W.V. ELECTROLYTIC COND.
C_5	IN 316	5 MFD 25 W V ELECTROLYTIC COND
C_6	IN 316	8 MFD 150 W.V. ELECTROLYTIC COND.
C_7	IN 316	14 MFD 175 W.V. ELECTROLYTIC COND.
C_8	401	.00025 MICA CONDENSER
V_{1-2}	621	2 GANG VARIABLE CONDENSER

LEGEND	PART NO.	DESCRIPTION
R_1	2006	10,000 OHM VOLUME CONTROL
R_2	—	275 OHM (Minimum on Volume Control)
R_3	104	600 OHM 1/4 WATT CARBON RESISTOR
R_4	108	5,000 OHM 1/4 WATT CARBON RESISTOR
R_5	111	25,000 OHM 1/4 WATT CARBON RESISTOR
R_6	142	51,000 OHM 1/4 WATT CARBON RESISTOR
R_7	116	250,000 OHM 1/4 WATT CARBON RESISTOR
R_8	117	500,000 OHM 1/4 WATT CARBON RESISTOR
R_9	120	3 MEGOHM 1/4 WATT CARBON RESISTOR
R_{11}	105	1000 OHM 1/4 WATT CARBON RESISTOR

LEGEND	PART NO	DESCRIPTION
R_{10}	2903	L-55-B BALLAST TUBE
T_1	1213	ANTENNA COIL
T_2	1312	R F COIL
T_3	IN 809	SPEAKER OUTPUT TRANSFORMER
T_4	IN 809	SPEAKER FIELD (2500 ohms)
S	—	LINE SWITCH ON VOLUME CONTROL
P	2902	MAZDA #46 PILOT LIGHT
A	2400	INDOOR ANTENNA HANK
L	809	5" DYNAMIC SPEAKER

FILAMENT VOLTAGES MEASURED ACROSS SOCKET.
ALL OTHER VOLTAGES MEASURED TO GROUND
WITH 1000-OHMS-PER-VOLT METER.

MODEL
B-66-RIS



IF PEAK 456 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

	ART NO.	DESCRIPTION
C	00C	.001 MFD. MICA 5%
C	04	.00025 " "
C	10	.000025 " "
C4	53	.5 " 150v
C	16	.25 " 400v
C	14	.25 " 200v
C7	01	.1 " 400v
C	00	.1 " 200V
C	03	.01 " 400V
C	11	.006 " 600V
C11	04	.01 " 600V
C	-100	10 M.F.D. 25V. ELECTROLYTIC
C13	45	8 " 150V "

	PART NO.	DESCRIPTION
R1	6017	1 MEG OHM 1/3 W.
R2	6018	.5 " "
R3	6024	.25 " " "
R4	6026	100,000 " "
R5	6025	50,000 " "
R6	6006	1800 " "
R7	6007	200 " "
R8	6117	25,000 " 1/2 W.
R9	6101	100 " "
R10	60-102	33 1/3 " WIRE WOUND

	PART NO.	DESCRIPTION
1	10-139	S.W. OSC. COIL
2	10-138	POLICE OSC. COIL
3	10-134	B.C. OSC. COIL
4	19-106	3 GANG CONDENSER
5	69-103	WAVE SWITCH
6	10-132	S.W. ANT. COIL
7	10-135	POLICE ANT. COIL
8	10-137	B.C. ANT. & PRESEL. C'L.
9	4600	BIAS CELL
10	1133	1ST. I.F. TRANSFORMER
11	1134	2ND. I.F. TRANSFORMER
12	26-102	TONE CONTROL
13	8010	PUSH-PULL AUDIO TRANS.

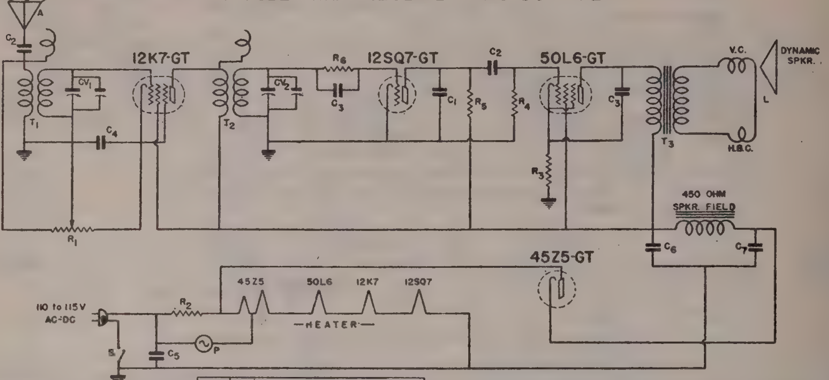
	PART NO.	DESCRIPTION
14	24-101	VOLUME CONTROL
15	20-100	B.C. OSC. PADDER
16		SPEAKER
17	3303	R.F. "B" CHOKE
18	3307	FILTER
19	23-103	BATTERY CABLE
20	8041	POWER TRANFORMER
21	3407	VIBRATOR
22	3313	R.F. "A" CHOKE
23	26-102	TRIMMER STRIP

TUNING RANGE
535 to 1680 KC
1.7 to 5.6 MC
5.4 to 20 MC

MODEL 209
MODEL 410
Schematics, Socket

WALGREEN CO.

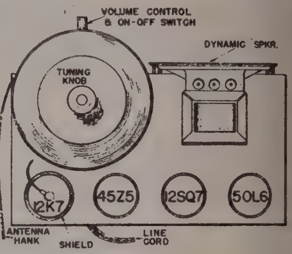
4 TUBE T.R.F. RECEIVER *AC-DC TYPE*



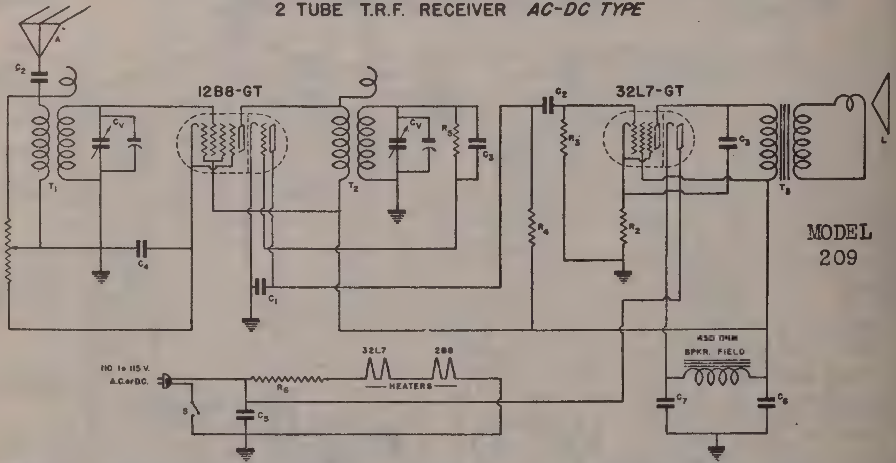
DIA. NO.	PART NO.	DESCRIPTION
R_1	2032	25,000 OHM VOLUME CONTROL
R_2	—	10 OHM $\frac{1}{4}$ WATT CARBON RESIST.
R_3	—	150 OHM $\frac{1}{4}$ WATT CARBON RESIST.
R_4	—	$\frac{1}{2}$ MEGOHM $\frac{1}{4}$ WATT CAR. RESIST.
R_5	—	1 MEGOHM $\frac{1}{4}$ WATT CARBON RESIST.
R_6	—	3 MEGOHM $\frac{1}{4}$ WATT CAR. RESIST.
P	—	MAZDA #47 PILOT LIGHT
S	—	LINE SWITCH ON VOLUME CONT.
A	—	ANTENNA WIRE
L	8338	DYNAMIC SPEAKER

DIA. NO.	PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 600V. TUB. COND.
C_2	—	.01 MFD. 400 V. TUBULAR COND.
C_3	—	.02 MFD. 400 V. TUBULAR COND.
C_4	—	.05 MFD. 200 V. TUBULAR COND.
C_5	—	.05 MFD. 400 V. TUBULAR COND.
C_6	IN 343	10 MFD. 150 V. TUBULAR COND.
C_7	IN 343	30 MFD. 150 V. TUBULAR COND.
CV_{1-2}	628C	2 GANG VARIABLE COND.
T_1	A-10	ANTENNA COIL
T_2	R-10	R.F. COIL
T_3	IN 8338	SPEAKER TRANSFORMER

MODEL
410



2 TUBE T.R.F. RECEIVER *AC-DC TYPE*

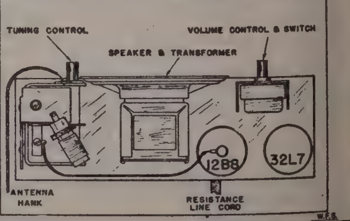


MODEL
209

LEGEND	OUR PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 800 V. TUBULAR CONDENSER
C_2	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_3	—	.02 MFD. 400 V. TUBULAR CONDENSER
C_4	—	.05 MFD. 200 V. TUBULAR CONDENSER
C_5	—	.05 MFD. 400 V. TUBULAR CONDENSER
C_6	IN 344	10 MFD. 150 V. ELECTROLYTIC CONDENSER
C_7	IN 344	30 MFD. 150 V. ELECTROLYTIC CONDENSER
C_V	628-D	2 GANG VARIABLE CONDENSER
A	—	AERIAL WIRE
L	833	DYNAMIC SPEAKER

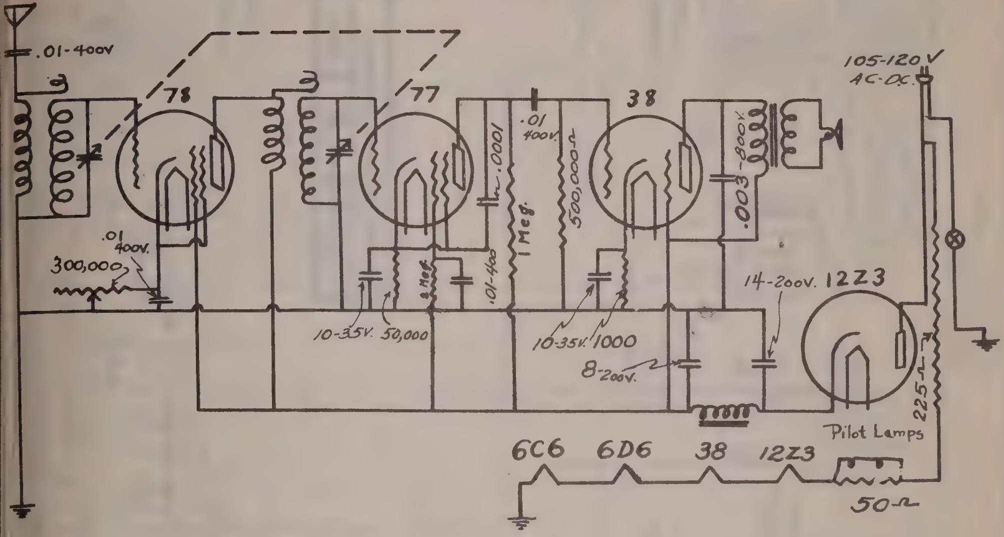
LEGEND	OUR PART NO.	DESCRIPTION
R_1	2031	10,000 OHM VOLUME CONTROL
R_2	—	150 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_3	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	1 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	3 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	1816	240 OHM RESISTANCE LINE CORD
T_1	A-10	ANTENNA COIL
T_2	R-10	R F. COIL
T_3	ON 833	SPEAKER TRANSFORMER
S	—	LINE SWITCH ON VOLUME CONTROL

CHASSIS LAYOUT & TUBE LOCATION

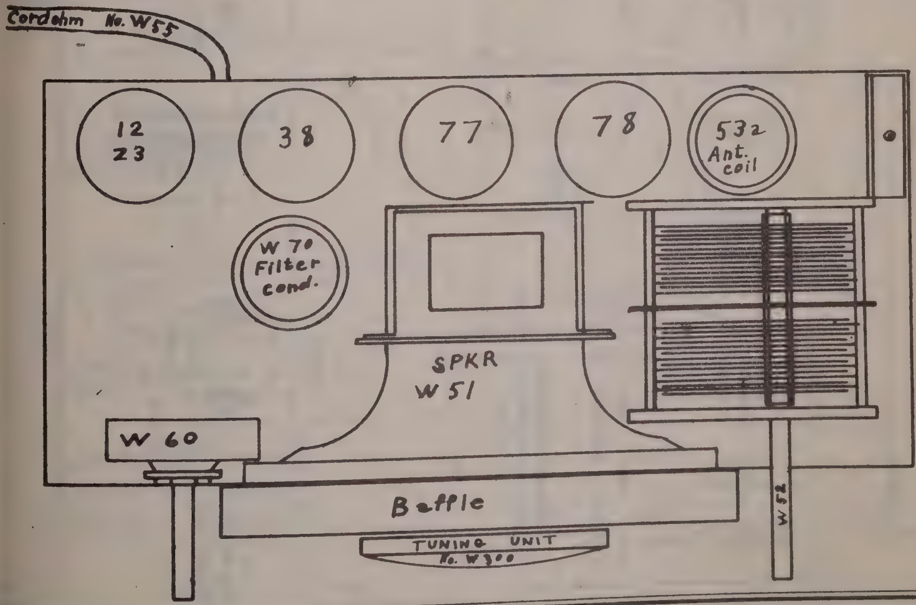


WALGREEN CO.

MODEL 250
Schematic
Socket

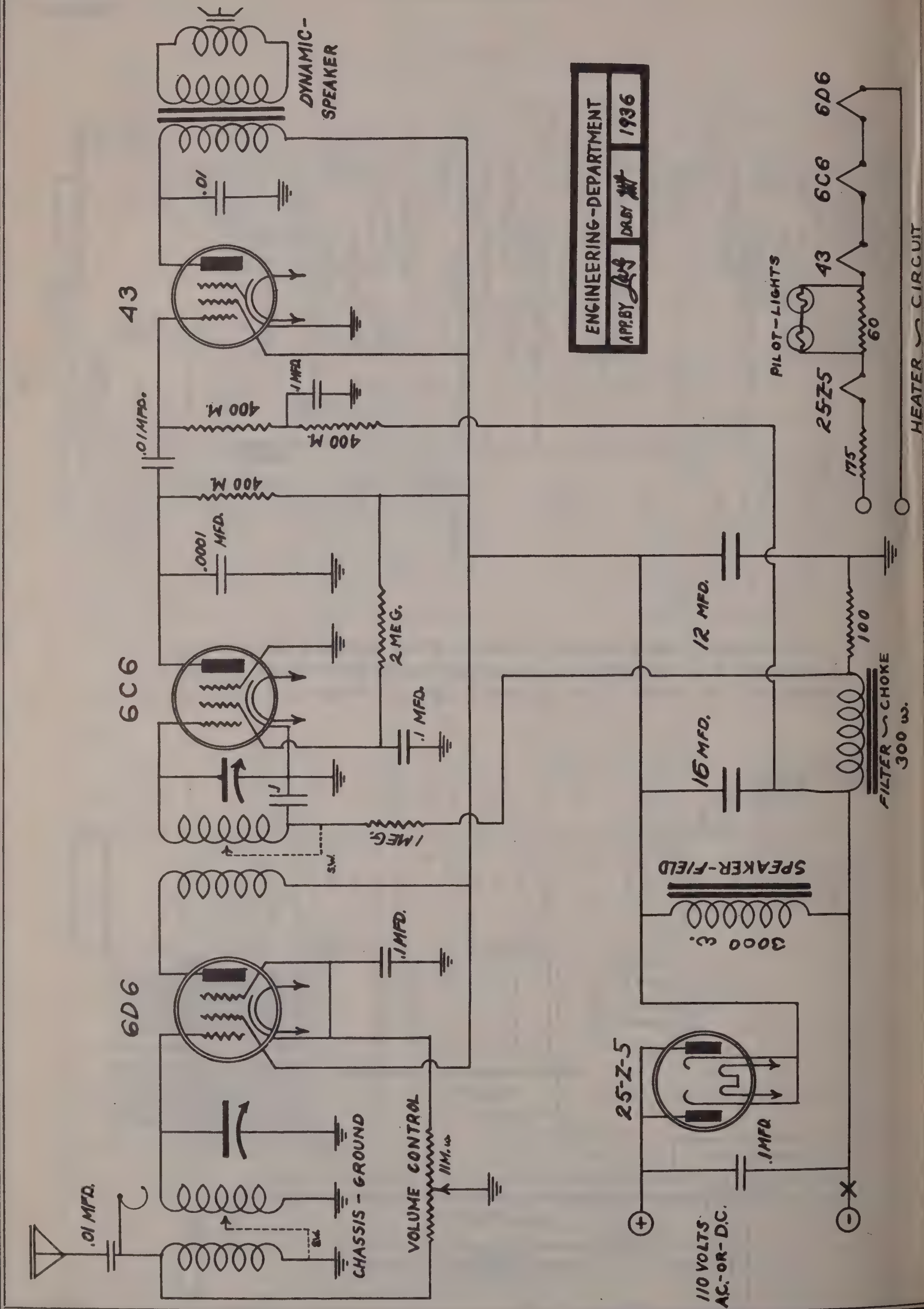


To balance set, remove chassis from cabinet then turn the condenser all the way up and adjust detector stage trimmer condenser to about 1720 kc and align RF stage for maximum gain.



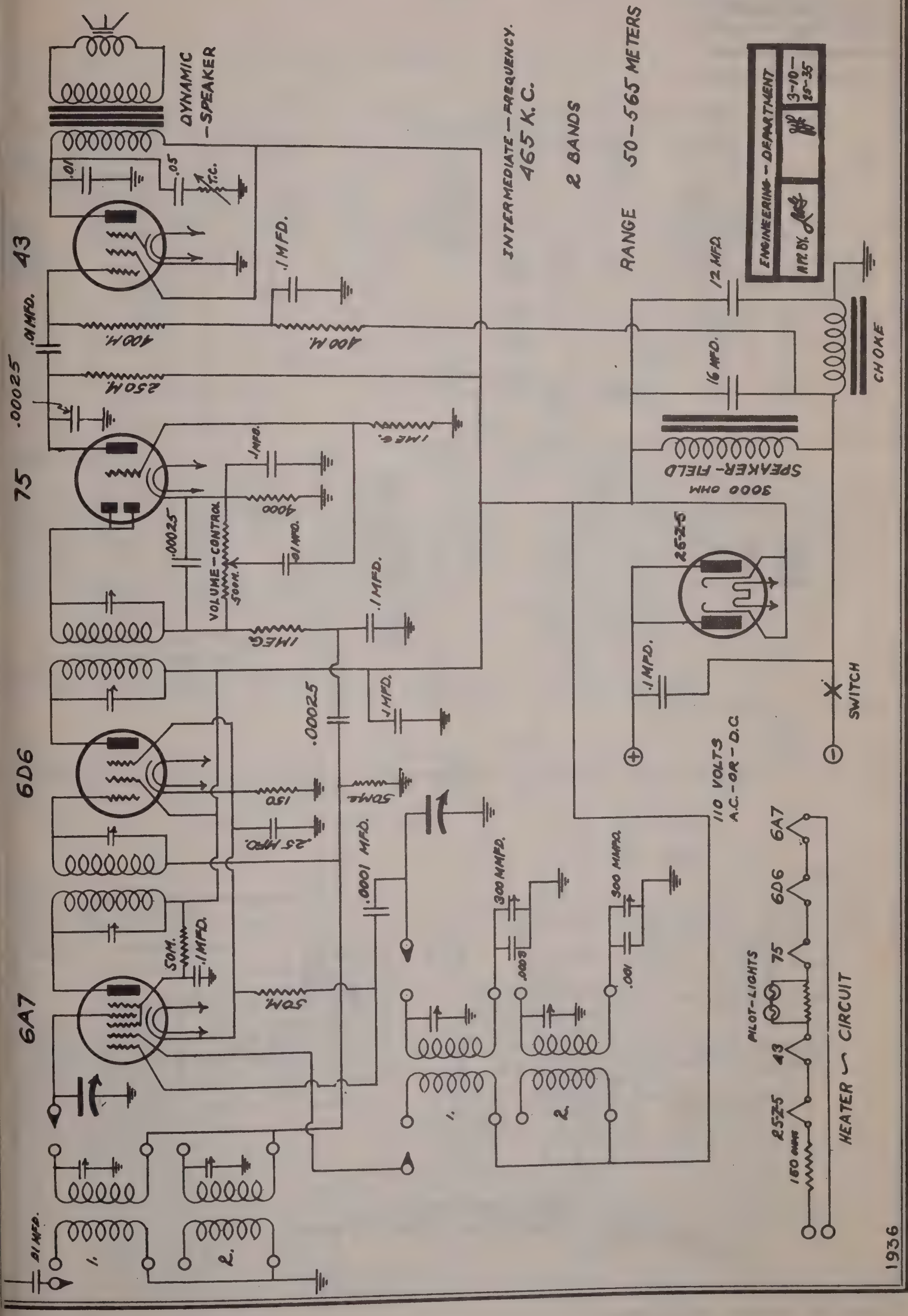
MODEL 252P
Schematic

WALGREEN CO.



WALGREEN CO.

MODELS 300,300P(Early)
Schematic



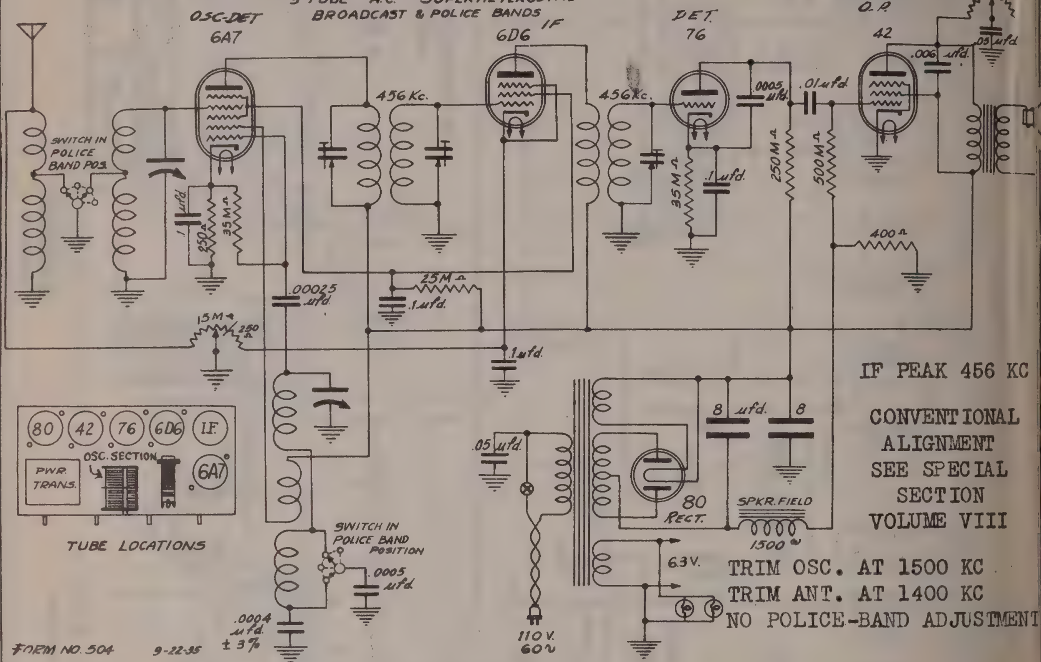
1936

MODEL 400(Late)
Schematic,Voltage
Socket,Trimmers
MODEL 502
Schematic,Socket
Alignment,Trimmers

WALGREEN CO.

CIRCUIT DIAGRAM MODEL 502

5 TUBE A.C. SUPERHETERODYNE
BROADCAST & POLICE BANDS

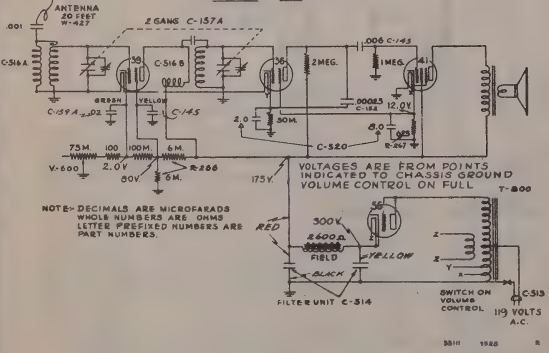


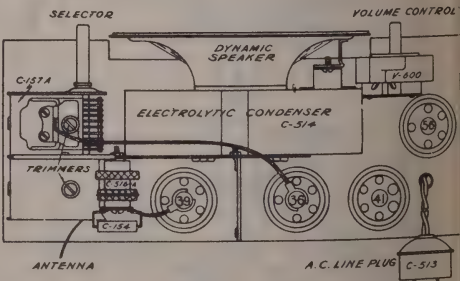
IF PEAK 456 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

TRIM OSC. AT 1500 KC
TRIM ANT. AT 1400 KC
NO POLICE-BAND ADJUSTMENT

MODEL 400 (LATE)





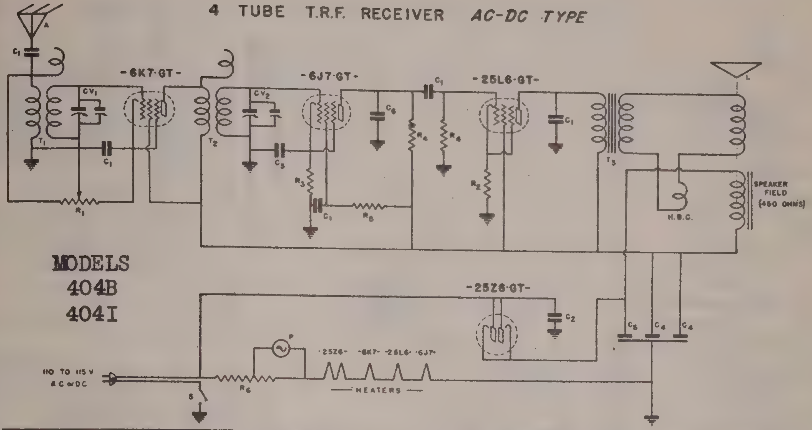
MODEL 400
(LATE)

Model 400 Radio Receiver.
USE ONLY ON 105-115 VOLTS
ALTERNATING CURRENT—45 WATTS

WALGREEN CO.

MODELS 404B,404I
MODELS 409,419
Schematics,Socket
Trimmers

4 TUBE T.R.F. RECEIVER *AC-DC TYPE*

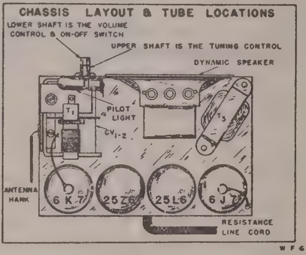


MODELS
404B
404I

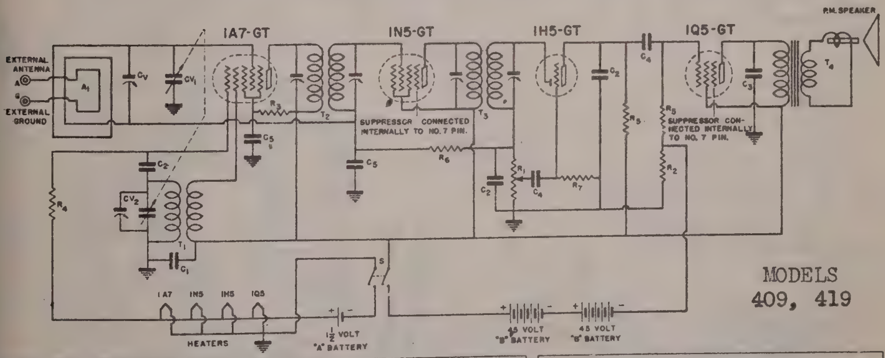
LEGEND	OUR PART NO.	DESCRIPTION
C_1	—	.01 MFD 400 V TUBULAR CONDENSER
C_2	—	.02 MFD. 400 V TUBULAR CONDENSER
C_3	—	25 MFD. 25 V TUBULAR CONDENSER
C_4	IN 336	10 MFD 150 W V ELECTROLYTIC COND
C_5	IN 336	20 MFD. 150 W V. ELECTROLYTIC COND
C_6	—	.00025 MICA CONDENSER
CV_{1-2}	829-A	2 GANG VARIABLE CONDENSER
T_1	A-10	ANTENNA COIL
T_2	R-10	R F COIL
T_3	IN 823	SPEAKER TRANSFORMER

LEGEND	OUR PART NO	DESCRIPTION
R_1	2026	10,000 OHM VOLUME CONTROL
R_2	—	150 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_3	—	25,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	2 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	1811-A	210 OHM RESISTANCE LINE CORD
S	—	LINE SWITCH ON VOLUME CONTROL
P	—	MAZDA # 44 PILOT LIGHT
A	—	ANTENNA HANK
L	823	DYNAMIC SPEAKER

CHASSIS LAYOUT & TUBE LOCATIONS



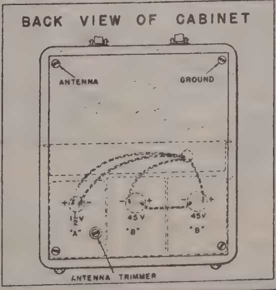
4 TUBE SUPERHETERODYNE RECEIVER - *BATTERY OPERATED*



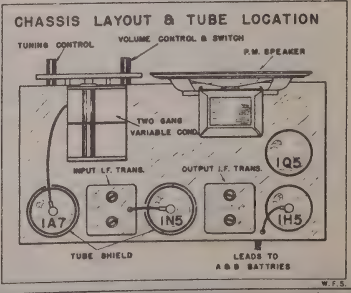
MODELS
409, 419

DIAG. NO.	PART NO.	DESCRIPTION
C_V	518	2 TO 40 MMFD. TRIMMING CONDENSER
CV_{1-2}	648	2 GANG VARIABLE CONDENSER
C_1	—	10 MFD. 200 V. ELECTROLYTIC CONDENSER
C_2	—	.00025 MFD. 800 V. TUBULAR CONDENSER
C_3	—	.002 MFD. 800 V. TUBULAR CONDENSER
C_4	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_5	—	.05 MFD. 200 V. TUBULAR CONDENSER
A_1	3515-A	ANTENNA LOOP
T_1	0-6	OSCILLATOR COIL
T_2	1-3	INPUT I.F. TRANSFORMER
T_3	0-3	OUTPUT I.F. TRANSFORMER
T_4	835-A	PERMANENT MAGNET SPEAKER
S	—	SWITCH ON VOLUME CONTROL
R_1	2009G	500,000 OHM VOLUME CONTROL
R_2	—	550 OHM $\frac{1}{4}$ WATT CARBON RESISTOR-10%
R_3	—	50,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	250,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	—	2 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_7	—	3 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR

BACK VIEW OF CABINET

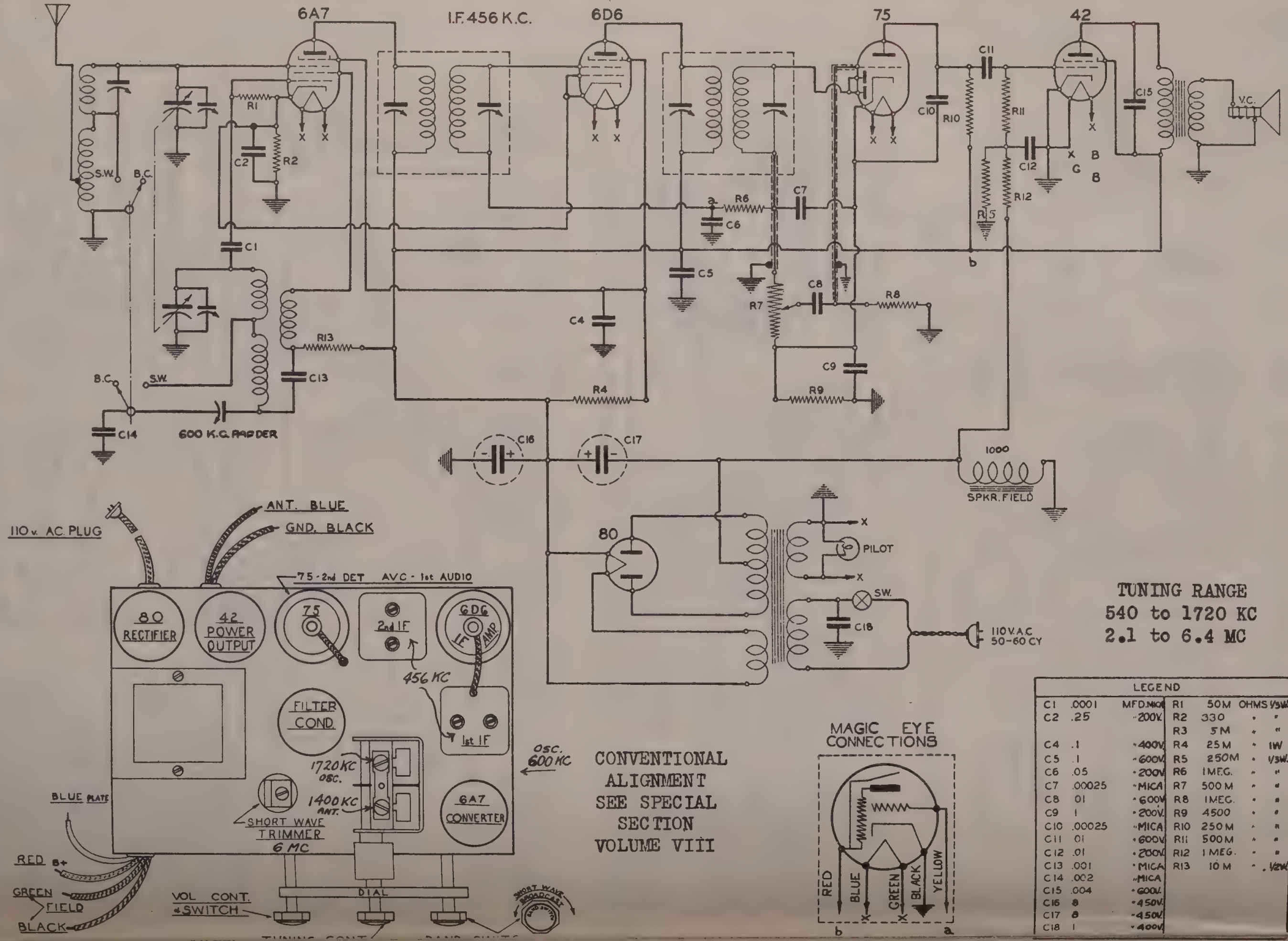


CHASSIS LAYOUT & TUBE LOCATION



MODEL 510 AC(Early)
Schematic,Socket
Alignment,Trimmers

WALGREEN CO.



TUNING RANGE
540 to 1720 KC
2.1 to 6.4 MC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

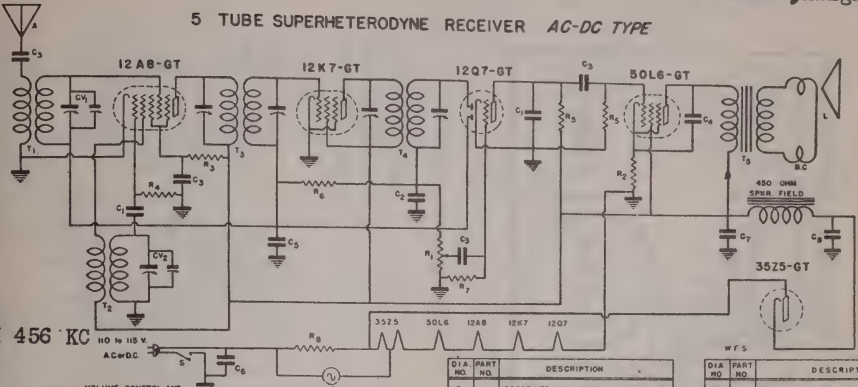
LEGEND

C1	.0001	MFD.MICA	R1	50M	OHMS	1/3W.
C2	.25	" 200V.	R2	330	"	"
			R3	5M	"	"
C4	.1	" 400V.	R4	25M	"	1W
C5	.1	" 600V.	R5	250M	"	1/3W.
C6	.05	" 200V.	R6	1MEG.	"	"
C7	.00025	" MICA	R7	500M	"	"
C8	.01	" 600V.	R8	1MEG.	"	"
C9	.1	" 200V.	R9	4500	"	"
C10	.00025	" MICA	R10	250M	"	"
C11	.01	" 600V.	R11	500M	"	"
C12	.01	" 200V.	R12	1MEG.	"	"
C13	.001	" MICA	R13	10M	"	1/2W.
C14	.002	" MICA				
C15	.004	" 600V.				
C16	8	" 450V.				
C17	8	" 450V.				
C18	1	" 400V.				

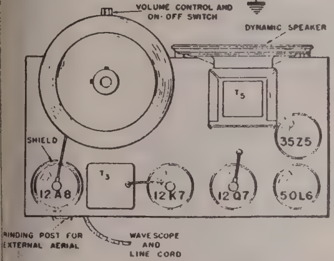
MODEL 510 AC-DC(Late)
MODEL 529
Schematics,Socket
Trimmers,Alignment

WALGREEN CO.

5 TUBE SUPERHETERODYNE RECEIVER *AC-DC TYPE*



PEAK 456 KC



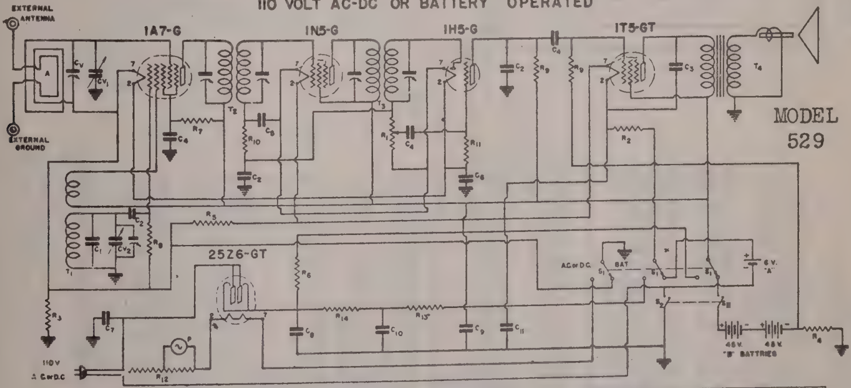
MODEL
510

DIA. NO.	PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 800 V. TUBULAR CONDENSER
C_2	—	.0005 MFD. 200V TUBULAR CONDENSER
C_3	—	.01 MFD 400 V TUBULAR CONDENSER
C_4	—	.02 MFD 400 V TUBULAR CONDENSER
C_5	—	.05 MFD. 200 V. TUBULAR CONDENSER
C_6	—	.1 MFD. 400 V TUBULAR CONDENSER
C_7	IN 344	10 MFD. 150 WV ELECTROLYTIC COND
C_8	IN 344	30 MFD 150 WV ELECTROLYTIC COND
CV_{1-2}	648	2 GANG VARIABLE CONDENSER
P	—	MAZDA NO 47 PILOT LIGHT
A	—	WAVESCOPE AERIAL
L	833-B	DYNAMIC SPEAKER
S	—	LINE SWITCH ON VOLUME CONTROL

WFS

DIA NO	PART NO	DESCRIPTION
R_1	2009-F	500,000 OHM VOLUME CONTROL
R_2	—	150 OHM $\frac{1}{4}$ WATT CARBON RESISTOR - 10%
R_3	—	50,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	25,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	—	2 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_7	—	6 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_8	—	10 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
T_1	A-5 A	ANTENNA COIL
T_2	O-5	OSCILLATOR COIL
T_3	I-3	INPUT I F TRANSFORMER
T_4	D-3	OUTPUT I F TRANSFORMER
T_5	IN 833-B	SPEAKER TRANSFORMER

110 VOLT AC-DC OR BATTERY OPERATED



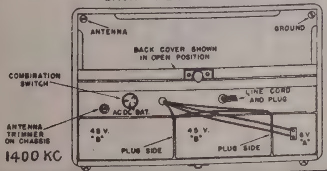
MODEL
529

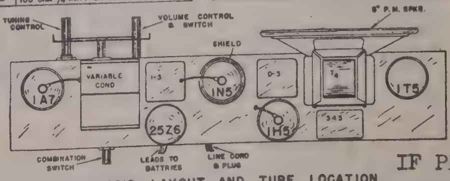
DIAG NO	PART NO	DESCRIPTION
C_1	—	.00002 MICA CONDENSER ± 10 %
C_2	—	.00025 MFD 600 V TUBULAR CONDENSER
C_3	—	.002 MFD. 600 V. TUBULAR CONDENSER
C_4	—	.01 MFD 400 V TUBULAR CONDENSER
C_5	—	.05 MFD. 200 V TUBULAR CONDENSER
C_6	—	.1 MFD 200 V TUBULAR CONDENSER
C_7	—	1 MFD 400V TUBULAR CONDENSER
C_8	345	40 MFD 200V ELECTROLYTIC CONDENSER
C_9	345	20 MFD 200V ELECTROLYTIC CONDENSER
C_{10}	345	10 MFD 35 V ELECTROLYTIC CONDENSER
C_{11}	345	70 MFD 6 V. ELECTROLYTIC CONDENSER
C_V	518	2 TO 40 MMFD TRIMMER CONDENSER

DIAG NO	PART NO	DESCRIPTION
CV_{1-2}	646	2 GANG VARIABLE CONDENSER
A	3519	ANTENNA LOOP
T_1	O-5	OSCILLATOR COIL
T_2	I-3	INPUT I.F TRANSFORMER
T_3	D-3	OUTPUT I F TRANSFORMER
T_4	837	PERMANENT MAGNET SPEAKER
S_1	1940	3 POLE TWO POSITION BAND SWITCH
S_2	—	SWITCH ON VOLUME CONTROL
R_1	2009-E	500,000 OHM VOLUME CONTROL
R_2	—	10 OHM 1/4 WATT CARBON RESISTOR ± 10%
R_3	—	30 OHM 1/4 WATT CARBON RESISTOR ± 10 %
R_4	—	100 OHM 1/4 WATT CARBON RESISTOR

DIAG NO	PART NO	DESCRIPTION
R_5	—	700 OHM 1/4 WATT CARBON RESISTOR
R_6	—	3000 OHM 1/4 WATT CARBON RESISTOR
R_7	—	50000 OHM 1/4 WATT CARBON RESISTOR
R_8	—	150 000 OHM 1/4 WATT CARBON RESISTOR
R_9	—	500 000 OHM 1/4 WATT CARBON RESISTOR
R_{10}	—	2 MEGOHM 1/4 WATT CARBON RESISTOR
R_{11}	—	3 MEGOHM 1/4 WATT CARBON RESISTOR
R_{12}	1818	305 OHM TAPPED RESISTANCE LINE CORD
R_{13}	IN-155	400 OHM 1 WATT WIRE WOUND RESISTANCE
R_{14}	IN-155	2200 OHM 5 WATT WIRE WOUND RESISTANCE
P	—	MAZDA NO. 47 PILOT LIGHT

BACK VIEW OF CABINET

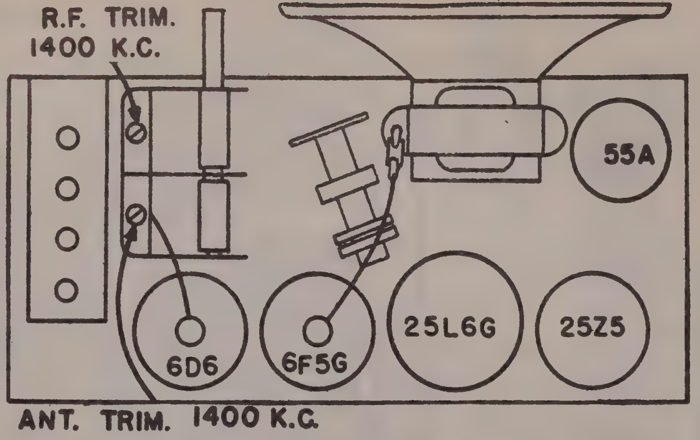




CHASSIS LAYOUT AND TUBE LOCATION

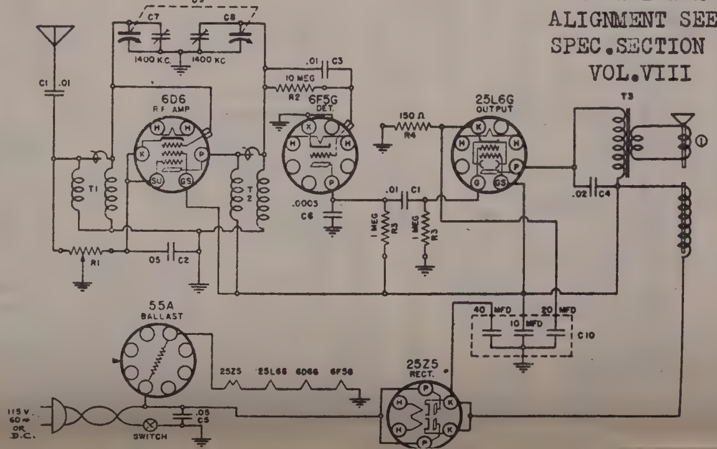
IF PEAK 456 KC

WALGREEN CO.



This receiver is a 5 tube AC/DC current operated T.R.F.

CONVENTIONAL
ALIGNMENT SEE
SPEC. SECTION
VOL. VIII



INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

After receiver is installed and antenna and ground properly connected, plug line cord into a convenient outlet. Then turn the volume control to about the center of rotation. This will turn the receiver on and put it in an operating condition. Time must be allowed for the tubes to heat up before stations can be tuned in. This time is approximately one-half minute.

The automatic tuning feature of your radio makes it possible to set up 6 favorite American broadcast stations and tune them in quickly with the automatic tuner. Choose stations for push-button operation heard with good volume at all times.

Cut the call letters of your 6 selected stations from the list supplied with your receiver and slip them into the Tab Holder from the top, with the clear celluloid in front of the call letters to protect them. Arrange the call letters in the Tab Holder from right to left. Have the call letters of the lowest frequency station at the extreme right and work progressively to the left so that the highest frequency call letters will be at the extreme left.

Follow the procedure outlined below, in order to adjust the push-buttons properly.

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holders.

Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

Carefully check each Push-Button for the accuracy of the setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

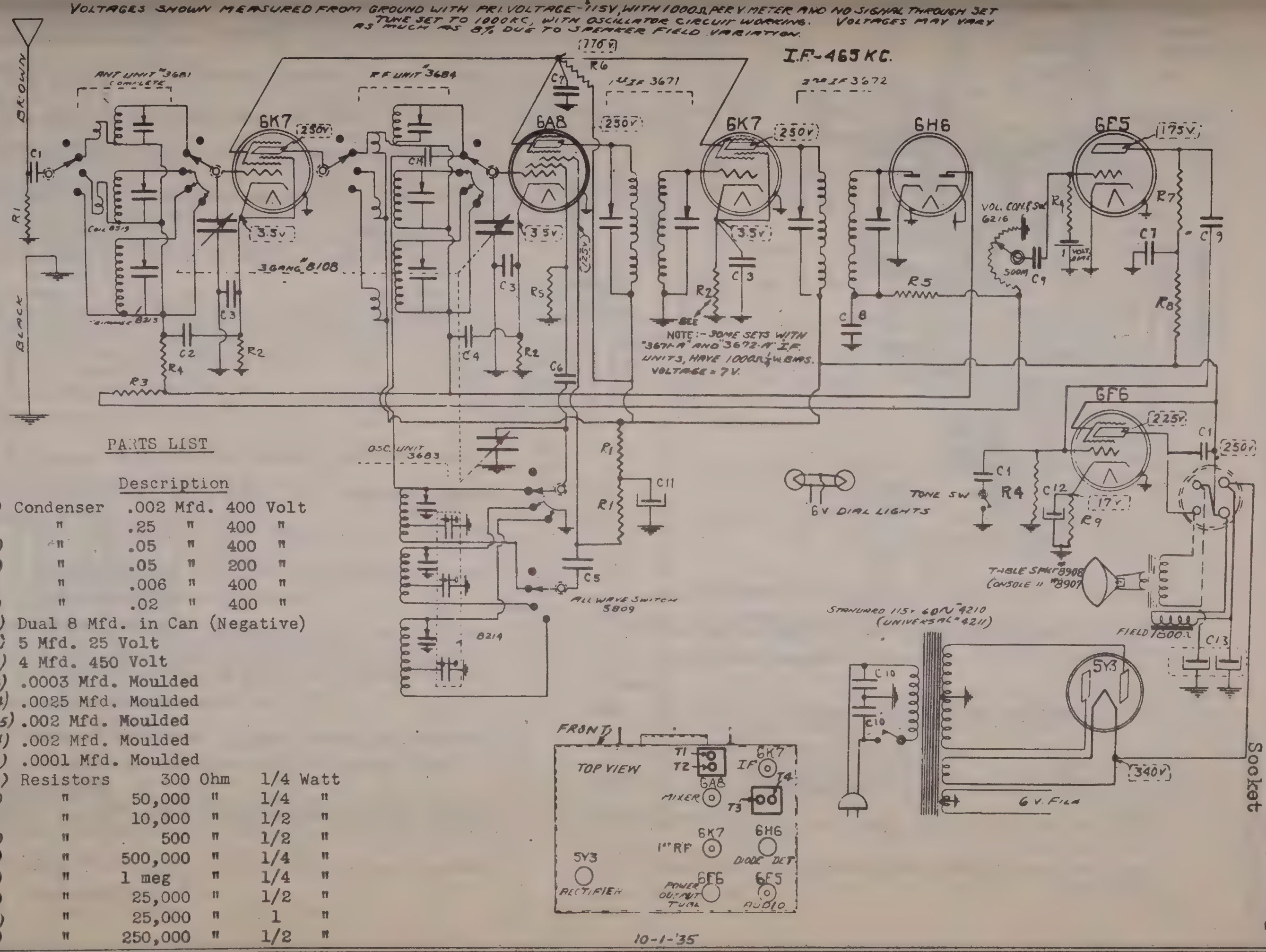
No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your four selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

This receiver is made to cover from 1750K.C. to 535K.C.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 542
C1	1604	.01 MFD. 600 V. TUBULAR CONDENSER	R1	24-127	VOLUME CONTROL & SWITCH
C2	1622	.05 MFD. 200 V. " "	R2	60-193	10 MEGOHM 1/3 W. RESISTOR
C3	16-119	.01 MFD. 400 V. "	R3	60-193	1 " " "
C4	16-108	.02 MFD. 600 V. " "	R4	60-184	150 OHMS " "
C5	1607	.05 MFD. 400 V " "			
C6	15-112	.0005 MFD. MICA CONDENSER	T1	10-249	ANTENNA COIL
C7 } C9	19-135	ANTENNA VARIABLE COND	T2	10-250	R.F COIL
C8 } C9		OSCILLATOR VARIABLE COND.	T3		OUTPUT TRANSFORMER
C10	18-234	FILTER CONDENSER 40 X 10 MF - 400 WV 20 MF - 25 WV	1	79-251	SPEAKER

WALGREEN CO.

MODEL 750
Schematic, Voltage
Socket



VOLTAGES SHOWN MEASURED FROM GROUND WITH PRI. VOLTAGE-115V, WITH 1000Ω PER V. METER AND NO SIGNAL THROUGH SET TUNE SET TO 1000KC, WITH OSCILLATOR CIRCUIT WORKING. VOLTAGES MAY VARY AS MUCH AS 8% DUE TO SPEAKER FIELD VARIATION.

NOTE:- SOME SETS WITH "3671-A" AND "3672-A" I.F. UNITS, HAVE 1000Ω ½W BIAS. VOLTAGE = 7V.

10-1-'35

PARTS LIST

Part No.	Description				
3516 (C2)	Condenser	.002 Mfd.		400	Volt
2758 (C7)	"	.25	"	400	"
2757 (C10)	"	.05	"	400	"
2183 (C3)	"	.05	"	200	"
3515 (C1)	"	.006	"	400	"
3517 (C9)	"	.02	"	400	"
3004 (C13)	Dual 8 Mfd. in Can (Negative)				
3003 (C12)	5 Mfd. 25 Volt				
8814 (C11)	4 Mfd. 450 Volt				
8304 (C8)	.0003 Mfd. Moulded				
8305X (C4)	.0025 Mfd. Moulded				
2287X (C5)	.002 Mfd. Moulded				
287 (C14)	.002 Mfd. Moulded				
2366 (C6)	.0001 Mfd. Moulded				
1836 (R2)	Resistors	300	Ohm	1/4	Watt
1843 (R5)	"	50,000	"	1/4	"
3349 (R1)	"	10,000	"	1/2	"
1890 (R9)	"	500	"	1/2	"
3328 (R4)	"	500,000	"	1/4	"
3335 (R3)	"	1 meg	"	1/4	"
3344 (R8)	"	25,000	"	1/2	"
2650 (R6)	"	25,000	"	1	"
1824 (R7)	"	250,000	"	1/2	"

MODEL 750
Alignment
Trimmers,Chassis

WALGREEN CO

THE I.F. STAGES

The I.F.'s are aligned by the usual system of feeding the intermediate frequency of 465KC into the grid of the 6A7 tube.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers number T1, T2, T3, T4. (See pictorial diagram).

The sensitivity of the I.F. stages will be 30 microvolts or better.

Always use as low an output as possible from the test oscillator in making the various adjustments.

II ALIGNMENT OF SHORTWAVE BAND 5.5 TO 18 M.C.

First check the position of the dial hand by rotating the condenser shaft to the left to full capacity. At this point the dial hand should be straight across in line with the lines dividing the scale in half. If the hand is off position it can be lined up by removing dial glass and setting hand with screw in center of dial.

1. Set the test oscillator to 17 megacycles.

2. Turn wave band switch all the way to right for highest S.W. band, and set dial hand to 17 M.C.

3. Peak trimmer condenser T5 of the oscillator coil (See pictorial) to resonance with 17 M.C. fed into antenna.

4. Adjust antenna and RF coil trimmers T6 and T7 to same frequency after the above mentioned oscillator trimmer has been set.

5. Turn dial hand to 6 M.C. on the same band and peak padding condenser P-1 to 6 M.C.

III SHORTWAVE BAND 1.7 TO 5.5 M.C.

1. Set band switch to this band and dial hand to 5 M.C.
2. Peak trimmer T8 to 5 M.C.
3. Peak antenna and RF trimmer to T9 and T10 to 5 M.C.
4. Rotate dial to 1.7 M.C. and adjust padding condenser P-2 1.7 M.C.

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the attenuator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same applies to the 5 M.C. adjustment.

IV THE BROADCAST BAND

1. Turn wave band switch all the way to left and dial hand set to 1400 KC (the top scale).

2. Peak oscillator trimmer T11 to 1400 KC and RF circuit trimmers T12 and T13 to same frequency.

3. Set dial hand to 550 KC and adjust oscillator padding condenser P-3 to 550 KC.

4. Recheck dial at 1400 KC as in number (1) and (2).

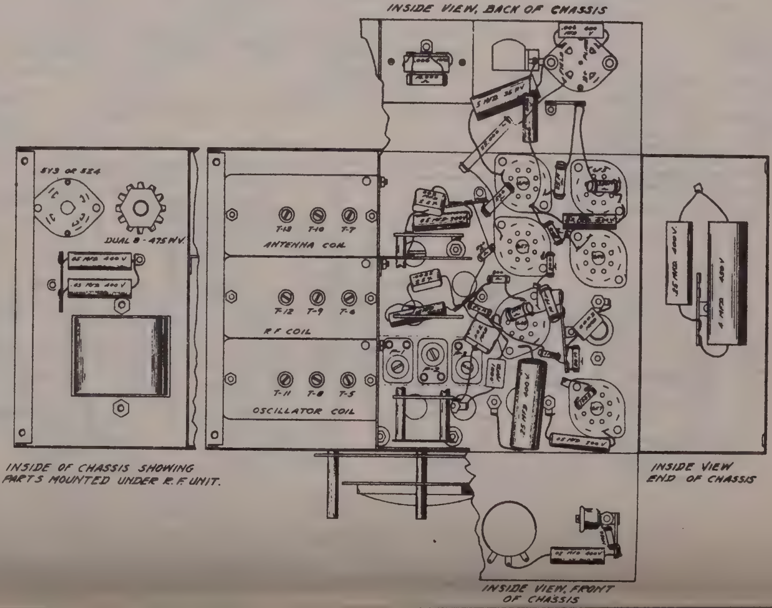
5. Points in the middle of the dial may be checked and if necessary the plates of the front section of variable condenser may be bent for alignment.

V NOTES.

1. Seal all trimmers after their final adjustment.

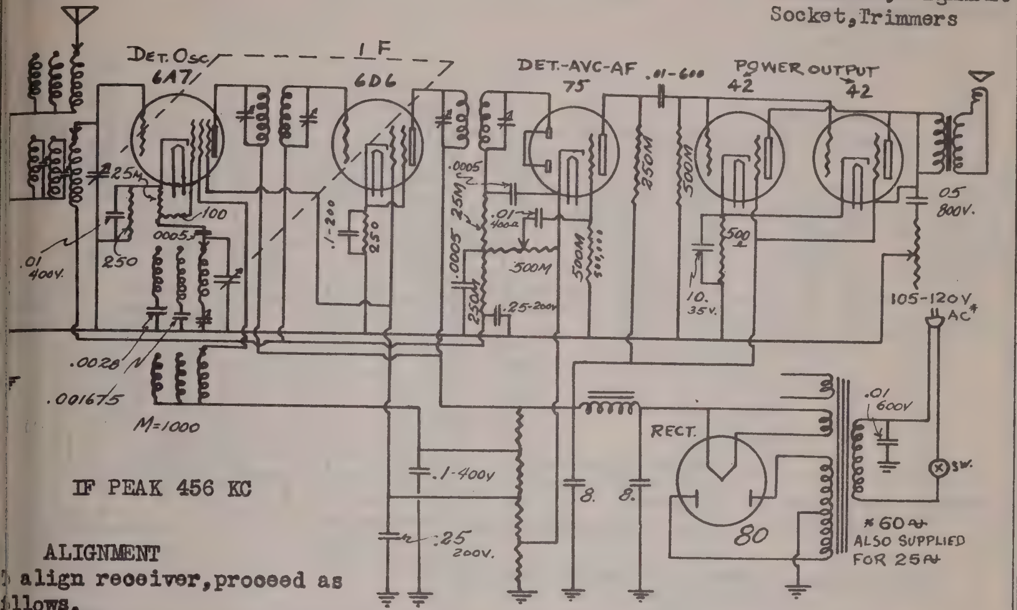
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.

3. Refer to the schematic for the voltages at the tube sockets.


INSIDE VIEW, BACK OF CHASSIS
5Y3 OR 5Z4
DUAL 8 - 475 W.V.
T-13
T-10
T-7
ANTENNA COIL
T-12
T-9
T-6
R F COIL
T-11
T-8
T-5
OSCILLATOR COIL
INSIDE OF CHASSIS SHOWING PARTS MOUNTED UNDER R.F. UNIT.
INSIDE VIEW END OF CHASSIS
INSIDE VIEW, FRONT OF CHASSIS

WALGREEN CO.

MODELS 600,650
Schematic,Alignment
Socket,Trimmers



IF PEAK 456 KC

ALIGNMENT

align receiver,proceed as
llows,

1 Apply 456 KC note to control grid of 6A7 and peak IF transformers for maximum
in.

2 Apply 4000 KC note to antenna wire; set band switch to second band and align
immer on oscillator section of variable condenser to track with 4000 KC on dial

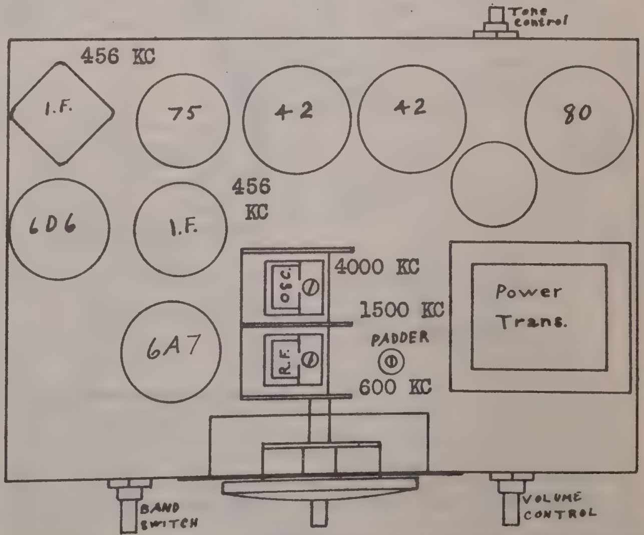
3 Turn band switch to broadcast band; apply 1500 KC note to antenna wire, adjust
immer of RF section of variable condenser for maximum gain.

4 Apply 600 KC note to antenna, adjust padder condenser for maximum gain, swing-
g condenser back and forth across 600 KC signal.

5 Check 1400 KC signal for alignment.

6 Turn band switch to second band; check 4000 KC signal for alignment and adjust
immer on antenna coil for
eatest gain at 4000 KC.

7 Turn band switch to
st band and adjust trim-
r on antenna coil for
eatest noise on 12
gacycles.

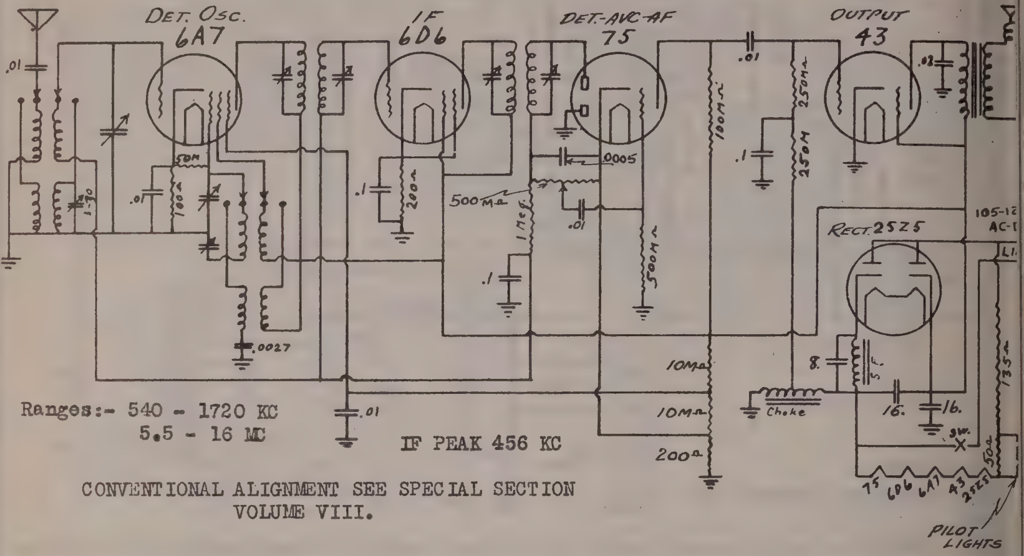


NGES:-

This receiver covers
540 - 1720 kilocycles
720- 5000 kilocycles
5.5- 16 megacycles

MODEL 901
Schematic, Alignment
Socket, Trimmers

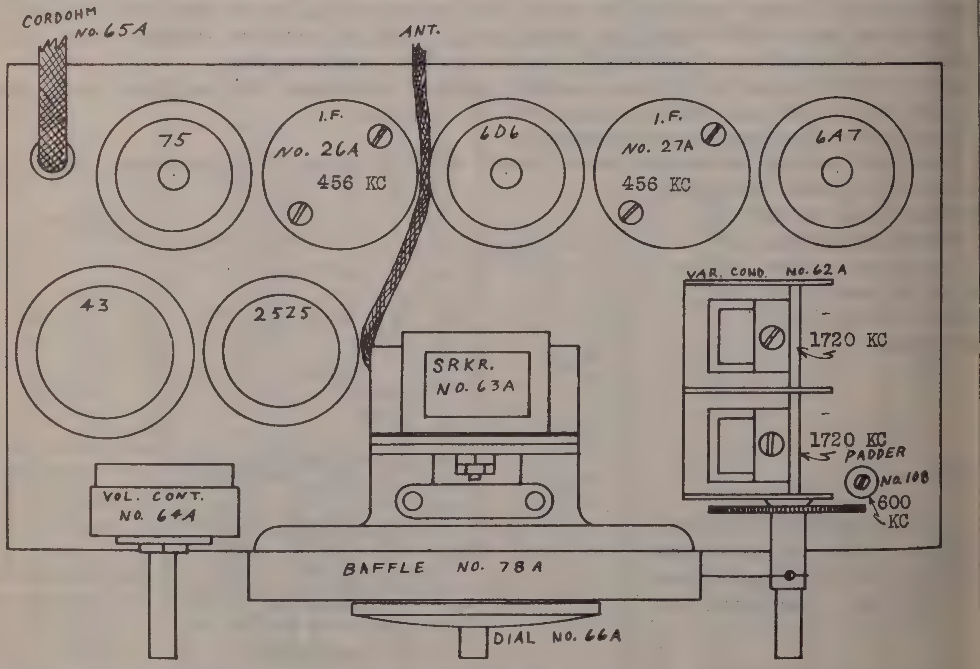
WALGREEN CO.



Ranges:- 540 - 1720 KC
5.5 - 16 MC

IF PEAK 456 KC

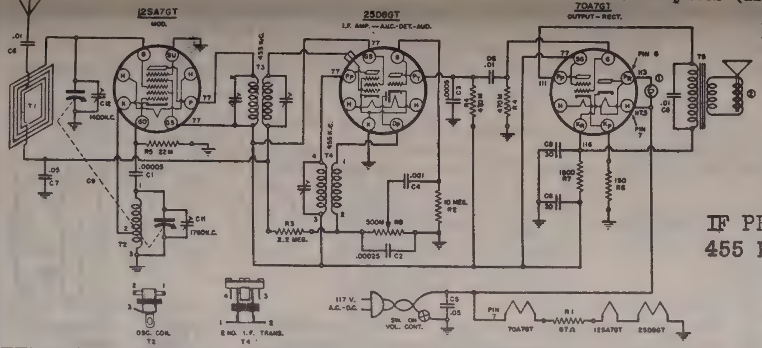
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.



Check alignment at 1400 KC. To align short wave band, adjust trimmer underneath chassis for greatest noise level around the 25 meter band.

6-14-35- F.W.

Kilocycles (K.C.).

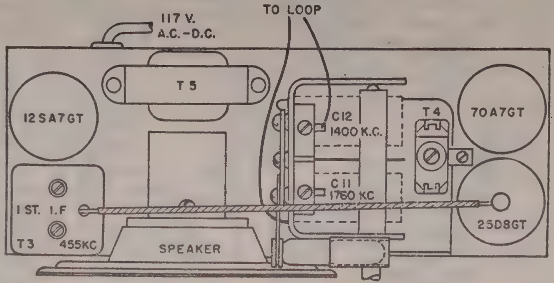


Model No. 0-30

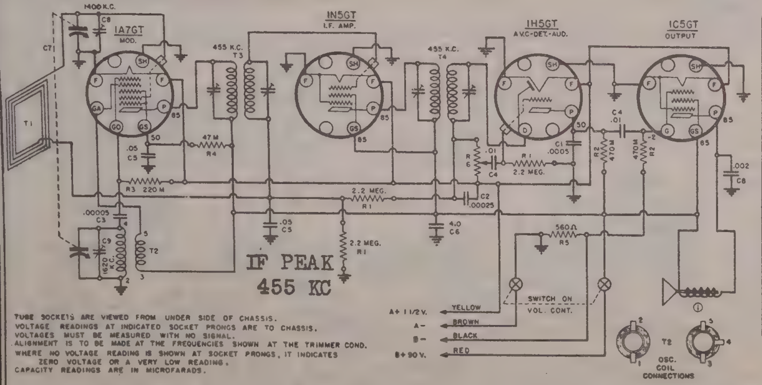
Model No. 0-300 to 0-309, Inclusive

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

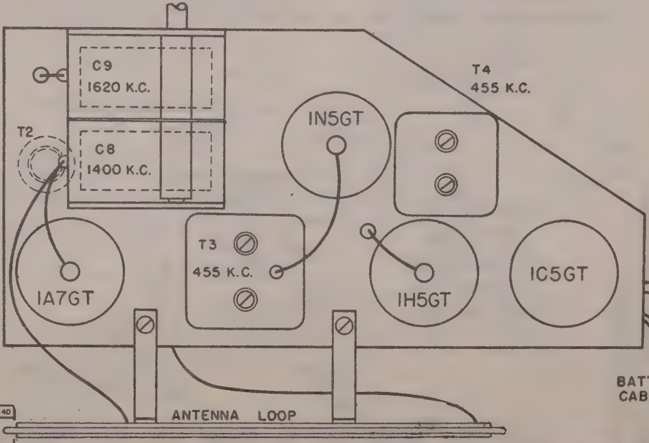
IF PEAK
455 KC



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-30
C1	1503	.00005 MFD. MICA CONDENSER	R1	60-239	87 OHMS 2 W. WIRE WOUND RESISTOR	T1	82-4	ANTENNA LOOP
C2	1504	.00025 " " "	R2	60-225	10 MEGOHM 1/2 W. CARBON RESISTOR	T2	10-299	OSCILLATOR COIL
C3	15-113	.0005 " " "	R3	60-208	2.2 " " " "	T3	10-296	1 ST. I.F. TRANSFORMER
C4	15-111	.001 " " "	R4	60-206	470 M OHM " " "	T4	10-297	2 ND. " "
C5	1607	.05 " - 400 V. TUBULAR CONDENSER	R5	60-223	22 M " " " "	T5	80-176	OUTPUT "
C6	16-121	.01 " 200 V. " "	R6	60-240	150 " " " "			
C7	1622	.05 " " " "	R7	60-241	1800 " 1 W. " "	1	89-4	PILOT LIGHT #47
C8	18-251	30 X 30 " 150W.V. ELECTROLYTIC COND.	R8	24-139	500 M - VOLUME CONTROL	2	79-270	SPEAKER
C9	19-150	2 GANG VARIABLE COND. ALSO C12 & C11						



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS.



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-40
R1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR	C1	15-112	.0005 MFD. MICA CONDENSER	T1	82-2	ANTENNA LOOP
R2	60-178	470 M OHM " " "	C2	1504	.00025 " " "	T2	10-294	OSCILLATOR COIL
R3	60-180	220 M " " " "	C3	1503	.00005 " " "	T3	10-293	1 ST. I.F. TRANSFORMER
R4	60-177	47 M " " " "	C4	16-121	.01 MFD. 200 V. TUBULAR CONDENSER	T4	10-281	2 ND. " "
R5	60-201	560 Ω " " " "	C5	1622	.05 " 200 V. " "			
R6	24-138	1 MEGOHM VOLUME CONTROL	C6	18-250	4.0 " 150W.V. " "	1	79-272	5" SPEAKER
			C7	19-149	2 GANG VARIABLE COND. ALSO C8 & C9			
			C8	1609	.002 MFD. 400 V TUBULAR CONDENSER			

MODEL 0-40 ,0-407.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

This receiver is made to cover the standard broadcast band from 1620 K.C. to 535 K.C.

MODELS 0-43,0-430 to 0-439
MODELS 0-44,0-440 to 0-449
MODELS 0-62,0-620 to 0-629
Schematics,Socket,Trimmers
Alignment,Voltage

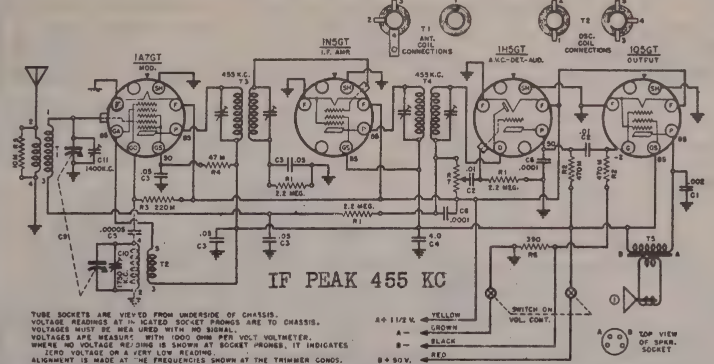
WARWICK MFG. CORP.

Model No. 0-44

Model No. 0-440 to 0-449, Inclusive

Model No. 0-43

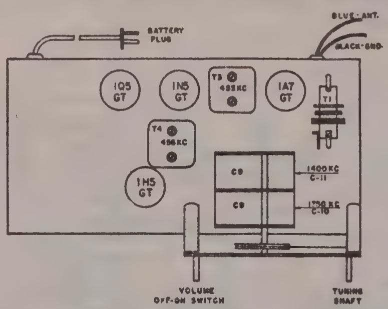
0-430 to 0-439, Incl.



IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-44
R1	60-179	2.2 MEGOHM 1/4 W. RESISTOR	C1	16-130	.002 MFD. 400V. TUBULAR COND.	T1	10-344	ANTENNA TRANSFORMER
R2	60-178	470M OHM " "	C2	16-121	.01 " 200V. " "	T2	10-341	OSCILLATOR "
R3	60-180	220M " " "	C3	1622	.05 " " " "	T3	10-342	1 ST. I.F "
R4	60-177	47M " " "	C4	18-250	4.0 " 150W.V. ELECTROLYTICS	T4	10-343	2 ND. I.F. "
R5	60-215	10M " " "	C5	15-120	.00005 MFD. MICA CONDENSER	T5	------	OUTPUT TRANS. (ON SPKR.)
R6	60-221	390 " " "	C6	1501	.0001 " " "			
R7	24-149	1 MEGOHM VOLUME CONTROL	C9	19-165	2 GANG VAR. COND. ALSO C10 & C11	1	79-297	5" P M. SPEAKER



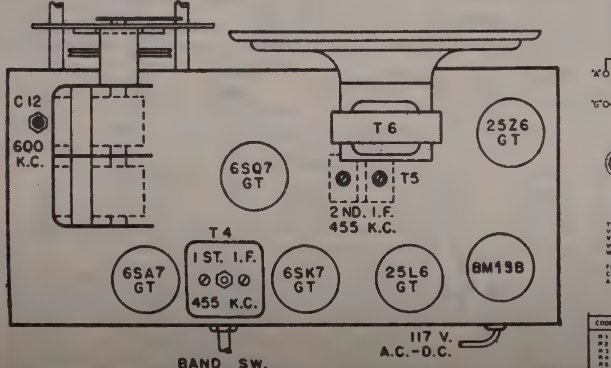
LOCATION OF PARTS ON TOP OF CHASSIS BASE

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

MODEL NO. 0-620 TO 0-629, INCLUSIVE

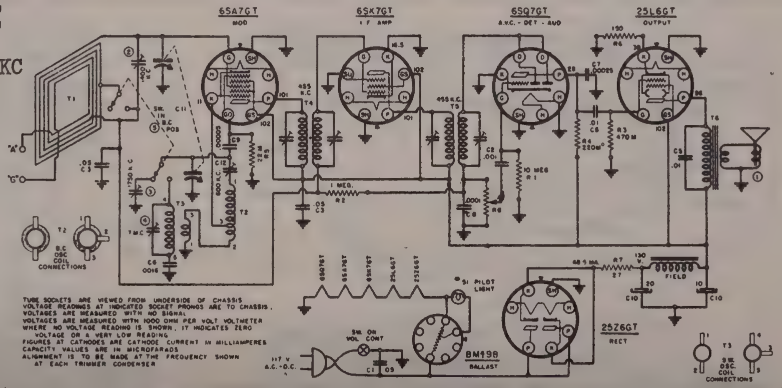
Model No. 0-62

IF PEAK 455 KC



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION

Bands
540 K.C. to 1750 K.C.

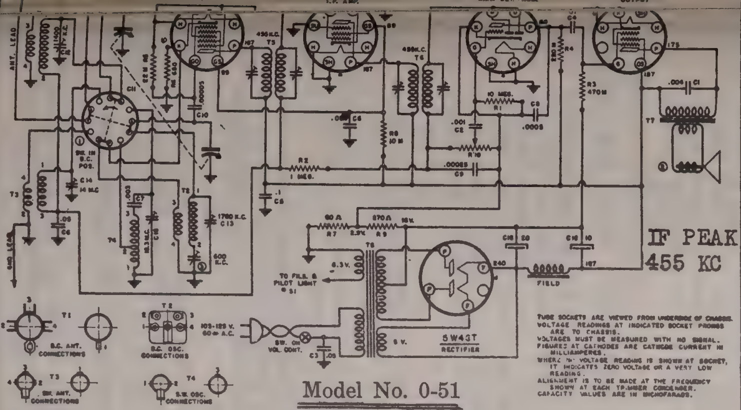


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER

CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-62
R1	60-193	10 MEGOHM 1/4 W RESISTOR	C1	1607	05 MFD. 400 V. TUBULAR COND.	T1	82-9	LOOP ANTENNA
R2	60-195	1 " " "	C2	16-124	001 " " " "	T2	10-330	B C OSCILLATOR COIL
R3	60-178	470M OHM " "	C3	1622	05 " 200 V " "	T3	10-331	S.W. " "
R4	60-180	220M " " "				T4	10-333	1 ST I.F. TRANSFORMER
R5	60-185	22M " " "	C5	16-121	01 " " " "	T5	10-281	2 ND. " "
R6	60-184	150 " " "	C6	15-116	0016 MFD MICA CONDENSER	T6	------	OUTPUT TRANSFORMER (ON SPKR.)
R7	60-220	27 " " "	C7	1504	00025 " " "	1	79-283	5" DYNAMIC SPEAKER
R8	24-142	500M " VOLUME CONTROL (WITH SW)	C8	1501	0001 " " "	2	20-129	TRIMMER (ON LOOP)
			C9	1503	00005 " " "	3	2090	2 PLATE TRIMMER
			C10	18-241	20 X 10 " 150 W.V. ELECTROLYTIC	4	20-128	1/2 PLATE TRIMMER
			C11	19-155	2 GANG VARIABLE CONDENSER	5	69-139	BAND SWITCH
			C12	20-126	PADDING CONDENSER			

MODEL 0-51
MODEL 0-63
Schematic, Voltage
Alignment, Trimmers
Socket

WARWICK MFG. CORP.



IF PEAK
455 KC

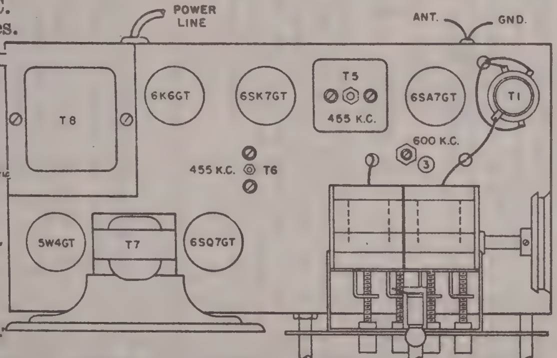
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE "0" VOLTAGE READING IS SHOWN AT SOCKET, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

Model No. 0-51

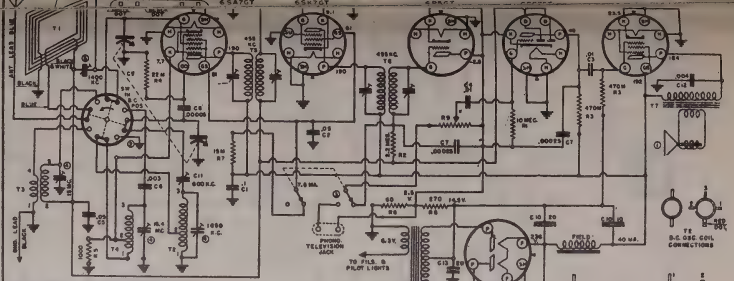
For push button data, see index.

Bands
537 K.C. to 1760 K.C.
5.7 to 18.3 megacycles.

CODE	PART NO.	DESCRIPTION
C1	16-123	.004 MFD. 400 V. TUBULAR COND.
C2	16-124	.001 " " " "
C3	1607	.05 " " " "
C4	16-119	.01 " " " "
C5	16-116	.1 " " " "
C6	1622	.05 " 200 V. " "
C7	15-118	.003 " MICA CONDENSER
C8	15-112	.0005 " " "
C9	1904	.00025 " " "
C10	1903	.00005 " " "
C11	95-8	2 GANG. VARIABLE CONDENSER
C12 C13 C14 C15	80-123	TRIMMER BLOCK
C16	18-224.	25 X 10 MFD. 350 W.V. ELECTROLYTIC
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR
R2	60-195	1 " " " "
R3	60-176	470M. OHM " " "
R4	60-180	220M " " " "
R5	60-183	22 M " " " "
R6	60-246	650 " " " "
R7	60-182	60 " 1/2 " "
R8	60-247	10M " 1 " "
R9	60-245	270 " " " "
R10	24-140	500M " VOLUME CONTROL & SW
T1	10-306	B.C. ANTENNA COIL
T2	10-308	B.C. OSCILLATOR COIL
T3	10-307	S.W. ANTENNA COIL
T4	10-309	S.W. OSCILLATOR COIL
T5	10-305	1ST. I.F. TRANSFORMER
T6	10-281	2ND. I.F. "
T7		OUTPUT TRANSFORMER (ON SPKR.)
T8	80-179	POWER TRANSFORMER 60~
1	69-136	BAND SWITCH
2	79 275	5" DYNAMIC SPEAKER
3	20-117	PADDING CONDENSER



Position of Variable	Generator Freq.	Dummy Ant. mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Closed	455 kc.	.1	6SA7 Grid.	T5 T6	I. F.
Fully Open	1760 kc	.0002	Antenna	C13	B. C. Osc.
600 kc	600 kc	.0002	Antenna	(3)	B. C. Padder
1400 kc	1400 kc	.0002	Antenna	C12	B. C. Ant.
Fully Open	18.3 mc	.0002	Antenna	C15	S. W. Osc.
14 mc	14 mc	.0002	Antenna	C14	S. W. Ant.



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

Bands
540 to 1650 K.C.
5:7 to 18.4 M.C.

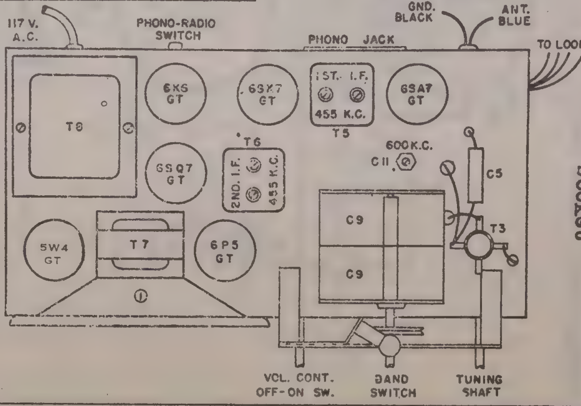
IF PEAK
455 KC

Model No. 0-63

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

CODE	PART NO.	DESCRIPTION
C1	18-116	.1 MFD 400 V TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	16-119	.01 " " " "
C4	16-121	.01 " 200V " "
C5	1622	.05 " 200V " "
C6	15-118	.003 MFD. MICA CONDENSER
C7	1904	.00025 " " "
C8	1903	.00005 " " "
C9	19-160	2 GANG VARIABLE CONDENSER
C10	18-234	20 X 10 MFD 350 W.V. ELECTROLYTIC
C11	20-130	PADDING CONDENSER
C12	1651	.004 MFD 600V TUBULAR CONDENSER
C13	18-243	20 MFD 25 W.V. ELECTROLYTIC
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 MEGOHMS " "
R3	60-176	470 M OHM " "
R4	60-185	22 M " " "
R5	60-217	1000 " " "
R6	60-182	60 " 1/2 W. "
R7	60-236	15 M " 1 W. "
R8	60-245	270 " " "
R9	24-146	500 M VOLUME CONTROL (WITH SW)

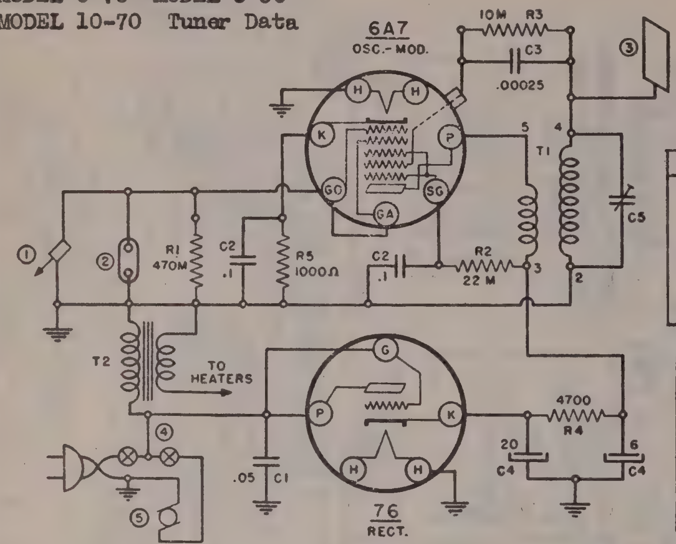
CODE	PART NO	DESCRIPTION 0-63
T1	82-11	LOOP ANTENNA
T2	10-328	B.C. OSCILLATOR COIL
T3	10-323	S.W. ANTENNA COIL
T4	10-320	S.W. OSCILLATOR COIL
T5	10-317	1ST I.F. TRANSFORMER
T6	10-318	2ND I.F. TRANSFORMER
T7	-------	OUTPUT TRANSFORMER (ON SPKR)
T8	80-179	POWER TRANSFORMER
1	79-273	5" DYNAMIC SPEAKER
2	69-143	BAND SWITCH
3	69-140	PHONO SWITCH
4	20-127	TRIMMER BLOCK
5	20-128	TRIMMER (ON LOOP)

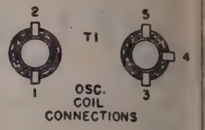


F. Rider, Publisher

MODEL 9-21 Phono.Osc.
Schematic,Notes
MODEL 0-51 MODEL 0-70
MODEL 0-75 MODEL 0-80
MODEL 10-70 Tuner Data

WARWICK MFG. CORP.





CODE	PART NO.	DESCRIPTION 9-
C1	1607	.05 MFD. 400V. TUB. CON
C2	16-115	.1 " 200V. " "
C3	1504	.00025 MFD. MICA "
C4	18-241	20 X 6 MFD. 150V. ELECT.
C5	20-119	3 PLATE TRIMMER
T1	10-240	OSCILLATOR TRANS
T2	80-170	FILAMENT TRANS.
5	59-1	PHONOGRAPH MOTOR

CODE	PART NO.	DESCRIPTION
R1	60-178	470M. OHM 1/3 W. RES.
R2	60-185	22 M. " " "
R3	60-215	10 M. " " "
R4	60-189	4700 " " "
R5	60-217	1000 " " "
1	83-130	PICKUP
2	12-1	MICROPHONE TERMINAL
3	82-1	ANTENNA PLATE
4	69-129	SWITCH (DUAL)

PHONO-OSCILLATOR

DESCRIPTION

This unit is a Two Tube Phono-Oscillator. The tubes used are a 6A7 as an oscillator and a 76 as a power rectifier.

This unit should be operated between 1500 K.C. and 1700 K.C. and is so designed that the playing of a record on the unit makes it possible that you receive this same recording from any radio set within a nearby vicinity.

ADJUSTING PUSH BUTTONS FOR MODELS 0-51, 0-70, 0-75, 0-80, and 10-70.

Cut the call letters of your four selected stations from the list supplied with your receiver and slip them into the top of the Push-Buttons, with the clear celluloid on top of the call letters to protect them. Arrange the call letters in the buttons from left to right, having the lowest frequency station (that is, the station closest to 600 K.C. at the left and work progressively towards the right, so that the highest frequency station is toward the right.

Follow the procedure outline below, in order to adjust the push-buttons properly:

1. By means of the tuning knob, tune in with the right hand as accurately as possible the desired station having the lowest frequency.

2. Continuing to hold the tuning control knob in its exact position with the right hand, loosen with the left hand the push-button to be set up for that station, (the one farthest toward the left) by unscrewing the push-button about one turn to the left (counter-clockwise).

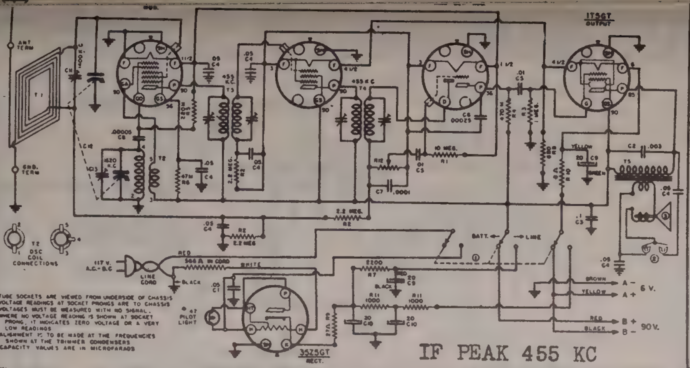
3. Push the push-button in all the way, and then tighten it gently toward the right (clockwise). Release push-button slowly and when in normal position grip button and tighten firmly.

The push-button tuning system is now correctly set up for your first selected station of lowest frequency.

Follow through with this same procedure, setting up the other three stations in the order of their frequency, that is, the second station set up will be second lowest in frequency, etc.

WARWICK MFG. CORP.

MODEL 0-53
MODEL 652B
Schematics, Voltage, Socket
Alignment, Trimmers



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READINGS
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS
CAPACITY VALUES ARE IN MICROFARADS

IF PEAK 455 KC

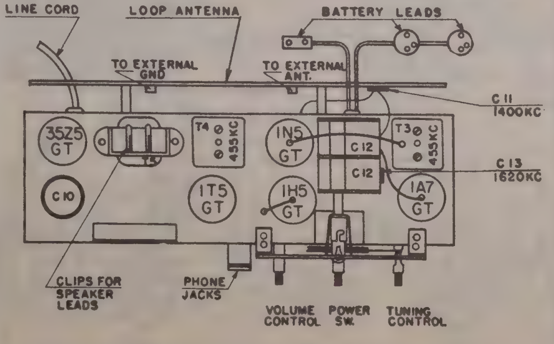
CODE	PART NO.	DESCRIPTION
C 1	1607	05 MFD. 400 V. TUBULAR COND
C 2	16 139	003 - - - -
C 3	16 115	1 - 200 V. - -
C 4	1622	05 - - - -
C 5	16 121	01 - - - -
C 6	1504	.00025 MFD. MICA CONDENSER
C 7	1501	0001 - - -
C 8	1503	.00005 - - -
C 9	18-263	20 X 20 - 150 W.V ELECTROLYTIC
C 10	18 262	20 X 20 - 150 W.V. -
C 11	20-129	TRIMMER ON LOOP
C 12	19-167	2 GANG VARIABLE COND. ALSO C 13

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W RESISTOR
R 2	60 175	2 2 - - -
R 3	60-195	1 - - -
R 4	60-178	470 M OHM - -
R 5	60-180	220 M - - -
R 6	60 177	47 M - - -
R 7	60 383	2200 - - -
R 8	60-379	680 - - -
R 9	60-220	27 - - -
R 10	60-128	8 - 1/2 W. -
R 11	60-644	1000 - 3 W. -
R 12	24-150	1 MEGOHM VOLUME CONTROL

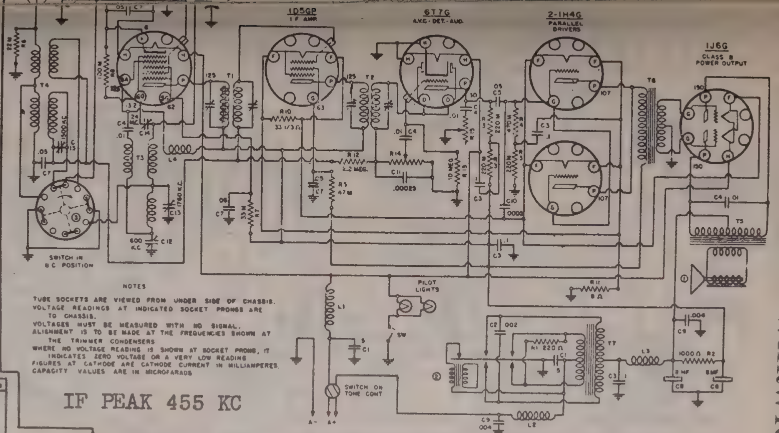
CODE	PART NO	DESCRIPTION 0-53
T 1	82-17	LOOP ANTENNA
T 2	10-310	OSCILLATOR COIL
T 3	10-355	1 ST. I.F. TRANSFORMER
T 4	10-343	2 ND. - -
T 5	80-196	OUTPUT TRANSFORMER
1	69-151	POWER SWITCH
2	12-3	PHONE JACK
3	79-298	5" P.M. SPEAKER

Model No. 0-53 radio receiver is a portable five (5) tube, 117 volt, 50-60 cycle A.C. or 117 volt D.C. or battery operated superheterodyne with self-contained loop antenna and batteries, designed to cover the standard broadcast band from 1620 to 535 K.C.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



LOCATION OF PARTS ON TOP OF CHASSIS



NOTES

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
FIGURES AT CATHODE ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS

IF PEAK 455 KC

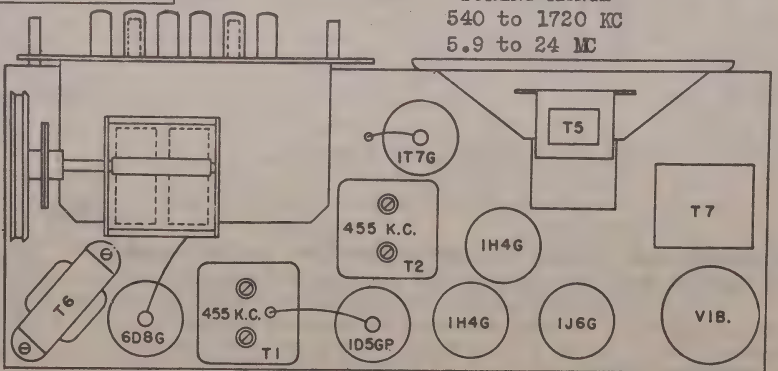
CODE	PART NO	DESCRIPTION
R 1	60-199	220 OHM 1/2 W RESISTOR
R 2	60-200	1000 - 1W -
R 3	60-180	220 M - 1/3 W -
R 4	60-178	470 M - - -
R 5	60-177	47 M - - -
R 6	60-185	22 M - - -
R 7	60 186	33 M - - -
R 8	60-156	100 M - - -
R 9	60-197	100 - - -
R 10	60-102	33 1/3 - 1/2W -
R 11	60-128	8 - - -
R 12	60-179	2.2 MEG 1.3W -
R 13	60-193	10 - - -
R 14	24-126	VOLUME CONTROL 1 MEG.
R 15	25-118	TONE CONTROL .5 MEG.

CODE	PART NO	DESCRIPTION
C 1	16-112	5 MFD. 200 V TUB CONDENSER
C 2.	16-126	002 - 1000 V BUFFER -
C 3	16 115	1 - 200 V TUB. -
C 4	16 119	01 - 400 V. - -
C 5	1607	05 - - - -
C 7	1622	.05 - 200 V - -
C 8	18-233	8 X 8 MFD 350 V ELECTROLYTIC
C 9	1508	004 - MICA CONDENSER
C 10	15-112	0005 - - -
C 11	1504	00025 - - -
C 12	20 117	300 600 MFD PADDING CONDENSER
C 13	2052	2 PLATE TRIMMER
C 14	20-118	3 PLATE -
C 15	19-133	VARIABLE CONDENSER

CODE	PART NO	DESCRIPTION 652B
1	19 194	SPEAKER 6" PM
2	34 103	VIBRATOR
3	69 125	WAVE BAND SWITCH
L1	33 216	FILAMENT CHOKE
L2	33 215	VIBRATOR -
L3	10-246	R F B -
L4	10 243	OSC CHOKE (R F.)
T1	10 247	1 ST I F TRANSFORMER
T2	10-248	2 ND I F -
T3	10-238	OSCILLATOR -
T4	10-237	ANTENNA -
T5		SPEAKER -
T6	80-164	AUDIO -
T7	80-161	VIBRATOR -

FOR PUSH BUTTON DATA SEE WARWICK PAGE 10-30.
FOR ALIGNMENT SEE MODEL 749, WARWICK PAGE 10-26.

TUNING RANGE
540 to 1720 KC
5.9 to 24 MC



MODEL 0-60,
MODEL 10-70

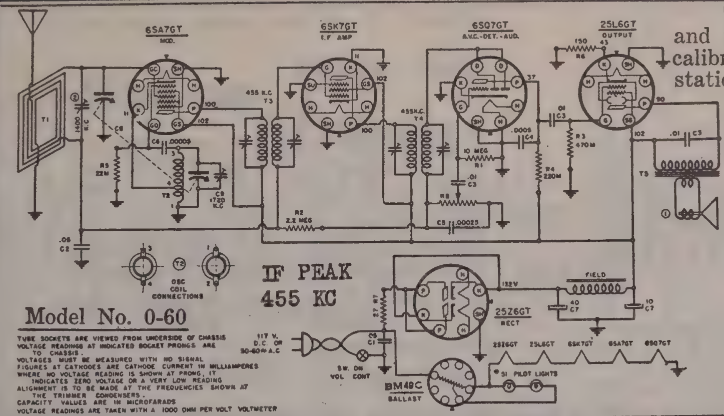
WARWICK MFG. CORP.

Schematics,Voltage,Socke
Alignment,Trimmers

This model has been designed to cover the standard broadcast band and the first police band from 538 K.C. to 1720 K.C. The dial scale is calibrated directly in kilocycles (less the final 0). Standard broadcast stations are listed in kilocycles in most station lists.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

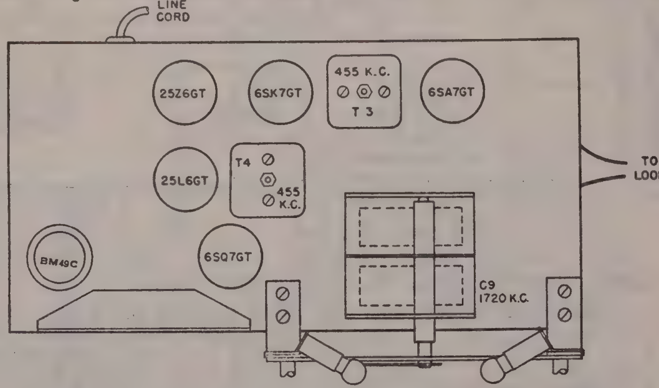
Note: Adjust antenna trimmer to 1400KC, see schematic.



Model No. 0-60

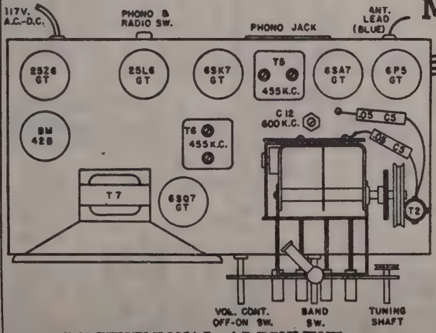
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
WHERE NO VOLTAGE READING IS SHOWN AT PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGE READINGS ARE TAKEN WITH A 1000 OHM PER VOLT VOLTMETER

CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-60
C1	1607	.05 MFD 400 V TUBULAR COND	R1	60-183	10 MEGOHM 1/4 W RESISTOR	T1	82-6	ANTENNA LOOP
C2	1622	.05 " 200 V. " "	R2	60-179	2.2 " " "	T2	10-311	OSCILLATOR COIL
C3	16-121	.01 " " " "	R3	60-178	470M OHM " "	T3	10-305	1 ST. I.F. TRANSFORMER
C4	15-112	.0005 MFD. MICA CONDENSER	R4	60-180	220M "	T4	10-312	2 ND. " "
C5	1504	.00025 " " "	R5	60-185	22M " " "	T5	------	OUTPUT TRANS. (ON SPKR.)
C6	1503	.00005 " " "	R6	60-184	150 " " "			
C7	18-255	40 X 10 " 150 W.V. ELECTROLYTIC	R7	60-220	27 " " "	1	79-277	6 1/2" DYNAMIC SPEAKER
C8	19-153	2 GANG VARIABLE COND. ALSO C9	R8	24-140	500 M " VOLUME CONTROL & SW.	2	20-124	TRIMMER



MODEL NO. 10-70

For push button data,see index.

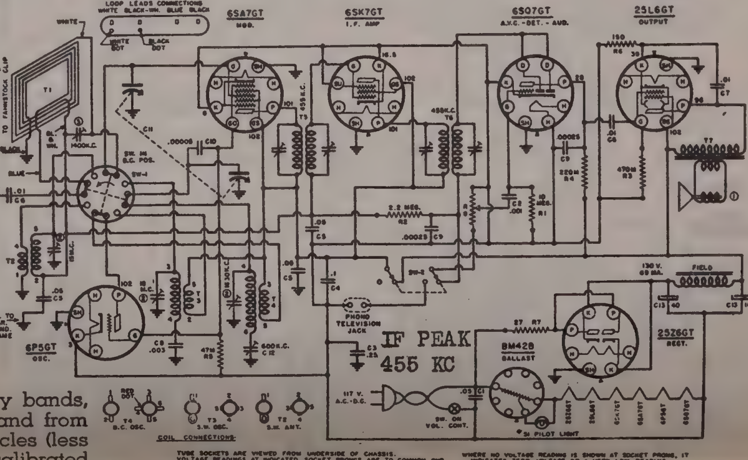


CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 400 V " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-162	2 GANG VARIABLE CONDENSER
C12	20-130	PADDING CONDENSER
C13	18-255	40 X 10 MFD. 150 W.V. ELECTROLYTIC
R1	60-183	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-146	500M " VOLUME CONTROL
SW1	69-145	BAND SWITCH
SW2	69-140	PHONO "
T1	82-11	LOOP ANTENNA (B.C.)
T2	10-337	S.W. ANTENNA COIL
T3	10-336	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-317	1 ST. I.F. TRANSFORMER
T6	10-312	2 ND. " "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

This model has been designed to cover two seperate frequency bands, a broadcast band from 540 K.C. to 1630 K.C. and a short wave band from 5.7 to 18 M.C. The dial scale has been calibrated directly in kilocycles (less the final 0) on the broadcast band, while the short wave band is calibrated



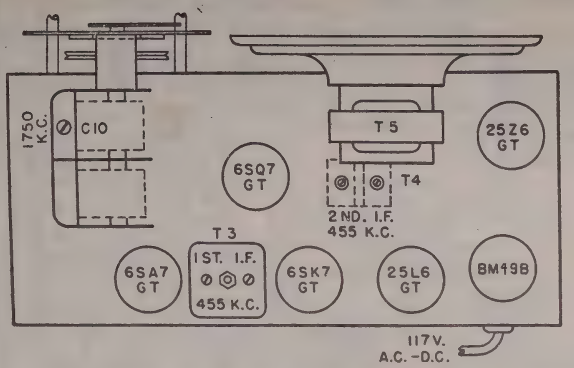
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.

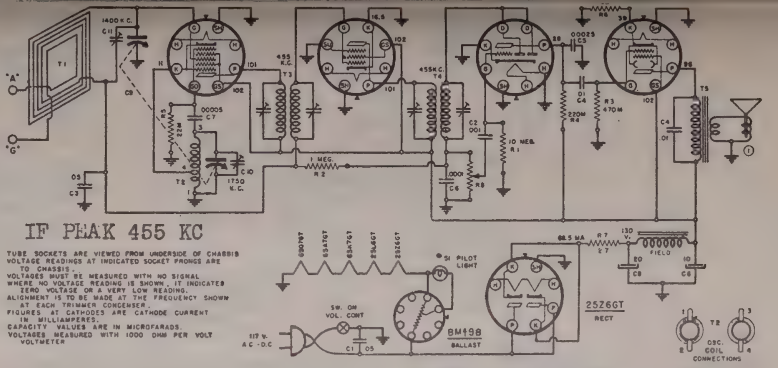
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH

MODELS 0-50,0-501
MODELS 0-61,0-610 to 0-619
Schematics,Voltage,Socket
Alignment,Trimmers

Model No. O-61

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



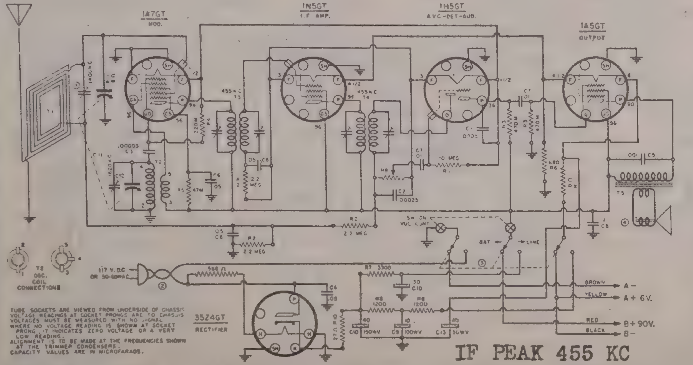


IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-61
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR	C 1	1507	05 MFD 400V TUBULAR COND	T 1	82-8	LOOP ANTENNA
R 2	60-195	1 - - -	C 2	16-124	001 - - - -	T 2	10-332	OSCILLATOR COIL
R 3	60-178	470M OHM - -	C 3	1622	05 - 200 V - -	T 3	10 333	1 ST. I F TRANSFORMER
R 4	60-180	220M - - -	C 4	16-121	.01 - - - -	T 4	10-281	2 ND. - -
R 5	60-185	22M - - -	C 5	1504	.00025 MFD MICA CONDENSER	T 5	------	OUTPUT TRANSFORMER (ON SPKR.)
R 6	60-184	150 - - -	C 6	1504	[illegible] - - -			
R 7	60-220	27 - - -	C 7	1503	.00005 - - -			
R 8	24-142	500M - VOLUME CONTROL (WITH SW.)	C 8	16-241	20 X 10 - 150 W.V. ELECTROLYTIC	1	79-283	5" DYNAMIC SPEAKER
			C 9	19-154	2 GANG VARIABLE COND. ALSO C10			
			C 11	20-129	TRIMMER (ON LOOP)			

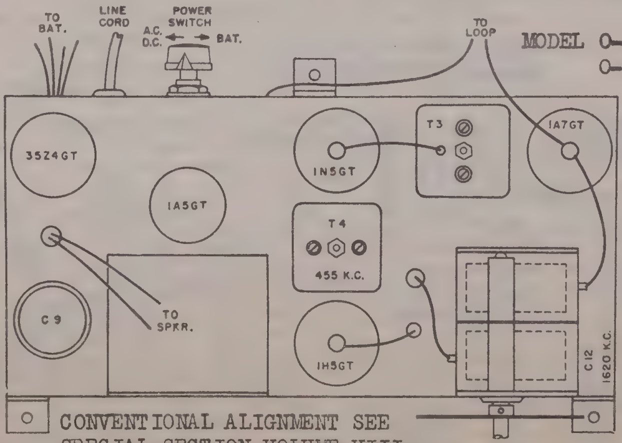
MODEL 0-50
0-501



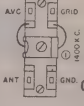
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS.

IF PEAK 455 KC

CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-50
R 1	60-193	10 MEGOHM 1/4 W RESISTOR	C 1	15-112	0005 MFD MICA CONDENSER	T 1	82-6	ANTENNA LOOP
R 2	60-79	2.2 - - -	C 2	1504	00025 - - -	T 2	10-310	OSCILLATOR TRANSFORMER
R 3	60-178	470M OHM - -	C 3	1503	00005 - - -	T 3	10-303	1 ST. I.F. -
R 4	60-180	220 M - - -	C 4	1607	05 MFD. 400 V. TUBULAR CONDENSER	T 4	10-304	2 ND. - -
R 5	60-77	47 M - - -	C 5	16-124	001 - - - -	C 13	18-259	40 MFD 50 W.V. ELECTROLYTIC
R 6	60-246	680 - - -	C 6	1622	05 - 200 V - -	1	20-124	TRIMMER
R 7	60-244	3300 - 1/2 W -	C 7	16-121	01 - - - -	2	23-138	LINE CORD (WITH RESISTOR)
R 8	60-242	1200 3 W. -	C 8	16-115	.1 - - - -	3	69-135	SWITCH
R 9	24-138	1 MEGOHM VOLUME CONTROL	C 9	18-258	10 - 100 W.V. ELECTROLYTIC	4	79-174	5 P.M. SPEAKER } OR 79-276 SPEAKER
R 10	60-126	27 OHM 1/4 W RESISTOR	C 10	18-257	30 X 40 MFD 150 W.V. ELECTROLYTIC	T 5	80-178	OUTPUT TRANS.
R 11	60-128	8 - 1/2 W -	C 11	19-132	2 GANG VARIABLE CONDENSER ALSO C12			



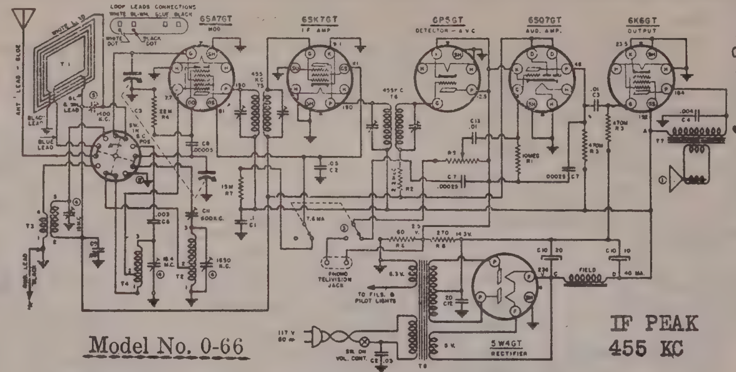
CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII



CONNECTIONS
ON TRIMMER
STRIP INSIDE
REAR COVER

MODEL 0-64
MODEL 0-66
Schematics, Voltage, Socket
Alignment, Trimmers

WARWICK MFG. CORP.

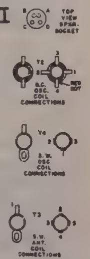


Model No. 0-66

IF PEAK
455 KC

Bands
540 to 1650 K. C.
5.7 to 18.4 M. C.

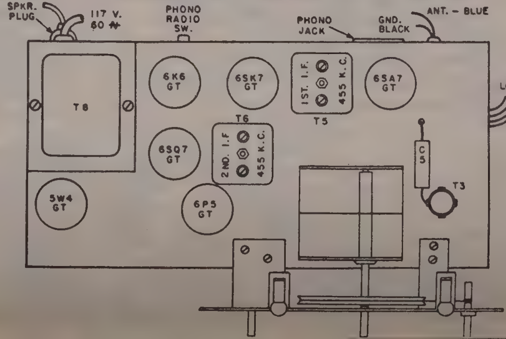
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

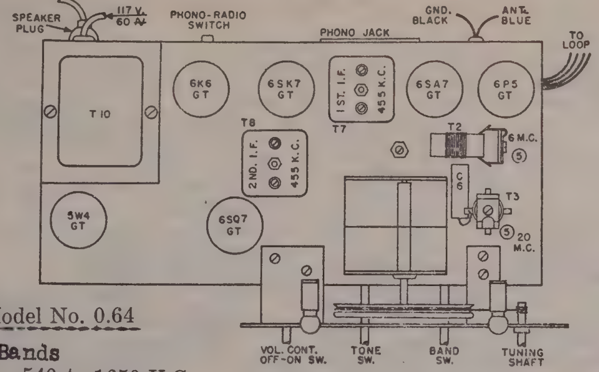

TOP VIEW SPKR. SOCKET
T2
B.C. OSC. COIL CONNECTIONS
RED DOT
T4
S.W. OSC COIL CONNECTIONS
T3
S.W. ANT. COIL CONNECTIONS

CODE	PART NO.	DESCRIPTION
C1	16-118	.1 MFD. 400 V. TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	16-119	.01 " " " "
C4	1631	.004 " 600 V. " "
C5	1622	.05 " 200 V. " "
C6	15-118	.003 MFD. MICA CONDENSER
C7	1504	.00025 " " "
C8	1503	.00005 " " "
C9	19-156	2 GANG VARIABLE CONDENSER
C10	18-254	20 X 10 MFD. 350 W.V. ELECTROLYTIC
C11	20-124	PADDING CONDENSER
C12	18-243	20 MFD. 25 V. ELECTROLYTIC
C13	16-121	.01 " 200V. TUBULAR CONDENSER

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-66
R1	60-193	10 MEGOHM 1/4 W. RESISTOR	T1	82-13	LOOP ANTENNA
R2	60-179	2.2 " " "	T2	10-326	B.C. OSCILLATOR COIL
R3	60-178	470M OHM " "	T3	10-323	S.W. ANTENNA COIL
R4	60-193	22 M " " "	T4	10-320	S.W. OSCILLATOR COIL
			T5	10-315	1 ST. I.F. TRANSFORMER
R6	60-182	60 " 1/2 W. "	T6	10-312	2 ND. "
R7	60-236	15 M " 1 W. "	T7	------	OUTPUT TRANSFORMER (ON SPKR.)
R8	60-245	270 " " "	T8	80-175	POWER
R9	24-144	500 M " VOLUME CONTROL (WITH SW.)	1	79-278	6 1/2" DYNAMIC SPEAKER
			2	69-141	BAND SWITCH
			3	69-140	PHONO SWITCH
			4	20-127	TRIMMER BLOCK
			5	20-129	TRIMMER (ON LOOP)

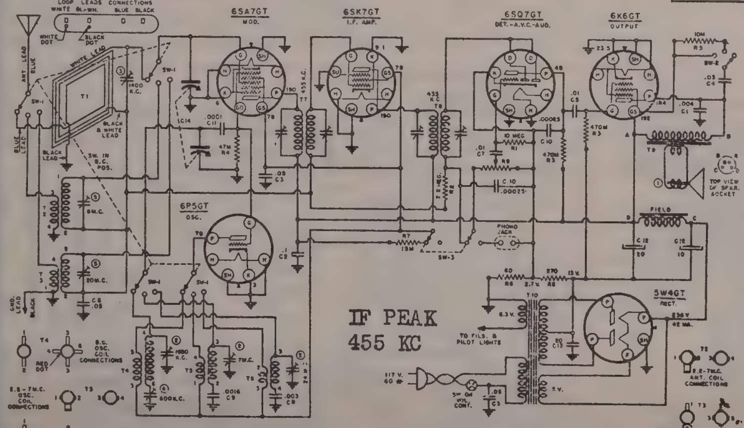




Model No. 0.64

Bands
540 to 1650 K.C.
2.22 to 7 M.C.
7.7 to 24 M.C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



IF PEAK
455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C1	1651	.004 MFD. 600 V. TUBULAR CONDENSER
C2	16-116	.1 " 400 V. " "
C3	1607	.05 " " " "
C4	1648	.03 " " " "
C5	16-119	.01 " " " "
C6	1682	.05 " 200 V. " "
C7	16-121	.01 " " " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	15-119	.0016 " " "
C10	1504	.00025 " " "
C11	1501	.0001 " " "
C12	18-234	20 X 10 " 350 W.V. ELECTROLYTIC
C13	18-243	20 MFD. 25 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-177	47M " " "
R5	30-215	10 M " " "
R6	60-182	63 " 1/2 W. "
R7	60-236	15 M " 1 W. "
R8	60-245	270 " " "
R9	24-144	500 M " VOLUME CONTROL
SW-1	69-142	BAND SWITCH
SW 2	69-143	TONE "
SW-3	69-140	PHONO "

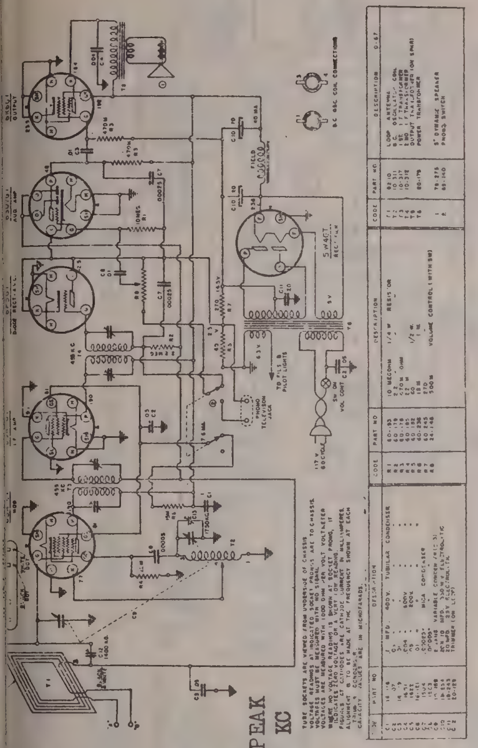
CODE	PART NO.	DESCRIPTION 0-64
T1	82-13	ANTENNA LOOP
T2	10-324	ANTENNA TRANSFORMER (2.2-7 M.C.)
T3	10-322	" " (7.7-24M.C.)
T4	10-318	OSCILLATOR " (B C.)
T5	10-327	" " (2.2-7 M.C.)
T6	10-329	" " (7.7-24M.C.)
T7	10-317	1ST. I.F. TRANSFORMER
T8	10-312	2ND. I.F. "
T9	------	OUTPUT TRANS. (ON SPKR.).
T10	80-173	POWER TRANSFORMER
1	79-278	6 1/2" DYNAMIC SPEAKER.
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

WARWICK MFG. CORP.

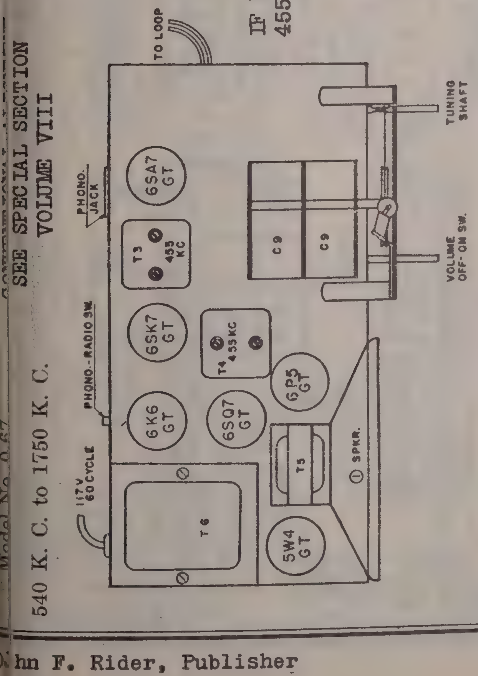
MODEL 0-65
MODEL 0-67
Schematics, Voltage, Socket
Alignment, Trimmers

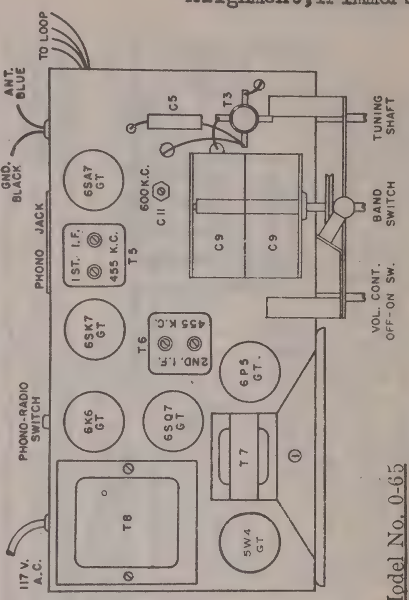
Model No. 0-67
540 K. C. to 1750 K. C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



IF PEAK
455 KC



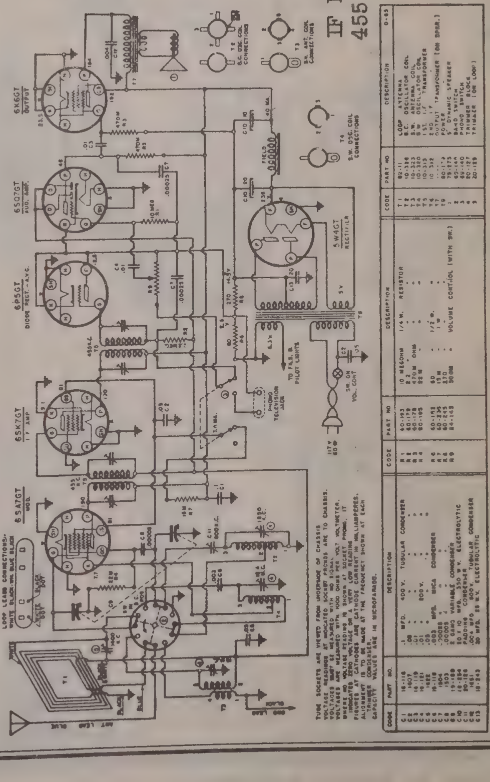


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

Model No. 0-65

Bands
540 to 1650 K. C.
5.7 to 18.4 M. C.

IF PEAK
455 KC

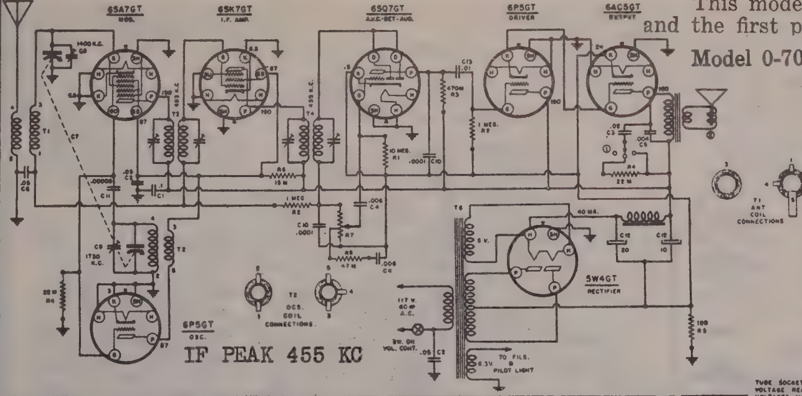


MODEL 0-70
MODEL 0-71
Schematics, Voltage, Socket
Alignment, Trimmers

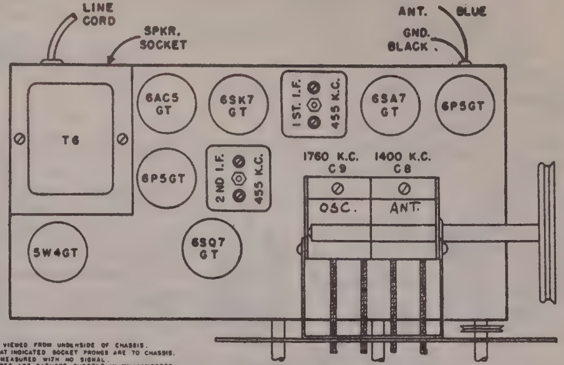
WARWICK MFG. CORP.

This model has been designed to cover the standard broadcast band and the first police band from 537 K.C. to 1730 K.C.

Model 0-70



IF PEAK 455 KC



CODE	PART NO.	DESCRIPTION
C 1	16-116	.1 MFD. 400 V. TUBULAR CONDENSER
C 2	1607	.05 " " " "
C 3	1608	.02 " " " "
C 4	16-114	.006 " " " "
C 5	16-123	.004 " " " "
C 6	1633	.05 " 200 V. " "
C 7	93-9	2 GANG VARIABLE CONDENSER ALSO C8 & C9
C 10	1501	.0001 MFD. MICA CONDENSER
C 11	1503	.00005 " " "
C 12	18-234	20 X 10 - 300 W.V. ELECTROLTIC COND
C 13	16-119	.01 MFD 400 V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-195	1 " " "
R 3	60-176	470 M OHM " "
R 4	60-185	22 M " " "
R 5	60-230	160 " " "
R 6	60-236	15 M " 1 W. "
R 7	24-147	500 M " VOLUME CONTROL
R 8	60-177	47 M " 1/4 W. RESISTOR

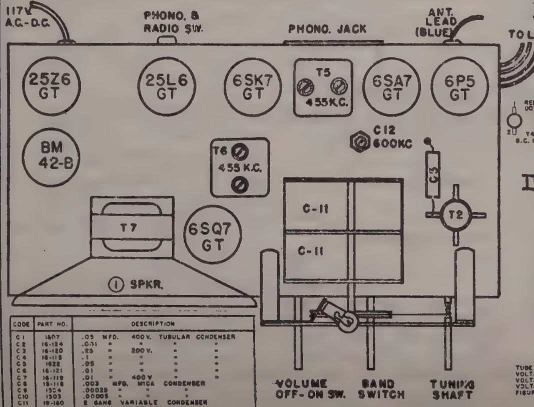
CODE	PART NO.	DESCRIPTION 0-70
T 1	10-233	ANTENNA COIL
T 2	10-316	OSCILLATOR COIL
T 3	10-315	1ST I.F TRANSFORMER
T 4	10-312	2 ND. " "
T 5	------	OUTPUT TRANS (ON SPKR)
T 6	80-179	POWER TRANSFORMER
1	69-137	TONE CONTROL SWITCH
2	79-278	6 1/2 DYNAMIC SPEAKER

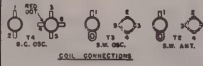
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

For Push Button
Data, see Index

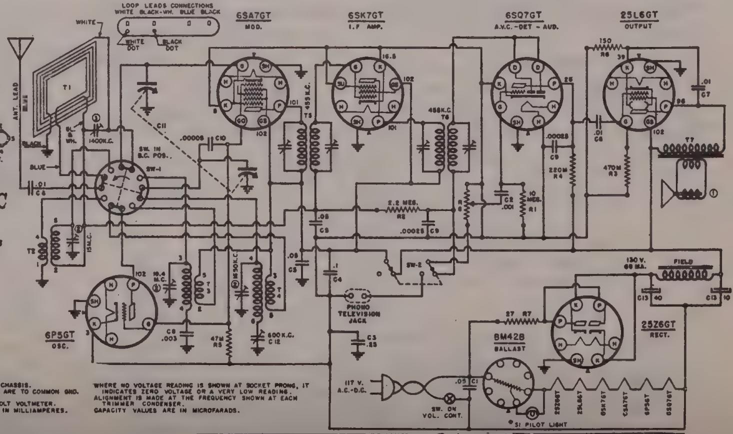
Model No. 0-71





IF PEAK 455 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C 2	16-124	.001 " " " "
C 3	16-120	.25 " 200 V. " "
C 4	16-115	.1 " " " "
C 5	1622	.05 " " " "
C 6	16-121	.01 " " " "
C 7	16-119	.01 " 400 V " "
C 8	15-118	.003 MFD. MICA CONDENSER
C 9	1504	.00025 " " "
C 10	1503	.00005 " " "
C 11	19-160	2 GANG VARIABLE CONDENSER
C 12	20-130	PADDING CONDENSER
C 13	18-235	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " " "
R 5	60-177	47M " " "
R 6	60-184	150 " " "
R 7	60-220	27 " " "

CODE	PART NO.	DESCRIPTION 0-71
T 1	82-11	LOOP ANTENNA (B.C.)
T 2	10-323	S.W. ANTENNA COIL
T 3	10-328	S.W. OSCILLATOR COIL
T 4	10-318	B.C. " "
T 5	10-317	1 ST. I.F. TRANSFORMER
T 6	10-312	2 ND. " "

This model has been designed to cover two separate frequency bands, a broadcast band from 540 K. C. to 1650 K. C. and a short wave band from

WARWICK MFG. CORP.

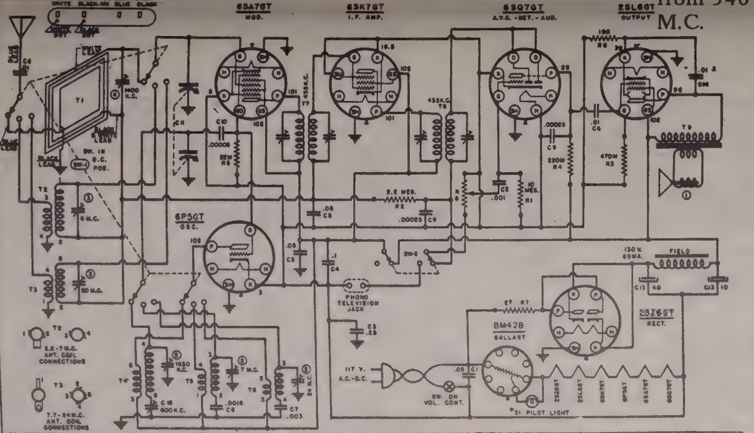
MODEL 0-72
MODEL 0-73
Schematics, Voltage, Socket
Alignment, Trimmers

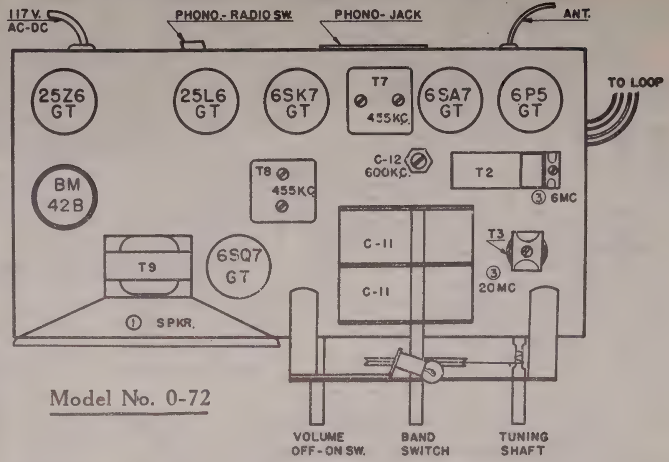
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.

INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH

from 540 K.C. to 1650 K.C., 2.22 M.C. to 7 M.C. and from 7.77 M.C. to 24 M.C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



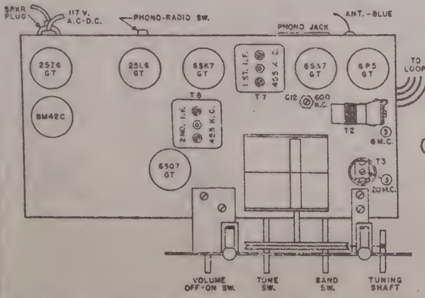


Model No. 0-72

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " [redacted] " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	15-118	.003 MFD. MICA CONDENSER
C8	15-119	.0018 " " "
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-158	2 GANG VARIABLE CONDENSER
C12	20-128	PADDING CONDENSER
C13	18-256	40 X 10 MFD. 150 W.V. ELECTROLYTIC
C14	16-119	.01 MFD. 400V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-185	22M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-145	500M " VOLUME CONTROL
SW1	69-144	BAND SWITCH
SW2	69-140	PHONO "

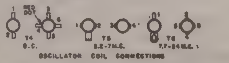
CODE	PART NO.	DESCRIPTION 0-72
T1	82-11	LOOP ANTENNA
T2	10-324	ANTENNA COIL (2.2-7 M.C)
T3	10-322	ANTENNA COIL (7.7-24 M.C.)
T4	10-318	OSCILLATOR COIL (B.C.)
T5	10-387	OSCILLATOR COIL (2.2-7 M.C.)
T6	10-389	OSCILLATOR COIL (7.7-24 M.C.)
T7	10-317	1ST I.F. TRANSFORMER
T8	10-318	2 ND. " "
T9	------	OUTPUT TRANSFORMER (ON SPKR.)
1	79-263	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	2052	2 PLATE TRIMMER
4	20-129	TRIMMER (ON LOOP)

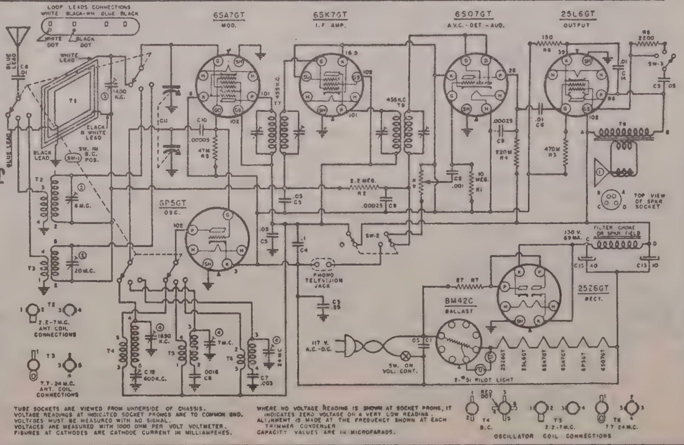


Model No. 0-73

Bands
540 K.C. to 1650 K.C.
2.22 M.C. to 7 M.C.
7.77 M.C. to 24 M.C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII





TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER
CAPACITY VALUES ARE IN MICROFARADS.

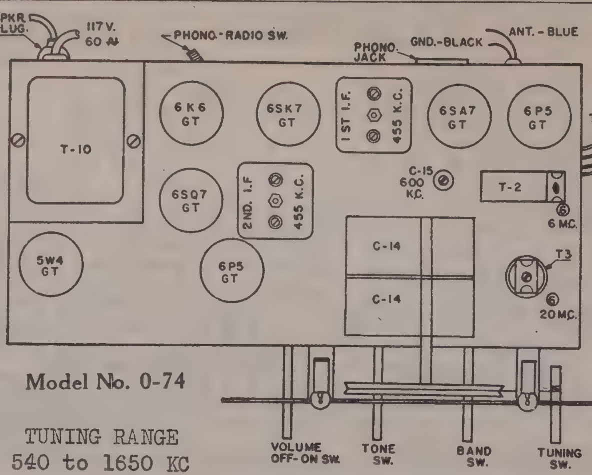
CODE	PART NO	DESCRIPTION
C1	1607	.05 MFD. 400V. TUBULAR CONDENSER
C2	16-24	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	15-118	.003 MFD. MICA CONDENSER
C8	15-119	.0018 " " "
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-156	2 GANG VARIABLE CONDENSER
C12	20-28	PADDING CONDENSER
C13	18-735	40 X 10 MFD. 150 W.V. ELECTROLYTIC
C14	16-119	.01 MFD. 400V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	60-253	2200 " " "
R9	24-144	500M " VOLUME CONTROL
SW1	69-142	BAND SWITCH
SW2	69-140	PHONO "
SW3	69-143	TONE "

CODE	PART NO.	DESCRIPTION 0-73
T1	82-11	LOOP ANTENNA
T2	10-324	ANTENNA COIL (2.2-7 M.C)
T3	10-322	ANTENNA COIL (7.7-24 M.C)
T4	10-318	OSCILLATOR COIL (B.C.)
T5	10-387	OSCILLATOR COIL (2.2-7 M.C.)
T6	10-389	OSCILLATOR COIL (7.7-24 M.C)
T7	10-317	1ST I.F. TRANSFORMER
T8	10-318	2 ND
T9	------	OUTPUT TRANSFORMER (ON SPKR.)
1	79-277	6 1/2" DYNAMIC SPEAKER
1	79-281	10" " "
1	79-291	8" P.M. SPEAKER
2	2052	2 PLATE TRIMMER
3	20-129	TRIMMER (ON LOOP)
4	20-127	TRIMMER BLOCK

MODEL 0-74
MODEL 0-75
Schematics, Voltage, Socket
Alignment, Trimmers

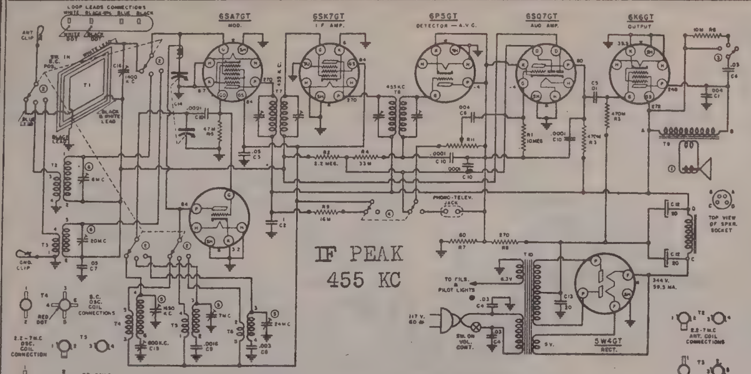
WARWICK MFG. CORP.



Model No. 0-74

TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



IF PEAK
455 KC

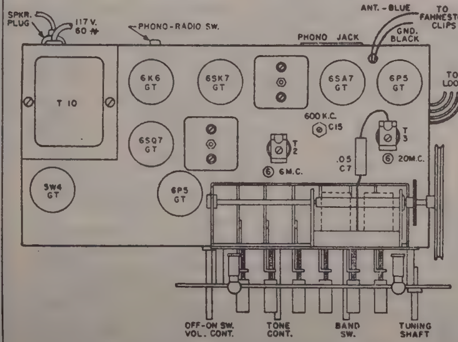
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.

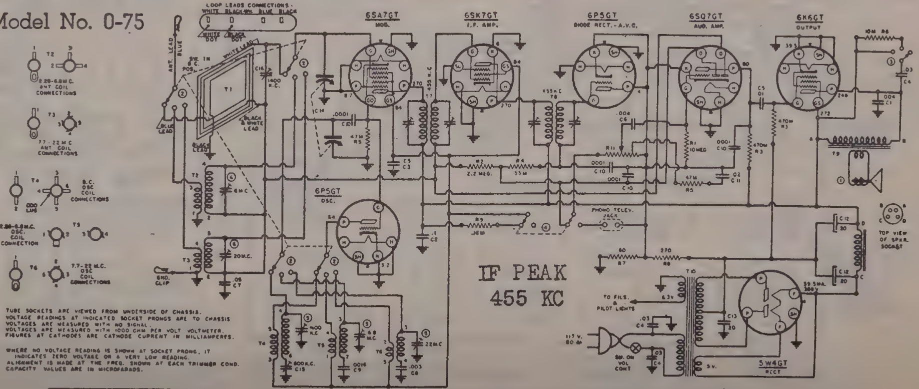
CODE	PART NO.	DESCRIPTION
C 1	1631	.004 MFD 600 V. TUBULAR CONDENSER
C 2	16-116	.1 " 400 V " "
C 3	1607	.05 " " " "
C 4	1648	.03 " " " "
C 5	16-119	.01 " " " "
C 6	16-128	.004 " " " "
C 7	1622	.05 " 200 V. " "
C 8	15-118	.003 MFD. MICA CONDENSER
C 9	15-119	.0016 " " "
C 10	1501	.0001 " " "
C 12	18-236	20 X 20 " 450 W.V. ELECTROLYTIC
C 13	18-243	20 MFD. " 25 W.V "
C 14	19-156	2 GANG VARIABLE CONDENSER
C 15	20-130	PADDING CONDENSER
C 16	20-129	TRIMMER (ON LOOP)

CODE	PART NO	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470 M OHM " "
R 4	60-186	33 M " " "
R 5	60-177	47 M " " "
R 6	60-215	10 M " " "
R 7	60-162	60 " 1/2 W. "
R 8	60-249	270 " 1 W. "
R 9	60-251	16 M " 2 W "
R 10		
R 11	24-144	500 M VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-74
T 1	82-13	LOOP ANTENNA (B.C.)
T 2	10-324	ANTENNA TRANSFORMER (2.2-7M.C.)
T 3	10-322	" " (7.7-24 M.C.)
T 4	10-318	OSCILLATOR " (B C.)
T 5	10-327	" " (2.2-7 M.C.)
T 6	10-329	" " (7.7-24 M.C.)
T 7	10-315	1ST. I.F. TRANSFORMER
T 8	10-312	2ND. " "
T 9	......	OUTPUT "
T 10	80-185	POWER "
1	79-284	6" DYNAMIC SPEAKER
2	69-142	BAND SWITCH
3	69-143	TONE "
4	69-140	PHONO " (2 SECT.)
5	20-127	TRIMMER BLOCK (3 SECT)
6	2032	2 PLATE TRIMMER



Model No. 0-75



IF PEAK
455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES ARE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

TUNING RANGE
540 to 1600 KC
2.28 to 6.8 MC
7.7 to 22 MC

For Push Button Data, see Index

CODE	PART NO	DESCRIPTION
C 1	1631	.004 MFD. 600 V. TUBULAR CONDENSER
C 2	16-116	.1 " 400 V " "
C 3	1607	.05 " " " "
C 4	1648	.03 " " " "
C 5	16-119	.01 " " " "
C 6	16-128	.004 " " " "
C 7	1622	.05 " 200 V. " "
C 8	15-118	.003 MFD. MICA CONDENSER
C 9	15-119	.0016 " " "
C 10	1501	.0001 " " "
C 11	16-123	.02 200 V TUBULAR CONDENSER
C 12	18-236	20 X 20 " 450 W.V. ELECTROLYTIC
C 13	18-243	20 MFD. " 25 W.V. "
C 14	[illegible]	2 GANG VARIABLE CONDENSER

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470 M OHM " "
R 4	60-186	33 M " " "
R 5	60-177	47 M " " "
R 6	60-215	10 M " " "
R 7	60-162	60 " 1/2 W. "
R 8	60-249	270 " 1 W. "
R 9	60-251	16 M " 2 W. "
R 10		
R 11	24-143	500 M " VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-75
T 1	82-13	LOOP ANTENNA (B C.)
T 2	10-333	ANTENNA TRANSFORMER (2.28-6.8 M C.)
T 3	10-340	" " (7.7-22 M C.)
T 4	10-318	OSCILLATOR " (B C.)
T 5	10-339	" " (2.28-6.8 M C.)
T 6	10-336	" " (7.7-22 M C.)
T 7	10-317	1ST I.F. TRANSFORMER
T 8	10-318	2ND. " "
T 9	------	OUTPUT "
T 10	80-183	POWER "
1	79-292	8" DYNAMIC SPEAKER
2	69-142	BAND SWITCH

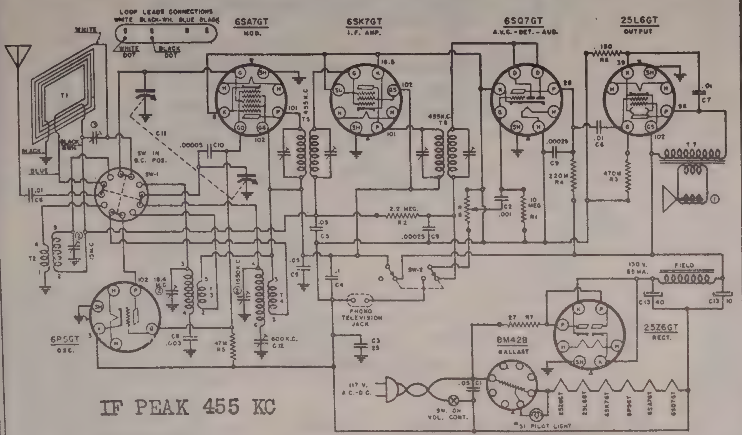
WARWICK MFG. CORP.

MODEL O-76
MODEL O-78
Schematics, Voltage, Socket
Alignment, Trimmers

Model No. O-76

has been designed to cover two separate frequency bands, a broadcast band from 540 K. C. to 1650 K. C. and a short wave band from 5.7 to 18.4 M.C.

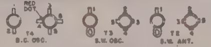
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



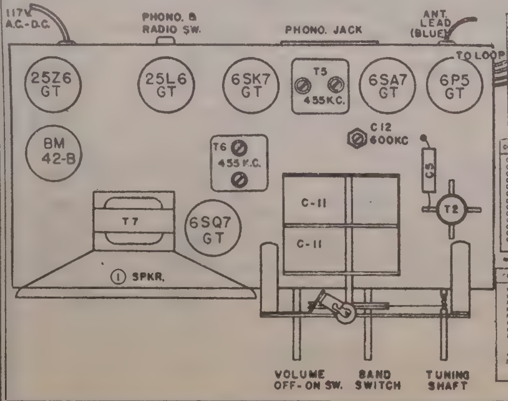
IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.



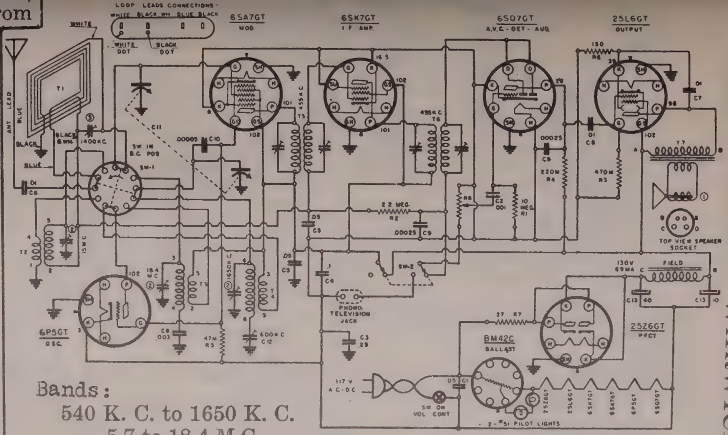
COIL CONNECTIONS



CODE	PART NO.	DESCRIPTION O-76
T1	82-11	LOOP ANTENNA (B.C)
T2	10-323	S.W. ANTENNA COIL
T3	10-328	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-317	1ST. I.F. TRANSFORMER
T6	10-312	2ND. " "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 600 V. " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-196	2 GANG VARIABLE CONDENSER
C12	20-126	PADDING CONDENSER
C13	18-295	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-145	500M " VOLUME CONTROL
SW1	69-148	BAND SWITCH
SW2	69-140	PHONO "

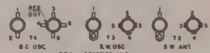


Bands:
540 K. C. to 1650 K. C.
5.7 to 18.4 M.C.

IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN. AT EACH TRIMMER CONDENSER
CAPACITY VALUES ARE IN MICROFARADS

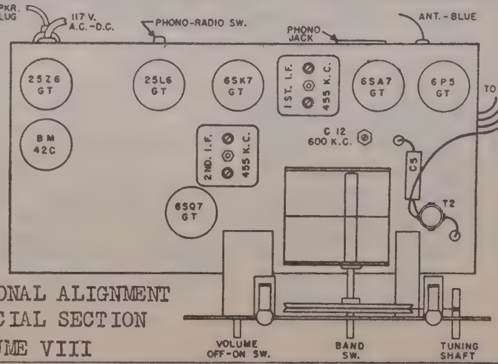


COIL CONNECTIONS

CODE	PART NO	DESCRIPTION
C1	1607	.05 MFD. 400V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200V. " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 400V. " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-156	2 GANG VARIABLE CONDENSER
C12	20-126	PADDING CONDENSER
C13	18-295	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-144	500M " VOLUME CONTROL
SW1	69-141	BAND SWITCH
SW2	69-140	PHONO

CODE	PART NO	DESCRIPTION O-78
T1	82-13	LOOP ANTENNA (B.C)
T2	10-323	S.W. ANTENNA COIL
T3	10-328	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-315	1ST. I.F. TRANSFORMER
T6	10-312	2ND. " "
T7	------	OUTPUT TRANSF. (ON SPKR)
1	79-277	6-1/2" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)



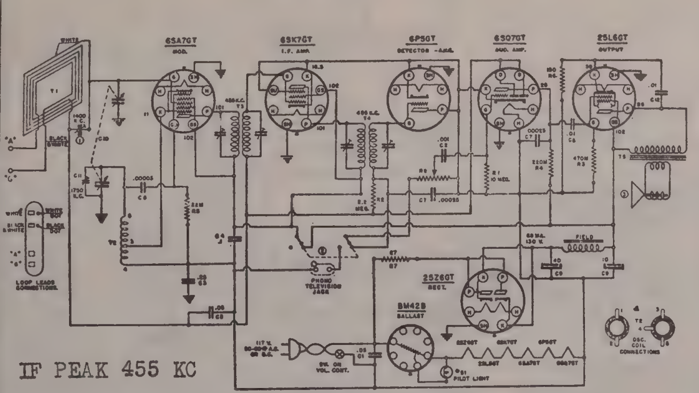
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

MODEL 0-77
MODEL 0-80

WARWICK MFG. CORP.

Schematics, Voltage, Socke
Alignment, Trimmers

Model No. 0-77

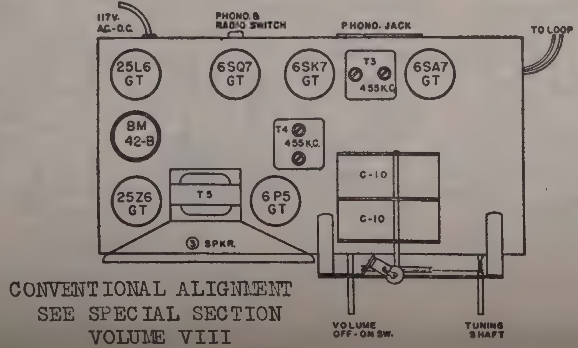


IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.

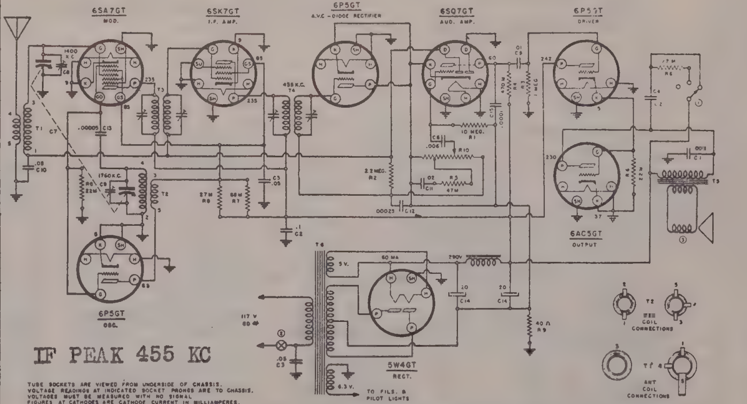
TUNING RANGE: 540 to 1750 KC

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-77
C1	1607	.05 MFD. 400 V. TUBULAR COND	R1	60-193	10 MEGOHM 1/4 W. RESISTOR	T1	82-10	LOOP ANTENNA
C2	16-124	.001 " " " "	R2	60-179	2.2 " " "	T2	10-311	OSCILLATOR COIL
C3	16-120	.25 " 200 V. " "	R3	60-178	470M OHM " "	T3	10-317	1 ST. I.F. TRANSFORMER
C4	16-115	.1 " " " "	R4	60-180	220M " " "	T4	10-318	2 ND. " "
C5	1622	.05 " " " "	R5	60-185	22M " " "	T5	------	OUTPUT TRANSFORMER (ON SPKR.)
C6	16-121	.01 " " "	R6	60-184	150 " " "			
C7	1504	.00025 MFD. MICA CONDENSER	R7	60-230	27 " " "	1	20-129	TRIMMER (ON LOOP)
C8	1503	.00005 " " "	R8	24-146	300M [illegible] CONTROL & SW.	2	69-140	PHONO SWITCH
C9	16-258	40 X 10 " 150W.V. ELECTROLYTIC				3	79-283	8" DYNAMIC SPEAKER
C10	16-189	2 GANG VARIABLE CONDENSER (ALSO C11)						
C12	16-118	.01 MFD 400V. TUBULAR CONDENSER						



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

Model No. 0-80



IF PEAK 455 KC

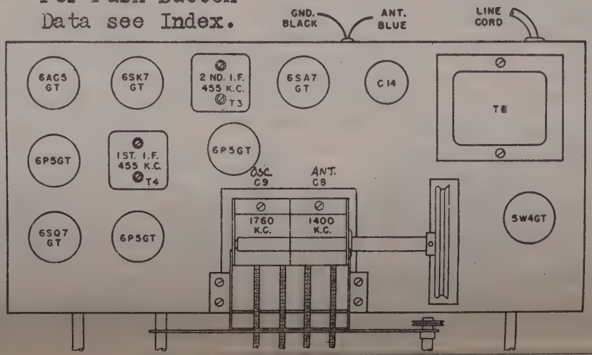
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET, IT INDICATES
ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN, AT THE
TRIMMER CONDENSERS.
CAPACITY VALUES ARE MICROFARADS.

TUNING RANGE: 537 to 1730 KC

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-80
C1	16-125	.004 MFD. 800 V. TUBULAR CONDENSER	R1	60-193	10 MEGOHM 1/4 W. CARBON RESISTOR	T1	10-235	ANTENNA COIL
C2	16-116	.1 " 400 V. " "	R2	60-179	2.2 " " " "	T2	10-316	OSCILLATOR COIL
C3	1607	.05 " " " "	R3	60-198	1 " " " "	T3	10-315	1 ST I.F. TRANSFORMER
C4	1605	.02 " " " "	R4	60-176	470M OHM " " "	T4	10-312	2 ND " "
C5	16-119	.01 " " " "	R5	60-177	47M " " " "	T5	- - -	OUTPUT TRANSFORMER
C6	16-114	.006 " " " "	R6	60-185	22M " " " "	T6	80-180	POWER TRANSFORMER
C7	95-10	2 GANG VARIABLE CONDENSER (ALSO C8 & C9)	R7	60-248	68M " 1/2 W. " "			
C10	1622	.05 MFD. 200 V. TUBULAR CONDENSER	R8	60-249	27M " 1 W. " "	1	69-137	TONE CONTROL
C11	16-123	.02 " " " "	R9	60-133	40 " 1/2 W. WIRE WOUND RESISTOR	2	69-138	A.C. SWITCH
C12	1804	.00025 MFD. MICA CONDENSER	R10	24-131	500 M" " VOLUME CONTROL	3	79-279	8" DYNAMIC SPEAKER
C13	1503	.00005 " " "						
C14	16-258	20 X 20 " 450 V. ELECTROLYTIC						
C15	1501	.0001 " MICA CONDENSER						

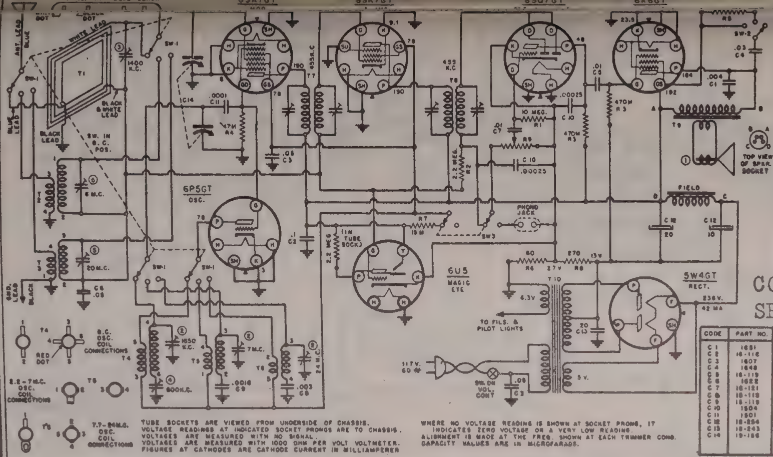
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

For Push Button
Data see Index.



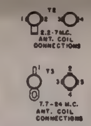
WARWICK MFG. CORP.

MODEL 0-79
MODEL 0-81
Schematics,Voltage,Socket
Alignment,Trimmers

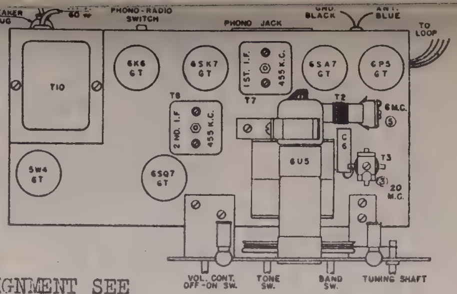


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERER

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS.


T2
2.2-7 M.C. ANT. COIL CONNECTIONS
T3
7.7-24 M.C. ANT. COIL CONNECTIONS

IF PEAK 455 KC
TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC
CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

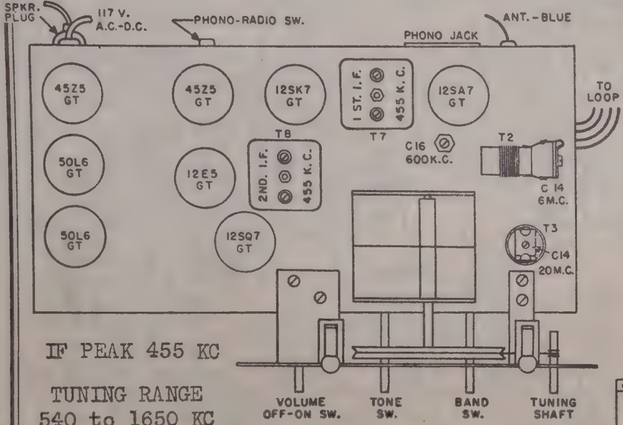


CODE	PART NO.	DESCRIPTION
C 1	1651	.004 MFD. 600V. TUBULAR CONDENSER
C 2	16-116	.1 " 400V. " "
C 3	1607	.05 " " " "
C 4	1648	.03 " " " "
C 5	16-119	.01 " " " "
C 6	1622	.05 " 200V. " "
C 7	16-121	.01 " " " "
C 8	15-113	.003 MFD. MICA CONDENSER
C 9	15-119	.0016 " " "
C 10	1504	.00025 " " "
C 11	1501	.0001 " " "
C 12	18-254	20 X 10 " 350 W.V. ELECTROLYTIC
C 13	18-243	20 MFD. 25 W.V. ELECTROLYTIC
C 14	19-186	2 GANG VARIABLE CONDENSER

CODE	PART NO	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-176	470M OHM " "
R 4	60-177	47M " " "
R 5	60-219	10M " " "
R 6	60-182	60 " 1/2 W. "
R 7	60-236	15M " 1 W. "
R 8	60-248	270 " " "
R 9	24-144	500M " VOLUME CONTROL
SW-1	69-142	BAND SWITCH
SW-2	69-143	TONE "
SW-3	69-140	PHONO "

CODE	PART NO.	DESCRIPTION 0-79
T 1	82-13	ANTENNA LOOP
T 2	10-324	ANTENNA TRANSFORMER (2.2-7 M.C.)
T 3	10-322	" " (7.7-24 M.C.)
T 4	10-318	OSCILLATOR " (B.C.)
T 5	10-327	" " (2.2-7 M.C.)
T 6	10-329	" " (7.7-24 M.C.)
T 7	10-315	1ST. I.F. TRANSFORMER
T 8	10-312	2ND. I.F. "
T 9	------	OUTPUT TRANS. (ON SPKR.)
T 10	80-179	POWER TRANSFORMER
1	79-278	6 1/2" DYNAMIC SPKR.
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)
4	20-126	PADDING CONDENSER
5	2052	2 PLATE TRIMMER

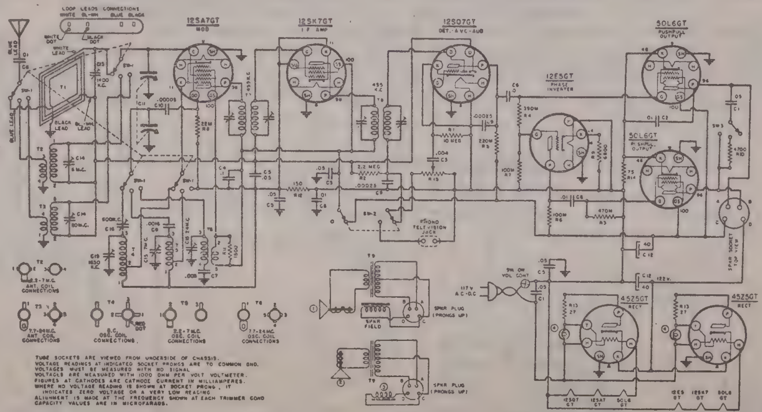
Model No. 0-81



IF PEAK 455 KC

TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER COND
CAPACITY VALUES ARE IN MICROFARADS.

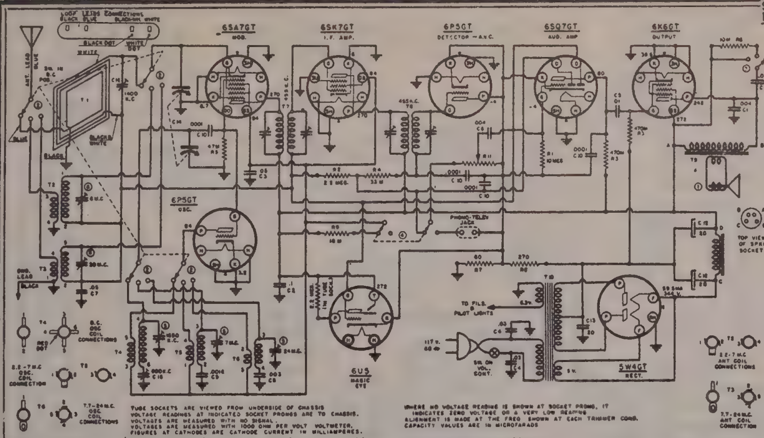
CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C 2	16-119	.01 " " " "
C 3	16-123	.004 " " " "
C 4	16-118	.1 " 200 V. " "
C 5	1622	.05 " " " "
C 6	16-121	.01 " " " "
C 7	15-118	.003 MFD. MICA CONDENSER
C 8	15-119	.0016 " " "
C 9	1504	.00025 " " "
C 10	1503	.00005 " " "
C 11	19-156	2 GANG VARIABLE CONDENSER
C 12	18-261	40 MFD 150 W.V. ELECTROLYTIC
C 13	20-128	TRIMMER (ON LOOP)
C 14	2052	2 PLATE TRIMMER
C 15	20-127	TRIMMER BLOCK
C 16	20-130	PADDING CONDENSER

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 WATT RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470M OHM " "
R 4	60-258	390M " " " ± 10%
R 5	60-180	220M " " "
R 6	60-188	100M " " "
R 7	60-254	100M " " " ± 10%
R 8	60-185	22M " " "
R 9	60-255	6800 " " " ± 10%
R 10	60-189	4700 " " "
R 11	60-257	1800 " " "
[illegible]	60-184	150 " " " ± 10%
R 13	60-220	27 " " " ± 10%
R 14	60-252	75 " 1/2 WATT " ± 10%
R 15	24-144	500M " VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION 0-81
T 1	82-13	ANTENNA LOOP (B.C.)
T 2	10-324	ANTENNA COIL (2.2-7 M.C.)
T 3	10-322	ANTENNA COIL (7.7-24 M.C.)
T 4	10-326	OSCILLATOR COIL (B.C.)
T 5	10-321	OSCILLATOR COIL (2.2-7 M.C.)
T 6	10-334	OSCILLATOR COIL (7.7-24 M.C.)
T 7	10-317	1ST I.F. TRANSFORMER
T 8	10-318	2ND I.F. TRANSFORMER
T 9	----	OUTPUT TRANSFORMER (ON SPKR.)
SW-1	69-142	BAND SWITCH
SW-2	69-140	PHONO SWITCH
SW-3	69-143	TONE SWITCH
1	79-288	8" DYNAMIC SPEAKER
2	79-290	6 1/2" P.M. SPEAKER
3	------	CHOKE (ON P.M. SPKR ONLY)
4	89 3	#51 PILOT LIGHT 200 MA

MODELS 0-82,0-82B,0-82C
MODEL 0-83
Schematics,Voltage,Socket,
Alignment,Trimmers

WARWICK MFG. CORP.



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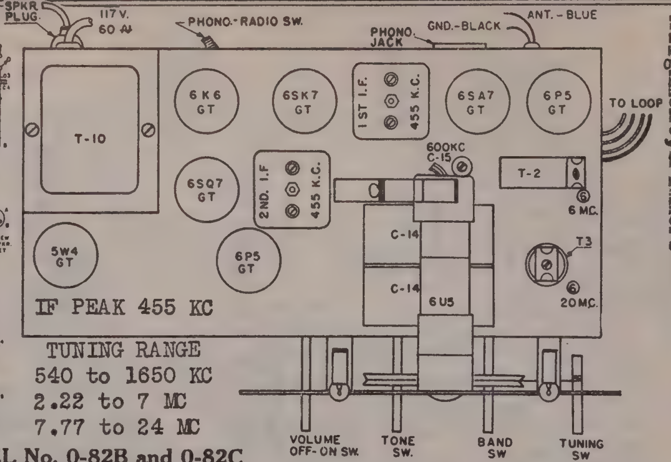


IF PEAK 455 KC

TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC

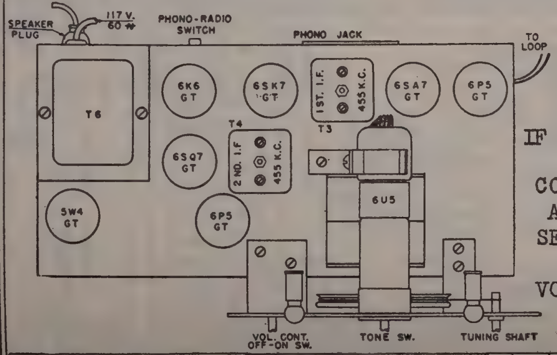
CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION
C 1	1631	.004 MFD. 600 V TUBULAR CONDENSER	R 1	60-193	10 MEGOHM 1/4 W RESISTOR	T 1	82-13	LOOP ANTENNA (B.C.)
C 2	16-116	.1 " 400 V " "	R 2	60-179	2.2 " " "	T 2	10-324	ANTENNA TRANSFORMER (2.2-7M.C.)
C 3	1607	.05 " " " "	R 3	60-178	470 M OHM " "	T 3	10-322	" " (7.7-24M.C.)
C 4	1648	.03 " " " "	R 4	60-186	33 M " " "	T 4	10-318	OSCILLATOR " (B C.)
C 5	16-119	.01 " " " "	R 5	60-177	47 M " " "	T 5	10-327	" " (2.2-7M.C.)
C 6	16-120	.004 " " " "	R 6	60-216	10 M " " "	T 6	10-329	" " (7.7-24M.C.)
C 7	1622	.05 " 200 V. " "	R 7	60-182	60 " 1/2 W. "	T 7	10-315	1ST I F TRANSFORMER
C 8	15-116	.003 MFD. MICA CONDENSER	R 8	60-242	270 " 1 W. "	T 8	10-312	2ND. " "
C 9	15-119	.0016 " " "	R 9	60-251	16 M " 2 W. "	T 9	.	OUTPUT TRANSFORMER (ON SPKR)
C 10	1501	.0001 " " "				T 10	80-185	POWER TRANSFORMER
			R 11	24-144	500 M " VOLUME CONTROL	1	79-284	8" DYNAMIC SPEAKER
C 12	16-236	20 X 20 " 450W.V. ELECTROLYTIC				2	69-142	BAND SWITCH
C 13	16-243	20 MFD. " 25 W.V. "			(WITH SW.)	3	69-143	TONE "
C 14	19-156	2 GANG VARIABLE CONDENSER				4	69-140	PHONO "
C 15	20-126	PADDING CONDENSER				5	20-127	TRIMMER BLOCK
C 16	20-128	TRIMMER (ON LOOP)				6	2032	2 PLATE TRIMMER

MODEL No. 0-82B and 0-82C

These models are distinguished from Model No. 0-82 in that the Phono-Radio attachment is wired thru a cable, directly to Phonograph unit. The Phono-Radio switch will therefore be found mounted to the motor board of the phonograph instead of to the radio chassis.

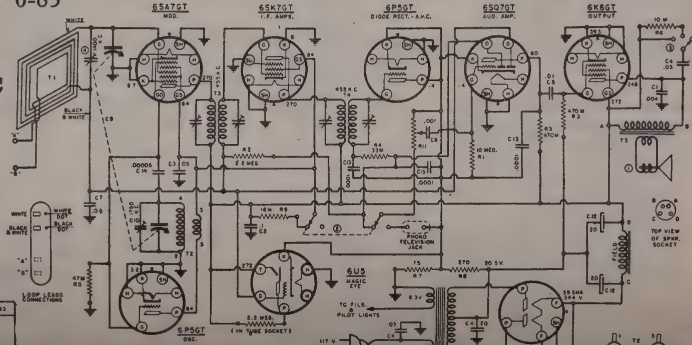
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

Model No. 0-83



IF PEAK 455 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-83
C 1	1651	.004 MFD. 600 V TUBULAR CONDENSER	R 1	60-193	10 MEGOHM 1/4 W. RESISTOR	T 1	82-12	LOOP ANTENNA
C 2	16-116	.1 " 400 V " "	R 2	60-179	2.2 " " "	T 2	10-325	OSCILLATOR COIL
C 3	1607	.05 " " " "	R 3	60-178	470 M OHM " "	T 3	10-315	1 ST I F. TRANSFORMER
C 4	1648	.03 " " " "	R 4	60-186	33 M " " "	T 4	10-312	2 ND " "
C 5	16-119	.01 " " " "	R 5	60-177	47 M " " "	T 5	------	OUTPUT TRANSFORMER (ON SPKR)
C 6	16-124	.001 " " " "	R 6	60-216	10 M " " "	T 6	80-185	POWER TRANSFORMER
C 7	1622	.05 " 200 V. " "	R 7	60-252	75 " 1/2 W "			
			R 8	60-245	270 " 1 W. "	1	79-284	8" DYNAMIC SPEAKER
C 9	19-157	2 GANG VARIABLE CONDENSER (ALSO C10)	R 9	60-251	16 M " 2 W "	2	69-140	PHONO SWITCH
C 11	18-243	20 MFD. 25 V ELECTROLYTIC				3	69-143	TONE SWITCH
C 12	16-236	20 X 20 MFD. 450 W.V. ELECTROLYTIC	R 11	24-144	500 M " VOLUME CONTROL WITH SW.	4	20-129	TRIMMER (ON LOOP)
C 13	1501	.0001 MFD. MICA CONDENSER						

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VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
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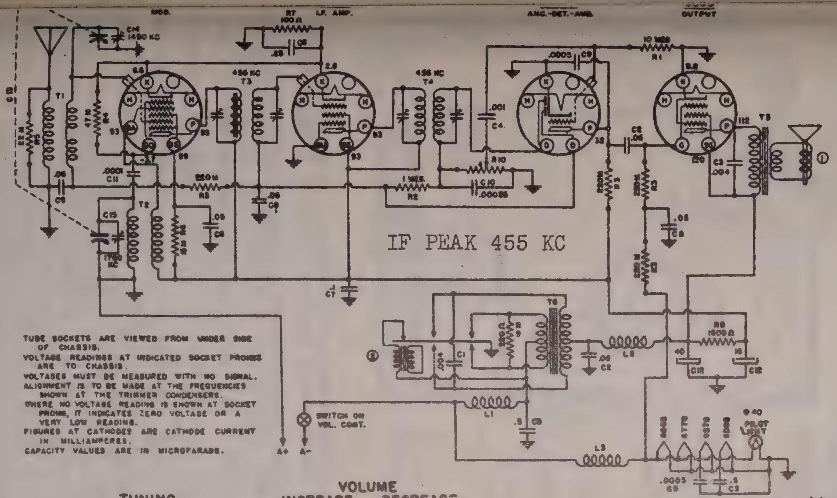
ZERO VOLTAGE OR A VERY LOW READING.

WARWICK MFG. CORP.

MODELS 9-41,9-44,406
Schematic,Voltage,Socket
Alignment,Trimmers



IF PEAK 455 KC

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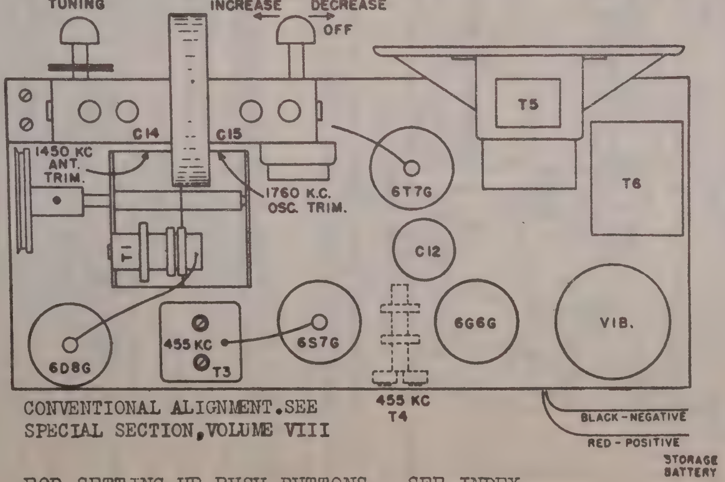
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.



CONVENTIONAL ALIGNMENT.SEE
SPECIAL SECTION,VOLUME VIII

FOR SETTING UP PUSH BUTTONS - SEE INDEX

Schematic Location	Part No.	Description	Selling Price Each
	1011323128	Cable—Battery	.45
	101373509	Caps—Grid Small ... Doz.	.10
	1012739257	Drum & Lever Assem.	.40
	1014052127	Knob—Tuning, Ivory or Cream & Tan	.15
	1014052132	Knob—Volume, Ivory or Cream & Tan	.15
	101318901	Lamp—Pilot No. 40	.15
	1012739248	Lever—Driver	.05
	1012739247	Link—Connecting	.05
L3	1011633218	Choke—Filament	.20
L2	1011610246	Choke—R.F. (B)	.20
L1	1011633217	Choke—Vibrator	.20
	101373516	Clamps—Battery	.20
C1	1012216127	Condenser—Buffer .004 mfd. 1000V	.25
C2		Condenser—.05 mfd. 400V Tub.	.25
C3		Condenser—.004 mfd. 400V Tub.	.25
C4		Condenser—.001 mfd. 400V Tub.	.25
C5		Condenser—.5 mfd. 200V Tub.	.25
C6		Condenser—.25 mfd. 200V Tub.	.25
C7		Condenser—.1 mfd. 200V Tub.	.25
C8		Condenser—.05 mfd. 200V Tub.	.25
C9		Condenser—.0005 mfd. Mica	.25
C10		Condenser—.00025 mfd. Mica	.25
C11		Condenser—.0001 mfd. Mica	.25
C12	1012118236	Condenser—Electrolytic 40x16 mfd. 200V	1.00
C13	1012019132	Condenser—Variable C14 & C15	2.05
	1012524124	Control—Volume 500M ohm	.75
1		1015179256 Speaker—5" P.M. with	5.00
T5	*	Output Transformer	
	1012770110	Spring—Drive	.05
	1012670111	Spring—Ribbon	.05
	1012770105	Spring—String	.05
T1	1011810239	Transformer—Antenna	.45
T2	1011810240	Transformer—Oscillator	.30
T3	1015510253	Transformer—1st I.F.	1.25
T4	1015710252	Transformer—2nd I.F.	.80
T6	1016580160	Transformer—Power, Virb.	1.75
	1013722112	Tripoints—Back Panel ... Doz.	.15
	1013722103	Tripoints—Ribbon ... Doz.	.15
	10127957	Tuner—4 Button	1.20
2	1016234103	Vibrator	4.00
	10128866	Washers—"C" ... Doz.	.10

*When ordering Speaker output transformer refer to number stamped on speaker frame.

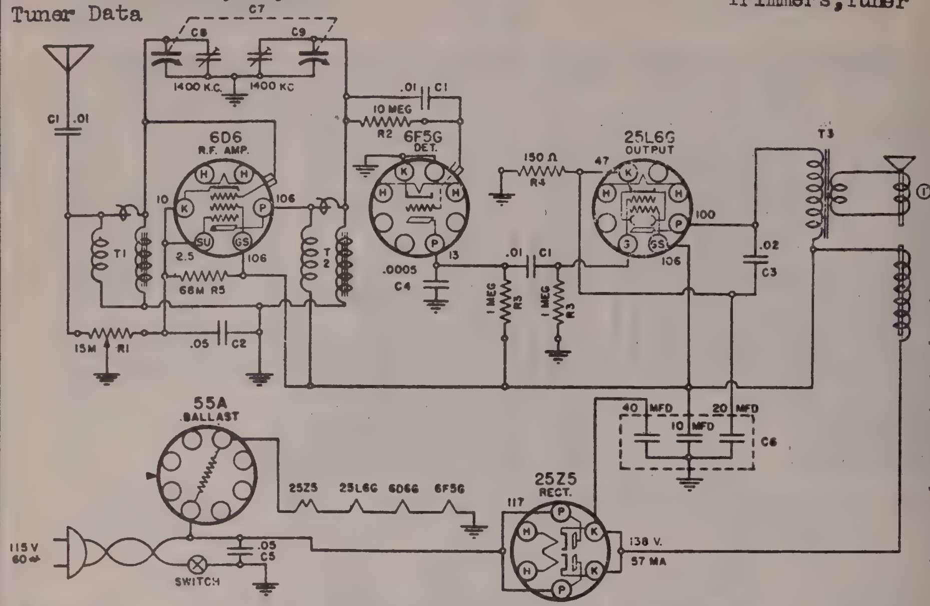
Schematic Location	Part No.	Description	Selling Price Each
	1012752131	Push Button & Stems, Cream & Tan or Ivory	.15
R1		Resistors—10 meg ohm 1/3W	.20
R2		Resistors—1 meg ohm 1/3W	.20
R3		Resistors—220M ohm 1/3W	.20
R4		Resistors—47M ohm 1/3W	.20
R5		Resistors—22M ohm 1/3W	.20
R6		Resistors—15M ohm 1/3W	.20
R7		Resistors—100 ohm 1/3W	.20
R8		Resistors—1500 ohm 1/2W	.20
R9		Resistors—220 ohm 1/2W	.20

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 9-41,9-44,406
MODEL 9-42 MODELS 9-61,
9-63,630,631
Tuner Data

WARWICK MFG. CORP.

MODELS 9-51,9-52,9-54,54
Schematic,Voltage,Socket
Trimmers,Tuner

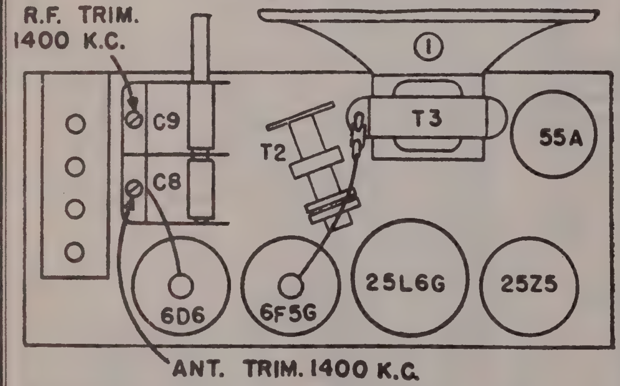


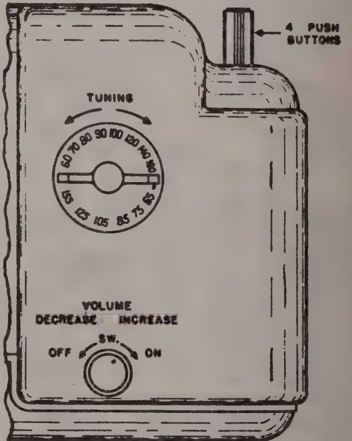
A ground connection is of no importance and therefore has been eliminated

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.

ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS WITH A 1000 OHM PER VOLT VOLTMETER.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES





PUSH BUTTON DATA for MODELS 9-41, 9-44, 406; 9-42; 9-61, 9-63, 9-64, 630, 631; 9-51, 9-52, 9-54, 542(1938):

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is, your selected station which is tuned in nearest number 160 on the Station Selector Knob.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of highest frequency and the Call Letter Tab for this station should be in the Push-button nearest the rear of the receiver.

Follow through with this same procedure, setting up the other 3 stations in the order of their frequency—that is, the second station set up will be second highest in frequency and the third station set up will be third highest in frequency.

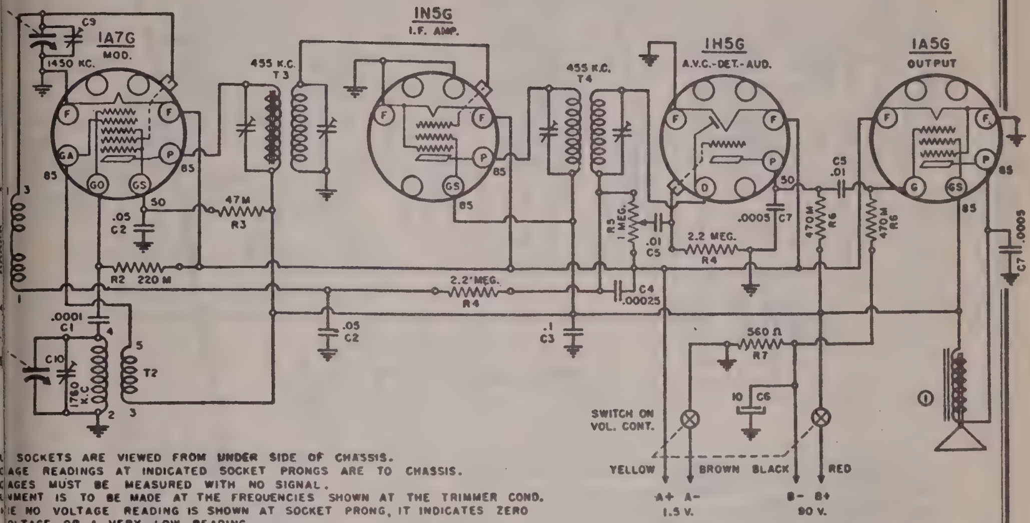
Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

To receive all other stations in the regular manner turn the tuning knob to the frequency of the station desired.

WARWICK MFG. CORP.

MODEL 9-42
Schematic, Voltage, Socket
Alignment, Trimmers



SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
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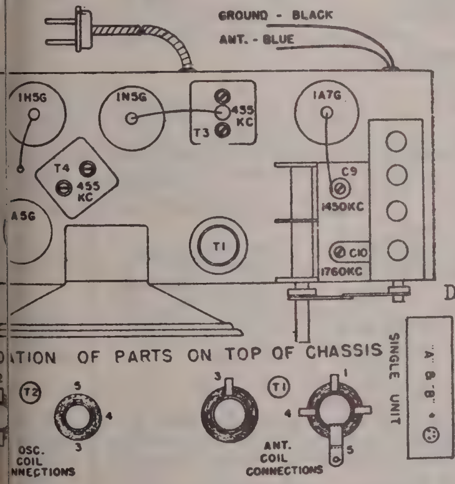
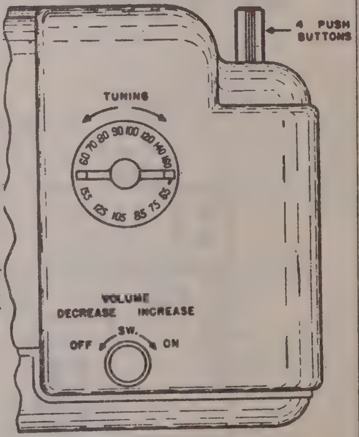


IF PEAK 455 KC

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

FOR PUSH BUTTON
DATA - SEE INDEX



Part No.	Description	Price Each
1011242184	Cabinet—Molded, Walnut	2.65
1011323130	Cable—Battery	.62
101373509	Clips—Grid ....Doz.	.15
	Condenser—.0001 mfd. Mica	.25
	Condenser—.05 mfd. 200 V. Tub.	.25
	Condenser—.1 mfd. 200 V. Tub.	.25
	Condenser—.00025 mfd. Mica	.25
	Condenser—.01 mfd. 400 V. Tub.	.25
1012118235	Condenser—Elec. 10 mfd. 35 Volts	.50
	Condenser—.0005 mfd. Mica	.25
1012019134	Condenser—Variable C9 and C10	.80
1012524126	Control—Volume 1 meg ohm	.90
101374710	Grommet—Rubber ⅜" ....Doz.	.20
101374700	Grommet—Rubber ¼" ....Doz.	.20
1014067367	Knob—Tuning, Ivory or Cream & Tan	.38
1014052116	Knob—Volume, Ivory or Cream & Tan	.15

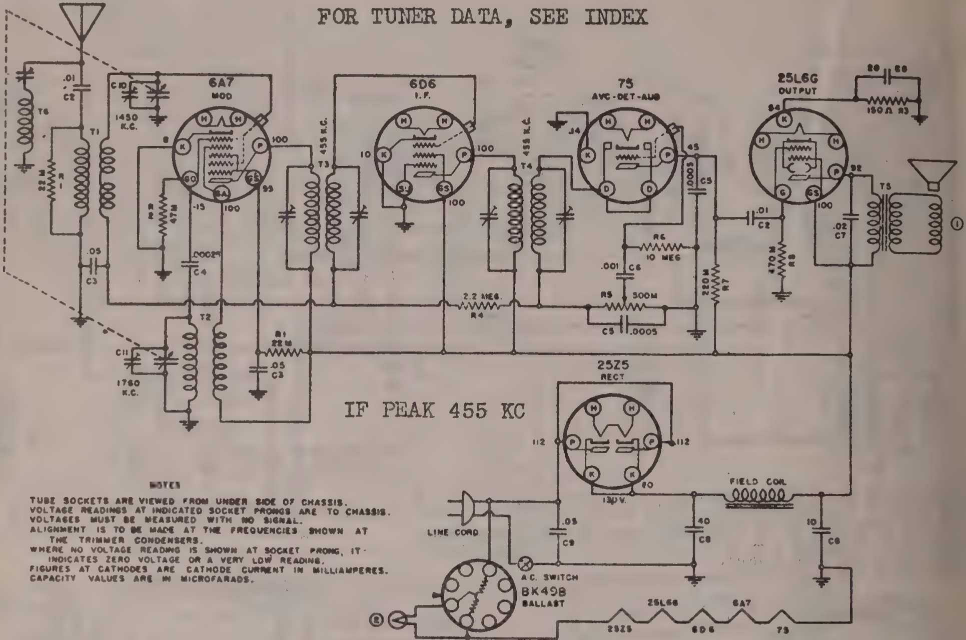
	Part No.	Description	Price Each
	1012752129	Knob—(Push Button) & Stem, Ivory or Cream and Tan	.15
R1		Resistor—22 M ohm 1/3 W	.20
R2		Resistor—220 M ohm 1/3 W	.20
R3		Resistor—47 M ohm 1/3 W	.20
R4		Resistor—2.2 meg ohm 1/3 W	.20
R6		Resistor—470 M ohm 1/3 W	.20
R7		Resistor—560 ohm 1/3 W	.20
1	10151179260	Speaker—5" Permanic	2.40
	1012770109	Spring	.05
T1	1011810258	Transformer—Antenna	.75
T2	1011810257	Transformer—Oscillator	.75
T3	1015510251	Transformer—1st I.F.	1.50
T4	1015710259	Transformer—2nd I.F.	1.25
	1013722112	Tri-points—Back panel ....Doz.	.15
	101289956	Tuner	1.30

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 9-61,9-63,9-64
630,631
Schematic,Voltage,Socket
Alignment,Trimmers

WARWICK MFG. CORP.

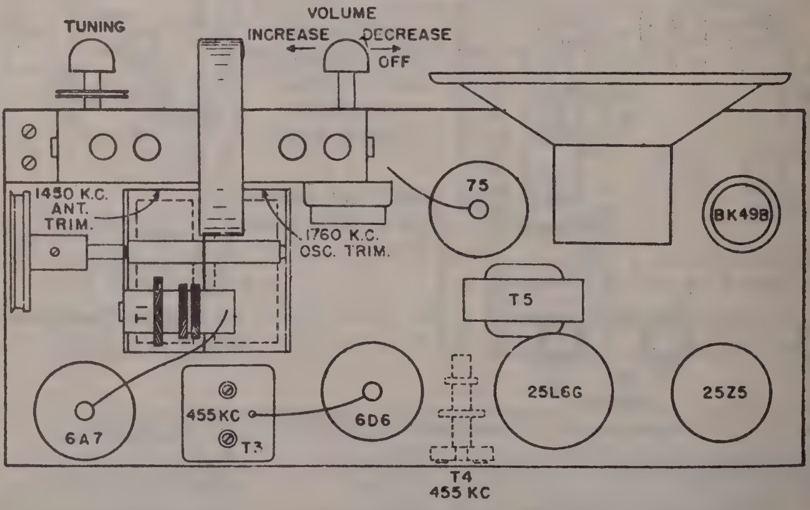
FOR TUNER DATA, SEE INDEX



IF PEAK 455 KC

NOTES

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.



FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

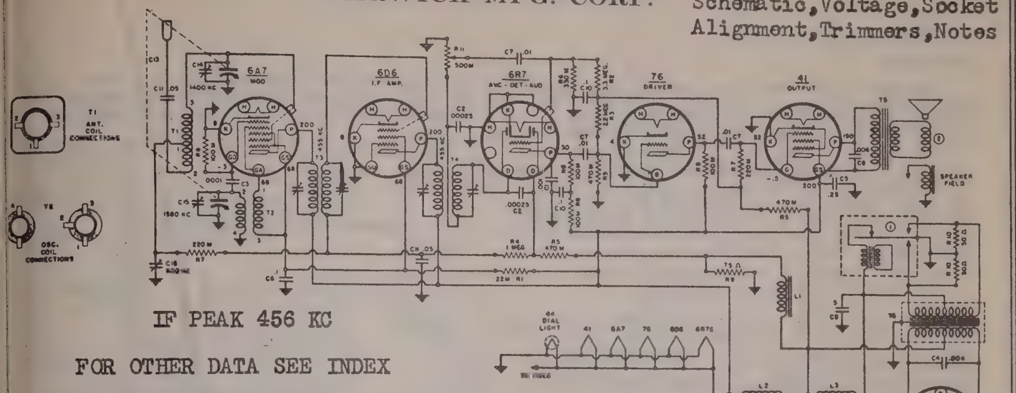
POWER SUPPLY

The receiver is designed for operation from 105-130 volt Alternating Current (A.C.) supply or a 105-130 volt Direct (D.C.) supply. Never connect the receiver to any supply having a higher voltage than that specified on the sticker. If not sure of the power supply voltage at your home, your Power Company will furnish the information.

When using a D.C. supply allow sufficient time for tubes to warm up (approximately 1½ minutes), and if at that t receiver does not operate, remove the line cord plug from the socket and reverse. Replace plug in the reverse position an tubes to warm up, at which time the receiver will operate.

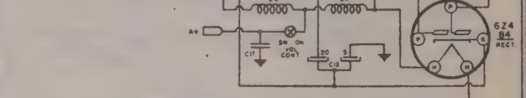
WARWICK MFG. CORP.

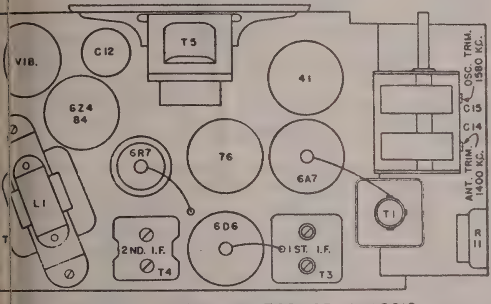
MODEL 9-627
Schematic,Voltage,Socket
Alignment,Trimmers,Notes



IF PEAK 456 KC

FOR OTHER DATA SEE INDEX





LOCATION OF PARTS ON TOP OF CHASSIS

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES TAKEN WITH A 6V. INPUT.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
ALIGNMENT IS TO MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS

CODE	PART NO.	DESCRIPTION 9-62
T1	10-223	ANTENNA TRANSFORMER
T2	10-224	OSCILLATOR "
T3	10-221	1 ST I.F. "
T4	10-222	2 ND I F "
T5		OUTPUT TRANS. (ON SPKR.)
T6	60-169	POWER TRANSFORMER }84-7
L1	33-219	FILTER CHOKE
L2	33-210	FILAMENT CHOKE
L3	33-211	VIBRATOR CHOKE
1	34-102	VIBRATOR
2	79-240	5" SPEAKER

CODE	PART NO	DESCRIPTION
R1	60-214	22 M OHM 1 W CARBON RES.
R2	60-209	3.3 MEGOHM 1/2 W. " "
R3	60-208	2.2 " " " "
R4	60-167	1 " " " "
R5	60-206	470 M OHM " " "
R6	60-210	330 M " " " "
R7	60-207	220 M " " " "
R8	60-172	100 M " " " "
R9	60-211	75 " " " "
R10	60-212	50 " " " "
R11	24-119	VOLUME CONTROL 500M OHMS

CODE	PART NO	DESCRIPTION
C1	19-111	.001 MFD. MICA CONDENSER
C2	1304	.00025 " " "
C3	1301	.0001 " " "
C4	16-129	.004 MFD 1600 V. BUFFER COND
C5	16-117	.25 " 400 V. TUB. CONDENSER
C6	16-116	.1 " " " "
C7	16-119	.01 " " " "
C8	16-128	006 " " " "
C9	16-112	5 " 200 V. OVAL "
C10	16-115	.1 " " TUB. "
C11	1622	05 " " " "
C12	18-240	20 & 5 MFD ELECTROLYTIC 300 V
C13	19-127	2 GANG VARIABLE COND ALSO C14 & C15
C16	20-117	300-600 MFD PADDING CONDENSER
C17	99-1	SPARK PLATE

ALIGNMENT PROCEDURE

ELIMINARY

Output Meter Connections	Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt	1.85 Volts
erator Ground Lead Connection	Receiver Chassis
Dummy Antenna Value to Be in Series with Generator Output	See Chart Below
Connection of Generator Output Lead	See Chart Below
erator Modulation	30%, 400 Cycles
otion of Volume Control	Fully On

osition Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmer Adjustment (In Order Shown)	Trimmer Function
lod	455 Kc.	.1 mfd.	6A7 Grid	T3 T4	I. F.
ul Open	1580 K. C.	.0002 mfd.	Antenna Conn.	C15	Osc. Trimmer
400 K.C.	1400 K.C.	.0002 mfd.	Antenna Conn.	C14	Ant. Trimmer
00 K. C.	600 K. C.	.0002 mfd.	Antenna Conn.	C16	Antenna Padder

he variable condenser should be at 600 k.c. for antenna adjustment.
he alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A
l djustment of antenna padder condenser C16 is always made after the receiver is installed in the car, in order to
c the car antenna.
lways keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver
n nterfering with accurate alignment.

AMMETER LEAD

T ammeter cable (See "H" in Fig. 1) has a spring clip at one end and a fuse receptacle at the other. Compress the
ng clip and slide it over the ammeter stud on the back of the car's ammeter. When the clip is released it will spring
ar grip the stud securely. (See fig 1.) (The cable clip may be connected to either stud of the ammeter. If connected to
st d, the current taken by the radio will register on the ammeter. If connected to the other stud, it will not register.) In
w ars such as the first models of the Ford V-8 the ammeter does not have terminals. In such cases the spring clip should
as ned to any available terminal behind the dash which is connected to the ungrounded side of the battery at all times.
ne erminals will be so connected only when the ignition or light switches are turned "On." Insert the fibre sleeve and
 (ee "J" and "K" in Fig. 1) in the other end of the ammeter cable. The black wire coming from the radio receiver has
u t its end which should be inserted into the fuse receptacle after the fuse sleeve and fuse have been inserted.

GENERATOR CONDENSER

T Generator Condenser should be mounted to the generator frame by means of any one of the generator assembly
s. Scrape all dirt and paint away so that a clean metal to metal contact is made. The flexible lead from the Generator
nd ser should be connected to the output terminal of the generator.

MODEL 9-627
Assembly, Notes
Tuner Data

WARWICK MFG. CORP.

ANTENNA

Insert the single prong of the antenna cable (See "G" in Fig. 1) into its receptacle located on the bottom of the receiver case and near the front left hand corner. Note that the other end of this cable has a white covered wire protruding from its end and a bright metal pigtail. The white covered inner-wire and the bright metal pigtail are to be connected to the car's antenna in the following manner:

If an antenna was located coming from the corner post of the car, it will probably have an inner wire covered with the metal braid. (If it has a plug at its end, cut off the plug). Scrape clean and solder the white wire of the receiver's antenna lead to the inner wire of the car antenna lead. Be certain these inner wires do not at any time touch the outer shield. (See Fig. 5.)

After the connection is cleaned and connected, cover the joint carefully with tape. (See Fig. 6.)

Connect the pigtail of the receiver's antenna wire to the pigtail braid of the car's antenna lead-in. Wrap pigtails and solder together using rosin core solder. IMPORTANT—Make certain when bolting soldered pigtail ends to car that the section is scraped clean and a good chassis ground. (See Fig. 7.)

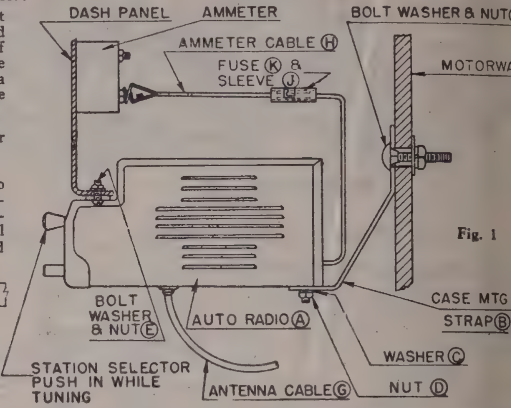


Fig. 1

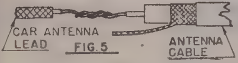


FIG. 5

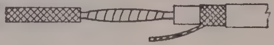


FIG. 6

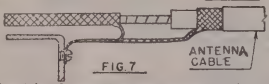


FIG. 7

If the lead-in from the car antenna is not shielded, it is advisable to do so to overcome motor noise. Slip a shielded loom over the entire length of the car antenna lead-in. In some cases where a roof antenna is used, the lead-in is brought down through a corner post of the car frame at the end of the windshield (See Figure 2). If the radio antenna cable is long enough to be inserted several inches into the corner post, connect antenna lead-in and the radio antenna cable as shown in Figures 5, 6 and 7, and after taping, insert the splice and all the unshielded portion of the lead-in up into the corner post. If this cannot be done, this type of lead-in should be covered with a shielded loom several inches into the corner post. Connect the lead-in and shielding as illustrated in Figures 5, 6 and 7. The other end of the shielding at the car antenna should be grounded. To eliminate crackling and noisy reception due to antenna lead-in pick-up, the shielded antenna lead-in should be either insulated from chassis (or car body) or grounded at interval points, leading from the radio antenna cable to the car antenna. Be sure to use car chassis or grounded section of body only for grounding

THE DISTRIBUTOR SUPPRESSOR

To install the distributor suppressor, cut the CENTER lead from the distributor cap in two, as close as possible to the distributor cap. Screw the Distributor Suppressor to one end of the cut cable and then to the other end leading to the distributor cap.

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.

Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

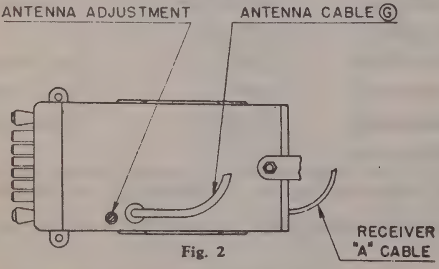


Fig. 2

Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your auto radio automatically or manually. To receive any one of your six selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

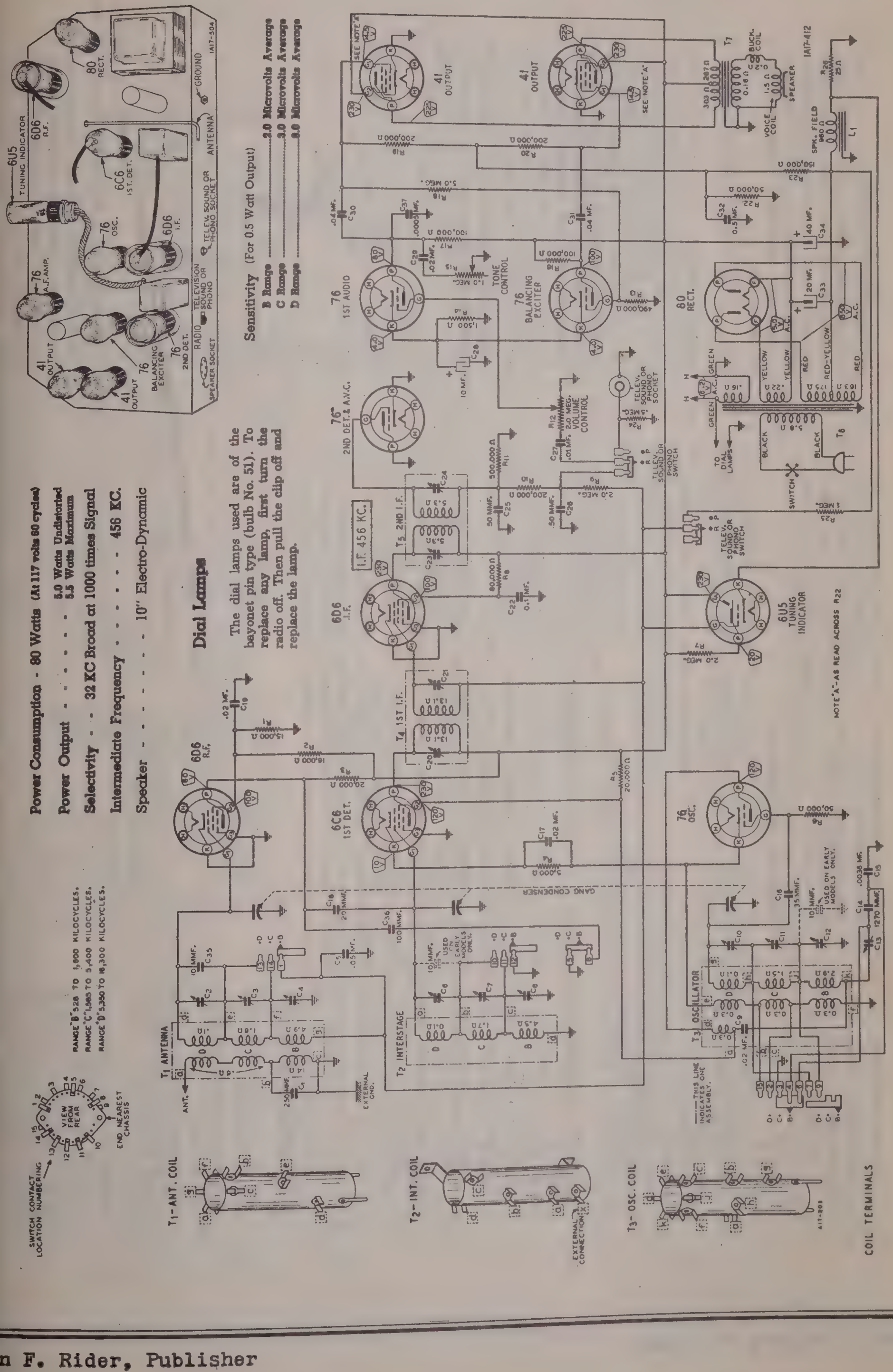
To receive all other stations in the regular manner, push in the Station Selector Knob and turn it to the frequency of the station desired.

IMPORTANT: ANTENNA ADJUSTMENT

The antenna adjustment control is located close to the antenna cable receptacle as shown in Figure 2. To make the adjustment first, remove plug button from bottom of case by inserting a screwdriver between case and plug button, then tune in a weak station with full volume at or very close to 600 kilocycles (60) on the dial. Second, insert a small screwdriver into the antenna adjustment screw shown in Figure 2 and turn the screwdriver either to the left or right until the volume of the station is at its maximum point. While adjusting the antenna adjustment screw it is advisable to vary the station selector knob a degree or two to obtain the best adjustment. Now insert plug button into case. The receiver is now balanced and no further radio electrical adjustments are necessary.

WELLS-GARDNER & CO.

MODEL 1A17
Schematic,Voltage,Socket
Sensitivity,Coils



Power Consumption - 80 Watts (At 117 volts 60 cycles)

Power Output - - - - - 5.0 Watts Undistorted
5.5 Watts Maximum

Selectivity - - 32 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - 456 KC.

Speaker - - - - - - - 10" Electro-Dynamic

Dial Lamps

The dial lamps used are of the bayonet pin type (bulb No. 51). To replace any lamp, first turn the radio off. Then pull the clip off and replace the lamp.

Sensitivity (For 0.5 Watt Output)

B Range	2.0 Microvolts Average
C Range	3.0 Microvolts Average
D Range	8.0 Microvolts Average

MODEL 1A17
Alignment,Trimmers
Drive Cord Data

WELLS-GARDNER & CO.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR					
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C23) & (C24) 1st I.F. (C20) & (C21)
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note A
RANGE C 5400 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11)
5000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C7)
RANGE B 1600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1400 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note B	Ant. Range B (C4) Int. Range B (C8)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A

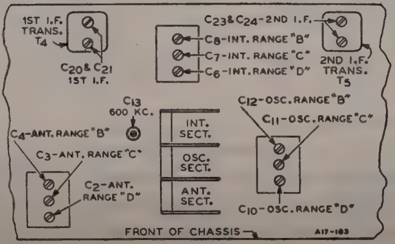
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer, to the 1400 KC mark, and tighten the clamps.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.



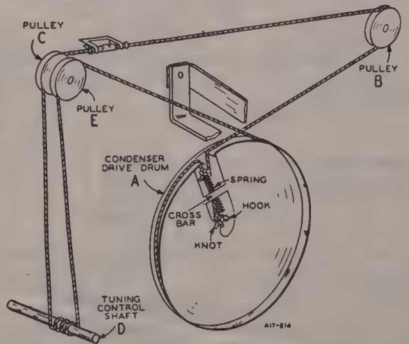
Drive Cord Replacement

Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. The free end of the drive cord should be tied to the tension spring in such a manner that there is a distance of 56⅝ inches between the knots.

Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See illustration. Bring the cord up through the slot in the drum rim and pass to the right (from back of chassis) and around pulley B. Then bring the cord to the left and over pulley C. See that the fabric tubing is now between pulleys B and C. Continue cord down to control shaft D and wind 3½ turns counter-clockwise (from back of chassis) on shaft D. Bring cord up to and over pulley E. Bring cord down to top of drive drum A and wind one turn clockwise around the drum rim.

Pass the remaining drive cord and tension spring through the slot in the drum. Place free end of spring over the hook on the condenser drive drum.



ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

WELLS-GARDNER & CO.

MODEL 1A29, Issues B,C,D
Changes in Chassis
MODEL 8A30 Record Changer Notes

Series 1A29 CHANGES MADE FOR "B" ISSUE SETS TO REDUCE HUM MODULATION. Sept. 8, 1939

In order to reduce hum modulation, the following circuit changes have been made. These changes are shown schematically on the back of this sheet. Models on which these changes have already been made can be identified by the Chassis Number 1A29-2B or 1A29-3B.

Resistor R1, 400,000 Ohms, in series with the AVC connection to the antenna coil, has been removed from the circuit.

The AVC line is no longer connected to the antenna coil at terminal "D." Instead, this terminal is connected to ground. The bypass condenser C6, .05 mf., formerly connected between the same terminal and ground, has been removed from the circuit.

The AVC line which formerly connected to the "D" terminal of the antenna coil and C6, is now connected through a 3 megohm resistor R46 to G1 of the 6SK7 R.F. tube.

G1 of the 6SK7 R.F. tube, which was formerly connected directly to the stator of the gang condenser, is now connected to this point through a .0005 mf. condenser C59.

Series 1A29 CHANGES MADE FOR ISSUE "C" Sept. 26, 1939

In order to obtain Underwriters' approval, the issue letter will be advanced to "C" when the following changes are made:

A cardboard shield is used with the electrolytic condenser which is insulated from the chassis.

The tube socket clip tension is reduced.

A wiring change was made to remove high voltage from pin No. 1 on the 6V6G tube socket. A terminal strip has been added to eliminate the use of the pin connection for this purpose.

Series 1A29 CHANGES FOR "D" ISSUE October 27. 1939

The following changes are made in the "D" issue of this model:

Condenser C37 is changed from 250 mmf. to 500 mmf. to add high frequencies in the high fidelity position.

The noise gate switch has been eliminated so that the noise gate circuit functions all of the time.

The Quiet switch, however, is still continued at the same position on the back panel of the chassis. When this switch is in the quiet position, two circuits are affected in the following manner:

The 6SK7 1st I.F. tube is biased with a 1500 ohm resistor connected between cathode and ground to reduce sensitivity.

A positive voltage secured from the B+line through a 15 Megohm resistor is applied to the AVC diode circuit. Under no signal conditions, this loads the AVC diode circuit, effectively short circuiting both the signal and AVC secondaries of the 2nd I.F. transformer (T5 in schematic). When a signal of predetermined intensity is received, the voltage developed in the AVC circuit offsets this positive voltage. The signal is amplified through the transformer and normal reception is obtained.

The effect of the circuits mentioned above, with the switch in the quiet position, is to reduce sensitivity and to "squelch" all signals, both noise and station, until a signal of a certain intensity or greater is received.

Series 1A29 DISTORTION February 21, 1940

Reference is made to a distortion in this model which manifests itself as a rasping sound and is heard on a signal of moderate volume. This may be an overload condition caused by a signal of high modulation.

It can be corrected by changing the signal diode load resistor, R19, from 250,000 ohms to 125,000 ohms.

Series 8A30 SERVICING AUTOMATIC RECORD CHANGER November 20, 1939

IF LANDING POSITION OF NEEDLE IS NOT CONSTANT
OR PICKUP ARM CANNOT BE ADJUSTED TO SET
NEEDLE DOWN IN STARTING GROOVE OF RECORD

In the first production of the automatic record changer, the pickup arm may display the following symptoms:

1. After the pickup arm has been set for the correct landing position, the needle does not lower consistently to the starting groove of a record during the playing of any one size of records.
2. The needle lowers so far away from the starting groove of the record that turning the needle landing adjusting screw does not bring the needle to the starting groove.

In early production, the pickup lead was permitted to hang down directly below the foot of the pickup. In such instances, the lead may become entangled with the rotating mechanism for the pickup arm. This will produce either one of the above actions.

To remedy the condition, clamp the pickup lead to the bracket - See Fig. 1, leaving enough slack in the load to permit free action of the pickup arm. That portion of the lead under the clamp should be covered with tape.

The clamping arrangement consists of a small clamp, a No.6 shakeproof lockwasher, and a 6-32 shakeproof self-tapping machine screw. On request, these items will be supplied free of charge by the factory.

IF PICKUP ARM DOES NOT SET NEEDLE DOWN IN
STARTING GROOVE OF BOTH 10" AND 12" RECORDS

It may be found that any one setting of the needle landing adjusting screw will not cause the phono pickup arm to set the needle down in the starting groove for both 10" and 12" records.

This condition may be remedied as follows: Set the automatic record changer for 10" record operation. Turn the needle landing adjusting screw so that the pickup arm sets the needle down in the starting groove of a 10" record.

Replace the 10" record with a 12" record and set the automatic record changer for 12" record operation. Start the mechanism. Note the landing position of the needle.

MODEL 1A29
MODEL 8A30
MODEL 8A31
Alignment,Trimmers

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1A29 ONLY { 1st I.F. (C19) & (C20) 2nd I.F. (C24) & (C25) 3rd I.F. (C28) & (C29) 1st I.F. (C17) & (C18) 2nd I.F. (C24) & (C25)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C43) (C16 ON 1A29) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

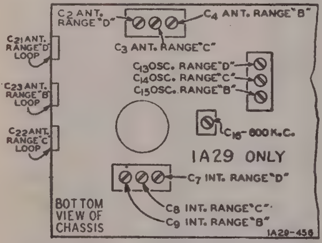
NOTE B—If the pointer is not at 1500 KC on the dial remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

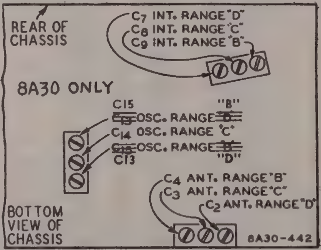
NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

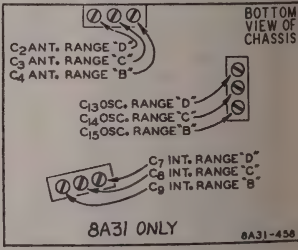
NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on schematic page.

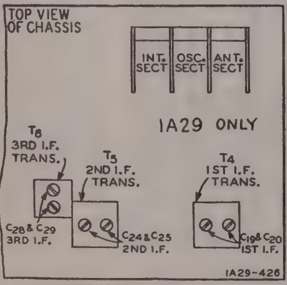
Note E (CONSOLE MODELS)—Turn knob of loop until output is maximum.

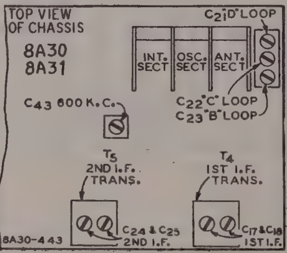
CAUTION—When aligning the short wav bands, be sure NOT to adjust at the imag frequency. This can be checked as follows Let us say the signal generator is set fo 5000 KC. The signal will then be heard a 5000 KC on the dial of the radio. The imag signal, which is much weaker, will be heard a 5000 less 912 KC, or 4088 KC on the dial It may be necessary to increase the input sig nal to hear the image.

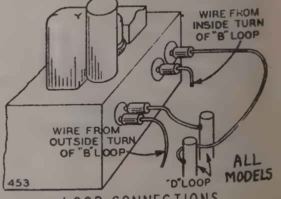











WIRE FROM INSIDE TURN OF "B" LOOP
WIRE FROM OUTSIDE TURN OF "B" LOOP
453
"D" LOOP
ALL MODELS

LOOP CONNECTIONS

Procedure for Setting the Station Buttons

ALL MODELS

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers decrease from left to right.

Setting a Station Button

6A26, 6A26S, 6A27, 6D1

At the right side of the cabinet (from the front) will be seen a cap which covers a hole in the cabinet—See illustration. Pry off this cap being careful not to scratch the cabinet. Removal of the cap will expose a large locking screw. Using a screwdriver, loosen the mechanism by turning this screw in a counter-clockwise direction. The screw will turn easily until the dial pointer stops moving. Then exert a slight amount of additional pressure and continue to turn the screw about one and one-half complete turns.

1A29 ONLY

Turn the tone and selectivity control to any of the sharp positions.

1A29, 8A30, 8A31

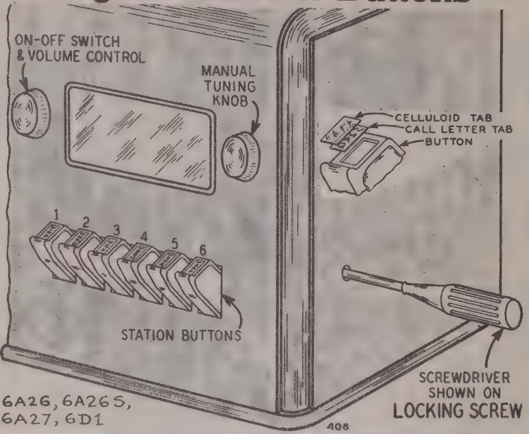
Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached.

At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon —See illustration. Pull off this cap.

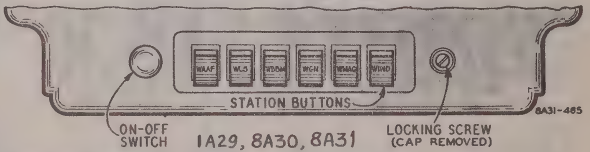
At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handle screwdriver, unlock the mechanism by turning this screw several turns in a counter-clockwise direction.

ALL MODELS

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning knob using the tuning eye as a guide.



6A26, 6A26S, 6A27, 6D1



1A29, 8A30, 8A31

With one hand, hold the manual tuning knob to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way down*. It will go down easily at first and then a firm gentle pressure must be applied to push it down the rest of the way. It is better to start with the left hand button. Hold *this* button all the way down. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning knob a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way down.*

Release the button after the station is tuned in.

Carefully tune in the second station on your list. Then hold the tuning knob and push the second button slowly and firmly all the way down. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

6A26, 6A26S, 6A27, 6D1

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Do this by turning the locking screw in a clockwise direction until it is tight. It will turn easily until the dial pointer stops moving. Then additional pressure must be exerted. Tighten firmly but not excessively. Replace the cap over the hole.

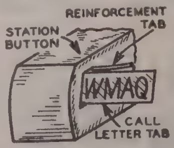
Remove the correct station call letter tab from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press this tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

1A29, 8A30, 8A31

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached. Then, with the SMALL HANDLE screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

Insert a celluloid reinforcement tab half way in the slot at the front of the first station button.

Remove the correct station call letter tab for this button from the sheet supplied by bending the sheet back and forth at the score marks. Place the call letter tab in front of the celluloid reinforcement tab and insert it in slot. Push both tabs all the way in the button slot. Follow the same procedure for inserting the station call letter tabs in any other buttons.



ALL MODELS

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons.

MODEL 1A29 Issue D

Drive Cord Replacement

Turn gang condenser to completely closed position. Remove 5Y3G tube from socket. Remove guide arm from front of chassis—See illustration.

Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

Wind ¾ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown. Wind 3½ turns in a clockwise direction (from front of chassis) around tuning control shaft. Turns should progress toward the chassis.

Wind 1¼ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This turn should be at left side (from front of chassis) of pulley groove. Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley.

Replace 5Y3G tube. Replace guide arm.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.

MODELS 8A30, 8A31.

Drive Cord Replacement

Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

Turn gang condenser to completely closed position. Remove guide arm from front of chassis—See illustration.

Wind ¼ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown. Wind 4½ turns in a clockwise direction (from front of chassis) around tuning control shaft. Turns should progress toward the **chassis.**

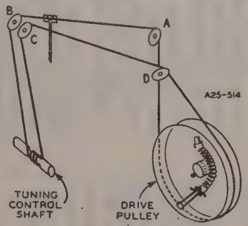
Wind 1¾ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This **turn should be at left side (from front of chassis) of pulley groove.** Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley. Replace guide arm.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.

MODEL 5A25S

Drive Cord Replacement

Remove dial lamp socket and bracket from dial mounting plate.



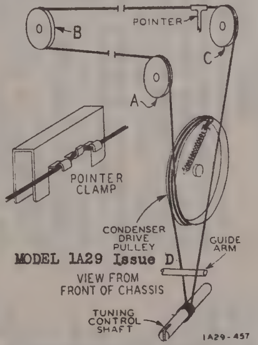
Remove tension spring from pulley. Double new drive cord and knot both ends to same loop on tension spring. There should be a distance of 13 inches between knot and looped end of cord.

Secure other end of spring to hook on pulley. Thread looped end of cord, starting from inside of drive pulley, through hole in rim of drive pulley.

Turn gang condenser to completely closed position. Remove any twists in doubled cord. Pass one portion of cord over pulleys A and B as shown in illustration. Then wind 3½ turns counter-clockwise (from rear of chassis) around tuning control shaft—See illustration

Loop ½ turn around bottom half of drive pulley. Continue cord over pulley D. Pull remaining portion of cord and place over pulley C.

Dial Pointer Attachment—Tune in a station of known frequency. Set the pointer at this frequency on the dial scale and secure pointer to cord —See illustration.



MODEL 1A29 Issue D

Adjusting Audio Noise Gate Control

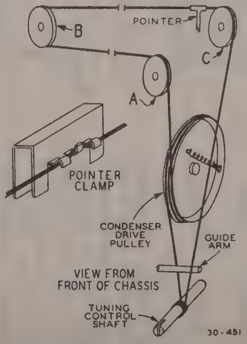
MODEL 1A29 Issue D.

CAUTION—Ordinarily the setting of the noise gate control should not be changed unless the 6P5G tube is replaced.

To adjust this control, use external antenna connection and short circuit the antenna lead. The noise switch on back panel of the chassis should be in the normal position. Turn the gang condenser to the completely closed position. Open the plate circuit of the 6P5G noise gate tube and insert a microammeter in series. On the back panel of the chassis near the noise gate switch will be seen an adjusting screw. This is the adjustment for variable resistance R18. Rotate this screw until the plate current is between 5 and 10 microamperes.

ALTERNATE METHOD—Turn band switch to B range. Use external antenna connection and short circuit antenna lead. Noise switch should be in the normal position. Turn the gang condenser to the completely closed position. Turn the noise gate control screw (R18) in a clockwise direction as far as it will go. All of the resistance will be in the circuit. Then turn the screw until tube noise starts to come through.

Disconnect antenna lead from ground and connect it to an external antenna. Tune in a weak station. If signal appears to be distorted, decrease the resistance by turning the adjusting screw in a counter-clockwise direction until the distortion is eliminated.



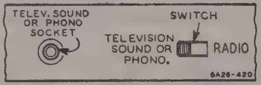
FOR MODELS 8A-30, 8A31.

Television Sound or Phonograph Connections

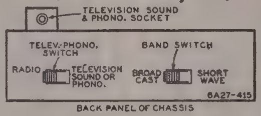
FOR MODELS 1A29(Early), 1A29 Issue D,6A26, 6A26S, 6A27, 6D1, 8A30, 8A31.

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter." Phonograph records may also be played through the radio.

For Models 6A26, 6A26S



For Models 6A27, 6D1.



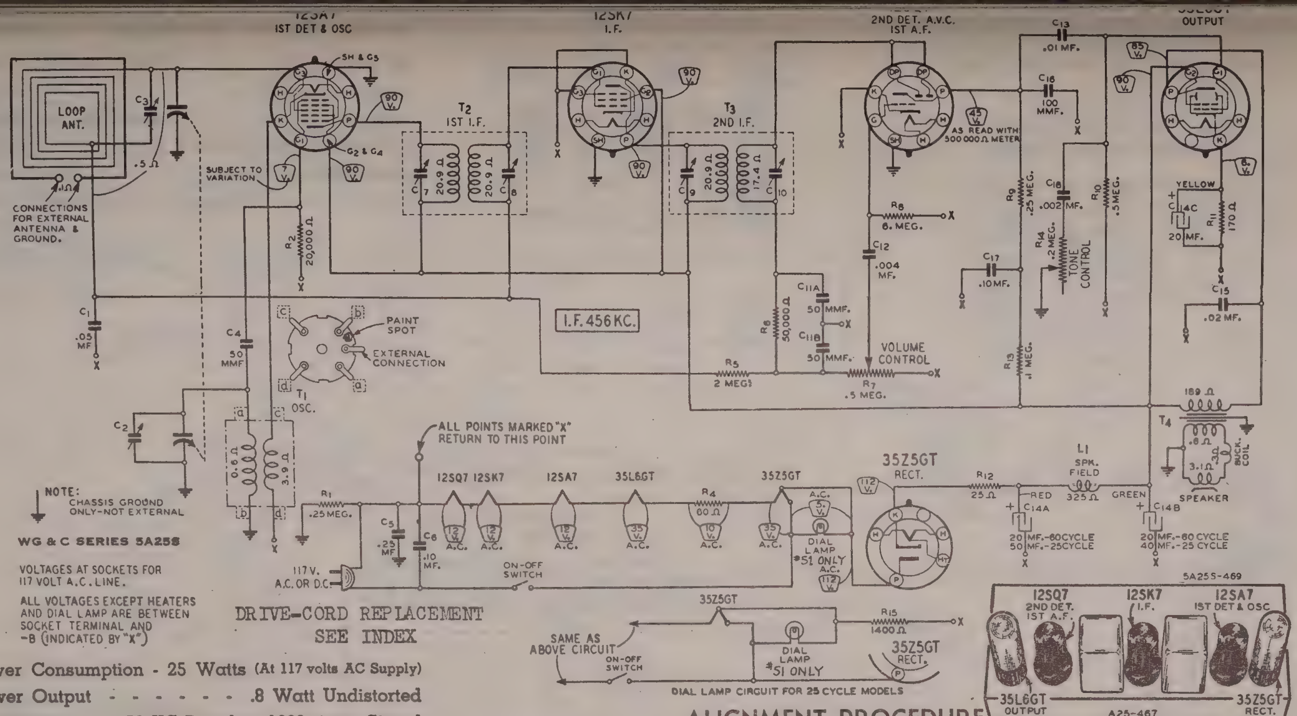
On the back panel of the chassis base is a switch and a socket for a single shielded pin tip at which connections are made. The connector on the cable from a television receiver or from a phono pickup can be inserted in the socket. (The cable connector must be a single shielded pin tip type,*Part No. M93.)

When phonograph or television sound reproduction is desired, the switch should be moved to the "Phono-Television Sound" position. For radio reception, the switch should be in the "Radio" position.

*For Model 1A29 Issue D use Part No. 6A224.

WELLS-GARDNER & CO.

MODEL 5A25S
Schematic,Voltage,Socket
Alignment,Trimmers
Sensitivity



NOTE: CHASSIS GROUND ONLY-NOT EXTERNAL

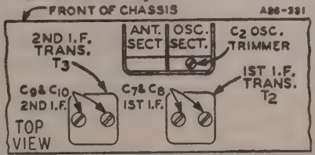
WG & C SERIES 5A25S

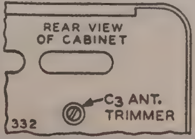
VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.

ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP ARE BETWEEN SOCKET TERMINAL AND -B (INDICATED BY "X")

DRIVE-CORD REPLACEMENT
SEE INDEX

Power Consumption - 25 Watts (At 117 volts AC Supply)
Power Output - - - - - - .8 Watt Undistorted
Selectivity - - 50 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1730 KC
Sensitivity - - - 50 Microvolts per Meter Average
(For .05 Watt Output)





ALIGNMENT PROCEDURE

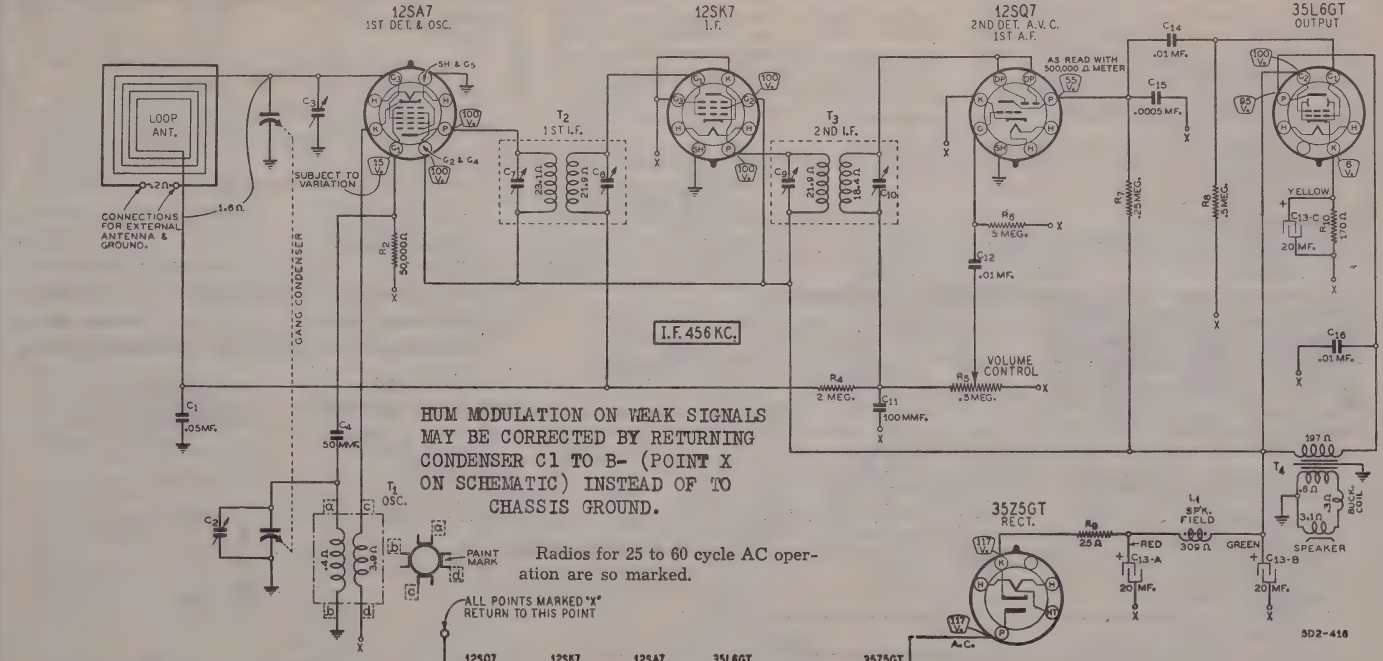
GENERATOR*	FEED INTO	DUMMY	GANG	ADJUST
456 KC * CONNECT GEN. GND. TO B- (PRONG NO.3 OF 12SK7 TUBE).	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn Rotor to max. output	Antenna (C3)

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—If it is necessary to calibrate the radio, remove the radio from the cabinet. Tune in an 800 KC signal. If the pointer is not at 800 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 800 KC mark, and tighten the clamps.

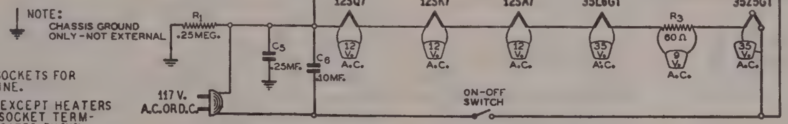
MODEL 5D2
Schematic, Voltage, Socket
Alignment, Trimmers
Sensitivity

WELLS-GARDNER & CO.



HUM MODULATION ON WEAK SIGNALS MAY BE CORRECTED BY RETURNING CONDENSER C1 TO B- (POINT X ON SCHEMATIC) INSTEAD OF TO CHASSIS GROUND.

Radios for 25 to 60 cycle AC operation are so marked.

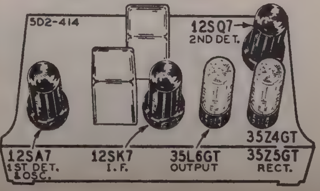


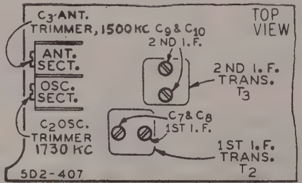
NOTE: CHASSIS GROUND ONLY - NOT EXTERNAL

VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.

ALL VOLTAGES EXCEPT HEATERS ARE BETWEEN SOCKET TERMINAL & -B (INDICATED BY "X")

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - .8 Watt Undistorted
Selectivity - - 60 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1730 KC
Sensitivity - - 35 Microvolts per Meter Average
(For .05 Watt Output)



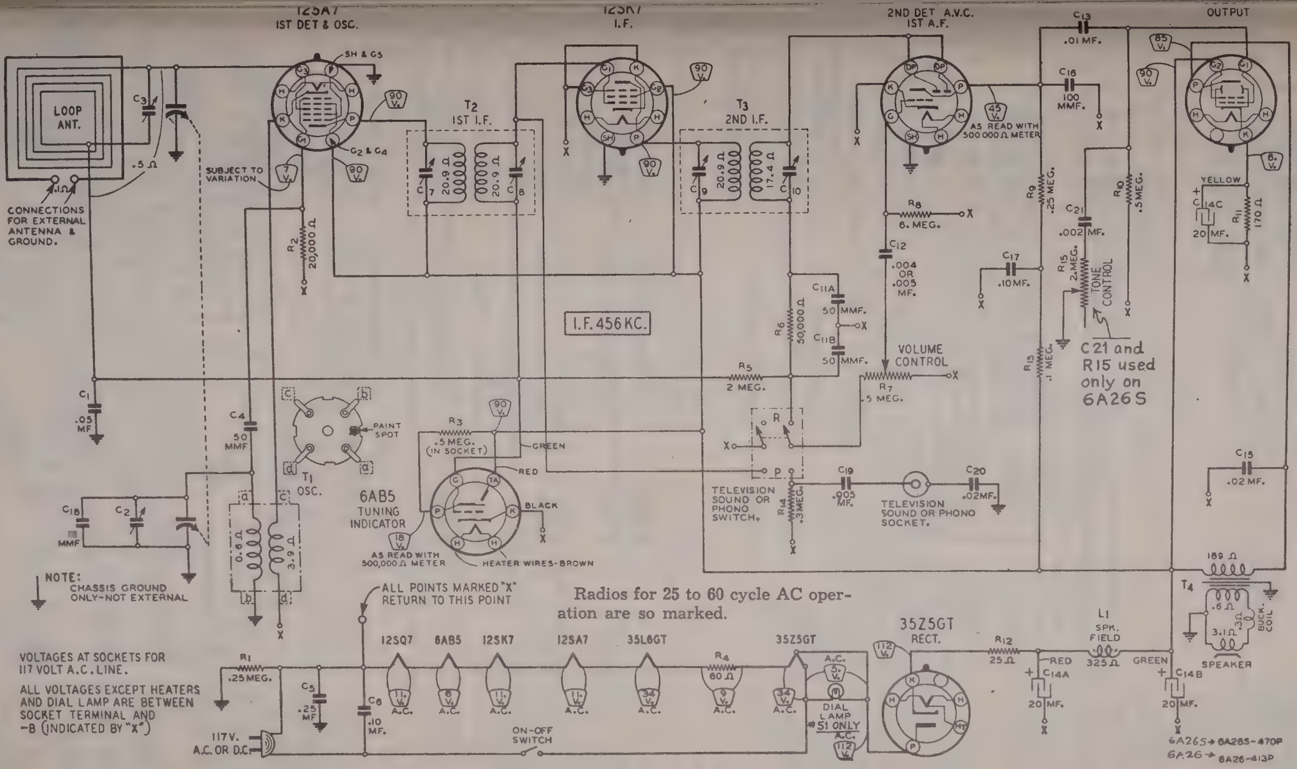


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, first remove the celluloid crystal by taking out the 4 buttons at the corner. Hold

WELLS-GARDNER & CO., INC.

MODELS 6A26,6A26S
Schematic,Voltage,Socket
Sensitivity,Notes


12SA7
IST DET & OSC.
12SK7
I.F.
2ND DET A.V.C.
IST A.F.
OUTPUT
LOOP ANT.
CONNECTIONS FOR EXTERNAL ANTENNA & GROUND.
SUBJECT TO VARIATION
T2
IST I.F.
T3
2ND I.F.
I.F. 456 KC.
AS READ WITH 500,000 Ω METER
VOLUME CONTROL
TONE CONTROL
C21 and R15 used only on 6A26S
T1
OSC.
PAINT SPOT
6AB5
TUNING INDICATOR
HEATER WIRES-BROWN
TELEVISION SOUND OR PHONO SWITCH.
TELEVISION SOUND OR PHONO SOCKET.
NOTE: CHASSIS GROUND ONLY-NOT EXTERNAL
ALL POINTS MARKED "X" RETURN TO THIS POINT
VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.
ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP ARE BETWEEN SOCKET TERMINAL AND -B (INDICATED BY "X")
117V. A.C. OR D.C.
ON-OFF SWITCH
DIAL LAMP #51 ONLY
35Z5GT
RECT.
L1
SPK. FIELD
325 Ω
SPEAKER
BUCK. COIL
T4
6A26S → 6A26S-470P
6A26 → 6A26-413P

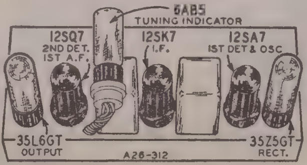
Radios for 25 to 60 cycle AC operation are so marked.

WG & C SERIES 6A26 WG & C SERIES 6A26S

Power Consumption	28 Watts (At 117 volts AC Supply)
Power Output	.8 Watt Undistorted
Selectivity	50 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	5" Electro Dynamic
Tuning Frequency Range	528 to 1730 KC
Sensitivity (For .05 Watt Output)	40 Microvolts per Meter Average

TO REDUCE MODULATION HUM:
Insulate dial-lamp clip from mounting bracket.
Return condenser C1 to B- (point X on schematic) instead of to chassis ground.
Dress lead from condenser C12 to volume control as far as possible from heater leads.
Use ground connection with external antenna.

DISTORTION and BLOCKING:
Check whether resistor R10 has open circuited due to loose pigtail connection to resistor proper.



FOR OTHER DATA
SEE INDEX

MODELS 6A26,6A26S
MODEL 6A27
MODEL 6D1
Alignment,Trimmers

WELLS-GARDNER & CO.

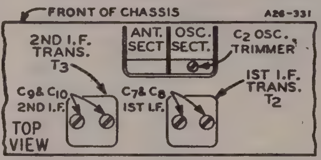
ALIGNMENT PROCEDURE: 6A26, 6A26S

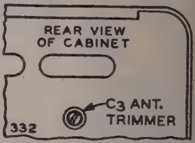
Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn Rotor to max. output	Antenna (C3)

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—If it is necessary to calibrate the radio, remove the radio from the cabinet. Tune in an 800 KC signal. If the pointer is not at 800 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 800 KC mark, and tighten the clamps.





ALIGNMENT PROCEDURE: 6A27, 6D1

Remove Jumper on Loop Antenna for All Adjustments.

Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

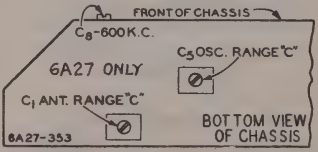
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustrations)
I. F.					
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	B Range	Turn Rotor to full open	1st I.F. (C11) & (C12) 2nd I.F. (C13) & (C14)
RANGE B					
1730 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to full open	Oscillator Range B (C4)
1500 KC	Red Antenna Screw at Back of Loop	.1 mf.	B Range	Turn Rotor to max. output	Antenna Range B (C6)—See Illustration below.
600 KC	Same as Above	.1 mf.	B Range	Turn Rotor to max. output	600 KC (C8) Rock Rotor—See Note A
RANGE C (6A27 ONLY)					
6500 KC	Same as Above	.1 mf.	C Range	Turn Rotor to full open	Oscillator Range C (C5)
6000 KC	Same as Above	.1 mf.	C Range	Turn Rotor to max. output	Ant. Range C (C1) Rock Rotor—See Note A
RANGE D (6D1 ONLY)					
12,200 KC	Same as Above	.1 mf.	D Range	Turn Rotor to full open	Oscillator Range D (C3)
11,000 KC	Same as Above	.1 mf.	D Range	Turn Rotor to max. output	Ant. Range D (C2) Rock Rotor—See Note A

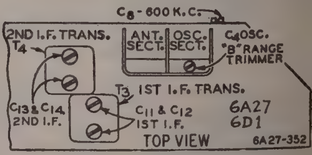
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

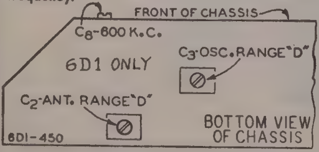
After each range is completed, repeat the procedure as a final check.

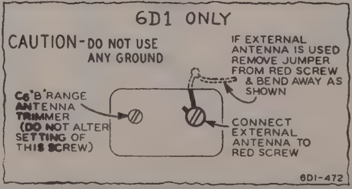
NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

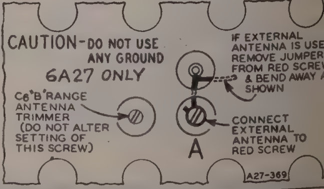
CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency.





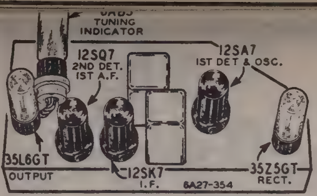



6D1 ONLY
CAUTION-DO NOT USE ANY GROUND
IF EXTERNAL ANTENNA IS USED REMOVE JUMPER FROM RED SCREW & BEND AWAY AS SHOWN
C6 "B" RANGE ANTENNA TRIMMER (DO NOT ALTER SETTING OF THIS SCREW)
CONNECT EXTERNAL ANTENNA TO RED SCREW
6D1-472


CAUTION-DO NOT USE ANY GROUND
6A27 ONLY
IF EXTERNAL ANTENNA IS USE REMOVE JUMPER FROM RED SCREW & BEND AWAY A SHOWN
C6 "B" RANGE ANTENNA TRIMMER (DO NOT ALTER SETTING OF THIS SCREW)
A
CONNECT EXTERNAL ANTENNA TO RED SCREW
A27-369

WELLS-GARDNER & CO., INC.

MODEL 6A27
Schematic,Voltage,Socket
Sensitivity



Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 6500 KC

Sensitivity (For .05 watt output)

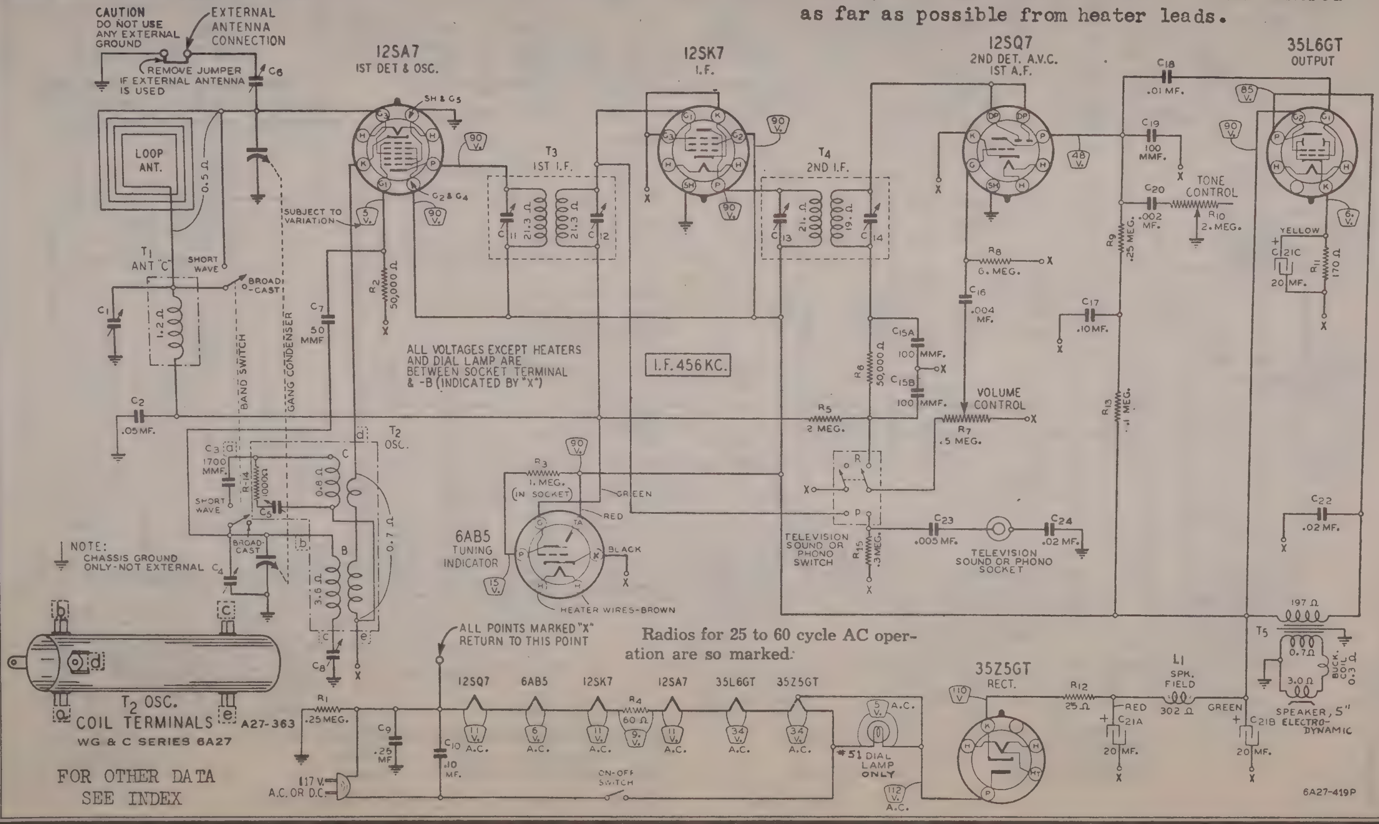
B Range	35 Microvolts Average
C Range	25 Microvolts Average

Power Consumption - 28 Watts (At 117 volts AC Supply)

Power Output - - - - - - .8 Watt Undistorted
1.25 Watts Maximum

Selectivity - - 50 KC Broad at 1000 times Signal

TO REDUCE MODULATION HUM:
Insulate dial-lamp clip from mounting bracket.
Return condenser C2 to B- (point X on schematic) instead of to chassis ground.
Dress lead from condenser C16 to volume control as far as possible from heater leads.



Radios for 25 to 60 cycle AC operation are so marked.

FOR OTHER DATA SEE INDEX

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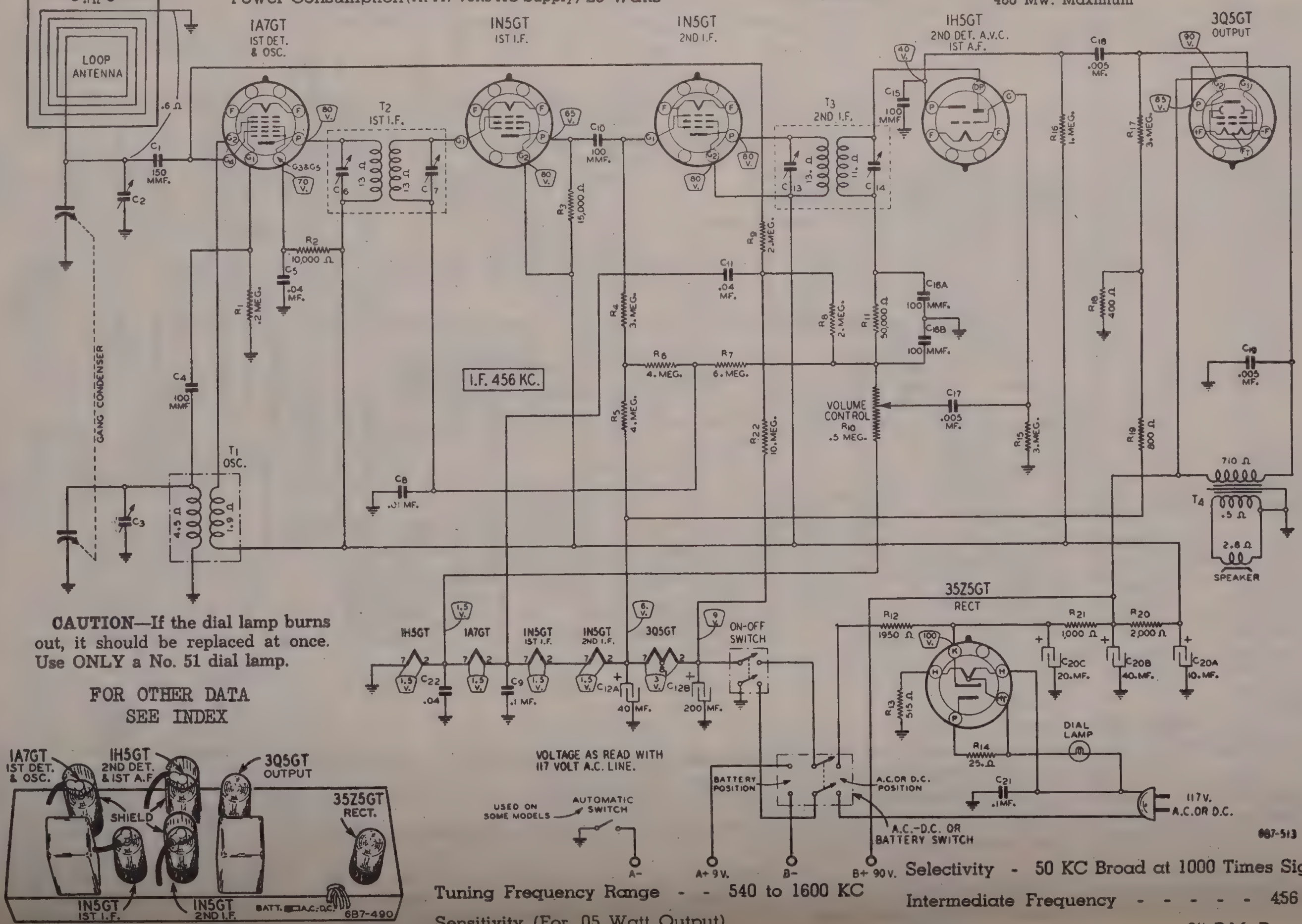
MODEL 6B7(Early)
Schematic,Voltage,Socket
Sensitivity
MODEL 6B7,Issues B,C,D
Socket Layout

WELLS-GARDNER & CO.

Input Voltages and Currents—Battery Operation
"A" Battery.................... 9 Volts—50 Ma.
"B" Battery....................90 Volts—11.5 Ma.
Power Consumption (At 117 volts AC Supply) 28 Watts

Power Output
Battery Operation - - - - 150 Mw. Undistorted
350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted
400 Mw. Maximum



CAUTION—If the dial lamp burns out, it should be replaced at once. Use ONLY a No. 51 dial lamp.

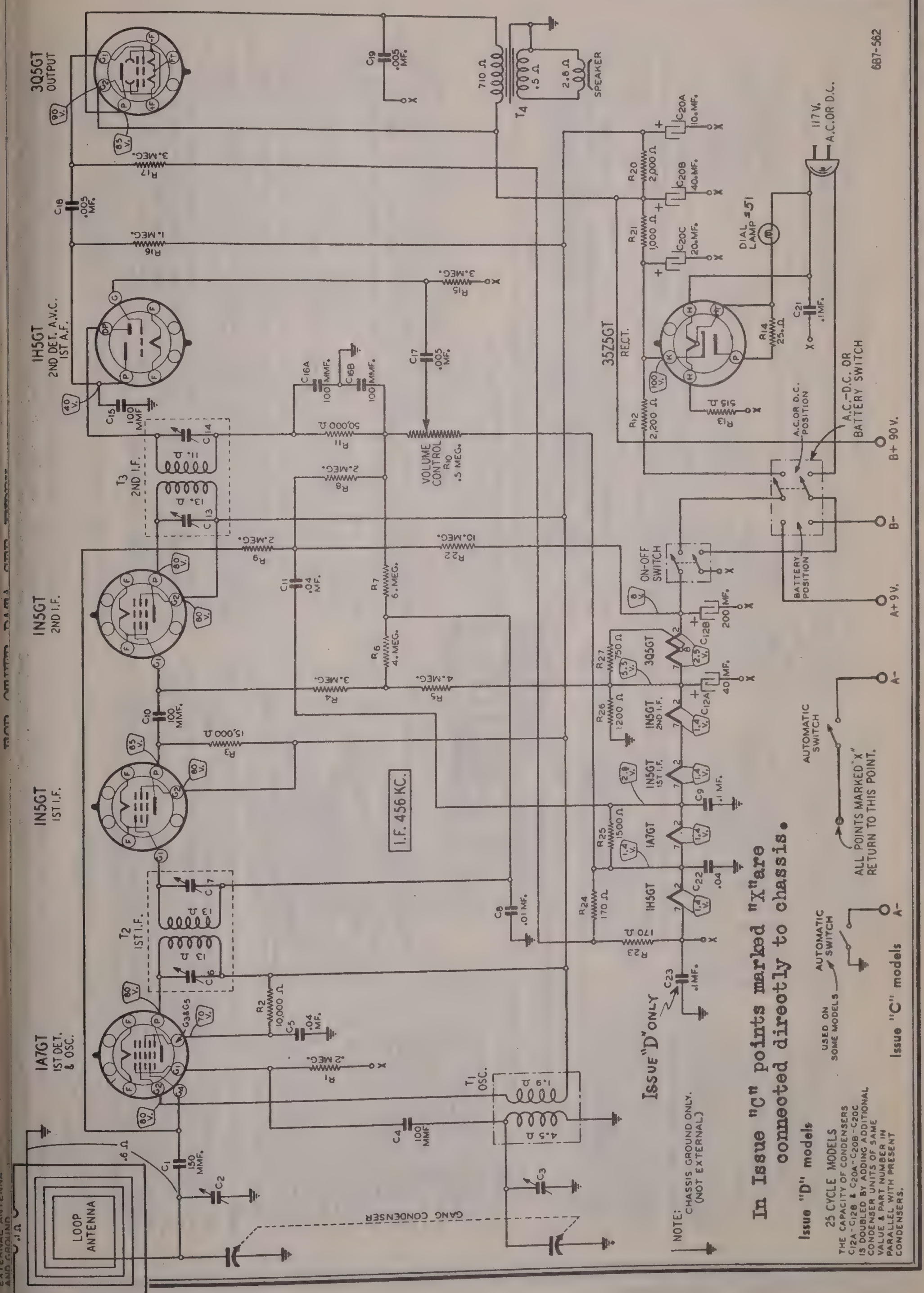
FOR OTHER DATA
SEE INDEX

Tuning Frequency Range - - 540 to 1600 KC
Sensitivity (For .05 Watt Output)

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - 456 KC

WELLS-GARDNER & CO.

MODEL 6B7,Issues C,D
6B7-3,6B7-4
Schematic,Voltage



In Issue "C" points marked "X" are connected directly to chassis.

NOTE: CHASSIS GROUND ONLY. (NOT EXTERNAL.)

Issue "D" models

Issue "C" models

25 CYCLE MODELS
THE CAPACITY OF CONDENSERS C12A-C12B & C20A-C20B-C20C IS DOUBLED BY ADDING ADDITIONAL CONDENSER UNITS OF SAME VALUE & PART NUMBER IN PARALLEL WITH PRESENT CONDENSERS.

MODELS 6B7,Issues B,C,D
6B7-3,6B7-4
Alignment,Trimmers,Changes
Notes

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.1 mf.

SIGNAL GENERATOR				
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below and Illustration of Back—Page 1)
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	None—See Note A		Turn Rotor to max. output	Antenna (C2)

NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench etc.).

CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial and loosen the pointer screw. Set the pointer at the 800 KC mark. Hold the pointer and retighten the pointer screw.

Removing Chassis from Cabinet

Take out the 2 screws, one at each side on the outside of the cabinet. Grasp the chassis shelf at each rear corner and edge it away from the cabinet front until the chassis shelf and chassis slide easily out of the cabinet.

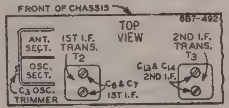
To remove the shelf from the chassis, take out the bolt and the 2 screws at the bottom of the shelf.

Using Radio Without Batteries—The radio may be used without batteries when it is operated on AC-DC. If this is done, tape the prongs of the battery plugs to prevent them from **accidentally touching each other, and place the plugs and cables in the battery compartment.**

Caution

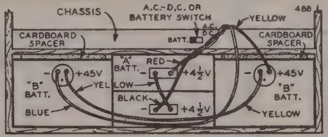
The metal chassis is connected to one side of the line through a .10 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

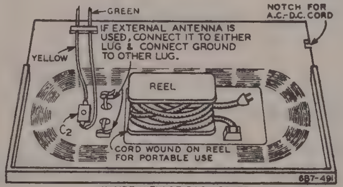
Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.



Two 4½ Volt "A" batteries—Portable Size 4" x 1⅜" x 4⅝" High

Two 45 Volt "B" batteries—Portable Size 4⅛" x 2½" x 5⅜" High




GREEN
NOTCH FOR A.C.-D.C. CORD
IF EXTERNAL ANTENNA IS USED, CONNECT IT TO EITHER LUG & CONNECT GROUND TO OTHER LUG.
YELLOW
REEL
C2
CORD WOUND ON REEL FOR PORTABLE USE
6B7-491

INSIDE VIEW OF BACK COVER

Series 6B7 CHANGES MADE FOR ISSUE "B" November 28,1939

To satisfy Underwriter's requirements, the chassis issue will become "B" when several changes in the routing of wires and the arrangement of parts in the chassis have been made.

Chassis with these changes have had the 6 lug terminal strip 4A98 removed.

PROLONGING TUBE LIFE
CHANGES FOR ISSUE "C" Jan. 9, 1940

To compensate for variations in tube characteristics as well as high line voltages, the following changes have been made in the filament series circuit to reduce the voltages across the tube filaments and to prolong tube life.

Resistor R12, which is in series with the filament series, has been changed from 1950 ohms to 2200 ohms.

There was unequal emission from the 2 sections of the filament of the 3Q5GT output tube. This caused unequal voltages across the 2 sections of the filament and shortened the tube life. There is now a 750 ohm resistor (R27) across one section which equalizes the currents through both portions.

The four 1½ volt tube filaments were shunted with 1200 ohms - Resistors R19 - 800 ohms and R18 400 ohms (See old schematic). The connecting point between these 2 resistors established the grid (bias) voltage for the output tube. These 4 tubes are now shunted by one 1200 ohm Resistor R26.

The 1A7GT 1st Detector Filament is now shunted with a 1500 ohm resistor - R25.

The 1H5GT 2nd Detector Filament is now shunted with 340 ohms - Resistors R24 and R23 in series. The connecting point between these 2 resistors establishes the grid (bias) voltage for the output tube.

Series 6B7-3, 6B7-4 CHANGES MADE FOR ISSUE "D" March 11, 1940

To satisfy additional Underwriters requirements, the chassis has been isolated from the AC-DC line except for a connection through a .1 mf. condenser - See schematic On these models the battery wires are held by a clamp located under the chassis shelf. On previous issues this clamp was above the shelf. The battery compartment cardboard fillers have been made smaller to clear the above mentioned clamp.

On chassis with the above changes incorporated, the issue letter becomes "D."

All voltages on this issue chassis except the heaters and dial lamp are measured between socket terminal and B- (indicated by "X") - See schematic

WELLS-GARDNER & CO.

MODEL 8A30 Record Changer Service Notes

Before tightening screws, drop Drive Pinion Assembly AH into mesh with Idler Gear (but not down far enough to seat upon drive pin). Then make sure that when the three screws are tightened, Drive Pinion and Idler still work freely together and do not bind. If necessary, loosen screws again, and shift them until proper tooth clearance is obtained. Then tighten screws, and test, as above directed, the centering of Record Pin between Changer Posts.

In wiring up, consult wiring diagram for particular installation. Use only Underwriters' approved wire. See that Motor Frame is well grounded by wire soldered to lugs, as shown on Bottom View photo.

Trouble Shooting

Cases of failure to operate satisfactorily will generally be found due either to neglect of proper lubrication, or to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage) even though the utmost factory precautions are taken against it--or that setscrews may work loose due to some external vibration. For tightening setscrews, a No. 8 size Allen (hexagon) wrench is required: be sure that setscrews are properly seated on the holes or flats provided. Damage from tampering is likely to take the form of bent parts; never bend any part during examination. Be careful, especially, never to push upward from below on Cam Connecting Rod Lift CV while mechanism is operating; bending may result, and even slight bending here might interfere with correct timing of the cycle operations.

Among the principal trouble symptoms to which such causes may give rise, are the following:

1. MECHANISM IS SLOW IN STARTING, OR STALLS DURING A CHANGE CYCLE, BUT A SLIGHT FORWARD PUSH WITH THE HAND STARTS IT AGAIN. May be caused by

a. Failure to lubricate properly. Oil thoroughly, per instructions above.

b. Loose setscrews.

c. Weakness of drive: line voltage may be abnormally low, or motor windings damaged. If windings are found damaged, remove motor and return it to factory for repair or replacement. See above: "Replacing Motor."

2. MOTOR FAILS TO RUN, EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM OTHER WIRING AND PROPER VOLTAGE IS APPLIED DIRECTLY TO THE TWO ENDS OF ITS WINDINGS. This indicates trouble in Motor windings. Unless the damage is easily seen and repaired, replace Motor, as above described.

3. MOTOR IS SLOW IN STARTING.

a. Check oiling, as directed above. It may not have been properly done; old oil may have become gummy.

b. Changer may have been in a very cold place, and may not yet have reached room temperature. Give it a fair chance to get warmed up before concluding that Motor is defective, and proceeding as in Paragraph 2 above.

4. SQUEAKS OR OTHER NOISES, DURING PLAYING OF RECORDS.

a. Check oiling, as directed above. (If squeaks are heard, they will usually be found to come from the records--not from the mechanism).

b. See that all setscrews are tight.

5. CHANGER IS NOISY WHEN IN CYCLE. Check oiling.

6. MOTION OF PICKUP TOWARD RECORD PIN WILL NOT TRIP CHANGER MECHANISM.

a. (Only on models not having Trip Adjustment Hole AR) It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring CK, allowing the spreaders to open. Increase tension of the Spring, by bending slightly the lug on either Spreader. If this increased tension causes needle to jump across the record, needle may be a little out of vertical, radially--it may "lean" toward center of record. To remedy this, grasp Pickup arm and twist it, very slightly, in a clockwise direction (looking from needle end) so that it stands vertical, or even leans a little in outward direction.

b. If trigger is being properly actuated, probably Cam Lever CS is binding against Sub-Plate CU. Look for dirt or obstructions; see that Pawl DH and Trigger CP are working freely on their rivets. If the Lever engages the Pawl so that Lift CV forces roller DJ up into the under groove on Cam Gear, and if setscrews are tight, the change cycle must operate, as Cam Gear turns.

7. PRESSING "R" BUTTON DOESN'T TRIP CHANGER MECHANISM.

a. Check Key Control Unit FM: see whether there is an obstruction or a bent part which prevents "R" button from going clear down to the end of its travel.

b. Examine Reject Rod FI. If it does not trip, even when properly revolved by complete depressing of "R" button, the rod has probably been bent, and must be restored in same way. Grasp the two ends and twist it slightly.

c. If Trigger CP is being properly actuated but without starting a change cycle, see directions above, Paragraph 6-b.

8. PRESSING "M" BUTTON FAILS TO PUT CHANGER MECHANISM OUT OF ACTION SO AS TO ENABLE MANUAL OPERATION. First see that button goes clear down; then follow its action through Manual Rod FH.

9. MOTOR STOPS IMMEDIATELY WHEN CHANGER SWITCH IS TURNED OFF DURING A CHANGE CYCLE (instead of continuing to run, as it should, until needle is again upon a record, and then stopping). Or--

10. TURNING ON-OFF SWITCH FAILS TO STOP CHANGER AT ALL. Either of these two conditions would indicate failure of Cycling Switch EH. Cycling Switch operates normally to short-circuit the manual On-Off Switch (which may be located in position shown at FA or elsewhere) during change cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning either the Sub-Plate Assembly or the entire Changer to factory.

11. CHANGER FAILS TO REPEAT LAST RECORD. See Paragraph 6, above.

12. NEEDLE LANDS PROPERLY ON RECORD BUT FAILS TO MOVE OVER INTO RECORD GROOVE. Pickup arm is normally impelled toward center of records by Lead Spring FR. Should a slight increase in its tension be found necessary, this can be easily obtained by bending the lug, to which it is attached, down against Main Plate. If tendency then appears for needle to jump across record, check angle of needle (see Paragraph 6-a above).

13. RECORDS FALL UNEVENLY UPON TURNTABLE. Seldom objectionable (some unevenness may even be advantageous) this is due to Record Pin not being correctly centered between Changer Posts. If necessary, it can be corrected as described above; see "Replacing Motor."

14. LAST RECORD DROPS ON ONE SIDE ONLY. This suggests a Changer Post bent out of perpendicular to Main Plate. Test as directed above under "Replacing Motor." If Post must be straightened, be careful not to bend other parts.

15. CHANGER CONTINUES CYCLING. Probably due to failure of Lift CV to be drawn back out of engagement with Cam Gear. Check the various rivets at which motion occurs, to find the point where friction or binding is interfering with freedom of motion.

16. RECORD IS DRIVEN, BUT NOT HEARD, or NOT HEARD WITH PROPER VOLUME. See that Pickup cord is plugged in. Check amplifier and speaker and connections to them, thoroughly. If then trouble is still suspected in pickup, test its output with a vacuum-tube voltmeter. Playing an average record, output should test 1 to 2.5 volts if pickup cartridge is of crystal type, or 0.5 volt if of magnetic type. If pickup cartridge is found not to deliver proper output, remove it and install another.

17. SELECTOR PLATE FAILS TO SEPARATE BOTTOM RECORD FROM STACK. This is due either to a badly warped condition of the record, or to its being of a thickness very considerably different from those now in standard use. The design of both Selector and Shelf Plates is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be impracticable for use in automatic changers.

If Necessary to Disassemble the Changer

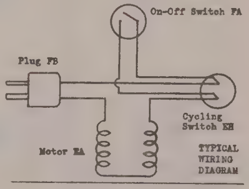
First detach the entire changer mechanism (except Changer Connecting Rod Assembly FD and Cam Connecting Rod Assembly DE, also seen at EC) from Main Plate EB. To do this, first take out Shoulder Screw CT, to free the rest of the mechanism from Assembly DE. Then remove the three screws AO, which hold Sub-plate Assembly DI to Main Plate EB. Also remove Screw BN, which holds Cam Gear DF. Pull off the four Key Control Buttons. Remove, then, the two screws that hold Key Control Unit FM to Main Plate. Now remove Control Unit Truss Bar FO, Rejection Rod Support EP, and Extension Rod Bracket FQ--this means taking out five screws. Remove Flat Spring FJ, by taking out one screw. Rods FH and FI can then, with due care, be extracted without bending. Free the Cam Connecting Rod Assembly DE, by loosening setscrew holding Spreader Hub EE to Rear Changer Shaft. In reassembling, reverse the procedure, taking care to get all springs properly connected as shown in the photos, without stretching any of them.

Replacement Parts

When spare parts or sub-assemblies are required, order them direct from the factory, by factory number and name as given on photos --not by reference letters. Where no number is given, order by full and exact description. Always specify Serial Number as seen at EO, and Model Number as seen at EN. Parts shown in above photographs, but not given factory numbers, are furnished only in assemblies as shown with factory numbers.

Handy Reference

Shops having frequent occasion to service this Changer can obtain on request a second copy of this Manual, for posting, both sides visible, above bench.



MODEL 6D1
Schematic, Voltage, Socket
Sensitivity

WELLS-GARDNER & CO.

Power Consumption	28 Watts (At 117 volts AC Supply)
Power Output	.8 Watt Undistorted 1.25 Watts Maximum
Selectivity	55 KC Broad at 1000 Times Signal
Intermediate Frequency	456 KC
Speaker	5" Electro-Dynamic

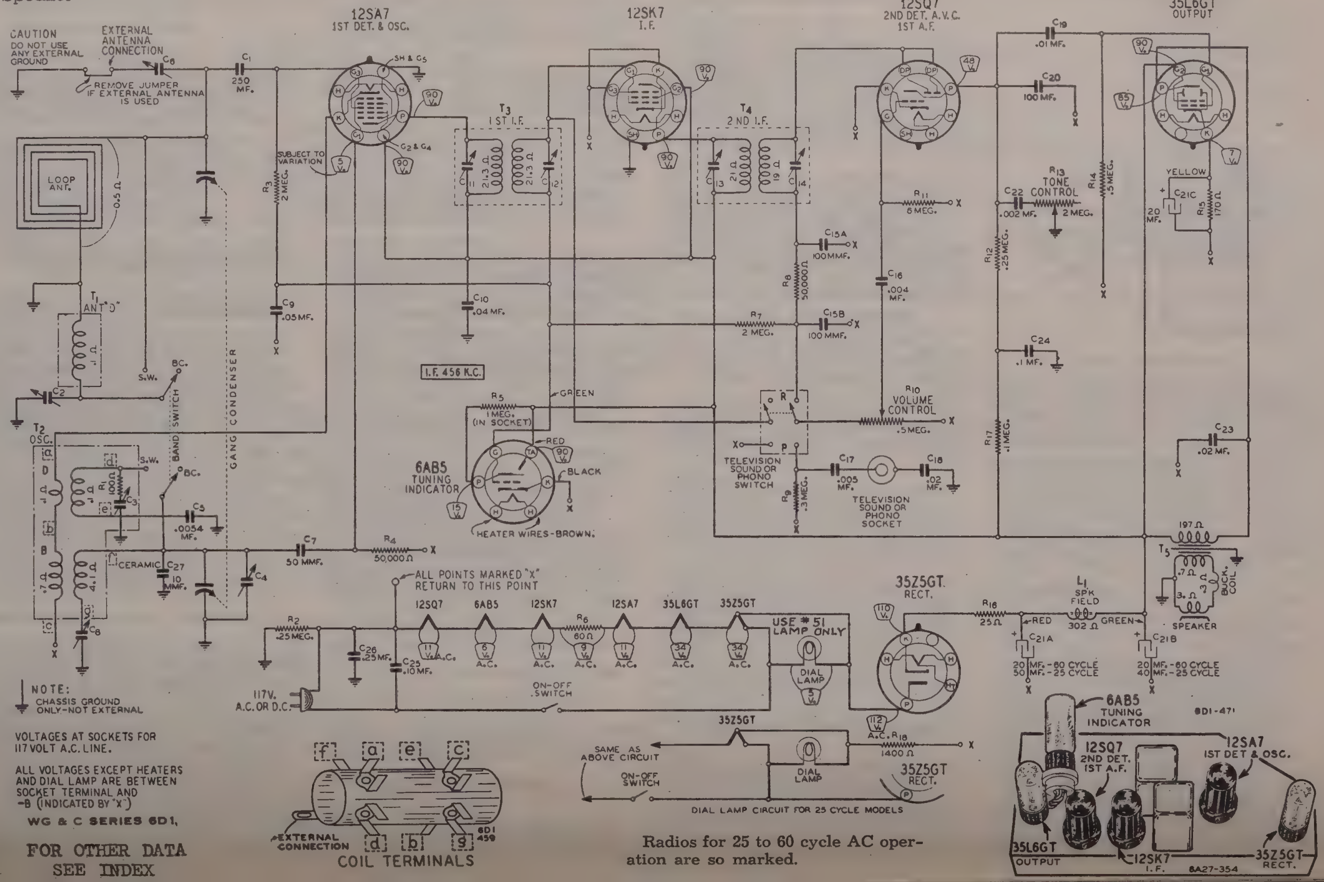
CAUTION—DO NOT USE A GROUND OF ANY KIND ON THIS RADIO. DO NOT USE A GROUNDED OBJECT, SUCH AS A RADIATOR, FOR AN EXTERNAL ANTENNA.

Tuning Frequency Range

B Range	528 to 1600 KC
D Range	4600 to 12,200 KC

Sensitivity (For .05 watt output)

B Range	35 Microvolts Average
D Range	30 Microvolts Average



NOTE:
CHASSIS GROUND ONLY-NOT EXTERNAL

VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.

ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP ARE BETWEEN SOCKET TERMINAL AND -B (INDICATED BY "X")

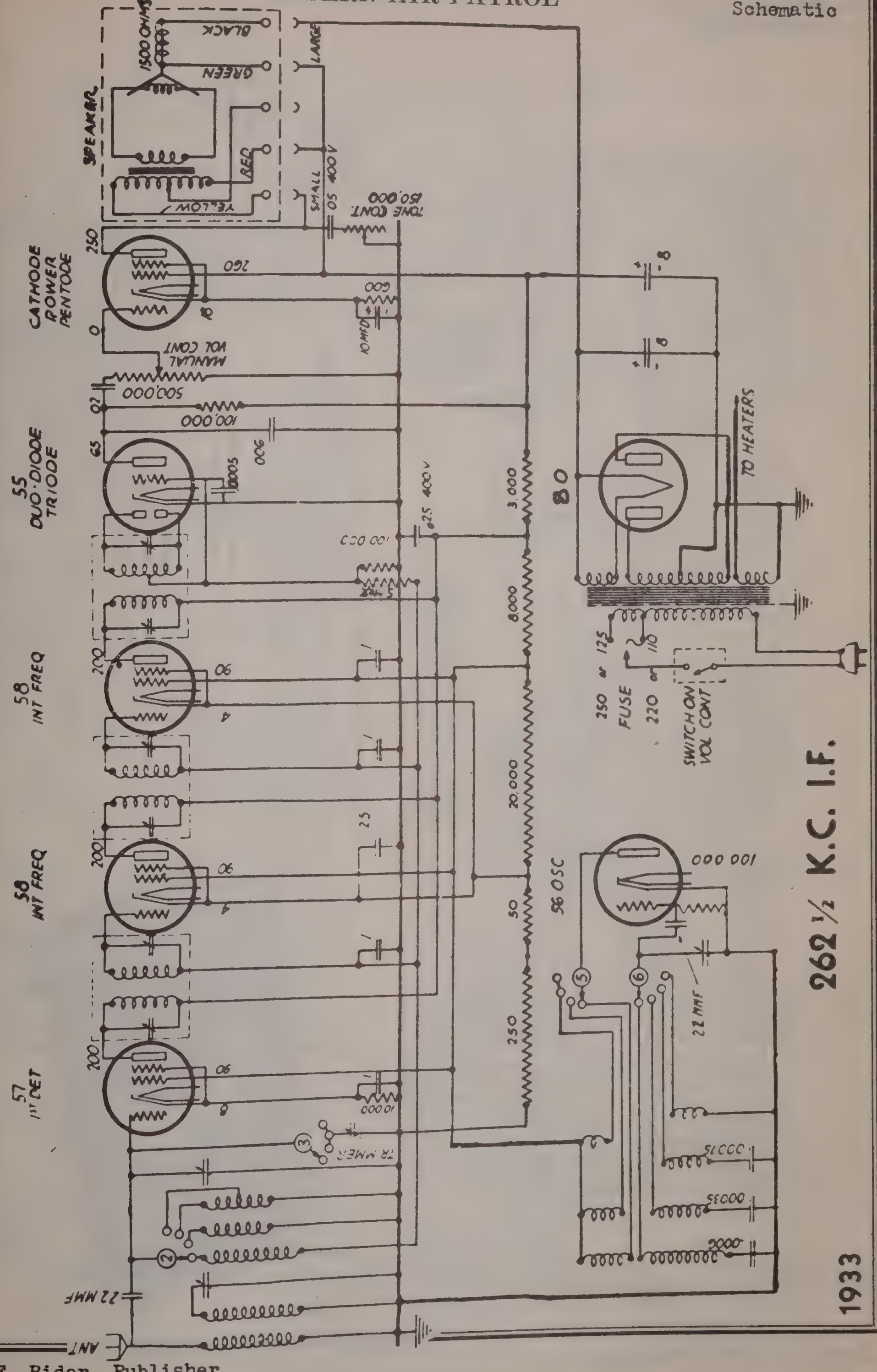
WG & C SERIES 6D1,

FOR OTHER DATA SEE INDEX

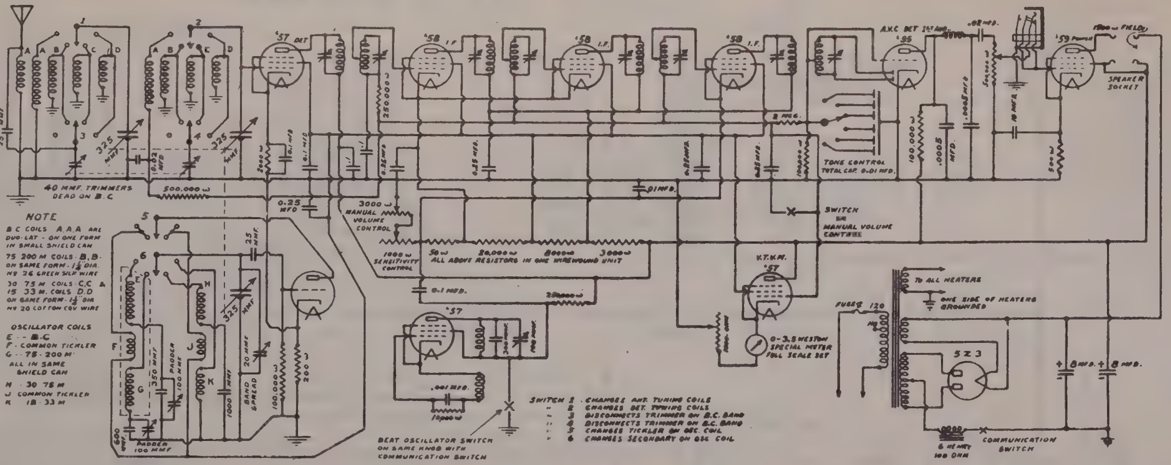
Radios for 25 to 60 cycle AC operation are so marked.

WESTERN AIR PATROL

MODEL W221
Schematic



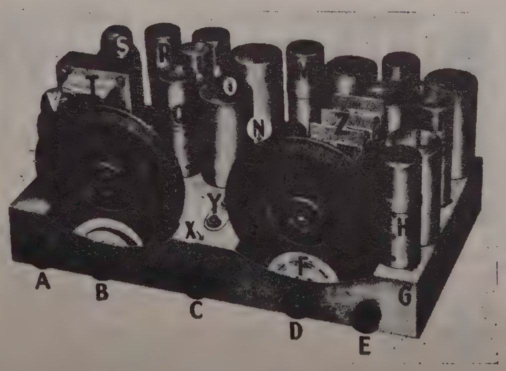
WESTERN AIR PATROL



NOTE
B C COILS A.A.A ARE DUO-LAT - ON ONE FORM IN SMALL SHIELD CAN
75 200 M COILS - B.B. - ON SAME FORM - 1½" DIA. NO 26 GREEN SILK WIRE
30 75 M COILS - C.C & 15 33 M. COILS D.D ON SAME FORM - 1½" DIA NO 20 COTTON COV WIRE

OSCILLATOR COILS
E - - B.C
F - COMMON TICKLER
G - - 75 - 200 M
ALL IN SAME SHIELD CAN
H - 30 75 M
J COMMON TICKLER
K 18 - 33 M

SWITCH 1 CHANGES ANT. TUNING COILS
" 2 CHANGES DET. TUNING COILS
" 3 DISCONNECTS TRIMMER ON B.C. BAND
" 4 DISCONNECTS TRIMMER ON B.C. BAND
" 5 CHANGES TICKLER ON OSC. COIL
" 6 CHANGES SECONDARY ON OSC COIL



PR-10 Chassis

A—"B" on and off, Beat Oscillator switch.
B—Push, Tone Control. Normal, Band Spread.
C—Volume Control, Power Switch.
D—Push, Band Change. Normal, Main Tuning.
E—Short-Wave Trimmer, two gang.
F—Band Indicator.
G—Heavy 18-gauge Chromium Plated Chassis.
H—First Detector—#57.
I—First I. F. Tube—#58.
J—B. C. and 75 Meter Oscillator.
K—Second I. F. Tube—#58.
L—Three Stages I. F.
M—Third I. F. Tube—#58.
N—High Frequency Oscillator Tube —#56.
O—Beat Oscillator Control.
P—Second Detector and AVC Tube —#55.
Q—Beat Oscillator Tube—#57.
R—Vacuum Tube Volt Meter—#57.
S—Output Tube—#59.
T—Heavy Duty Power Supply.
U—Moisture-proof Filter.
V—Rectifier Tube—5Z3.
W—Patterson Velvet Tuning Dials.
X—Manual Control Mounts Here.
Y—Sensitivity, "R" Meter Adjustments.
Z—Three-gang Condenser, Rubber Mounted.

To rebalance the receiver does not require any equipment. The meter will indicate the exact resonance point of the I.F. trimmers and also the condenser gang. Proceed as follows: Set band spread dial at "O," then tune in a station on the high frequency end of the Broadcast band (any station around 1400 K.C. is okay). Next, adjust the trimmer on the condenser section nearest the dial until the station reads exactly on its known K.C. Now, tune in a station in around 600 K.C. and be careful to be on the exact center of the carrier. All of the above operations must be made with the manual control in off position. Next, turn the sensitivity control toward minimum so that the meter reads about R-9. Now, adjust each of the eight I.F. trimmers very carefully until the meter swings the farthest to the right. You probably will not be able to increase the gain more than 1.5-R. It should not be necessary to turn any trimmer more than ⅛ of a turn.

WESTERN AIR PATROL

MODEL W409
Schematic
Socket

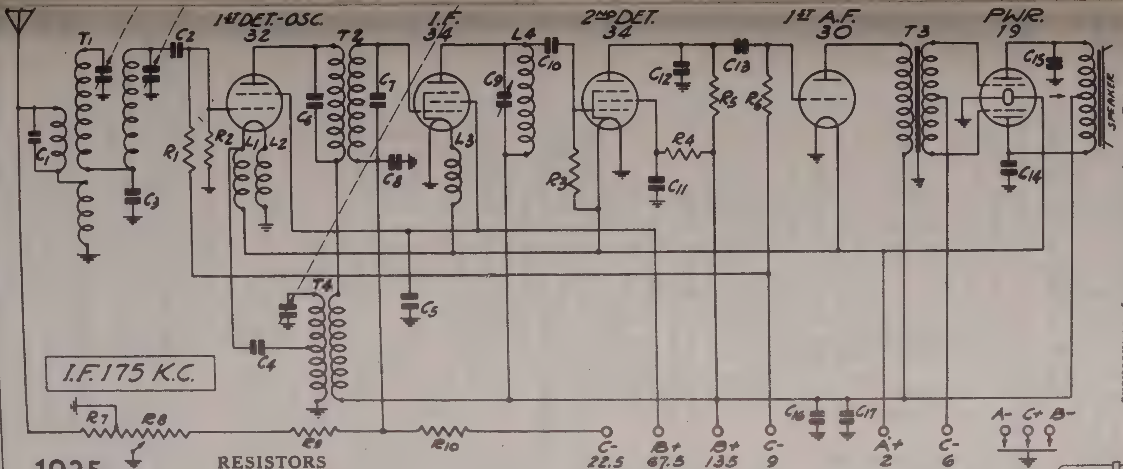


Fig. 1—Schematic Circuit Diagram.

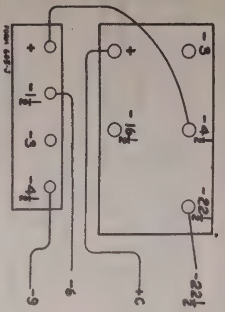


Fig. 3—Optional "C" Battery Connections

1935

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A94505	R1	5 Megohm	0.2	Carbon
P-A94105	R2	1 Megohm	0.2	Carbon
P A94205	R3	2 Megohm	0.2	Carbon
P-B94104	R4	100,000 Ohm	0.5	Carbon
P-B94403	R5	40,000 Ohm	0.5	Carbon
P-A95105	R6	1 Megohm	0.2	Carbon
P-96001	R7 R8	3,000 Ohm 60,000 Ohm		Volume Control
P-A94901ww	R9	900 Ohm	0.2	Wire Wound
P-A94652	R10	6,500 Ohm	0.2	Carbon
*P-A94106	R1	10 Megohm	0.2	Carbon
*P-A94205	R2	2 Megohm	0.2	Carbon

*These resistors were used on first models.

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81812	C1	200 mmf		Wire—Part of Ant. Assem
P-81801	C2	35 mmf		Wire—Part of Ant. Assem.
P-80862	C3	0.05 mf	200V	Tubular
P-80862	C4	0.05 mf	200V	Tubular
P-80862	C5	0.05 mf	200V	Tubular
P-81806	C6	70 mmf		Wire
P-81804	C7	45 mmf		Wire
P-80862	C8	0.05 mf	200V	Tubular
P-1685	C9	70 ± 30 mmf		I. F. Trimmer
P-81800	C10	50 mmf		Wire
P-81045	C11	0.25 mf	200V	Tubular
P-80863	C12	0.004 mf	600V	Tubular
P-80898	C13	0.006 mf	600V	Tubular
P-80969	C14 C15	0.01 mf 0.01 mf	400V 400V	Dual Tubular
P-80864	C16	0.1 mf	200V	Tubular
P-80968	C17	4.0 mf	150V	Electrolytic
P-81036	3 Gang Condenser			

MISCELLANEOUS

Part No.	ITEM
P-2131	No. 32 Socket
P-1645	No. 34 Socket
P-1644	No. 30 Socket
P-1833	No. 19 Socket
P-1640	Speaker Socket
P-20406-A	Tube Shield for 34 and 32 Tubes
P-20786	Tube Shield Base
P-50586-D	Audio Input Transformer T3
P-5168	Double Tuned Ant. Trans. Assem. Comp. with resistors and condensers T1 less can
P-40432	Can for above Assem.
P-5199	1st I.F. Coil and Can Assem. T2
P-5187	Oscillator Coil and Can Assem. T4
P-5188	2nd I.F. Coil and Can Assem. L4
P-5172	Double Filament Reactor L1, L2
P-5189	Single Filament Reactor L3
P-30342-A	Grid Cap Only
P-2060	Knob, plain
P-2122	Knob, Arrow Indicator
P-1441-A	Double Insulated Terminal Strip
P-1786	Five Lug Terminal Strip
P-1831	On-Off Switch
P-20711	Gang Condenser Shield
P-10272	Rubber Chassis Cushions
P-70703	Antenna and Ground Wire
P-70749	"B" Battery Wire Assem.
P-70771	"A" Battery Wire Assem.
P-70772	"C" Battery Wire Assem.
P-2124	Speaker 6"
P-2125	Speaker 8"

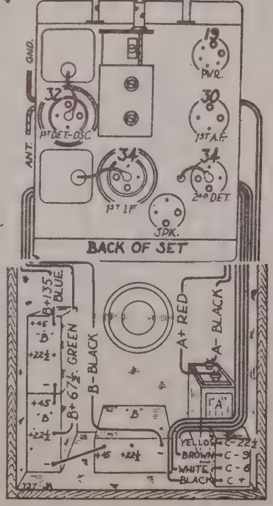


Fig. 2—Tube Arrangement and Battery Connections.

MODEL W409
Circuit Data,Voltage
Alignment,Resistance

WESTERN AIR PATROL

Circuit

This receiver is designed to operate from a battery power supply the values of which are shown in Fig. 1. All of the tubes used are of the 2 volt type. The receiver is designed to operate at a very low current drain from the batteries and still have a very satisfactory quality of output.

The circuit has a preselector stage incorporating 2 tuned circuits for image rejection. This couples into the type 32 first detector-oscillator tube through a combination of inductive coupling in T1 and capacitive coupling through C3. In Fig. 1 the two coils to the right of the 32 1st detector tube are the primary and secondary of the 1st I. F. transformer while below this tube are the oscillator coils. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency of 175 K. C. above the frequency to which the R. F. circuit is tuned.

One stage of I. F. amplification is employed using a 34 tube. Fixed condensers tune the primary and secondary of the first I. F. transformer. A second I. F. unit of the impedance coupled type is provided in which the inductance L4 is tuned by a trimmer condenser C9. The volume control is of the variable antenna input and I. F. bias type. Referring to Fig 1 it will be noted that one end of the volume control strip is connected to the antenna and the other end is connected to resistor R9. Also note that the volume control strip is tapped. Bias voltage for the 34 I. F. tube is obtained from a potentiometer consisting of resistors R9, R10 and the 60,000 ohm section of the volume control R8 which resistors are connected across the 22½ volt "C" battery.

As the slider of the volume control is moved away from the antenna end, the signal input to the antenna stage is increased. The bias voltage of the I. F. tube is not affected until the tap is reached. As the slider moves from this point to the end of the strip the I. F. bias is decreased, thus increasing the sensitivity. When this happens the plate current goes up and more battery current is used.

A 34 tube is used as the 2nd detector or demodulator. Demodulation takes place in the grid circuit of this tube.

Resistance coupling is used between the 2nd detector and the 1st audio stage which uses a 30 tube. The 1st audio stage is transformer coupled to the output stage. Class "B" amplification is employed in the output stage which uses a type 19 tube. This consists of two output tubes in one envelope. A magnetic reproducer is used.

A 3 pole switch controls all three sources of battery supply.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the broadcast band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator to a frequency of 175 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector thru a .05 mfd. condenser. The ground lead from the signal generator goes to the ground lead of the receiver. Adjust trimmer condenser C9 on the back panel of the chassis until maximum output is obtained. **A non-metallic screw driver should be used in making this adjustment as the I. F. trimmer is at B+ potential.**

Next set the signal generator for 1730 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Then set the signal generator for 1400 K. C. and tur the rotor until maximum output is obtained. Adjust th other two trimmers on the gang condenser for maximu output.

To obtain dial scale calibration tune in an 800 K. C signal and set the dial pointer at that mark on the dia scale. When calibrated in this manner, the setting wil be approximately correct at both ends of the scale.

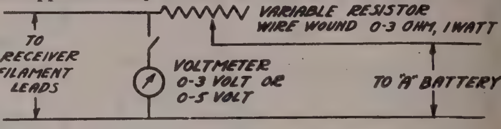

VARIABLE RESISTOR
WIRE WOUND 0-3 OHM, 1WATT
TO RECEIVER FILAMENT LEADS
VOLTMETER 0-3 VOLT OR 0-5 VOLT
TO "A" BATTERY

Fig. 4—Using Voltage Regulator with 3 Volt "A" Battery

The use of the cut plate type of condenser eliminate the necessity of a 600 K. C. padder and no adjustmen at this frequency, therefore, is required.

D. C. Resistance of Windings

Following are the D.C. resistances of the various winding in the chassis.

Part No.	Item	Code	D. C. Re sistanc in Ohm
P-5168	Double Tuned Ant. Coil Pri.	T1	19.2
	Double Tuned Ant. Coil Sec. (Preselector)	T1	3.2
	Double Tuned Ant. Coil Sec. (1st Det.)	T1	3.2
P-5199	1st I.F. Coil Pri.	T2	90.0
	1st I.F. Coil Sec.	T2	116.0
P-50586-D	Audio Input Trans. Pri.,	T3	1010.
	Audio Input Trans. Sec. Cent. Tap to outside end	T3	648.
	Audio Input Trans. Sec. Cent. Tap to inside end	T3	588.
P-5187	Oscillator Coil, Grid Winding	T4	4.1
	Oscillator Coil, Plate Winding	T4	10.4
P-5172	Double Filament Reactor Assem.	L1	.6
	Double Filament Reactor Assem.	L2	.6
P-5189	Single Filament Reactor Assem.	L3	.6
P-5188	2nd I.F. Reactor Coil	L4	52.1
P-2124	6" Magnetic Speaker, Center Tap to outside end		272.
	6" Magnetic Speaker, Center Tap to inside end		225.
P-2125	8" Magnetic Speaker (same as P-2124)		

VOLTAGES AT SOCKETS

Volume Control at Maximum—Antenna Shorted to Groun

B+135 Volts

Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Cath.	Screen to Cath.	Grid to Cath.	Norma Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5(1) (2)	2.5
34	I. F	2.0	135	67.5	2.5(3)	2.8
34	2nd Det.	2.0	50	40(1)	0	1.8
30	1st Audio	2.0	135		9(4)	3.0
19	Output	2.0	135		6	1.8 Total

(1) With 250,000 ohm meter.
(2) Subject to variation due to oscillatory current.
(3) With 25,000 ohm meter.
(4) As read at "C" battery.

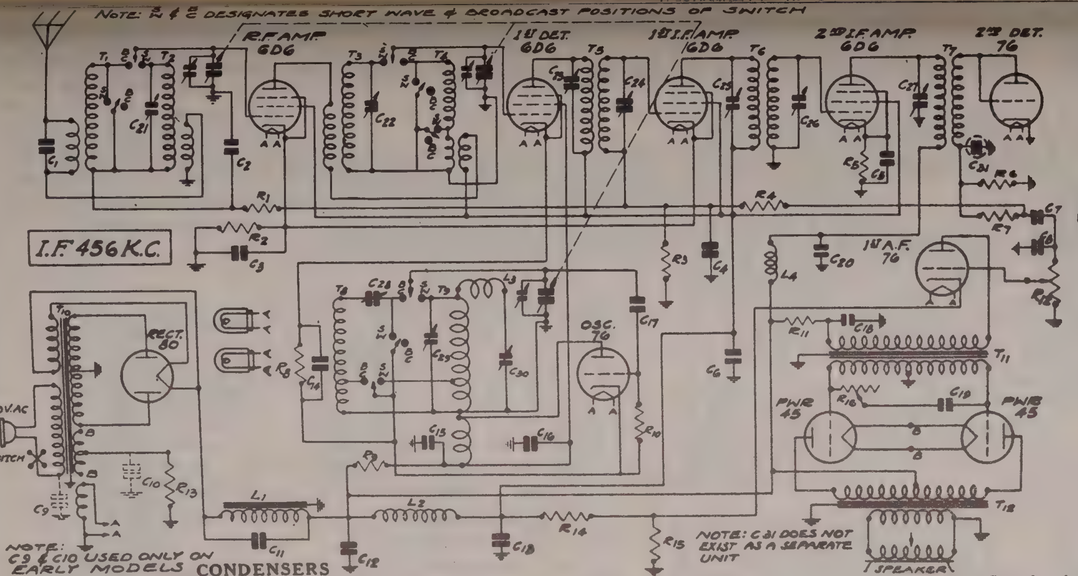
Voltages

Check the voltages at the sockets to see if corre values are being delivered to the tubes. The antenna an ground should be disconnected and the antenna an ground leads from the set connected together. Th volume control should be turned to the right or maximu position.

The voltage chart gives the voltages with all tubes i the speaker connected and the set in operating conditio These voltages are typical of the sets but will vary sligh ly with variations in individual receivers, tubes, te equipment used and battery voltages.

WESTERN AIR PATROL

MODEL W416
Schematic



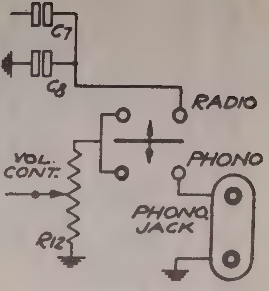


Fig. 5—Phonograph Connections

Fig. 1—Schematic Circuit Diagram

1934

CONDENSERS

Part No.	Code	Capacity	Volts	Type
P-80919	C1	250 mmfd.		Moulded
P-80862	C2	.05 mfd.	200V.	Tubular
P-80888	C3	.25 mfd.	200V.	Tubular
P-80862	C4	.05 mfd.	200V.	Tubular
P-80862	C5	.05 mfd.	200V.	Tubular ....
P-80888	C6	.25 mfd.	200V.	Tubular ....
P-80862	C7	.05 mfd.	200V.	Tubular ....
P-81005	C8	35 mmfd.	600V.	Moulded ....
*P-80997	C9	.01 mfd.	600V.	Condenser in metal can
*P-80888	C10	.25 mfd.	200V.	Tubular ....
P-80985	C11	.15 mfd.	200V.	Tubular ....
P-81039	C12	16.0 mfd.	400V.	Wet Electrolytic ....
P-81018	C13	6.0 mfd.	150V.	Dry Electrolytic ....
	C16	2.0 mfd.	300V.	
	C18	2.0 mfd.	300V.	
P-80862	C14	.05 mfd.	200V.	Tubular ....
P-80864	C15	.10 mfd.	200V.	Tubular ....
P-81005	C17	35 mmfd.	600V.	Moulded ....
P-80863	C19	.004 mfd.	600V.	Tubular ....
P-81041	C20	.10 mfd.	400V.	Tubular ....
P-2102	C21	3-40 mmfd.		Ant. S.W. Trimmer ....
P-2102	C22	3-40 mmfd.		1st Det. S.W. Trimmer
P-2103	C23	200± 50 mmfd.		Dual Trimmer
	C24	200± 50 mmfd.		Part of I.F. Assem.
P-2103	C25	200± 50 mmfd.		Dual Trimmer
	C26	200± 50 mmfd.		Part of I.F. Assem.
P-1685	C27	70± 30 mmfd.		3rd I.F. Coil Trimmer
P-2112	C28	300-500 mmfd.		600 K.C. Trimmer ..
P-2102	C29	3-40 mmfd.		Osc. S.W. Trimmer
P-1685	C30	70± 30 mmfd.		6000 K.C. Trimmer
P-81027		Three Gang Condenser		

RESISTORS

Part No.	Code	Resistance	Watts	Type
P-A95204	R1	200,000 ohm	.2	Carbon ....
P-98023	R2	150 ohm	.5	Flex. Wire Wound ....
P-A95105	R3	1 megohm	.2	Carbon ....
P-A95205	R4	2 megohm	.2	Carbon ....
P-98024	R5	400 ohm	.5	Flex. Wire Wound .....
P-A94304	R6	300,000 ohm	.2	Carbon ....
P-A95104	R7	100,000 ohm	.2	Carbon ....
P-A94252	R8	2,500 ohm	.2	Carbon ....
P-98022	R9	30,000 ohm	2.0	Carbon ....
P-A95104	R10	100,000 ohm	.2	Carbon ....
P-C94303	R11	30,000 ohm	1.0	Carbon ....
P-96005	R12	2 megohm		Volume Control and Switch...
P-98006	R13	780 ohm	3.0	Armored Wire Wound
	R14	6000 ohm	1.4	
	R15	460 ohm	.2	
P-97003	R16	3 megohm		Tone Control ....

*Used in Early Models only.

Part No.	Item
P-50638	Power Transformer 115V. 60 cycles T 10 .....
P-50639	Power Transformer 115V. 25 cycles T 10 .....
P-50640	Power Transformer 115-230V. 40-60 cycles T 10
P-50641	Power Choke L 1 ....
P-50642	Audio Output Transformer T 12 ....
P-50643	Audio Input Transformer T 11 ....
P-5176	Antenna R.F. Trans. T 1 and T 2 less can ...
P-5177	Interstage R.F. Trans. T3 and T4 less can ...
P-5178	Oscillator Coil Assembly T8 and T9 less can ...
P-5186	3rd I. F. Coil T7 less can ....
P-40433	Cans for the above coils ....
P-5184	1st I.F. Coil & Can Assembly T5 ......
P-5185	2nd I.F. Coil & Can Assembly T6 ......
P-5190	H. F. Oscillator Tracking Coil L3 ......
P-5151	I.F. Plate Isolating Reactor L4 ....
P-70702	A.C. Cord & Plug ....
P-1421	Single Insulated Terminal Strip ....
P-1441	Double Insulated Terminal Strip ....
P-2060	Small Knob ....
P-2062	Large Knob ....
P-30342A	Grid Cap only ....
P-30456	Small Pointer ....
P-20912	Large Double End Pointer ....
P-2012	Pilot Light Bulb ....
P-10272	Rubber Mounting Feet ....
P-10320	Glass Crystal ....
P-20875	Crystal Retaining Ring ....
P-2152	8" Dynamic Speaker Mantel L2 ....
P-1968	10" Dynamic Speaker Console L2 ....
P-2101	Three Position Band Change Switch .....
P-20905	Condenser Shield ....
	8" Black Drive Cord (V.C. or T.C. Ind.)
	29" Black Drive Cord (Cond. Drive) .....
P-2126	Pilot Lamp Socket & Clip Assembly ...
P-20911	Bottom Shield ....
P-1011A	Phono-Radio Switch ....
P-1193	Phono Jack ....
P-2025	No. 80 Socket ....
P 1643	No. 45 Socket ....
P-2022	No. 76 Socket ....
P-1885	No. 6D6 Socket ....
P-1637	Speaker Socket ....
P-40434	Tube Shield—Aluminum (for earlier models) ...
P-40424	Tube Shield Base—Aluminum (for earlier models)

MODEL W416
Voltage,Socket,Changes
Alignment,Trimmers
Drive Cord Data

WESTERN AIR PATROL

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 4.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 4. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 4.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

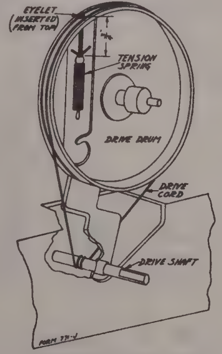


Fig. 4—Drive Cord Replacement

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately ¾" from the flange of the drum as shown in Fig. 4. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

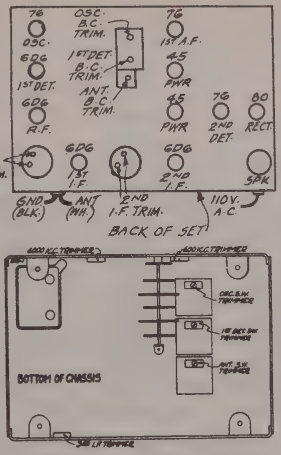


Fig. 2—Tube Arrangement & Location of Trimmers

Voltages at Sockets

LINE VOLTAGE — 115

ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cath.	Cath. to Ground	Normal Plate M. A.
6D6	R. F.	6.3	95	95	2.8	7.0
6D6	1st Det.	6.3	88	95	9.2	2.9
76	Osc.	6.3	110	—	—	5.0
6D6	1st I. F.	6.3	95	95	2.8	7.0
6D6	2nd I. F.	6.3	300	95	3.3	6.0
76	2nd Det.	6.3	—	—	—	—
76	1st Audio	6.3	160	—	9.0	4.0
45	Output	2.5	245	—	48.0	30.0
80	Rectifier	5.0	890 V. A. C. pl. to pl.			58.0 per plate

Phono Connections

Phonograph connections can be made as shown in Fig. 5. A single pole double throw switch and double pin jack are required. These should be mounted on the back panel of the chassis close to the 2nd detector. The connections are made by opening the diode circuit at the point shown in the illustration and completing the connections to the switch and pin jacks as indicated. A high impedance pick-up should be used. If a low impedance pick-up is used a step-up transformer will be required for sufficient volume. The volume control of the set will regulate the phono volume.

Change in Early Models

In the early models of this receiver the side of the trimmer condenser C27 which is shown in Fig. 1 as connected to ground was connected to the B+ side of the 3rd I. F. coil primary.

Condenser Alignment

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 456 K. C. and accurately calibrated signals over the broadcast and short wave bands, 530-1740 K. C. and 5.8-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Reduce the signal so that A. V. C. action is not obtained.

Then adjust the five I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st and 2nd trimmer condensers are reached from the top of the chassis and are in the round I. F. cans - See Fig. 2. The openings to these trimmer condensers are covered over by small cover plates which are held in position by screws. Loosen these screws until the cover plates can be swung around. **CAUTION - Use an insulated screwdriver for adjusting trimmers to prevent short circuiting to ground.** In the 3rd I. F. coil, only the primary has a variable trimmer condenser. This condenser is mounted on the back panel of the chassis as shown in Fig. 2 and the adjustment screw is reached through a hole in the back panel.

Broadcast Band Adjustment

The broadcast short wave switch should be in the broadcast position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Reduce the signal so that A. V. C. action is not obtained. Adjust the oscillator broadcast trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2.

Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the set screw in the pointer hub and set the pointer at the 1500 K. C. mark on the broadcast band scale. Retighten the hub set screw. Then adjust the antenna and 1st detector broadcast trimmers until maximum output is obtained.

Next set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION—After the broadcast band alignment as described above has been made, do not change the adjustment of any of the broadcast band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K.C. higher in frequency than the signal.

Turn the broadcast short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be reduced to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2. If a maximum output peak cannot be reached, it may be due to the fact that the antenna and 1st detector short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

Next set the signal generator for 15,000 K. C. Turn the rotor until maximum output is obtained. Then adjust the antenna and 1st detector short wave trimmers for maximum output.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. This condenser is mounted on the front panel of the chassis as shown in Fig. 2 and is reached through a hole in the front panel. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K. C. trimmer screw until the highest output is obtained.

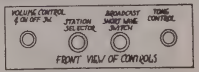


Fig. 3—Arrangement of Controls

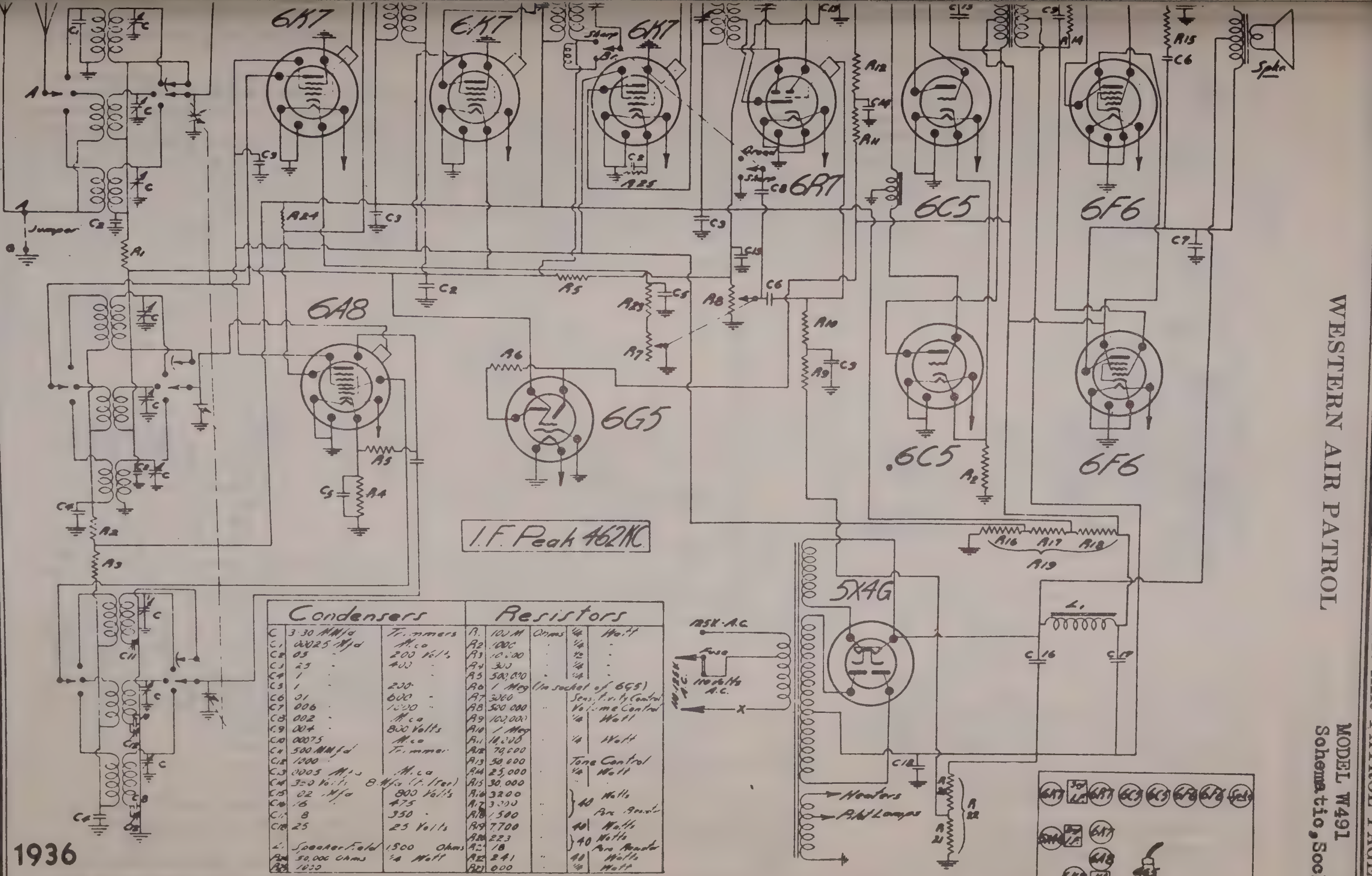
D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Item	Code	D.C. Resistance in Ohms
P-5176	S.W. and B.C. Antenna R.F. Transformer Primaries (in series)	T1 T2	27.9
	B.C. Antenna R.F. Transformer Secondary	T1	5.0
	S.W. Antenna R.F. Transformer Secondary	T2	Small
P-5177	S.W. and B.C. Interstage R.F. Transformer Primaries (in series)	T3 T4	2.7
	B.C. Interstage R.F. Transformer Secondary	T4	4.4
	S.W. Interstage R.F. Transformer Secondary	T3	Small
P-5178	S.W. Oscillator Grid Coil	T9	Small
	S.W. Oscillator Plate Coil	T9	.25
	B.C. Oscillator Grid Coil	T8	3.5
P-5190	S.W. Oscillator Tracking Coil	L3	1.27
P-5184	1st I.F. Coil Primary	T5	5.0
	1st I.F. Coil Secondary	T5	5.0
P-5185	2nd I.F. Coil Primary	T6	5.0
	2nd I.F. Coil Secondary	T6	5.0
P-5186	3rd I.F. Coil Primary	T7	9.3
	3rd I.F. Coil Secondary	T7	26.3
P-50643	Audio Input Transformer Primary	T11	2400.
	Audio Input Transformer Secondary Center Tap to Outside	T11	2600.
	Audio Input Transformer Secondary Center Tap to Inside	T11	2006.
P-50642	Audio Output Transformer Primary Center Tap to Outside	T12	360.
	Audio Output Transformer Primary Center Tap to Inside	T12	320.
	Audio Output Transformer Secondary	T12	.44
P-1968	Speaker Voice Coil		3.0
	Speaker Field Coil	L2	5000.
P-50641	Filter Choke	L1	150.
P-50638	Power Transformer 115V. 60 Cycles Pri.	T10	5.3
	Power Transformer 115V. 60 Cycles H.T. Sec. Center Tap to Outside	T10	120.
	Power Transformer 115V. 60 Cycles H.T. Sec. Center Tap to Inside	T10	110.
	Power Transformer 115V. 60 Cycles Sec. (80 Fil.)	T10	Small
	Power Transformer 115V. 60 Cycles Sec. (AA Fil.)	T10	Small
	Power Transformer 115V. 60 Cycles Sec. (BB Fil.)	T10	Small

WESTERN AIR PATROL

MODEL W491
Schematic, Socket



Condensers			Resistors				
C	3-30 MMfd	Trimmers	R1	100 M	Ohms	¼	Watt
C1	00025 Mfd	Mica	R2	1000	"	¼	"
C2	05 "	200 Volts	R3	10,000	"	½	"
C3	25 "	400 "	R4	300	"	¼	"
C4	1 "	"	R5	500,000	"	¼	"
C5	1 "	200 "	R6	1 Meg	(In socket of 6G5)		
C6	01	600 "	R7	3000		Sensitivity Control	
C7	006 "	1000 "	R8	500 000	"	Volume Control	
C8	002 "	Mica	R9	100,000		¼	Watt
C9	004 "	800 Volts	R10	1 Meg			
C10	00075	Mica	R11	10,000	"	¼	Watt
C11	500 MMfd	Trimmer	R12	70,000			
C12	1000 "		R13	50,000		Tone Control	
C13	0005 Mfd	Mica	R14	25,000	"	¼	Watt
C14	350 Volts	8 Mfd (Filter)	R15	30,000		"	"
C15	02 Mfd	800 Volts	R16	3200		} 40	Watts
C16	16 "	475	R17	3000	"		
C17	8	350 "	R18	1500	"		Arc Regulator
C18	25	25 Volts	R19	7700		40	Watts
			R20	223	"	} 40	Watts
L1	Speaker Field	1500 Ohms	R21	18			Arc Regulator
R24	50,000 Ohms	¼ Watt	R22	241	"	40	Watts
R25	1000		R23	000	"	¼	Watt

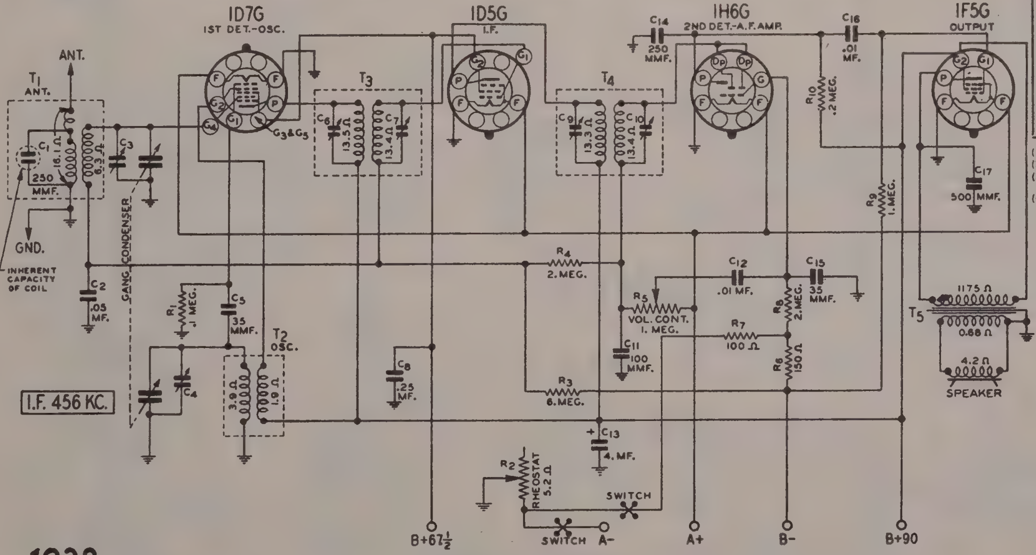
1936

DOUBLET ANTENNA. For regular antenna use put terminal marked "A" on left side of ground connection. To use doublet antenna connect the two leads of doublet to terminals marked "A"—if no doublet antenna is used, put jumper wire from center terminal marked "A" to "G" and use regular antenna

MODEL W831
Schematic,Voltage,Socket
Alignment,Trimmers

WESTERN AIR PATROL

Input Voltages and Currents	
"A" Battery	2 Volts—3 Amperes
"B" Battery	90 Volts—11.5 to 15 Ma.
Power Output	135 Milliwatts Undistorted
Selectivity	40 KC Broad at 1000 Times Signal
Intermediate Frequency	456 KC.
Speaker	6" Dynamic
Tuning Frequency Range	528 to 1730 KC.
Sensitivity	40 Microvolts



1938

Fig. 1—Schematic Circuit Diagram

VOLTAGES AT SOCKETS Volume Control: Maximum — Antenna Shorted to Ground "A" Battery — 2 Volts					
Tube	**Function**	**Across Filament**	**Plate to Ground**	**Screen to - Ground**	**Control Grid**
1D7G	1st Det.-Osc.	2.0	87 87(1)	64	3.5(2)
1D5G	I.F.	2.0	87	64	3.5(2)
1H6G	2nd Det.-1st Audio	2.0	32(3)		1.25(4)
1F5G	Power	2.0	82	87	3.5(2)

(1) Anode Grid (G2) to ground
(2) As read across R6 and R7
(3) As read on 100 volt scale (1000 ohm per volt meter). Subject to variation.
(4) As read across R7

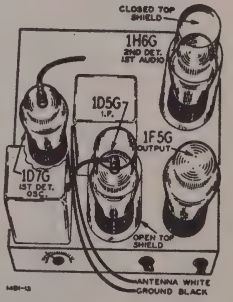


Fig. 2—Tube Arrangement

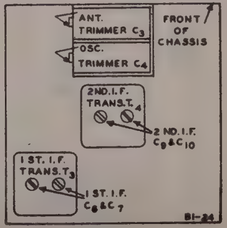


Fig. 3—Trimmer Location

ALIGNMENT PROCEDURE

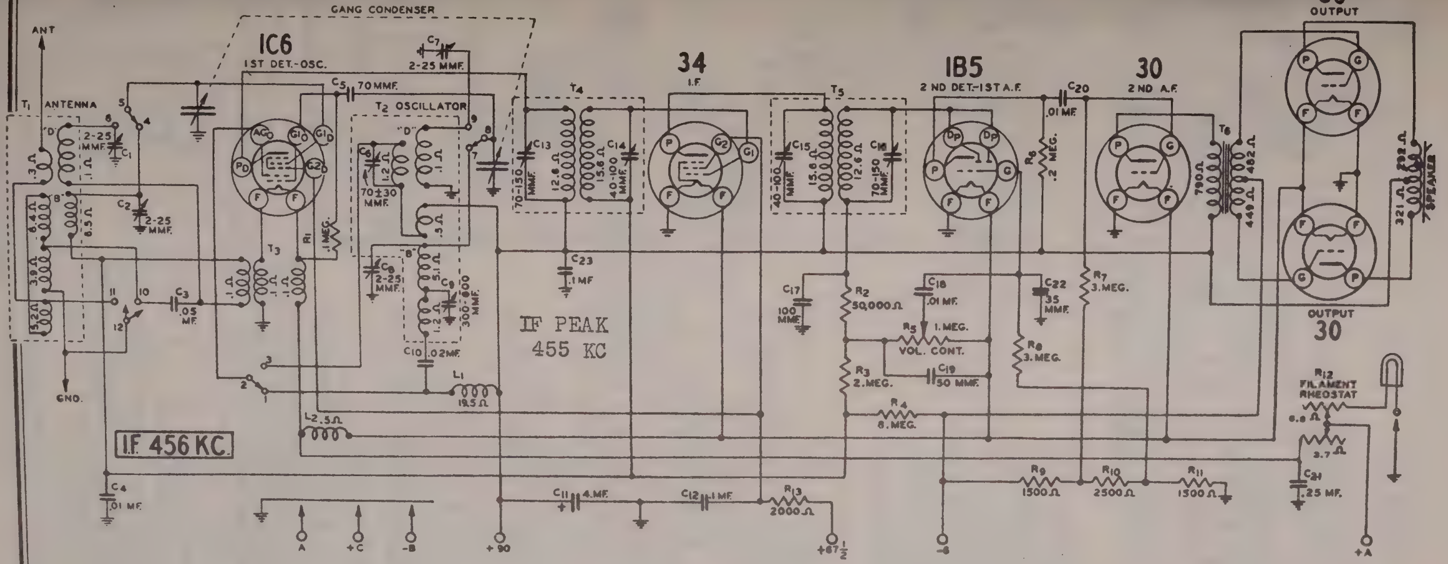
STEP (Follow Order as Given)	DUMMY ANTENNA	SIGNAL GENERATOR		TRIMMERS ADJUSTED See Illustration	PROCEDURE	
		FREQUENCY SETTING	CONNECTION AT RADIO		INITIAL STEPS	ADJUSTMENT
I. F.	.1 mf.	456 KC	Grid of 1st Det.	2nd I. F. (C9) & (C10) 1st I. F. (C6) & (C 7)	Turn rotor to full open	Adjust to Maximum Output
1730 KC Adj.	200 mmf.	1730 KC	Antenna Lead	Osc. (C4)	Turn rotor to full open	Adjust to Maximum Output
1500 KC Adj.	200 mmf.	1500 KC	Antenna Lead	Ant. (C3)	Turn Rotor to Max. Output	Adjust to Maximum Output

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, note the position of the pointer and remove the chassis from the cabinet. Loosen the pointer screw and set the pointer so that it will be at the 800 KC mark. Tighten the pointer screw and replace the chassis in the cabinet. If the pointer is not at the 800 KC mark another adjustment will be necessary.

WESTERN AIR PATROL

MODEL W493
Schematic



TUBE ELEMENT LEGEND

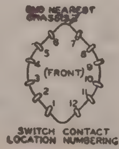
F - FILAMENT
P - PLATE
G - CONTROL GRID
G_1 - CONTROL GRID
G_2 - SCREEN GRID
D_P - DIODE PLATE

$G1_O$ - CONTROL GRID (OSC.)
$G1_D$ - CONTROL GRID (DET.)
$G2_O$ - SCREEN GRID (DET.)
AG_O - ANODE GRID (OSC.)
P_D - PLATE (DET.)

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE "B"	POSITION 2 SHORT WAVE "D"
FRONT	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
BACK		

IN MODELS WHICH DO NOT HAVE THE FILAMENT RHEOSTAT THE "+A" CONNECTION IS MADE DIRECTLY TO THE "+A" LINE AND THE PILOT LAMP.



SWITCH CONTACT LOCATION NUMBERING

SPECIFICATIONS

Input Voltages and Currents
"A" Battery - - - - - - - 2 Volts—.42 Amperes
"B" Batteries - 90 & 67½ Volts—11.5 to 25.5 Ma.
"C" Battery - - - - - - - - - - - - - 6 Volts

Power Output - - - 400 Milliwatts Undistorted

Selectivity - - 30 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - 6 inch Magnetic—Mantel Models
8 inch Magnetic—Console Models

Tuning Frequency Range
B Range - - - - - - - - - - 528 to 1730 KC
D Range - - - - - - - - - 5650 to 16,000 KC

Sensitivity
B Range Average - 25 to 35 Microvolts Absolute
D Range Average - 25 to 60 Microvolts Absolute

1937

MODEL W493
Voltage,Socket,Trimmers
Alignment

WESTERN AIR PATROL

Standard and Short Wave Battery Radio

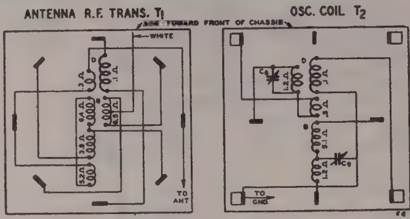


Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

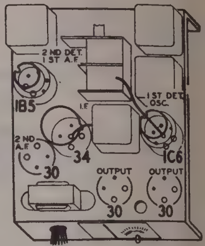


Fig. 9—Tube Arrangement

6 Tube - 2 Band

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.**

VOLTAGES AT SOCKETS
Volume Control at Maximum — Antenna Shorted to Ground
Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Grid to Ground
1C6	1st Det.-Osc.	2.0	90 90(1)	60	6(2)
34	I.F.	2.0	90	60	6(2)
1B5	2nd Det.-1st A.F.	2.0	30(3)		1.5(4)
30	2nd A.F.	2.0	90		4.0(5)
30	Power	2.0	90		6

(1) Anode Grid to ground.
(2) As read at "C" Battery.
(3) As read with 500,000 ohm meter.
(4) As read from negative end of R11 to ground.
(5) As read from negative end of R10 to ground.

Alignment Procedure

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 7.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C8) until maximum output is obtained. The location of this trimmer is shown in Fig. 7.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

Adjust the antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C9) until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

16,000 KC Adjustment

Set the signal generator for 16,000 KC.

Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C7) until maximum output is obtained. See Fig. 7 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C1) to maximum. When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C6) trimmer until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

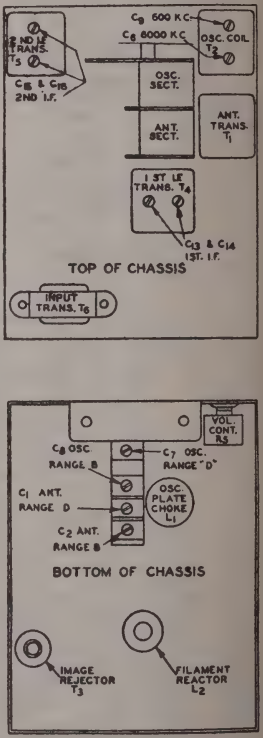
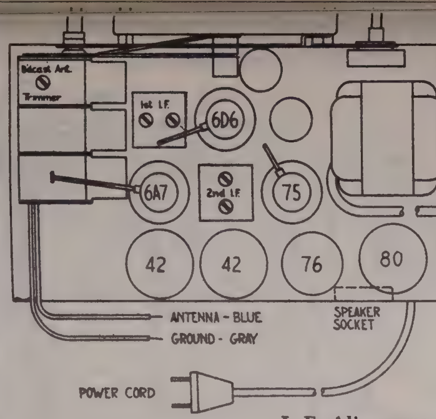
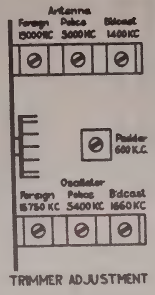


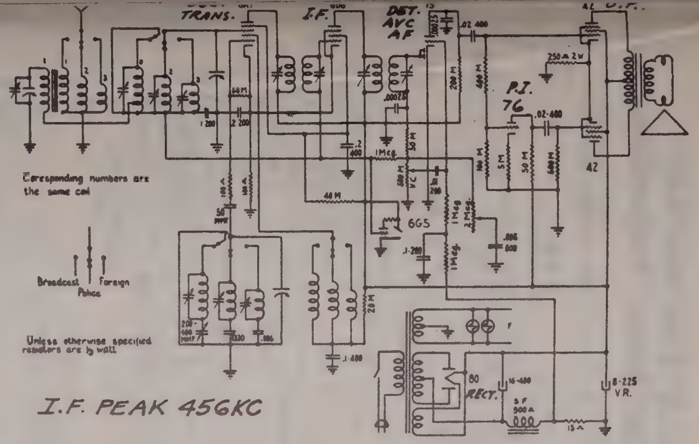
Fig. 7—Location of Trimmers

WESTERN AUTO SUPPLY CO.

MODELS D699,D724(1938) Schematic,Socket Alignment,Trimmers







I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an ouput meter is used, it should be connected across the voice coil terminals of the speaker. Use ½ volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.

RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the *two* antenna trimmers. Set generator to 600 kc, tune receiver to signal and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being set in order to secure perfect alinement.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to *second* peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to *first* peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. **Above procedure for alinement at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.**

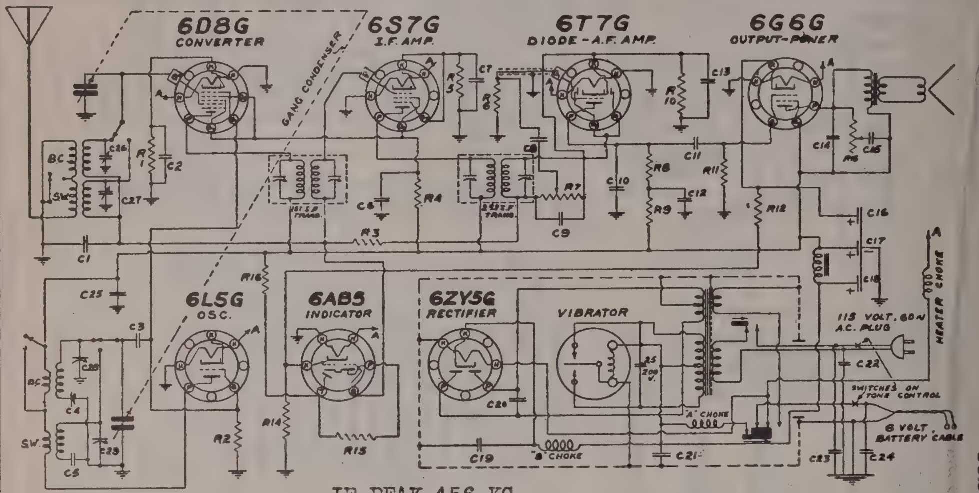
Part No.	Req.	Description
2163		Cable, Drive, Approx. 20"
3351	1	Cond. 8 MF. 225 V. Reg. Wet El.
3774		Schematic Diagram
3775		Tube Sticker
2560	1	Condenser, Padder
2597	4	Condenser, Trimmer, 1-10
1611	1	Condenser, Trimmer, 5-35
3157	1	Condenser, Trimmer
1286	1	Condenser, Mica, .00025
2780	1	Condenser, Mica, .00005
2741	1	1 Condenser, Mica, 1330
2872	1	Variable Condenser
576	2	Condenser, .02, 400 V., Paper
572	2	Condenser, .1, 200 V., Paper
565	1	Condenser, .01, 200 V., Paper
581	1	Cond., .005, 600 V., Paper
2792	1	Condenser, .2, 200 V., Paper
2793	1	1 Cond., .006, 600 V., Paper
3352	1	Condenser, .2, 400 V., Paper
575	1	Condenser, .1, 400 V., Paper
624	2	Resistor, 1/3 W., 1 Meg.
2731	1	Resistor, 1/3 W., 500 M.
2730	1	Resistor, 1/3 W., 200 M.
631	2	Resistor, 1/3 W., 50 M.
617	1	Resistor, 1/3 W., 20 M.
3353	1	Resistor, 2 W., 250 Ohm
2689	2	Resistor, 1/3 W., 100 Ohm
2883	1	Resistor, 1/3 W., 5 M.
2882	1	Resistor, 1/3 W., 15 Ohm
2881	1	Resistor, 1/3 W., 400 M.
2880	1	Resistor, 1/3 W., 100 M.
636	1	Resistor, 1/3 W., 40 M.
2724	1	Switch, Band
2837	1	Coil, Antenna
2772	1	Coil, Oscillator
2845	1	Coil, B. C. Antenna
3343	1	Transformer, Power
3344	1	Transformer, 1st I. F.
3345	1	Transformer, 2nd I. F.
3375	1	Cond. Elec. 16 MF., 400 V
2908	1	Spring, Drive Cable
3374	1	Indicator
2378	1	Pointer
2726	1	Control, Vol. & Switch
2737	1	Control, Tone
1732	1	A. C. Cord
3778	1	Book, Instruction
2897	1	Escutcheon Tuning Tube
2981	1	Tuning Tube Cable
3710	1	Speaker, 8"
3377	1	Escutcheon

MODEL D716(1938-9)
Schematic,Socket
Trimmers,Alignment

WESTERN AUTO SUPPLY CO.

Seven Tube Combination 6 Volt Battery and 110-120 Volt AC 60 Cycle Dual Wave Superheterody

ALIGNMENT:
FOLLOW PROCEDURE OF D709 (1938) BUT USE 18.100 AND 6000 KC FOR S.W.



IF PEAK 456 KC

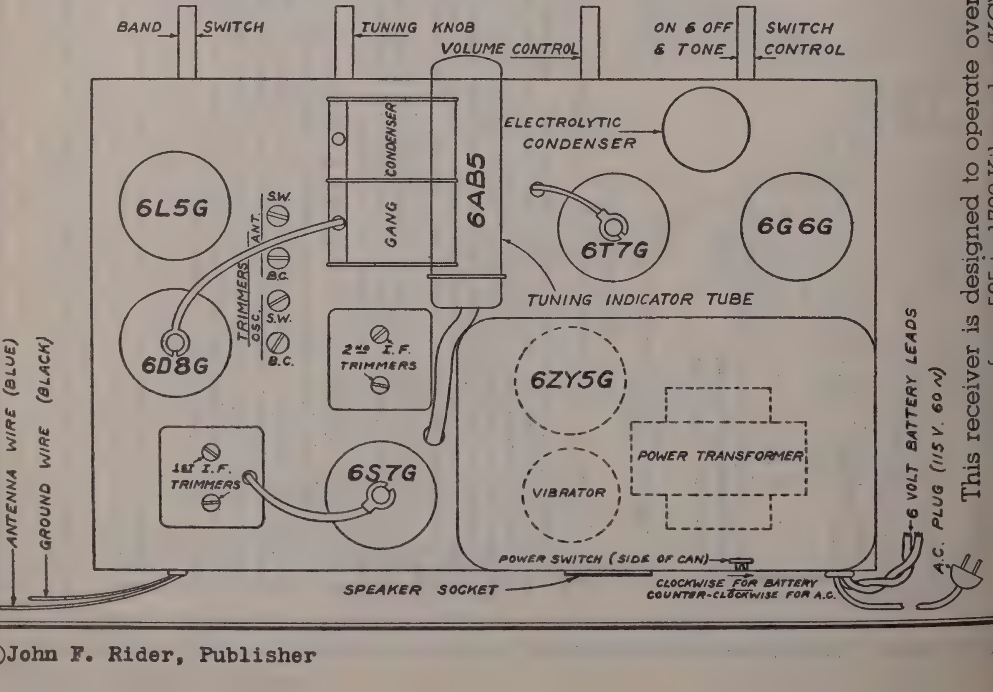
CONDENSERS

Nº	CAPACITY	TYPE	Nº	CAPACITY	TYPE
1	.05 Mfd.	200 V.	14	.005 Mfd.	600 V.
2	.05 Mfd.	200 V.	15	.05 "	400 V.
3	50 μμf.	MICA	16	5. "	25 V.
4	300-600 μμf	MICA	17	8. "	200 V.
5	4000 μμf	M. ±5%	18	8. "	200 V.
6	.1 Mfd.	200 V.	19	.01 "	600 V.
7	.05 "	200 V.	20*	.015 "	1000 V.
8	.01 "	400 V.	21	.5 "	10 V.
9	250 μμf	MICA	22	.05 "	400 V.
10	250 "	"	23	.01 "	600 V.
11	.01 Mfd.	400 V.	24	.5 "	10 V.
12	.1 "	200 V.	25	.1 "	200 V.
13	.5 "	200 V.		* OIL TYPE	

RESISTORS

Nº	OHMS	WATTS	SPL. TOL.
1	1500	¼	± 10%
2	40,000	¼	± 10%
3	1,000,000	¼	
4	30.000	¼	
5	1,500	¼	± 10%
6	1,000,000	¼	
7	500,000	¼	(VOL. CONT.)
8	500,000	¼	
9	200,000	¼	
10	10.000	¼	± 10%
11	500,000	¼	
12	325	¼	± 10%
13	100,000	¼	(TONE CONT.)
14	110	¼	± 10%
15	250,000	¼	
16	15,000	¼	

BAND SWITCH IN BROADCAST POSITION
POWER SWITCH IN BATTERY POSITION.
I.F. – 456 K.C.
C26 TO C29, 2-20 μμf TRIMMERS.



This receiver requires a good ground.

This receiver is designed to operate over two tuning ranges; from 535 to 1730 Kilocycles (KC) (173.4 to 561 meters), and from 5650 to 18,100 Kilocycles (KC) (16.5 to 53 Meters).

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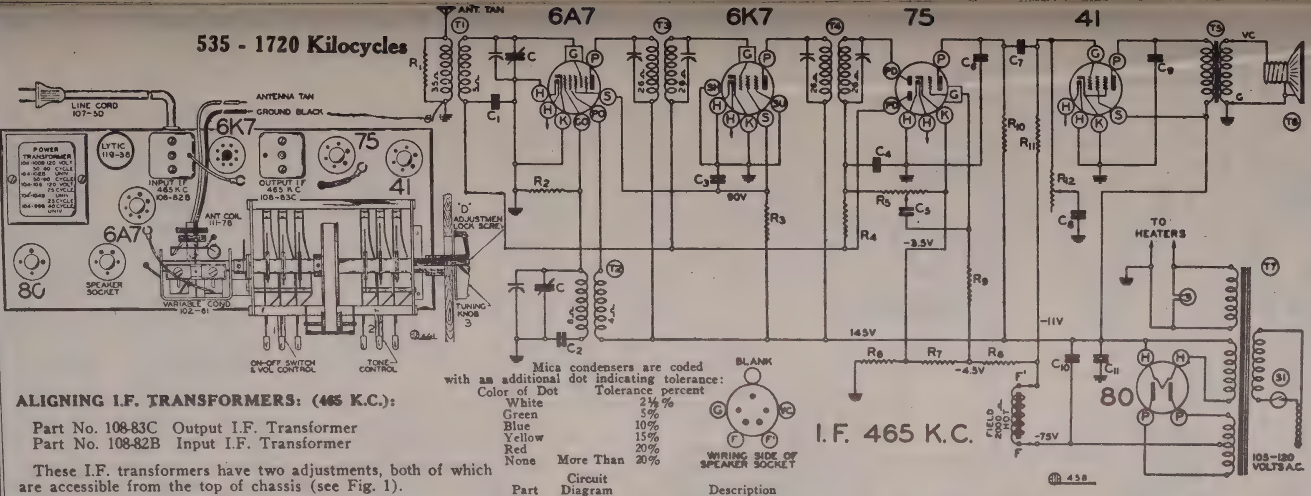
WESTERN AUTO SUPPLY CO.

MODEL D717(1937)
Schematic,Voltage
Alignment,Trimmers
Socket,Tuner

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.



Mica condensers are coded with an additional dot indicating tolerance:

Color of Dot		Tolerance percent
White		2½%
Green		5%
Blue		10%
Yellow		15%
Red		20%
None	More Than	20%

(No. 7K [illegible] and up)

Part No.	Circuit Diagram Reference	Description
		CONDENSERS
100-9	C1	.05 x 200 Volt Tubular
100-11	C5	.01 x 400 Volt Tubular
100-19	C9	.006 x 600 Volt Tubular
100-26	C7	.02 x 400 Volt Tubular
100-71	C8	.004 x 600 Volt Tubular
100-74	C3	.1 x 400 Volt Tubular (with Bracket)
119-38	C10, C11	5MFD x 200 w.v.; 5MFD x 250 w.v. Electrolytic Filter
129-2	C6	.0005 Mica - Type MT - 20%
129-5	C4	.0001 Mica - Type MT - 20%
129-75	C2	.0003386 Mica Compression Type Padder
		RESISTORS
106-29	R6, R7, R8	100 Ohm; 33 Ohm; 200 Ohm Metal Clad Resistor
130-4	R4, R9	3 Meg Ohm - 1/3 Watt - 20%
130-9	R10	200M Ohm - 1/3 Watt - 20%
130-12	R2	50M Ohm - 1/3 Watt - 20%
130-17	R1	10M Ohm - 1/3 Watt - 20%
130-118	R11	600M Ohm - 1/3 Watt - 20%
130-149	R3	15M Ohm - 1/3 Watt - 20%
		COILS
108-82B	T3	Input I.F. Coil Assembly Complete With Can
108-83C	T4	Output I.F. Coil Assembly Complete With Can
110-62	T2	Oscillator Coil Assembly Complete
111-78	T1	Antenna Coil Assembly Complete
		SOCKETS
121-6		Six Prong Socket - Marked "41"
121-6		Six Prong Socket - Marked "75"
121-7		Seven Prong Socket - Marked "6A7"
121-8		Five Prong Socket - Marked "SPKR"
121-9		Four Prong Socket - Marked "80"
121-27		Eight Prong Octal Socket - Marked "6K7"
		TRANSFORMERS
104-100B	T7	Power Transformer 50/60 Cycle 105-115 Volt
104-102B		Universal 50/60 Cycle Transformer
104-108		Power Transformer 25/60 Cycle - 105-115 Volts
104-104B		Universal 25/60 Cycle Transformer
104-99B		Universal 40/60 Cycle Transformer
		SPEAKER
114-97	T6	Five Inch Dynamic Speaker (Field 2000 Ohm)
		MISCELLANEOUS
101-59	R12	Tone Control (1 Meg Ohm)
101-94	R5, S1	Volume Control and Switch (1 Meg Ohm)
102-61	C	Two Gang Variable Condenser
105-53	T5	Output Transformer (For Speaker)
107-5D		Line Cord and Plug
128-109		Wood Knob (Spring Type)
128-126		Special Tuning Knob

PROCEDURE FOR SETTING THE "PRESTO-MATIC" LEVERS:

There are six levers on the dial by means of which six stations may be selected,

Press down any one of the six "Presto-matic" levers. Holding it down, tune in by means of knob No. 3 any one of your favorite stations. Turn the tuning knob very slowly back and forth until the signal is clearest. The station will then be accurately tuned in.

Release the lever and press down any other "Presto-matic" lever and again hold it down, tune in by means of knob No. 3 another favorite station.

When you have selected all your favorite stations, hold tuning knob No. 3 securely and with a coin or a screw driver, tighten the special locking screw ("D") in the center of the tuning knob, (See Fig. 1).

This screw will lock in place all the stations you have selected on the "Presto-matic" levers. (Note: Locking Screw "D" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold tuning knob No. 3 securely, loosen locking screw ("D") and select the new station as explained.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83C Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

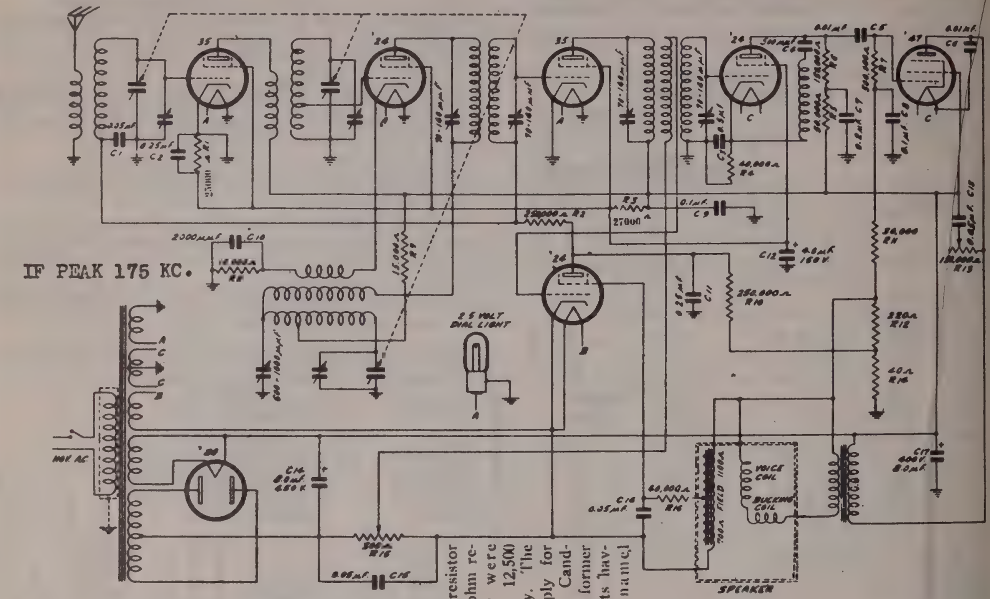
1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   - (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-83C) to resonance.
   - (b) Move oscillator output clip from grid of 6K7 to grid of 6A7 and adjust input I.F. transformer (No. 108-82B) to resonance.
   - (c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-83C) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
   - (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   - (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   - (c) Check sensitivity at 600 and 1000 kilocycles.

MODEL S720
Schematic, Voltage
Socket, Trimmers

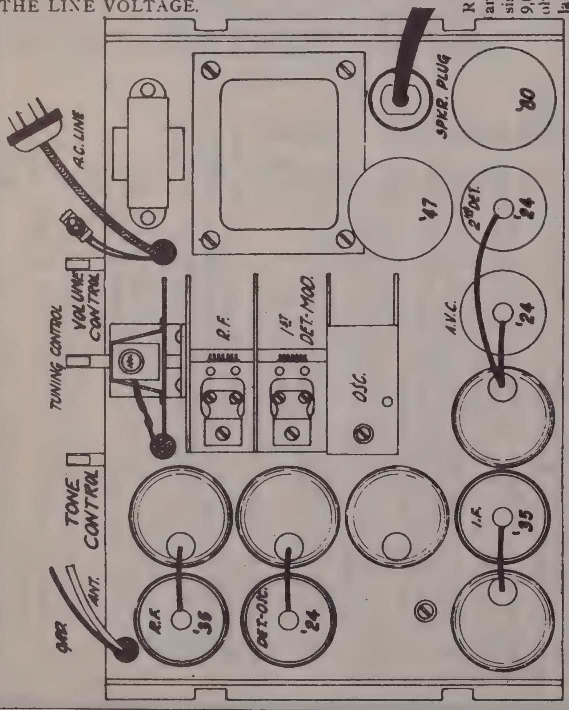
WESTERN AUTO SUPPLY CO.



IF PEAK 175 KC.

TURN THE VOLUME CONTROL ALL THE WAY ON, CONNECT THE ANTENNA AND GROUND LEADS TOGETHER AND TURN THE GANG CONDENSER PLATES ALL THE WAY OUT. CHECK THE LINE VOLTAGE.

R1—25,000 ohm resistor and R3—27,000 ohm resistor formerly were 9,000 ohms and 12,500 ohms respectively. The latter values apply for all sets having Candohm units; the former values for all sets having vitreous enamel units.

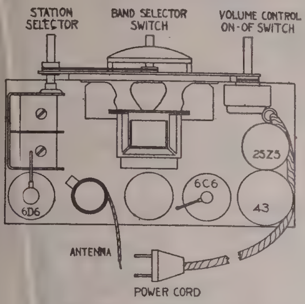


The voltages shown are measured to the cathode of the heater type tubes and to filament of the '47 Pentode.

TUBE	CIRCUIT	LINE VOLTAGE				
		90 V.	100 V.	110 V.	120 V.	130 V.
R.F. '35	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
Det.-Modulator '24	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
I. F '35	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
2nd Detector '24	Screen-Grid Plate	70 154	78 171	85 187	92 204	100 221
Audio '47	Accelerating Grid Plate	199 181	221 200	244 220	267 240	289 260
A. V. C. '24	Grid Screen-Grid	12.3 34.5	13.7 38.5	15.1 42	16.5 46	17.8 50
Rectifier '80	Plate to Plate Current (both plates)	308 52.3 MA	342 58.1 MA	376 64 MA	410 69.7 MA	445 75.5 MA

MODEL D729(1937)
MODEL D730(1938-9)
Schematics,Socket
Trimmers,Alignment

WESTERN AUTO SUPPLY CO.



MODEL D729 (1937)

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

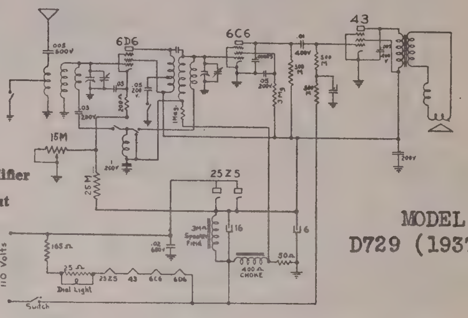
Ranges

540 and 1600 K.C.

75 to 200 meters

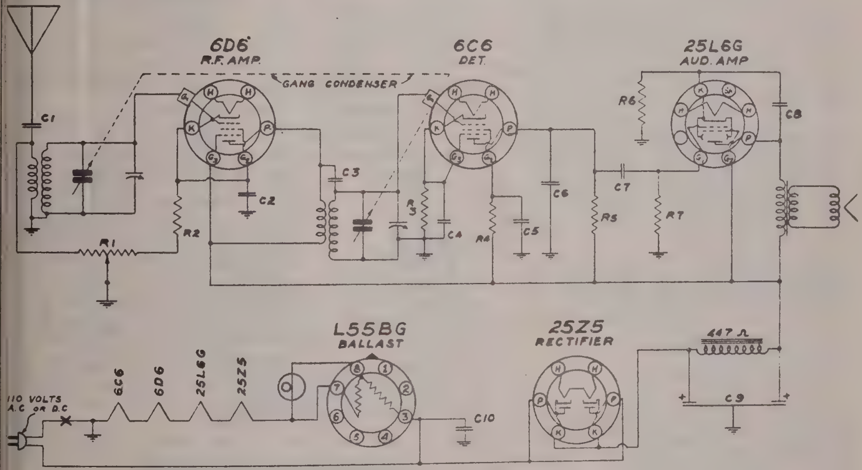
Tubes

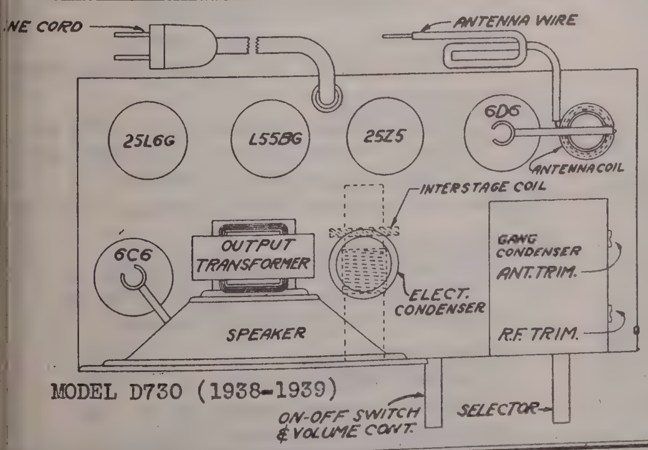
1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
1—No. 43 Power Output
1—No. 25Z5 Rectifier



MODEL D729 (1937)

This receiver is designed to operate on 105 to 125 volts, direct or alternating current.





MODEL D730 (1938-1939)

MODEL D730
(1938-1939)

CONDENSERS

Nº	CAPACITY	TYPE
C1	.002 MFD.	400V.
C2	.1 "	200V
C3	1.5 μμf.	GIMMIK
C4	.25 MFD.	200V.
C5	.1 "	200V.
C6	.0002 "	600V.
C7	.01 "	400V
C8	.02 "	400V
C9	16.0-16.0-	150V ELECT.

RESISTORS

Nº	OHMS R.	WATTS	
R1	75,000		VOL. CONT
R2	250	¼	
R3	25,000	¼	
R4	2,000,000	¼	
R5	500,000	¼	
R6	110	½	WIRE WOUND
R7	500,000	¼	

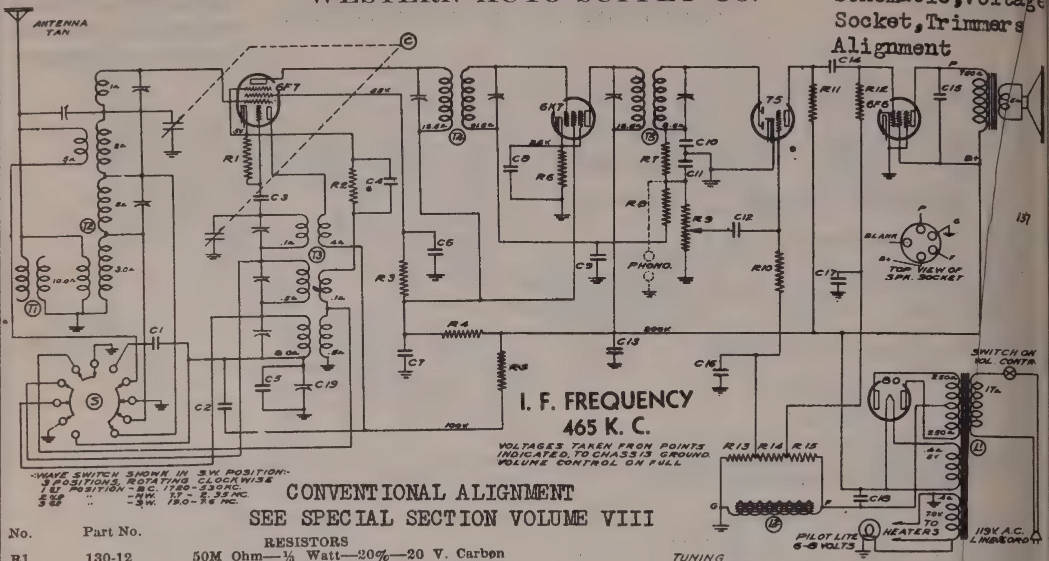
C10 .1 Mfd. 400V

ALIGNMENT DATA AND SERVICING

Connect a signal generator to the antenna lead of the receiver through a 100 Mmf. condenser. Set the dial pointer at 1400 KC. Set the generator at 1400 KC. Now adjust the antenna and RF trimmers of the gang condenser to maximum output.

WESTERN AUTO SUPPLY CO.

MODEL D731(1935)
Schematic,Voltage
Socket,Trimmers
Alignment



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

No.	Part No.	
		RESISTORS
R1.	130-12	50M Ohm—⅓ Watt—20%—20 V. Carbon
R2.	130-39	700 Ohm—⅓ Watt—20%—20 V. Carbon
R3.	130-20	100M Ohm—⅓ Watt—20%—50 V. Carbon
R4.	130-44	25M Ohm—½ Watt—20%—150 V. Carbon
R5.	130-42	20M Ohm—½ Watt—20%—100 V. Carbon
R6.	130-32	250 Ohm—⅓ Watt—20%—10 V. Wire Wound
R7.	130-12	50M Ohm—⅓ Watt—20%—20 V. Carbon
R8.	130-3	500M Ohm—⅓ Watt—20%—100 V. Carbon
R9.	101-18	500M Ohm Volume Control
R10.	130-19	1 meg Ohm—⅓ Watt—20%—100 V. Carbon
R11.	130-11	250M Ohm—⅓ Watt—10%—100 V. Carbon
R12.	130-11	250M Ohm—⅓ Watt—10%—100 V. Carbon
R13.	130-48	15M Ohm—⅓ Watt—10%—20 V. Carbon
R14.	130-47	180M Ohm—⅓ Watt—10%—100 V. Carbon
R15.	130-46	800M Ohm—⅓ Watt—10%—100 V. Carbon
		CONDENSERS
C1.	129-23	.002 Mica—MW—5%
C2.	100-20	.1 x 120 V.—25%
C3.	129-5	.0001 Mica—MT—20%
C4.	100-20	.1 x 200 V.—25%
C5.	129-24	.00038—MT—5%
C6.	118-1	.1x 200 V.—Dual Plus 50%; Minus 10%
C7.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C8.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C9	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C10.	129-51	.000125—Mica MT—20%
C11.	129-51	.000125—Mica MT—20%
C12.	100-22	.05 x 200 V.—25%
C13.	103-7	.8 mfd. x 300 V. Electrolytic
C14.	100-11	.01 x 400 V.—25%
C15.	100-19	.006 x 600 V.—25%
C16.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C17.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C18.	103-6	.8 mfd. x 350 V. Electrolytic
C19.	124-5	B. C. Series Pad J-3-S.
		MISCELLANEOUS
T1.	105-10	Antenna Choke Coil
T2.	111-27	Antenna Coil
T3.	110-22	Oscillator Coil
T4.	108-38A	Input I.F. Transformer
T5.	108-40	Output I.F. Transformer
C	102-12	Two Gang Variable Cond.
S	125-6	Wave Change Switch
L1.	104-14A	Power Transformer 50/60 Cycle
L1.	104-18	Power Transformer 25 Cycle
L2.	114-11	Speaker—Field Resistance 1550 Ohms
L1.	104-17	Power Trans. Universal 50/60 Cycle
L1.	104-41	Power Trans. Universal 25 Cycle.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

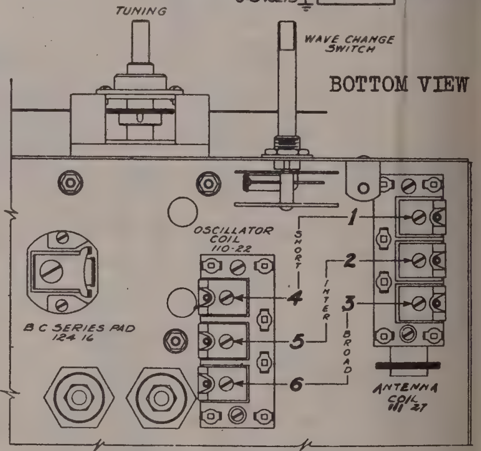
Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.



ALIGNMENT FREQUENCIES

Intermediate Frequency 465 KC
Adjust output then input transformers

Broadcast Band
Adjust trimmer number 6 at 1720 KC
Adjust trimmer number 3 at 1400 KC.
Adjust series pad at 600 KC
Tracking and sensitivity check- 1000 KC

Short wave Band
Adjust trimmer number 4 at 18 MC
Adjust trimmer number 1 at 18 MC
Tracking and sensitivity check- 9 MC

Intermediate Band
Adjust trimmer number 5 at 7 MC
Adjust trimmer number 2 at 7 MC
Tracking and sensitivity check-2.5 MC

Schematic, Voltage
Socket, Trimmers

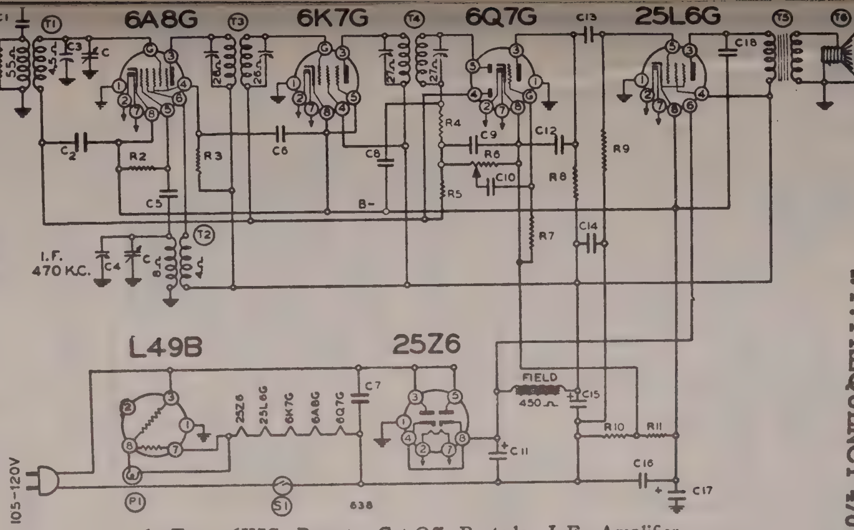
MODEL D731(1938-9)
5-Lever Model

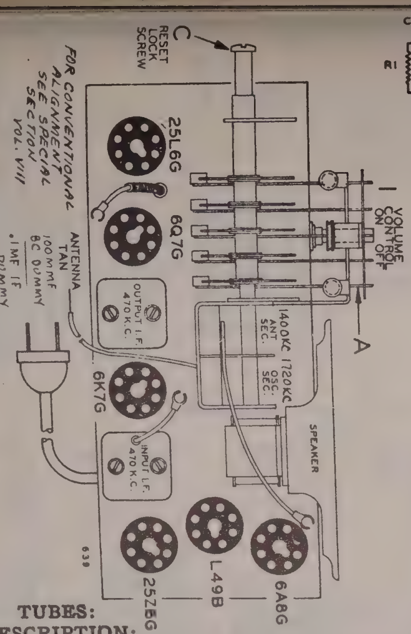
WESTERN AUTO SUPPLY CO.

Frequency Range — 535 - 1720 Kilocycles

I. F. FREQUENCY 470 KILOCYCLES

FOR TUNER DATA
SEE INDEX





FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

ANTENNA TAN
100 MMF BC DUMMY
.1 MF IF DUMMY

FIG. 1 — TOP VIEW

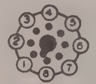
TUBES:

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass tubes.

The type and function of each tube is as follows:

1—Type 6A8G Pentagrid Mixer, First Detector-oscillator.
1—Type 6K7G Remote Cut-Off Pentode, I. F. Amplifier (470 K.C.).
1—Type 6Q7G Duplex-Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 25L6G Beam Output Amplifier.
1—Type 25Z6G High Vacuum Rectifier.
1—Type L49B Ballast Tube.



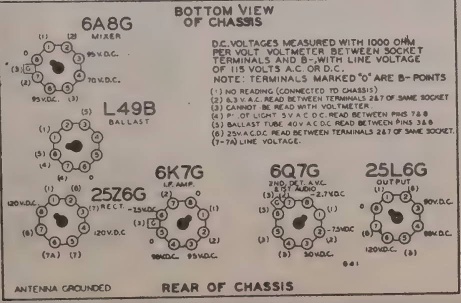
WIRING SIDE OF OCTAL TUBE SOCKET SHOWING LOCATION OF PINS

Code No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—½ w.
R2	13012	50M ohm—⅓ w.
R3	130149	15M ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	130170	3 megohm—⅓ w.
R6	101127	Volume control (1 megohm)
R7	130225	15 megohm—⅓ w.
R8	130100	150M ohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	130231	75 ohm—½ w.
R11	130174	50 ohm—⅓ w.
		CONDENSERS
C	10284	2 gang variable condenser
C1	1292	.0005 mica
C2	10026	.02 x 400 v.
C3		Antenna Trimmer—on gang
C4		Oscillator Trimmer—on gang
C5	12912	.00025 mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1295	.0001 mica
C9	1295	.0001 mica

Code No.	Part No.	Description
C10	10011	.01 x 400 v.
C11	11953C	30 mfd. lytic
C12	12912	.00025 mica
C13	10011	.01 x 400 v.
C14	1009	.05 x 200 v.
C15	11953C	30 mfd. lytic
C16	11953C	40 mfd. lytic
C17	10091	.15 x 400 v.
C18	10067	.025 x 400 v.

NOTE:—C11, 15 and 16—One unit for 60 cycle Use 11953C (30 mfd. 30 mfd. 40 mfd.)
C11, 15 and 16—One unit for 25 cycle Use 11962C (60 mfd. 60 mfd. 40 mfd.)

Code No.	Part No.	Description
		PARTS
T1	111108	Antenna Coil complete
T2	11073	Oscillator Coil complete
T3	10882F	Input I. F.—470 kc. complete
T4	10883F	Output I. F.—470 kc. complete
T5	10560	Output Transformer
T6	114116E	5 inch Dynamic Speaker (450 ohm field)
S1		Off-on switch on volume control
P1	10794	T-44 Pilot Light

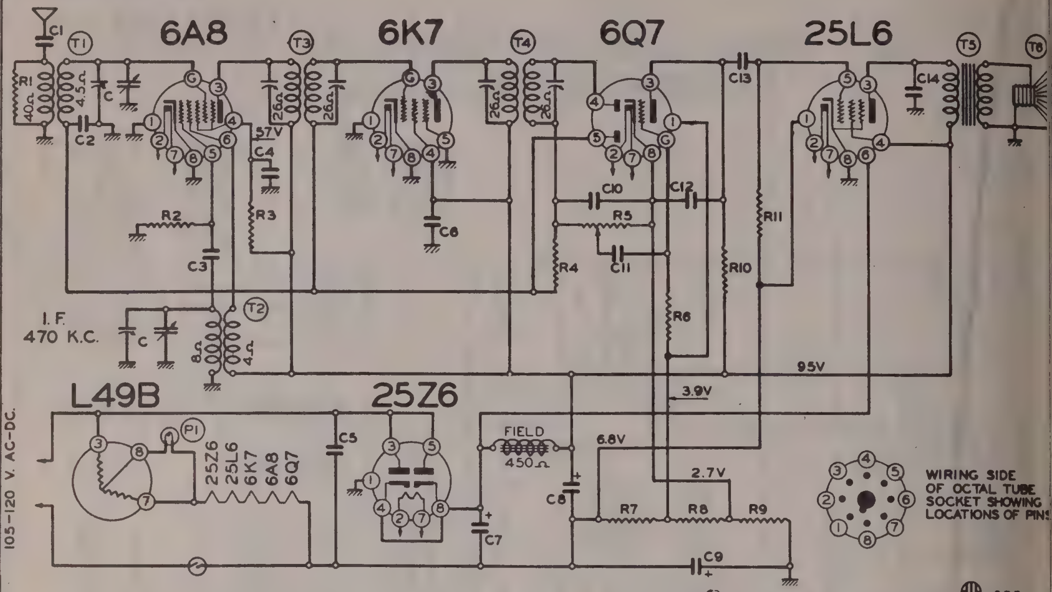


D.C. VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B-, WITH LINE VOLTAGE OF 115 VOLTS A.C. OR D.C.
NOTE: TERMINALS MARKED "0" ARE B- POINTS
(1) NO READING (CONNECTED TO CHASSIS)
(2) 6.3 V. A.C. READ BETWEEN TERMINALS 2&7 OF SAME SOCKET
(3) CANNOT BE READ WITH VOLTMETER.
(4) PILOT LIGHT 5 V A C D C. READ BETWEEN PINS 7&8
(5) BALLAST TUBE 40 V A C D.C READ BETWEEN PINS 3&8
(6) 25V. A C.D.C READ BETWEEN TERMINALS 2&7 OF SAME SOCKET.
(7-7A) LINE VOLTAGE.

FIG. 3

MODEL D731(1938-9)
4-Lever Model
Schematic,Voltage
Socket,Trimmers

WESTERN AUTO SUPPLY CO.



Frequency Range — 530 - 1720 Kilocycles

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

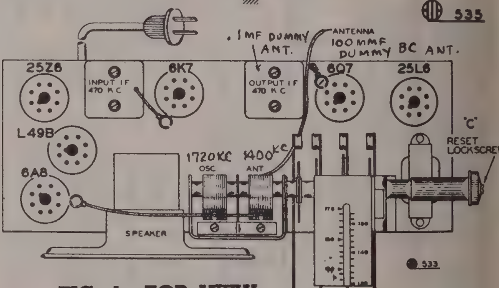


FIG. 1—TOP VIEW

LIST OF REPAIR PARTS (No. 175500 and up)

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSERS	
1001	C5	.1 x 400 Volt Tubular Condenser	$ .25
1009	C2, C4	.05 x 200 Volt Tubular Condenser	.25
10011	C11, C13	.01 x 400 Volt Tubular Condenser	.25
10020	C6	.1 x 200 Volt Tubular Condenser	.25
10067	C14	.025 x 400 Volt Tubular Condenser	.25
11953	C7 C8, C9	30MFD—30MFD—40MFD Lytic Filter Condenser	1.50
1292	C1	.0005 Mica Type Condenser—20%	.25
1295	C10	.0001 Mica Type Condenser—20%	.25
12912	C3, C12	.00025 Mica Type Condenser—20%	.25
		RESISTORS	
13011	R11	250M Ohm—⅓ Watt Resistor—20%	.20
13012	R2	50M Ohm—⅓ Watt Resistor—20%	.20
13019	R6	1 Meg. Ohm—⅓ Watt Resistor—20%	.20
13021	R1	20M Ohm—⅓ Watt Resistor—20%	.20
130100	R10	150M Ohm—⅓ Watt Resistor—20%	.20
130149	R3	15M Ohm—⅓ Watt Resistor—20%	.20
130170	R4	3 Meg. Ohm—¼ Watt Resistor—25%	.20
130174	R7, R9	50 Ohm—⅓ Watt Resistor—10%	.20
130215	R8	25 Ohm—⅓ Watt Resistor—10%	.20
		COILS	
10882F	T4	Input I. F. Coil Assembly Complete with Can	1.25
10883F	T3	Output I. F. Coil Assembly Complete with Can	1.25
11073	T2	Oscillator Coil Assembly Complete	.50
11192B	T1	Antenna Coil Assembly Complete	.60

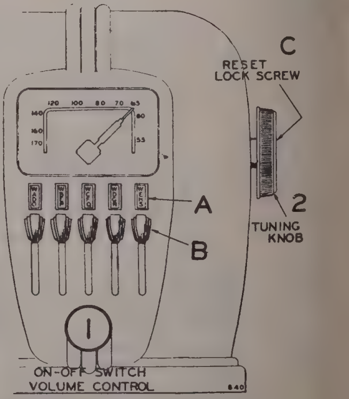


FIG. 2.—FRONT VIEW

FOR SETTING PUSH BUTTONS
SEE INDEX

WESTERN AUTO SUPPLY CO.

MODELS D731(1938-9)
4 and 5-Lever Models
Alignment, Tuner Data

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are four or five levers on the dial by means of which stations my be selected, (See "B" Fig. 2) see note

Make a list of local stations you tune in regularly; any number up to and including four.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the cabinet is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the cabinet above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 1).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning.

NOTE:
For arrangement of levers for 5 lever model see Fig. 2 on schematic page for 5 lever model.

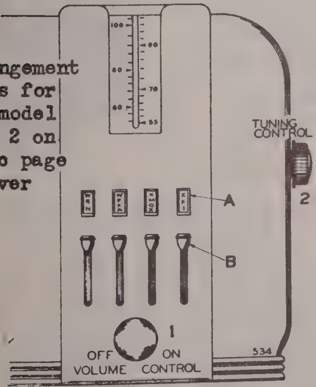


FIG. 2—FRONT VIEW

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass tubes which are interchangeable with metal tubes.

The type and function of each tube is as follows:

- 1—Type 6A8G Pentagrid Mixer, First Detector-oscillator.
- 1—Type 6K7G Remote Cut-Off Pentode, I.F. Amplifier(470 K.C.)
- 1—Type 6Q7G Duplex-Diode Triode Second Detector, A.V.C. and First Audio.
- 1—Type 25L6G Beam Output Amplifier.
- 1—Type 25Z6G High Vacuum Rectifier.
- 1—Type L49B Ballast Tube.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 117 volt A.C. or D.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

All adjustments should be made with a non-metallic screw driver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 25L6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (470 K.C.):

Part No. 108-83F Output I.F. Transformer
Part No. 108-82F Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   - (a) Connect external oscillator set at 470 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83F) to resonance.
   - (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82F) to resonance.
   - (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83F) if necessary.

R.F. ALIGNMENT: (530-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
   - (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   - (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   - (c) Check sensitivity at 600 and 1000 kilocycles.

MODEL D734(1935)
Schematic,Voltage
Socket,Trimmers

WESTERN AUTO SUPPLY CO.

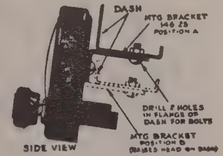
CONDENSERS

C1	129-3	.00002 Mica—"0"—20%
C2	129-49	.00009 Mica—"0"—5%
C3	100-9	.05x200 Volt
C4	100-6	.25x200 Volt
C5	129-21	.0002 Mica—"MT"—"0"—20%
C6	100-1	.1 x400 Volt 50%—10%
C7	100-33	.1 x200 Volt 50%—10%
C8	100-9	.05x200 Volt 25%—25%
C9	100-1-B	.1 x400 Volt 50%—10%
C10	129-12	.00025 Mica —"MT"—"0"—20%
C11	100-9	.05 x200 Volt 25%—25%
C12	129-5	.0001 Mica—"MT"—"0"—20%
C13	116-15	.05 x400 Volt
C14	116-15	.007x800 Volt
C15	100-33	.1x200 Volt 50%—10%
C16	119-20	8.0 Mfd. Electrolytic Condenser—350 Working Volts
C17	119-20	4.0 Mfd. Electrolytic Condenser—350 Working Volts
C18	100-36	.01x1400 Volt—10%
C19	100-35	.5 x 200 Volt 50%—10%
C20	100-35	.5 x 200 Volt 50%—10%
C21	100-33	.1 x 200 Volt 50%—10%
C22	124-17	Single Padder J-4-S

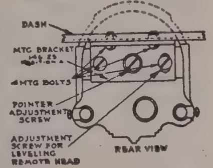
NOTE: C-13 and C-14 in one unit—part number 116-15.

RESISTORS

R1	130-20	100M Ohm—⅓ Watt—20% 50 Volt—Carbon
R2	130-79	400 Ohm—⅓ Watt—10% 10 Volt—Carbon
R3	130-94	50M Ohm—⅓ Watt—10% 10 Volt—Carbon—Ins.
R4	130-23	2M Ohm—⅓ Watt—20% 10 Volt—Carbon
R5	130-42	20M Ohm—⅓ Watt—20% 100 Volt—Carbon—Ins.
R6	130-68	1 Meg Ohm—⅓ Watt—10% 20 Volt—Carbon
R7	130-79	400 Ohm—⅓ Watt—10% 10 Volt—Carbon
R8	101-41	500M Ohm—Volume Control and Switch
R9	130-106	50M Ohm—⅓ Watt—10% 100 Volt—Carbon—Ins.
R10	130-101	600 Ohm—⅓ Watt—10% 10 Volt—Carbon—Ins.
R11	130-68	1 Meg Ohm—⅓ Watt—10% 20 Volt—Carbon
R12	130-95	12M Ohm—⅓ Watt—10% 100 Volt—Carbon
R13	130-3	500M Ohm—⅓ Watt—20% 100 Volt—Carbon
R14	130-5	300M Ohm—⅓ Watt—20% 10 Volt—Carbon
R15	130-45	250M Ohm—⅓ Watt—20% 20 Volt—Carbon—Ins.
R16	130-84	200 Ohm—⅓ Watt—20% 10 Volt—Carbon—Ins


DASH
MTG BRACKET 146 25 POSITION A
DRILL 2 HOLES IN FLANGE OF DASH FOR BOLTS
MTG BRACKET POSITION B (RAISES HEAD ON DASH)

SIDE VIEW

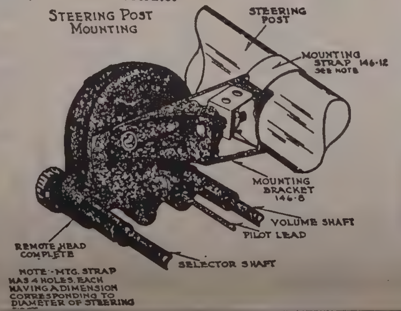

DASH
MTG BRACKET 146 25 POSITION A
4 MTG BOLTS
POINTER ADJUSTMENT SCREW
ADJUSTMENT SCREW FOR LEVELING REMOTE HEAD

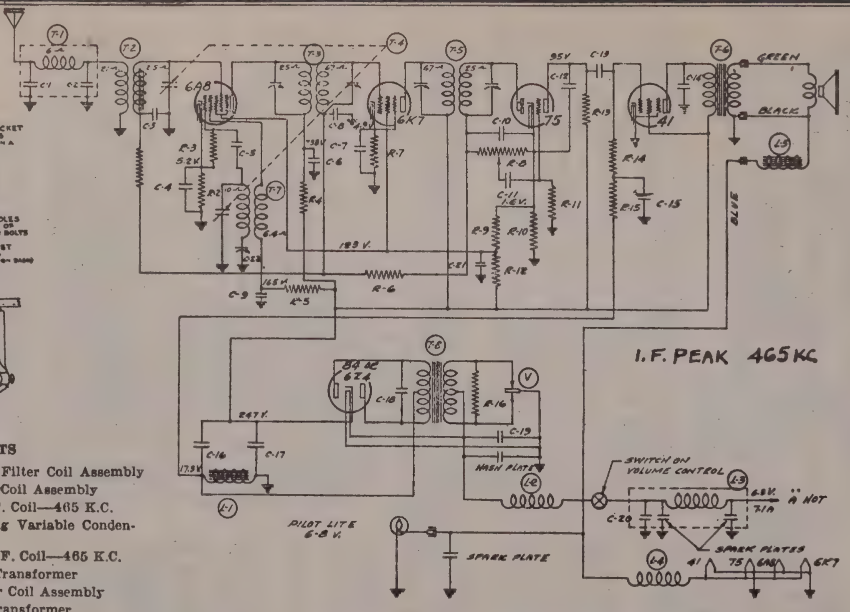
REAR VIEW

PARTS

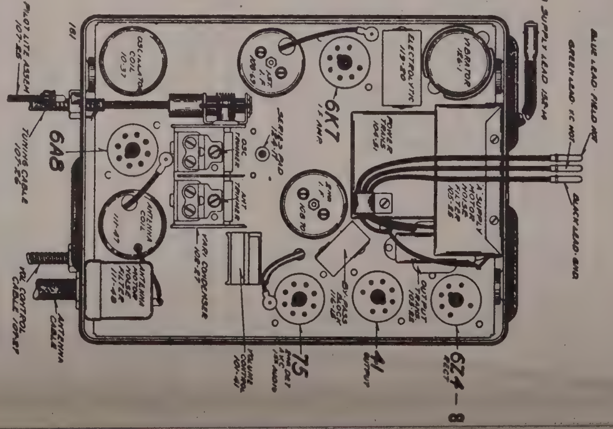
T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	108-69	Input I.F. Coil—465 K.C.
T4	102-27	Two Gang Variable Condenser
T5	108-70	Output I.F. Coil—465 K.C.
T6	105-22	Output Transformer
T7	110-37	Oscillator Coil Assembly
T8	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-25	"A" Filter Assembly
L4	105-24	"A" Choke
L5	114-34	5¼" Speaker (Field resistance 4 ohms)
V		Vibrator

STEERING POST MOUNTING


STEERING POST
MOUNTING STRAP 146-12 SEE NOTE
MOUNTING BRACKET 146-8
VOLUME SHAFT
PILOT LEAD
SELECTOR SHAFT
REMOTE HEAD COMPLETE
NOTE:-MTG. STRAP HAS 4 HOLES. EACH HAVING A DIMENSION CORRESPONDING TO DIAMETER OF STEERING



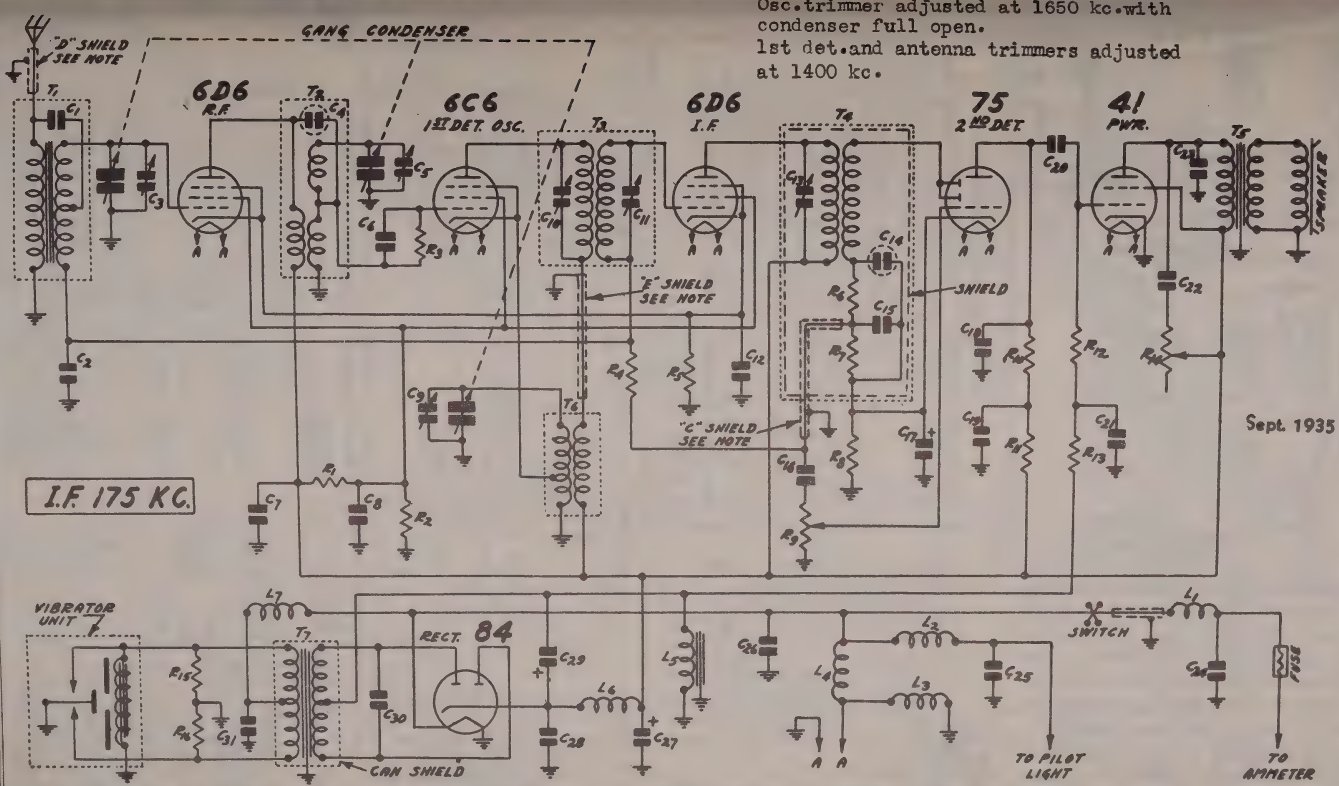
I.F. PEAK 465 KC



WESTERN AUTO SUPPLY CO.

MODEL D737(1935)
Schematic

Power Consumption - - 6.5 Amperes at 6.3 Volts
Power Output - - - - 3 Watts Undistorted
Tuning Frequency Range - - - - 530-1650 KC



Osc. trimmer adjusted at 1650 kc. with condenser full open.
1st det. and antenna trimmers adjusted at 1400 kc.

Sept. 1935

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1	21 mmf.	
C 2	.05 mf. 180 V.	
C 3	Gang Trimmer	
C 4	40 mmf..	
C 5	Gang Trimmer	
C 6	35 mmf.	
C 7	.10 mf. 360 V.	
C 8	.10 mf. 180 V.	
C 9	Gang Trimmer	
C10	70-150 mmf.	One Unit
C11	70-150 mmf.	
C12	.10 mf. 180 V.	
C13	70-150 mmf.	
C14	250 mmf.	
C15	250 mmf.	
C16	.01 mf. 360 V.	
C18	250 mmf.	
C19	.10 mf. 360 V.	
C20	.01 mf. 360 V.	
C21	.25 mf. 180 V.	
C22	.02 mf. 600 V.	
C23	.002 mf. 600 V.	
C24	.50 mf. 180 V.	
C25	2000 mmf.	
C26	2000 mmf.	
C28	.01 mf. 360 V.	
C30	.0075 mf. 1600 V.	
C31	.50 mf. 180 V.	
C17	4.0 mf. 25 V.	Electrolytic Block
C27	5.0 mf. 350 V	
C29	8.0 mf. 350 V	
R 1	17000 ohm 1.0 W.	
R 2	20000 ohm ohm .5 W.	
R 3	.50 Megohm .2 W.	
R 4	1.0 Megohm .2 W.	
R 5	350 ohm .2 W.	
R 6	50000 ohm .2 W.	
R 7	500000 ohm .2 W.	
R 8	6000 ohm .2 W.	
R 9	2.0 Megohm Volume Control	
R10	150000 ohm .2 W.	
R11	50000 ohm .2 W.	
R12	.50 Megohm .2 W.	
R13	100000 ohm .2 W.	
R14	150000 ohm Tone Control	
R15	50 ohm .5 W.	
R16	50 ohm .5 W.	
T 1	Antenna Trans.	
T 2	R. F. Interstage Trans.	
T 3	1st I. F. Trans.	
T 4	2nd I. F. Trans.	
T 5	Output Trans.	
T 6	Osc. Inductor	
T 7	Power Trans.	
L 1	Motor Noise Reactor	
L 2	Pilot Light Reactor	
L 3	Speaker Field 5.3	
L 4	Filament Reactor	
L 5	Filter Choke	
L 6	"B" Reactor	
L 7	Vibrator Reactor	

MODEL D737(1935)
Voltage,Socket Trimmers,Coils Changes

WESTERN AUTO SUPPLY CO.

Receivers of this series having this change incorporated can be identified by a green paint mark on the battery lead. There will also be a letter "C" stamped on the chassis.

It will be necessary in many Ford V8 installations to take the steps described above. If motor noise persists after the regular procedure has been followed, make this change in the "A" line circuit in Ford V8s or any other cars.

If motor noise still persists, it may be radiated through the openings in the chassis case on the tuning condenser side. Remove the chassis from the case and solder a piece of tin plate on the inside of the case over the openings on the tuning condenser side to completely cover these openings.

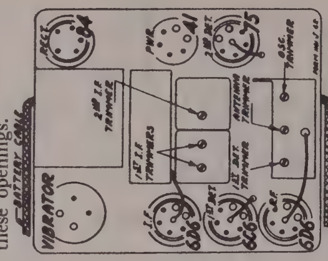


Fig. 2—Location of Tubes and Trimmers

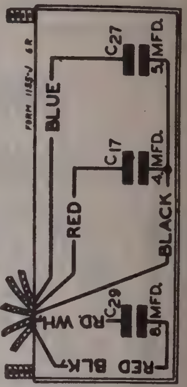
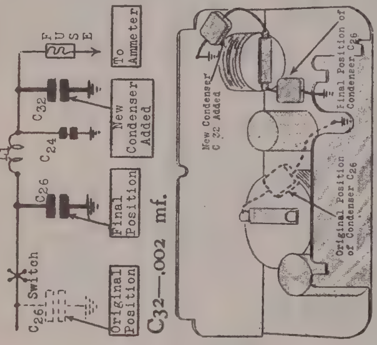


Fig. 4—Condenser Block—Internal Wiring



Schematic, Fig. 1, shows changes to eliminate motor noise. Fig. 2, below, shows new parts positions

VOLTAGES AT SOCKETS

Antenna Disconnected **Battery 6 Volts Under Load**

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.8	220	90	4.5	6.3
6C6	1st Det. Osc.	5.8	220	90	0	2.4
6D6	I. F. Amp.	5.8	220	90	4.5	6.3
75	2nd Det.	5.8	130(1)		1.2	0.3
41	Power	5.8	210	220	16(2)	25.[illegible]
84	Rectifier	5.8				50.0

(1) With 250,000 Ohm Meter
(2) As read across filter choke.

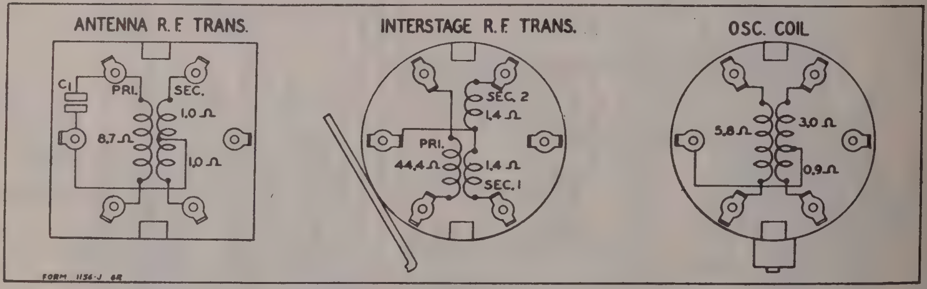


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A443	Antenna Transformer	T1	
	Primary Winding		8.7
	Secondary Winding—Either Portion		1.0
P-9A439	Interstage Transformer	T2	
	Primary Winding		44.4
	Secondary Winding—Either Portion		1.4
P-9A441	1st I. F. Transformer	T3	
	Primary Winding		93.5
	Secondary Winding		97.6
P-9A442	2nd I. F. Transformer	T4	
	Primary Winding		44.1
	Secondary Winding		49.6

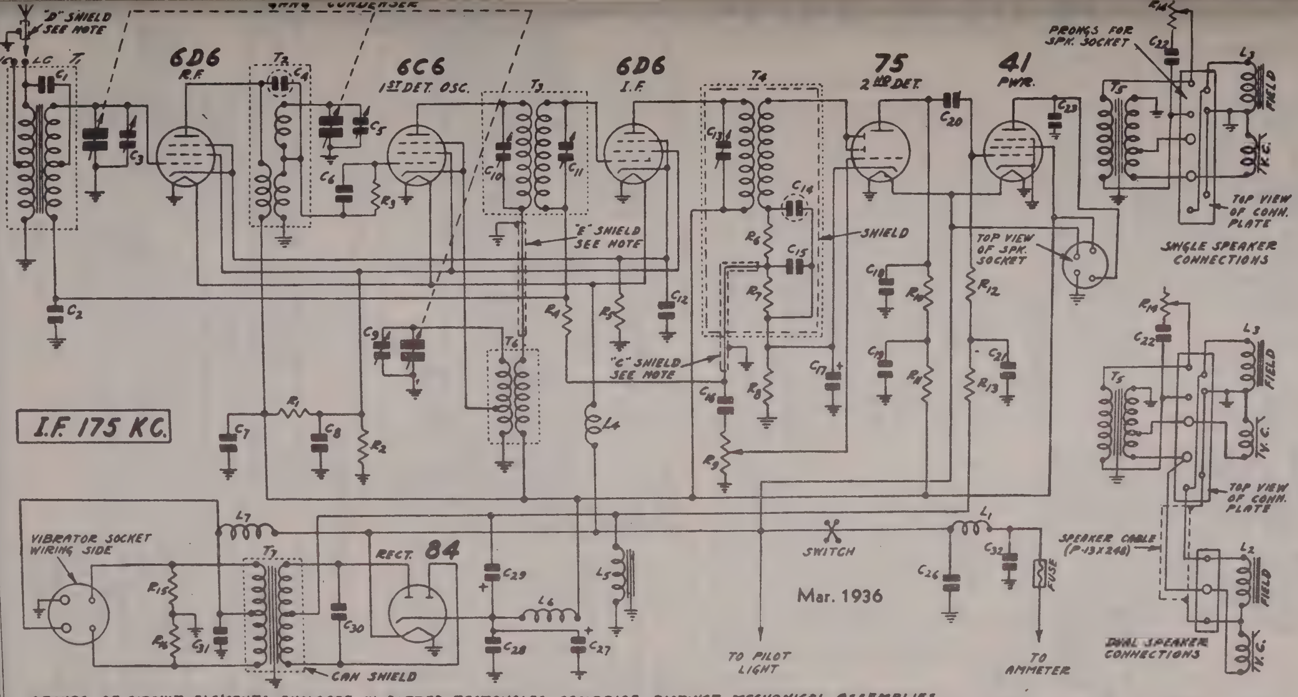
Part No.	Winding	Code	D. C. Resistance in Ohms
P-12A227	Dynamic Speaker		
	Output Transformer Primary	T5	416.6
	Output Transformer Secondary	T5	Small
	Speaker Field	L3	5.3
	Speaker Voice Coil		Small
P-9A440	Oscillator Coils	T6	
	Grid Coil		
	Long Portion		3.0
	Short Portion		0.9
	Plate Coil		5.8
P-53X108	Power Transformer	T7	
	Primary Winding		
	Center Tap to Inside		Small
	Center Tap to Outside		Small
	Secondary Winding		
	Center Tap to Inside		200.
	Center Tap to Outside		200.
P-9A444	Motor Noise Reactor	L1	Small
P-9A448	Pilot Light Line Reactor	L2	Small
P-9A446	Filament Reactor	L4	Small
P-52X42	Filter Choke	L5	312.5
P-9A447	R. F. "B" Plate Reactor	L6	4.1
P-9A445	Vibrator Filter Reactor	L7	Small

WESTERN AUTO SUPPLY CO.

MODEL D737-C(1936)
Schematic,Socket
Trimmers

Power Consumption - - 7.0 Amperes at 6.0 Volts
Power Output - - - - - 3 Watts Undistorted
Sensitivity - - - - - 1.0 Microvolt Absolute
Selectivity - - 45 KC Broad at 1000 Times Signal

Tuning Frequency Range - - - 530 to 1650 KC
Intermediate Frequency - - - - - - 175 KC
Speaker - - - - - - - - - 6 inch Dynamic



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1	10 mmf.
C 2	.05 mf. 180 V.
C 3	Gang Trimmer
C 4	40 mmf.
C 5	Gang Trimmer
C 6	35 mmf.
C 7	.10 mf. 360 V.
C 8	.10 mf. 180 V.
C 9	Gang Trimmer
C10	70-150 mmf. } Dual
C11	70-150 mmf. } Dual
C12	.10 mf. 180 V.
C13	70-150 mmf.
C14	250 mmf.
C15	250 mmf.
C16	.01 mf. 360 V.
C18	250 mmf.
C19	.10 mf. 360 V.
C20	.01 mf. 360 V.
C21	.25 mf. 180 V.
C22	.02 mf. 600 V.
C23	.002 mf. 600 V.
C26	2000 mmf.
C28	2000 mmf.
C30	.0075 mf. 1600 V.
C31	.50 mf. 180 V.
C32	2000 mmf.
C17	4.0 mf. 25 V. } Electrolytic Block
C27	5.0 mf. 350 V. } Electrolytic Block
C29	8.0 mf. 350 V. } Electrolytic Block
R 1	17000 ohm 1.0 W.
R 2	20000 ohm .5 W.
R 3	.50 Megohm .2 W.
R 4	1.0 Megohm .2 W.
R 5	350 ohm .2 W.
R 6	50000 ohm .2 W.
R 7	500000 ohm .2 W.
R 8	6000 ohm .2 W.
R 9	2.0 Megohm Vol. Control
R10	150000 ohm .2 W.
R11	50000 ohm .2 W.
R12	.50 Megohm .2 W.
R13	100000 ohm .2 W.
R14	150000 ohm Tone Control
R15	50 ohm .5 W.
R16	50 ohm .5 W.
T 1	Antenna Trans.
T 2	R.F. Inter. Trans.
T 3	1st I.F. Trans.
T 4	2nd I.F. Trans.
T 5	Output Trans.
T 6	Osc. Inductor
T 7	Power Trans.
L 1	Motor Noise Reactor
L 2	Speaker Field 4.9 ohm
L 3	Speaker Field 5.3 ohm
L 4	Filament Reactor
L 5	Filter Reactor
L 6	"B" Reactor
L 7	Vibrator Reactor

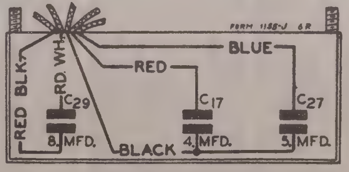


Fig. 4—Condenser Block—Internal Wiring

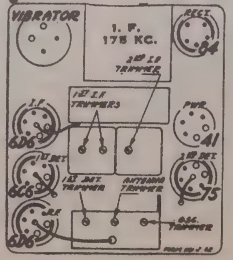


Fig. 2—Location of Tubes and Trimmers

MODEL D737-C(1936)
Voltage,Resistance
Coils,Antenna Data

WESTERN AUTO SUPPLY CO.

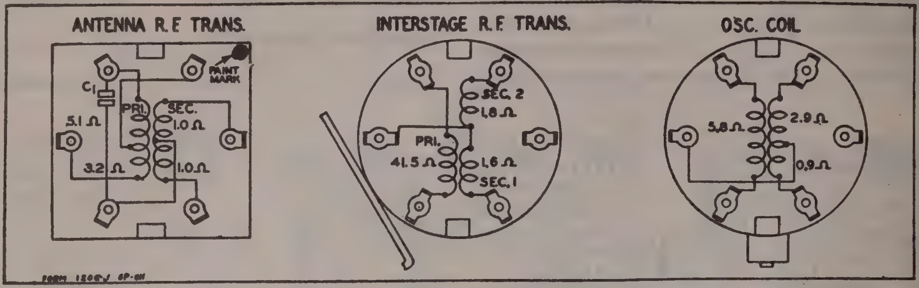


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	Interstage Transformer	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2

Code	Winding	D. C. Resistance in Ohms
	Dynamic Speaker	
T5	Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	Motor Noise Reactor	Small
L4	Filament Reactor	.22
L5	Filter Choke	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

VOLTAGES AT SOCKETS

Antenna Disconnected **Battery 6 Volts Under Load**

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)		1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

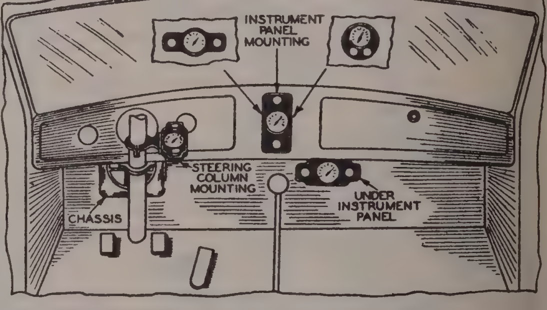


Fig. 1—Various Control Head Mountings

Antenna

IMPORTANT—If the car antenna is of high capacity (600 mmf. or higher) insert the antenna plug with the mark on the HC side—See Fig. 10. If it is a low capacity antenna, insert the plug with the mark on the LC side.

The General Motors cars have steel roofs, and a running board or other under car antenna must be used. These are low capacity antennas. The Chrysler motor cars (except Plymouth) have a steel roof separated from the body proper, which is used as an antenna. These are high capacity antennas. Other cars without steel roofs such as Ford and Plymouth have a built-in roof antenna which is of low capacity.

If a running board or under-car antenna is used, it must be one which is covered with a suitable insulation, to prevent short circuiting in wet weather.

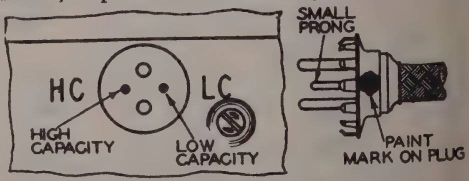


Fig. 10—Antenna Plug Insertion

WESTERN AUTO SUPPLY CO.

MODEL D737-C(1936)
Alignment,Noise Data
Notes

Alignment and Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is on the center tuning condenser section—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Suppression of Ignition and Generator Noise

The two units mentioned below must be used in every case:

Distributor Suppressor—Remove the high tension lead to the distributor. Insert a distributor suppressor and connect the wire to the other end of the suppressor (see Fig. 13). If this is not practical, cut the high tension lead *close to the distributor* and use a wood screw end type distributor suppressor in this line.

Generator Condenser—The generator condenser is installed at the cut-out as shown in Fig. 13. The lead from the condenser goes to the terminal on the cut-out.

In some of the new cars the cut-out relay is on the front of the dash or in some other location. It will be most convenient to mount this generator condenser at the relay.

Withdraw Antenna Cable Plug

Turn on the receiver and start the engine.

If motor noise is heard, proceed as follows:

Shielding High Tension Lead—In some cars when the coil is mounted on the dash, the high tension lead from the coil to within about four inches of the distributor must be covered with braided shielding and the shield grounded to the motor block or frame.

Bypass Condenser—Try a .25 or .5 mfd. condenser from the ammeter to ground. Try a condenser from the car fuse to ground, switch to ground, windshield wiper connections and various other 6 volt connections to ground noting what effect these condensers have on the noise pick-up.

Try a .25 or .5 mfd. condenser from the "Hot" side of the coil primary to ground. In some cases this condenser may not help. It can be tried out, however, experimentally.

Spark Plug Suppressors—If motor noise persists, spark plug suppressors must be installed. One suppressor is put on each plug as shown in Fig. 13. These are not regularly supplied with the receiver and must be purchased extra. Seventy percent of all cars will not require spark plug suppressors.

Care should be taken that a good mechanical and electrical connection is made between the spark plugs, suppressors and plug wires.

Then Reinsert Antenna Cable Plug

If motor noise is heard when the antenna cable is reconnected, proceed as follows until the noise is satisfactorily reduced:

Dome Light Lead—To determine the amount of noise due to the dome light lead, disconnect this lead at the ammeter, block, or where it is connected, coil it up, and tuck it as far as possible up in the column at which it comes down. Then, with the engine running, ground the end of this wire. If this is found to reduce the noise noticeably, interference is being radiated by the dome light lead. Reconnect the dome light lead and try a .25 or .5 mfd. condenser from the connecting point of the lead to ground. If this does not cure the noise, disconnect the lead and encase it in braided copper shield from the point where it leaves the column post to the point of connection. Keep the lead as far away as possible from car ignition wires and ground the shield.

If the noise due to the dome light lead still persists, disconnect this lead and remove it from the front corner post, at which point it is generally run down. Run the lead down one of the side posts in back of the door and direct to the storage battery. If done in this manner this lead should be fused.

Bonding Cables—Try grounding to the dash all cables and tubing which pass through it, such as oil lines, gas lines, etc. By means of a file, contact can be established between any of the lines and the dash, in order to determine whether such a ground will reduce the noise. To bond the cables to the dash, clean the point of contact, wrap a length of braided shielding around the cable and solder the connection. Then solder the end of the shielding to the dash or ground it under a screw head if one is convenient.

Sufficient play should be left in the bonding shielding so that movement of the cables or tubing will not loosen this shielding from the dash.

High and Low Tension Leads—In some cases, the high and low tension leads between the coil and distributor are run close together. In some cars they are in the same conduit. If this is the case, remove the low tension lead from this conduit. In any event, keep the high and low tension leads as far apart from each other as possible. Shield and ground the shield of the low tension lead, if separating the two leads is not sufficient.

Steering Column, Etc.—It is possible for the steering column, foot pedals and brake lever to carry interference to the back of the dash at which point it may affect the radio receiver. See if each of these items are well grounded to the frame of the car. By means of a file or a braided shielding jumper, contact can be established between any of these items and the frame in order to determine whether such a ground will reduce the noise. A piece of one inch braided shielding should be used if such a ground is necessary and this shielding may be grounded under a screw head, nut or may be soldered in position.

Grounding Engine and Other Parts—The engine must, in every case, be well grounded to the frame of the car. If it is not, use a very heavy braided lead for this purpose, similar to a storage battery ground lead. In like manner it may be necessary to check the grounding of the metal dash, instrument panel, radiator and hood to the frame of the automobile.

Weak Pick-up—Noise, on occasion, may be due to weak pick-up caused by the automobile being in a shielded location or by a faulty antenna system. The action of the automatic volume control, due to the low pick-up, causes the set to operate at its maximum sensitivity, thereby increasing noisy reception, due both to external pick-up and internal conditions.

Loose Parts in Car—Noisy operation is also caused in some instances by loose parts in the car body or frame. These loose parts rubbing together affect the grounding and cause noises, due to the rubbing or wiping action. Tightening up the frame and body at all points and in some cases, the use of a copper jumper will eliminate noise of this nature.

Making Final Adjustments and Bolting Chassis in Place

Battery Cable

The battery connection is made at the ammeter. The end of the battery cable with the connecting lug is secured to one of the posts at the back of the ammeter in the instrument panel.

The other end of the battery cable has a fuse receptacle with bayonet fitting. Insert the fuse shield and fuse into the receptacle and connect it to the bayonet pin connector in the end of the battery lead coming from the chassis case as shown in Fig. 11.

Fuse

A 20 ampere automobile fuse is used in the battery cable. This fuse is placed in an insulating shield and is in the receptacle provided for it at the chassis end of the battery cable. **CAUTION—Be sure the fuse shield is on the fuse before the latter is inserted in the receptacle.** ***If a fuse blows, do not replace it without first investigating the cause.***

Bolting Chassis in Place

Place the nuts and flat washers on the mounting bolts and put the chassis in place on the dash, extending the mounting bolts through the drilled holes in the dash.

On one of the mounting bolts assemble the extra shakeproof lockwasher as shown in Fig. 9. Then complete the assembly to the dash as illustrated.

After the chassis is in place, secure the flexible shafts and electrical cables into position at the nearest convenient point.

Advancing Generator Charging Rate

The installation of the automobile radio imposes an additional drain on the car storage battery. This can be compensated for by advancing the charging rate of the car generator. Check the state of charge of the storage battery about a week after the installation of the automobile radio is made and have the charging rate adjusted accordingly.

Readjusting Flexible Shafts

When the receiver is in position on the dash, loosen the flexible shaft casing set screws on the chassis. Allow the casing to position itself so that it does not bind. Then retighten the set screws.

MODELS D-740,S740(1934)
(Mallory Vibrator 296)

WESTERN AUTO SUPPLY CO.

Schematic,Voltage,Socket
Alignment,Trimmers

ALIGNMENT

1. Connect output meter across voice coil of speaker.
2. Set volume control on full.
3. Set tone control to bass position.
4. Connect dial light.

(A) I. F. Adjustment

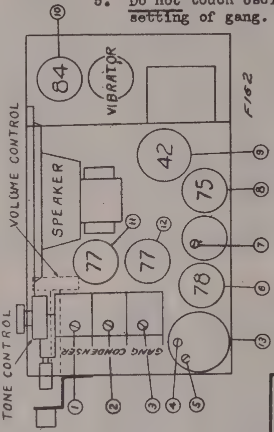
1. Connect a .1 mfd. condenser in series with antenna lead of test oscillator.
2. Set test oscillator to 175 K. C.
3. Connect test oscillator to grid of 1st I. F. tube #6 (see Fig. #2) and adjust #7 to maximum output.
4. Connect test oscillator to grid of 1st Det. #12 and adjust condensers #4 and 5 to maximum output.
5. Repeat the above adjustments for accuracy.

(B) Oscillator Adjustment

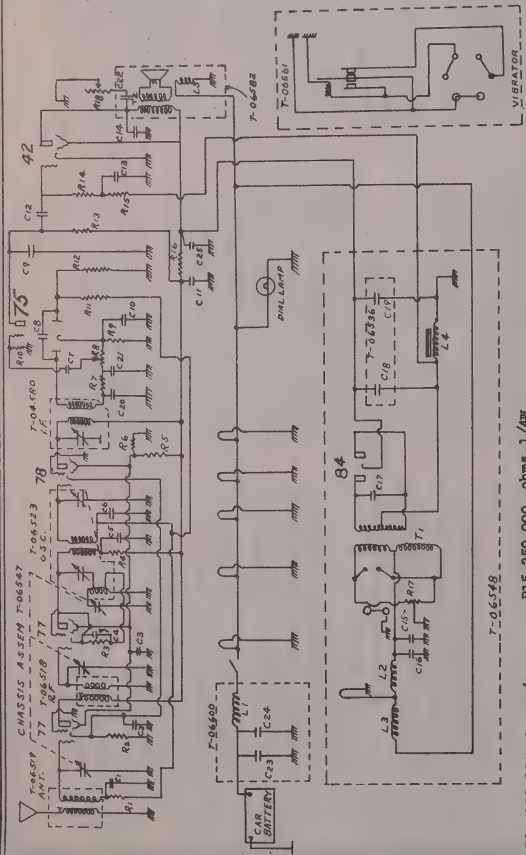
1. Set test oscillator to 1500 K. C.
2. Connect test oscillator leads to grid of 1st Det. #12.
3. Set gang condenser to 1500 K. C. as follows:
   (a) Open gang to fullest extent.
   (b) Close slowly to the thickness of a thin cardboard strip or approximately .015 thousands of an inch.
4. Peak oscillator condenser #3 on end of gang.

(C) R. F. Adjustment

1. Set test oscillator to 1400 K. C.
2. Change antenna condenser in oscillater lead from .1 mfd. to .0002 mfd., and connect test oscillator to antenna lead of set.
3. Set condenser gang at 1400 K. C.
4. Peak condensers #1 and 2 on gang.
5. Do not touch oscillator trimmer #3 at 1400 K.C. setting of gang.



#1 RF Trimmer Condenser
#2 1st Det. Trimmer Cond.
#3 Osc. Trimmer Cond.
#4)
#5) 1st IF Trimmer Cond.
#6 IF Amplifier
#7 2nd IF Trimmer Cond.
#8 2nd Det. AVC & AF Amplifier
#9 Power Output
#10 Rectifier
#11 RF Amplifier
#12 Det. and Osc.
#13 1st IF & Osc. Coil



R1 100,000 ohms 1/4 W
R2 500 " "
R3 7500 " "
R4 2000 " "
R5 40,000 " "
R6 75,000 " "
R7 50,000 " "
R8 1/2 meg. Vol. Control
R9 5000 ohms 1/4 W
R10 1 meg. " "
R12 1/2 meg. " "
R13 100,000 " "
R14 250,000 " "
R15 250,000 ohms.1/4W
R16 4,000 " 1 W
R17 200 Center tapped
R18 1/2 meg. Tone Control

T1 Power Trans.
T2 Output Trans.

L1 Filter Choke
L2 " "
L3 " "
L4 Power "
L5 Field Coil

C1 .05 mfd. 2 ply
C2 .25 " "
C3 .25 " "
C4 .002 " 4 ply
C5 .05 " 3 ply
C6 .05 " 2 ply
C7 .005 " 3 ply
C8 100 mmfd. mica
C9 .002 mfd. 4 ply
C10 .5 " 2 ply
C12 .005 " 3 ply
C13 .1 " 2 ply
C14 .005 mfd. 3 ply
C15 .5 " 2 ply
C16 .5 " 2 ply
C17 .02 " 4 ply
C18 6. mfd.)
C19 10. ")
C20 10 mmfd. mica
C21 100 " "
C22 .05 mfd. 3 ply
C23 .001 mica
C24 .5 mfd. 2 ply
C25 .001 mica

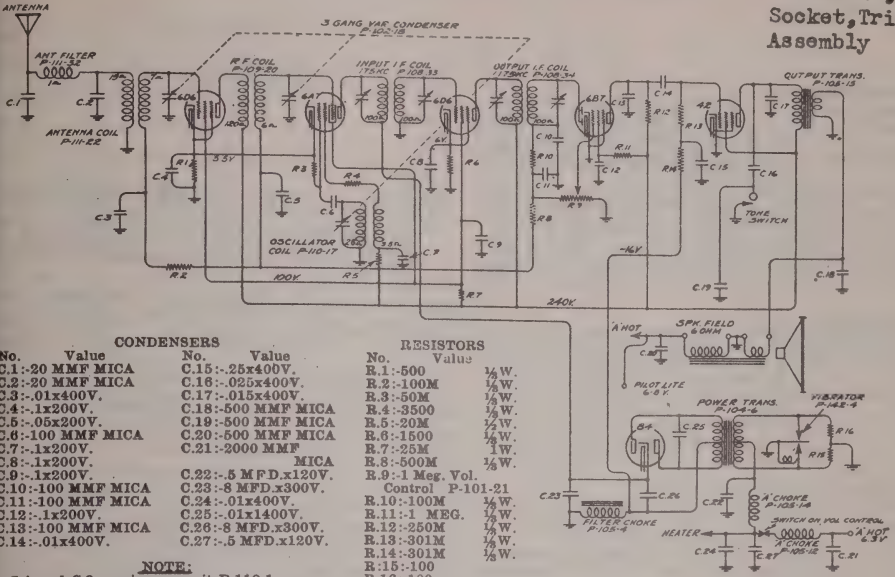
MODEL S740 SOCKET VOLTAGES
(Car Battery 6 Volts Under Load)

Tube	Use	Fil.	Plate	Screen	Cathode	Bias
77	RF	5.3	179	79	2.9	
77	Det. Osc.	5.3	178	79	4.3 to 8.4	
78	IF	5.3	179	79	2.9	
75	2nd Det. AVC	5.3	113			
42	AF	5.3	201	217	1.2	13.0

The above readings were taken from ground or metal of chassis to socket terminals and will vary slightly with different types of voltmeters used.

WESTERN AUTO SUPPLY CO.

MODEL D739
Schematic,Voltage
Socket,Trimmers
Assembly



CONDENSERS

No. Value
C.1:-20 MMF MICA
C.2:-20 MMF MICA
C.3:-.01x400V.
C.4:-.1x200V.
C.5:-.05x200V.
C.6:-100 MMF MICA
C.7:-.1x200V.
C.8:-.1x200V.
C.9:-.1x200V.
C.10:-100 MMF MICA
C.11:-100 MMF MICA
C.12:-.1x200V.
C.13:-100 MMF MICA
C.14:-.01x400V.

No. Value
C.15:-.25x400V.
C.16:-.025x400V.
C.17:-.015x400V.
C.18:-500 MMF MICA
C.19:-500 MMF MICA
C.20:-500 MMF MICA
C.21:-2000 MMF MICA
C.22:-.5 MFD.x120V.
C.23:-8 MFD.x300V.
C.24:-.01x400V.
C.25:-.01x1400V.
C.26:-8 MFD.x300V.
C.27:-.5 MFD.x120V.

NOTE:

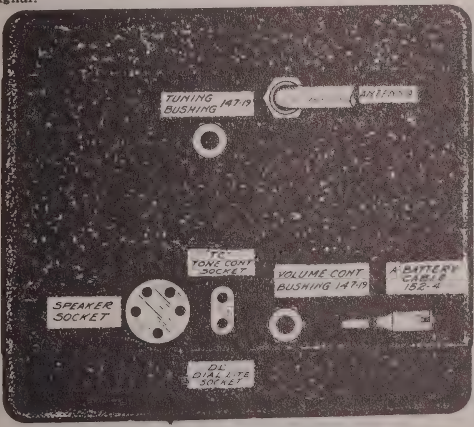
C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.26 and C.23 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

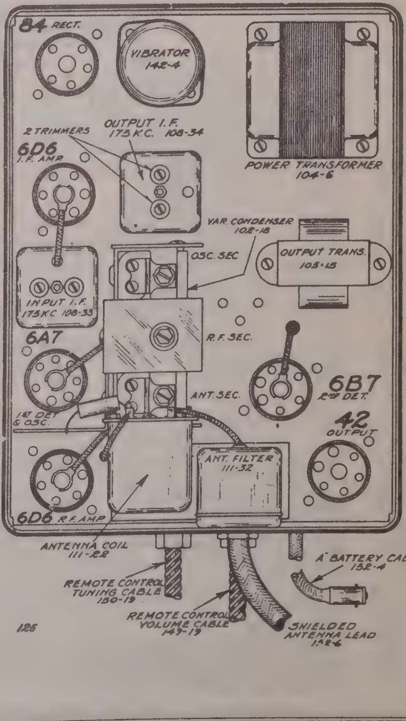
RESISTORS

No. Value	
R.1:-500	⅓W.
R.2:-100M	⅓W.
R.3:-50M	⅓W.
R.4:-3500	⅓W.
R.5:-20M	½W.
R.6:-1500	⅓W.
R.7:-25M	1W.
R.8:-500M	⅓W.
R.9:-1 Meg. Vol. Control P-101-21	
R.10:-100M	⅓W.
R.11:-1 MEG.	⅓W.
R.12:-250M	⅓W.
R.13:-301M	⅓W.
R.14:-301M	⅓W.
R:15:-100	
R.16:-100	

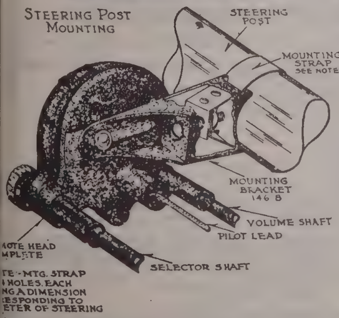
Serial No. 60001 and up.

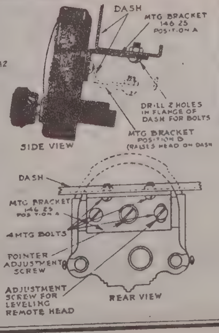
IF PEAK 175 KC.





Steering Post Mounting




DASH
MTG BRACKET 146 25 POSITION A
DRILL 2 HOLES IN FLANGE OF DASH FOR BOLTS
MTG BRACKET POSITION B (RAISES HEAD ON DASH
SIDE VIEW
DASH
MTG BRACKET 146 25 POSITION A
4 MTG BOLTS
POINTER ADJUSTMENT SCREW
ADJUSTMENT SCREW FOR LEVELING REMOTE HEAD
REAR VIEW

125

MODEL D739
Alignment,Notes
Parts

WESTERN AUTO SUPPLY CO.

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.

(a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

REPAIR PARTS

Serial No. 60001 and up

When ordering parts, always specify part and model number as well as serial number of chassis.

Part No.	Description	List Price Ea.
	CONDENSERS	
	Unless otherwise listed, all single section tubular paper by-pass condensers	$ .25
	Unless otherwise listed, all dual section tubular paper by-pass condensers	.50
	Unless otherwise listed, all molded mica condensers	.25
119-17	Dual 8 mfd. electrolytic filter condenser	2.25
148-1	.5 Mfd. Generator Condenser	.50
148-3	.5 Mfd. Ammeter Condenser	.40
148-5	.5 Mfd. x 120 Volt Condenser	.50
148-6	Special Ford Ignition Coil Condenser	.60
	COILS	
105-12	"A" Choke - 28 Turns No. 12 Wire	.10
105-14	"A" Choke - 37 Turns No. 12 Wire	.10
108-33	Input I.F. Transformer Complete with Shield	1.50
108-34	Output I.F. Transformer Complete with Resistors and Condensers, Mounted in Shield	2.50
109-20	R.F. Coil Complete - Less Shield	1.00
110-17	Oscillator Coil Complete with Bracket	.75
111-22	Antenna Coil Complete - Less Shield	1.00
111-32	Antenna Filter Assembly Complete with Shield and Antenna Cable	1.50
	RESISTORS	
	Unless otherwise listed, all carbon resistors	.20
106-6	200 Ohm Center Tapped Resistor	.25
168-2	Distributor Suppressor	.40
168-3	Cable Type Suppressor	.40
	TRANSFORMERS	
104-6	Power Transformer	3.00
105-4	380 Ohm Filter Choke	.85
105-15	Output Audio Transformer	1.50
	MISCELLANEOUS	
101-21	Volume Control with Switch	1.35
102-18	Three Gang Variable Condenser	4.00
113-30	Two Lug Terminal Strip	.05
113-37	Terminal Strip	.05
115-34	Antenna and R.F. Coil Shield	.15
114-21	Speaker Chassis Only	5.00
114-22	Ford Header speaker chassis only	5.00
128-4	Complete Speaker Housing for 114-21	2.50
128-5	Ford speaker housing for 114-22	2.50
140-5	Set Case less Covers	1.00
140-6	Covers for Above	1.25
142-4	Plug-in Vibrator	4.50
147-19	Flexible Cable Control Bushing	.10
152-2	Battery Cable & Fuse Assembly	.35
152-3	Fuse Insulating Sleeve	.05
152-4	Chassis Battery Cable Assembly	.30
152-6	Antenna Cable	.50
152-8	Speaker Cable with Plug for 114-21	1.00
152-9	Special Ford Header speaker cable and plug	1.25
153-4	Special Speaker-Tone Control-Dial Light Socket Assembly	.25
160-11	Mounting Studs Complete with Nut & Washer	.05
169-1	15 Amp. Fuse (3AG-15)	.05

Part No.	Description	List Price Ea.
	All Sockets	.10
123-1	Dome Lite Filter	.90
	Plate Antenna	3.50
	REMOTE CONTROL PARTS	
112-39	Selector Control Shaft	.20
112-41	Idler Gear	.15
112-42	Pointer Shaft	.05
112-85	Volume Control Shaft	.10
112-45	Bezel (Crystal Retainer)	.15
112-46	Celluloid Dial Crystal	.15
112-48	Pointer Shaft Gear	.05
112-96	Celluloid dial	.25
116-13	6-8 Volt, T-51 Bulb Bayonet Base	.10
116-14	6-8 volt T-51 frosted glass bayonet lamp	.13
116-9	Pilot Light Assembly	.45
116-11	Tone Control Assembly Unit Complete	.35
131-5	Black Bakelite Remote Control Knobs	.15
146-8	Die Cast Remote Control Mounting Bracket	.30
146-12	Steering Column Strap	.15
146-25	Dash Mounting Bracket	.15
147-3	Selector Control Bushing for 112-39 Shaft	.10
147-4	Volume Control Bushing for 112-43 Shaft	.10
149-25	Flexible Volume Control Cable - 24″	1.50
150-25	Flexible Selector Control Cable - 24″	1.50
151-7	Remote Control Head complete with Steering Column Bracket	5.00
	Dash Mounting Kit (specify make and year of car)	1.25
151-8	Special General Motors Control Head	7.00
	Dash Mounting Kits for 1935 Chevrolet and Pontiac for use with 151-8 head	1.50
	Dash Mounting Kits for 1935 Oldsmobile for use with 151-8 head	1.75

Vibrators can be reconditioned at a cost of $3.00 each, if the old unit is returned.

All resistors are RMA color coded - specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None.

All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER PARTS, CONES, TRANSFORMERS OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $2.00 NET, IF IT IS RETURNED TO OUR FACTORY TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

BRC - CHICAGO

WESTERN AUTO SUPPLY CO

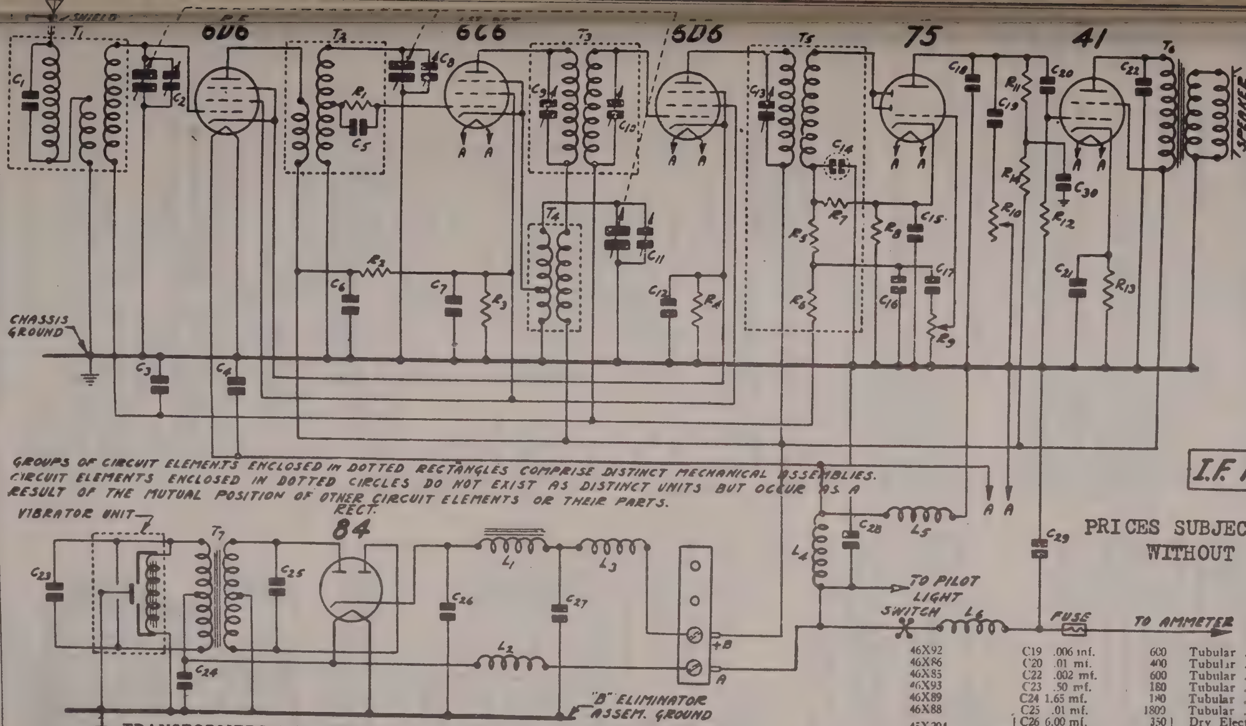
MODELS S743,D743-W(1935)
Schematic

Power Output - 3 Watts Maximum
Sensitivity - 1.5 Microvolts Absolute
Frequency Range - 530 to 1650 KC
Speaker - 6 Inch Dynamic
Power Consumption - 5.75 Amperes at 6 Volts

I.F. 175 KC.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

April, 1935



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

TRANSFORMERS AND COILS

New Part No.	Old Part No.	Description	Code	List Price
51X17-6S	50632	Output Transformer	T6	1.65
9A368-6S		Antenna Coil Assembly (Less Can)	T1	.50
9A369-6S		R.F. Interstage Coil Assembly (Less Can)	T2	1.25
1A23-6S		Dual-Coil Can Assembly Only (for above two coils)		.30
9A371-6S		1st I.F. Coil & Can Assembly Complete	T3	1.70
9A370-6S		Oscillator Coil & Can Assembly Complete	T4	.60
9A372-6S		2nd I.F. Coil & Can Assembly Complete	T5	2.05
9A375-6S		Pilot Light Choke Assembly	L4	.15
9A373-6S		Motor Noise Choke	L6	.25
9A268-6S	5174	R.F. "B" Choke Coil Assembly	L3	.10
9A374-6S		Filament Reactor	L2	.30
53X72-6S	50633	Power Transformer	T7	3.20
52X27-6S	50637	Filter Choke	L1	.90

CONDENSERS

New Part No.	Old Part No.	Code	Capacity	Voltage	Type	List Price
47X54		C1	.0005 mf.		Moulded	.15
		C2	Antenna Trimmer-Part of Gang Condenser			
46X80		C3	.05 mf.	180	Tubular	.15
47X50		C4	.003 mf.		Moulded	.25
47X53		C5	.000035 mf.		Moulded	.10
46X81		C6	.10 mf.	400	Tubular	.25
46X83		C7	.10 mf.	180	Tubular	.25
		C8	1st Detector Trimmer-Part of Gang Condenser			
*17A32		C9 C10	130-300 mmf. 130-300 mmf.		1st I. F. Trimmer Condensers	.50
†17A33		C9 C10	70-150 mmf. 70-150 mmf.		1st I. F. Trimmer Condensers	.50
		C11	Oscillator Trimmer-Part of Gang Condenser			
46X82		C12	.10 mf.	180	Tubular	.25
17A18	1965	C13	70 140 mmf.		2nd I.F. Trimmer Condenser	.35
		C14	.00025 mf.		Part of 2nd I.F. Coil Assembly	
45X203		C15 C21	12.00 mf. 12.00 mf.	25 25	Dry Electrolytic Block	1.05
4 X52		C16	.00025 mf.		Moulded	.15
46X84		C17	.01 mf.	180	Tubular	.15
47X52		C18	.00025 mf.		Moulded	.15
46X92		C19	.006 mf.	600	Tubular	.20
46X86		C20	.01 mf.	400	Tubular	.20
46X85		C22	.002 mf.	600	Tubular	.20
46X93		C23	.50 mf.	180	Tubular	.35
46X89		C24	1.65 mf.	180	Tubular	.80
46X88		C25	.01 mf.	1800	Tubular	.30
45X204		C26 C27	6.00 mf. 8.00 mf.	350 350	Dry Electrolytic Block	2.10
46X93		C28	.50 mf.	180	Tubular	.35
4·X50		C29	.005 mf.		Moulded	.25
46X94		C30	.25 mf.	300	Tubular	.30
14A39					3 Section Gang Condenser	4.20

RESISTORS

New Part No.	Code	Resistance	Wattage	Type	List Price
A95504	R1	500,000 Ohm	0.2	Carbon	.10
B94153	R2	15,000 Ohm	0.5	Carbon	.15
B94203	R3	20,000 Ohm	0.5	Carbon	.15
43X41	R4 R13	450 Ohm 800 Ohm	0.2 0.3	Armored Wire Wound	.30
A95503	R5	50 000 Ohm	0.2	Carbon	.10
A95105	R6	1.0 Megohm	0.2	Carbon	.10
A94504	R7	500,000 Ohm	0.2	Carbon	10
A95752	R8	7,500 Ohm	0.2	Carbon	.10
36X200	R9	2.0 Megohm		Volume Control & Switch	1.15
40X201	R10	3[illegible] Ohm		Tone Control	.75
*A95201	R11	200,000 Ohm	0.2	Carbon	.10
†A95154	R11	150,000 Ohm	0.2	Carbon	.10
A95504	R12	500,000 Ohm	0.2	Carbon	.10
†A95503	R14	50,000 Ohm	0.2	Carbon	.10

WESTERN AUTO SUPPLY CO.

Remove chassis from case.

Establish ground connection between chassis and power supply.

Reconnect A and B wires from power supply to chassis.

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector (middle) section of the tuning condenser. This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling off action of the A.V.C.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers are shown in Fig. 2.

1650. KC. Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the shielded antenna lead from the chassis through a 250 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A. V. C. action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 K C. Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Voltages at Sockets

Antenna Disconnected - Voltage at Battery 6.1

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M.A.
6D6	R. F.	5.8	218	100	5.2	5.8
6C6	1st Det. and Osc.	5.8	218	100		2.0
6D6	I. F.	5.8	218	100	5.2	5.8
75	2nd Det. & 1st A. F.	5.8	160 (1)		1.4	2.8
41	Output	5.8	210	220	16.0	16.0
84	Rectifier	5.8				20.0 per plate

Speaker Field ..1.15 Amperes "B" Unit ......3.00 Amperes
Chassis ... .. 1.50 Amperes Pilot Lamp ....0.1 Amperes

(1) Measured on 1000 V. Scale (1000 Ohms per volt)

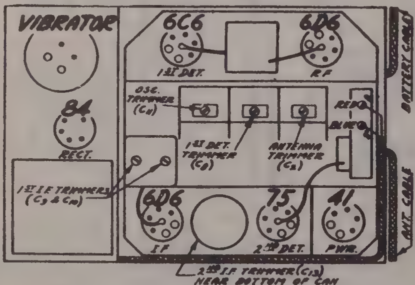


Fig. 2—Tube Arrangement and Trimmers

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is the trimmer condenser closest to the terminal strip—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

After installing the receiver in the car, it will be necessary to calibrate the control unit. Tune in a station of known frequency at about the center of the dial. At the back of the control unit is a calibration screw—See Fig. 4 in the installation manual enclosed with each receiver. Remove the pilot light assembly.

The calibration screw will be seen at the bottom of the receptacle from which the pilot light assembly is withdrawn. Insert a screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

Voltages At Sockets

On the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

If the chassis is taken out, a jumper wire must be connected from the chassis base to the metal wall of the "B" power unit, in order to complete the ground circuit.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

New Part No.	ITEM	Code	D. C. Resistance in Ohms
9A368-6S	Antenna Trans. Primaries in Series	T1	6.3
	Antenna Trans. Secondary	T1	2.5
9A369-6S	R.F. Interstage Trans. Pri.	T2	4.5
	R.F. Interstage Trans. Sec.	T2	
	(Center Tap to inside)		1.8
	(Center Tap to ground)		1.3
9A371-6S	1st I.F. Trans. Primary	T3	58.
	1st I.F. Trans. Secondary	T3	58.
9A370-6S	Oscillator Cathode Coil (Total)	T4	3.
	Oscillator Plate Coil	T4	6.
9A372-6S	2nd I.F. Trans. Primary	T5	46.
	2nd I.F. Trans. Secondary	T5	46.
53X17-6S	Output Trans. Primary	T6	440.
	Output Trans. Sec. and Voice coil in paralle	T6	.4
53X72-6S	Power Trans. Primary	T7	.3
	Power Trans. Secondary	T7	500.
52X27-6S	Filter Choke	L1	300.
9A374-6S	Filament Reactor	L2	Small
9A268-6S	R.F. "B" Choke	L3	3.5
9A375-6S	Pilot Light Choke Assembly	L4	Small
12A62A	Speaker Field	L5	5.
9A375-6S	Motor Noise Choke	L6	Small

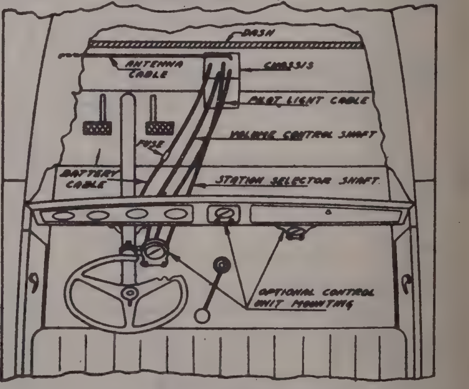
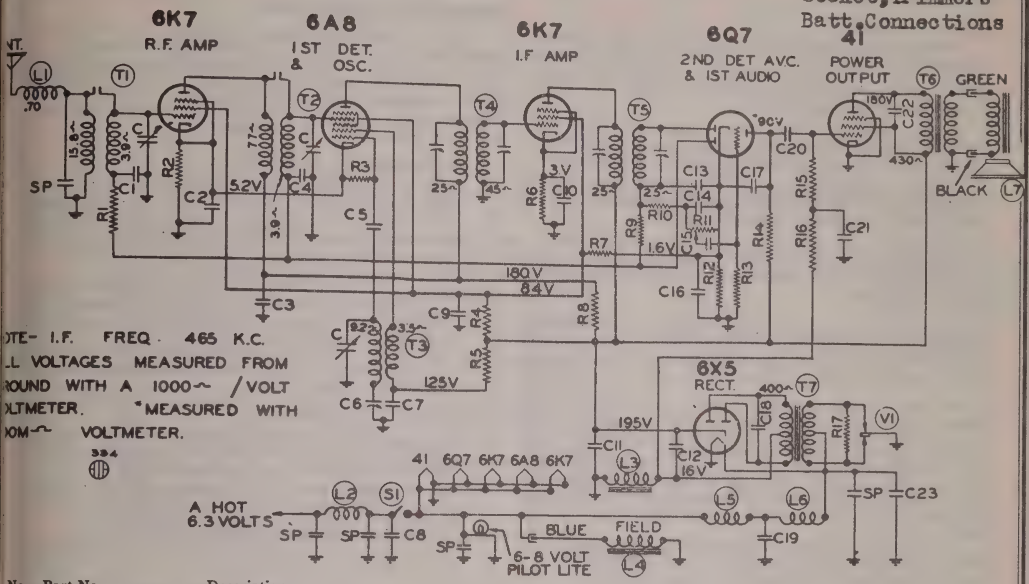


Fig. 1—General Mounting Position

MODEL D743(1936)
Schematic,Voltage
Socket,Trimmers
Batt.Connections

WESTERN AUTO SUPPLY CO.



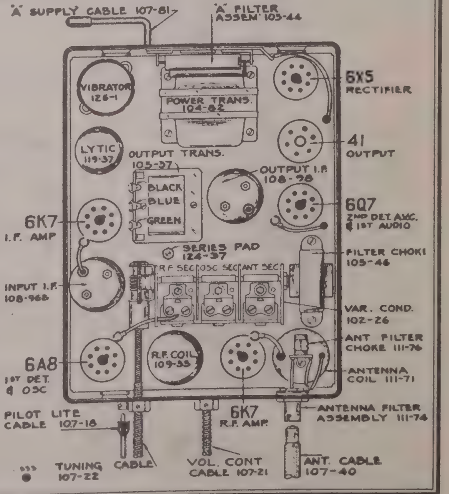
No.	Part No.	Description
		CONDENSERS
C	102-26	3 Gang Variable Condenser
C1	100-63	.05 x 200v. 50 - 10%
C2	100-63	.1 x 200v. 50 - 10%
C3	100-13	.05 x 400v. 25%
C4	100-22	.05 x 200v. 25%
C5	129-12	.00025 Mica - 20%
C6	124-37	Series Pad
C7	100-20	.1 x 200 v. 25%
C8	100-31	.5 x 120 v. 10 50%
C9	100-62	.25 x 200 v. 50 - 10%
C10	100-20	.1 x 200 v. 25%
C11	119-37	8 mfd. lytic 300 wv.
C12	119-37	4 mfd. lytic 300 wv.
C13	129-5	.0001 Mica 20%
C14	129-5	.0001 Mica 20%
C15	100-11	.01 x 400 v. 25%
C16	100-11	.01 x 400 v. 25%
C17	129-5	.0001 Mica 20%
C18	100-58	.005 x 1200 v. 20 - 10%
C19	100-31	.5 x 120 v. - 10 50%
C20	100-11	.01 x 400 v. 25%
C21	100-62	.25 x 200 v. 50 - 10%
C22	100-54	.006 x 600 v. 25%
C23	100-31	.5 x 120 v. - 10 50%
SP		Spark Plate
		RESISTORS
R1	130-20	100M - 1/3 w. - 20%
R2	130-54	500 ohm - 1/3 w. - 20%
R3	130-12A	50M ohm - 1/3 w. insulated 20%
R4	130-165	15M ohm - 1 w. - 20%
R5	130-131A	20M ohm - 1/2 w. - insulated - 10%
R6	130-24	400 ohm - 1/3 w. - 20%
R7	130-139A	40M ohm - 1/3 w. Insulated - 20%
R8	130-31A	1500 ohm - 1/3 w. insulated - 20%
R9	130-19	1 megohm - 1/3 w. - 20%
R10	130-52	50M ohm - 1/3 w. - 20%
R11	101-41	500M ohm - Volume Control
R12	130-153	700 ohm - 1/3 w. - 20%
R13	130-19	1 megohm - 1/3 w - 20%
R14	130-11A	250M - 1/3 w. Insulated - 20%
R15	130-5A	300M ohm - 1/3 w. insulated - 20%
R16	130-11A	250M ohm - 1/3 w. insulated - 20%
R17	130-84	200 ohm - 1/3 w. insulated - 20%
		PARTS
T1	111-71	Antenna Coil Complete
T2	109-35	R.F. Coil Complete
T3	110-57	Oscillator Coil Complete
T4	108-96B	Input I.F. Complete
T5	108-98	Output I. F. Complete
T6	105-37	Output Transformer
T7	104-82	Power Transformer
L1	111-76	Antenna Filter Choke
L2	105-26	"A" Choke
L3	105-46	"B" Filter Choke, 335 ohm
L4		Speaker Field, 4 ohm
L5	105-24	"A" Choke
L6	105-19	"A" Choke
L7	114-59	Dynamic Speaker
S1		Switch on Volume Control
V1	126-1	Vibrator

C1, C2 in same block
C11 and C12 in same block
C9 and C21 in same block

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 148-3, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.



SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

DESCRIPTION

Model No. 661 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 465 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 41 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

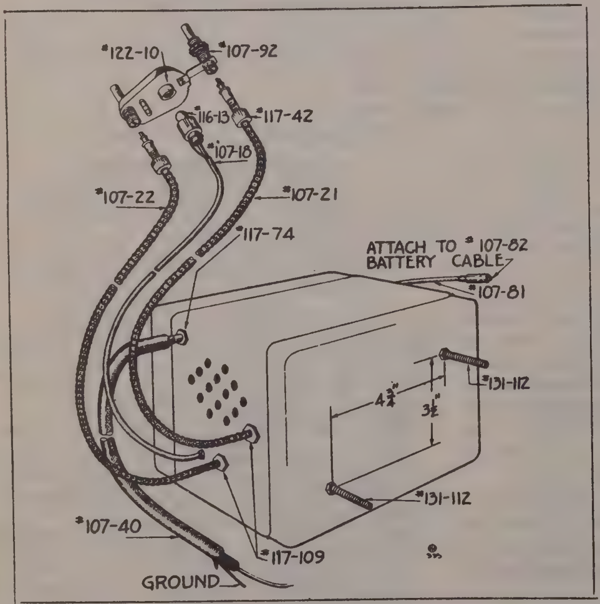
I.F. ALIGNMENT: (465 K.C.)

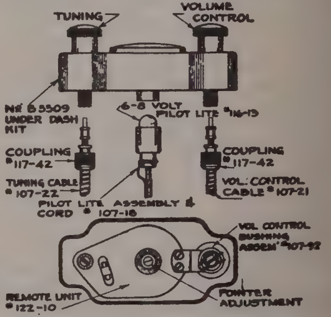
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-98 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-96B to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

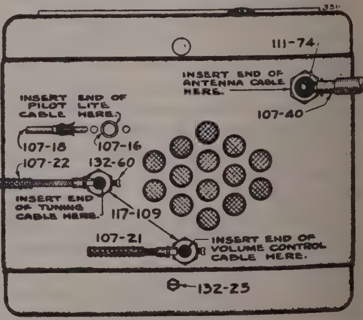
BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view, Fig. 2).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view, Fig. 2).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad, rocking gang condenser to and fro, at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis—see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

WIRING CONNECTIONS AND ASSEMBLY






111-74
INSERT END OF ANTENNA CABLE HERE.
107-40
INSERT END OF PILOT LITE CABLE HERE.
107-18
107-16
107-22
132-60
INSERT END OF TUNING CABLE HERE.
117-109
107-21
INSERT END OF VOLUME CONTROL CABLE HERE.
132-25

ODEL D744(1936)
chematic,Voltage
ocket,Trimmers

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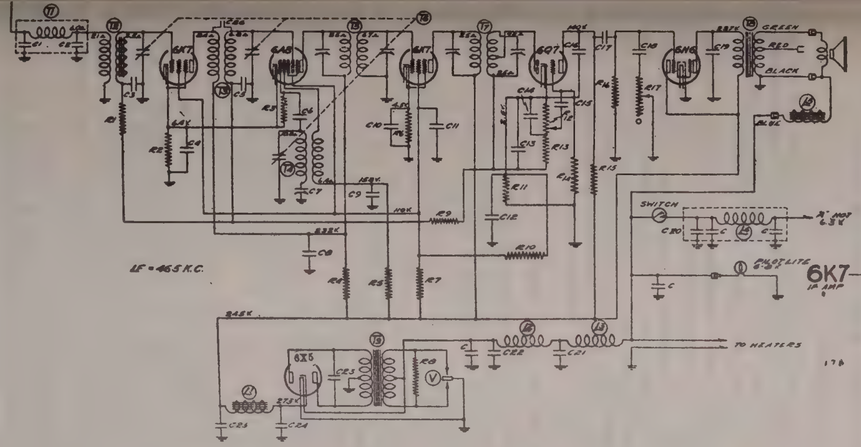
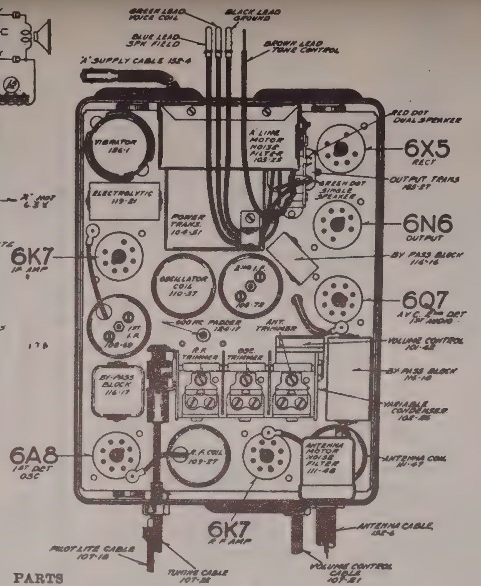




No.	Part No.	Description
		RESISTORS
R1	130-20	100M Ohm - ⅛ Watt 20% - 50 Volt - Carbon
R2	130-99	300 Ohm - ⅛ Watt - 20% - 10 Volt - Carbon
R3	130-94	50M Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R4	130-98	1500 Ohm - ⅛ Watt 20% - 25 Volt - Carbon
R5	130-42	20M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R6	130-70	500 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R7	130-95	12M Ohm - 1.2 Watt - 10% - 100 Volt - Carbon
R8	130-97	200 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R9	130-3	500M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R10	130-108	40M Ohm - ⅛ Watt - 10% - 100 Volt - Carbon
R11	130-107	800 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R12	101-42	50M Ohm - Volume Control and Switch
R13	130-22	5M Ohm - ⅛ Watt - 20% -10 Volt - Carbon
R14	130-68	1 Meg Ohm - ⅛ Watt - 10% - 20 Volt - Carbon
R15	130-9	200M Ohm - ⅛ Watt - 20% - 20 Volt - Carbon
R16	130-3	500M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R17	101-45	1 Meg Ohm - Tone Control

CONDENSERS

C		Spark Plate
C1	129-3	.00002 Mica - "O" - 20%
C2	129-49	.00009 Mica - "O" - 5%
C3	116-18	.05 x 200 Volt
C4	116-18	.25 x 200 Volt
C5	116-17	.05 x 200 Volt
C6	129-21	.0002 Mica - MT - "O" - 20%
C7	124-17	Single Padder J-4-S
C8	116-17	.1 x 400 Volt
C9	116-18	.1 x 400 Volt
C10	116-17	.1 x 200 Volt
C11	116-17	.1 x 200 Volt
C12	116-16	.05 x 200 Volt
C13	129-5	.0001 Mica - MT - "O" - 20%
C14	129-2	.0005 Mica - MT - "O" - 20%
C15	116-18	.02 x 200 Volt
C16	129-5	.0001 Mica - MT - "O" - 20%
C17	116-16	.05 x 400 Volt
C18	100-37	.003 x 600 Volt - 10%
C19	116-16	.01 x 800 Volt
C20	100-35	.5 x 200 Volt - 50% - 10%
C21	100-35	.5 x 200 Volt - 50% - 10%
C22	100-35	.5 x 200 Volt - 50% - 10%
C23	100-36	.01 x 1400 Volt - 10%
C24	119-21	8.0 mfd. Lytic Cond. 350 Working Volts
C25	119-21	4.0 mfd. Lytic Cond. 350 Working Volts
C26		5.0 mmf. Gimmick

PARTS

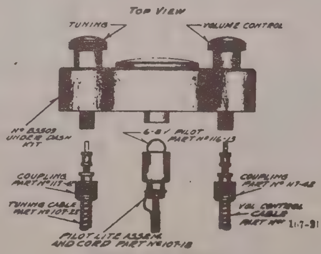
T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	109-27	R.F. Coil Assembly
T4	110-37	Oscillator Coil Assembly
T5	108-69	Input I.F. Coil—465 Kc.
T6	102-26	Three Gang Variable Condenser
T7	108-72	Output I.F. Coil—465 Kc.
T8	105-27	Output Transformer
T9	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-24	"A" Choke
L4	105-26	"A" Choke
L5	114-34	5¼" Speaker (Field Resistance—4 Ohms)
V	126-1	Vibrator

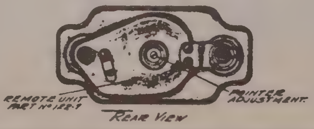
C3, C4, C9, C15, in one unit—part No. 116-18.

C5, C8, C10, C11, in one unit—part No. 116-17.

C12, C17, C19, in one unit—part No. 116-16.

C24, C25, in one unit—part No. 119-21.

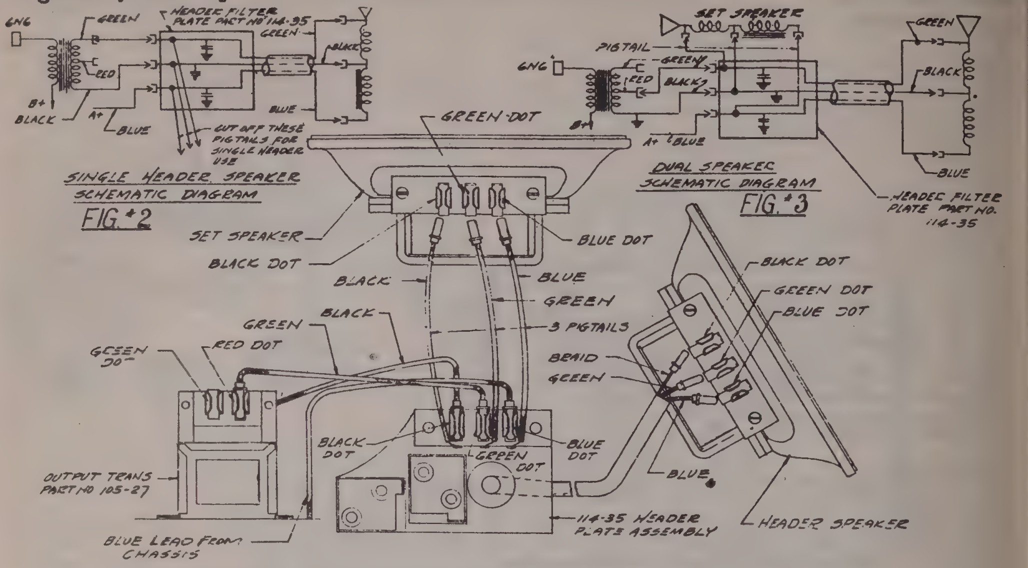




MODEL D744(1936)
Alignment,Assembly

WESTERN AUTO SUPPLY CO.

Notes



NO SPARK PLUG SUPPRESSORS ARE REQUIRED

DESCRIPTION:

Model No. 666 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 465 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

The receiver is so designed that it may be used as either a single or two unit installation. Taps are provided on the output transformer to a pin jack terminal board, a red dot distinguishing dual speaker tap and green dot for single speaker operation.

For complete details see illustration and Header speaker data chart.

Dash kits for the remote control head are available for 1936 cars drilled for dash plates.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

All adjustments are accessible and any part replaceable without removing the chassis from the case.

TUBE COMPLEMENT

1—Type No. 6K7—Remote Cut-off Pentode as an R.F. Amplifier
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator)
1—Type No. 6K7—Remote Cut-off Pentode as an I.F. Amplifier (465 K.C.)
1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio
1—Type No. 6N6—Twin Triode Output Amplifier
1—Type No. 6X5—High Vacuum Rectifier

The tube complement consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes.

Cars with floating power must have the motor bonded to the bulkhead and again to the frame to provide a direct path for the high frequency interference developed in the ignition system. ⅝" copper braid will be necessary, SMALL DIAMETER WIRE WILL NOT DO. Bond flexible shaft leads, such as free wheeling, choke wires, etc., which pick up motor noise and reradiate it into the car. Free wheeling cables should be grounded at the point at which they go through the fire wall of the car. In extreme cases it has been found necessary to ground the steering column.

I.F. ALIGNMENT

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-72 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-69 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 KC. Adjust series pad rocking gang condenser to and fro at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis (see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

Make certain that the instrument panel has a ground connection to the frame of the car.

NOTE—Where ignition coils are mounted in motor compartments a .5 mfd cond (148-1 or 148-3) connected between primary coil terminal and receiver mounting bolt will often reduce motor noise.

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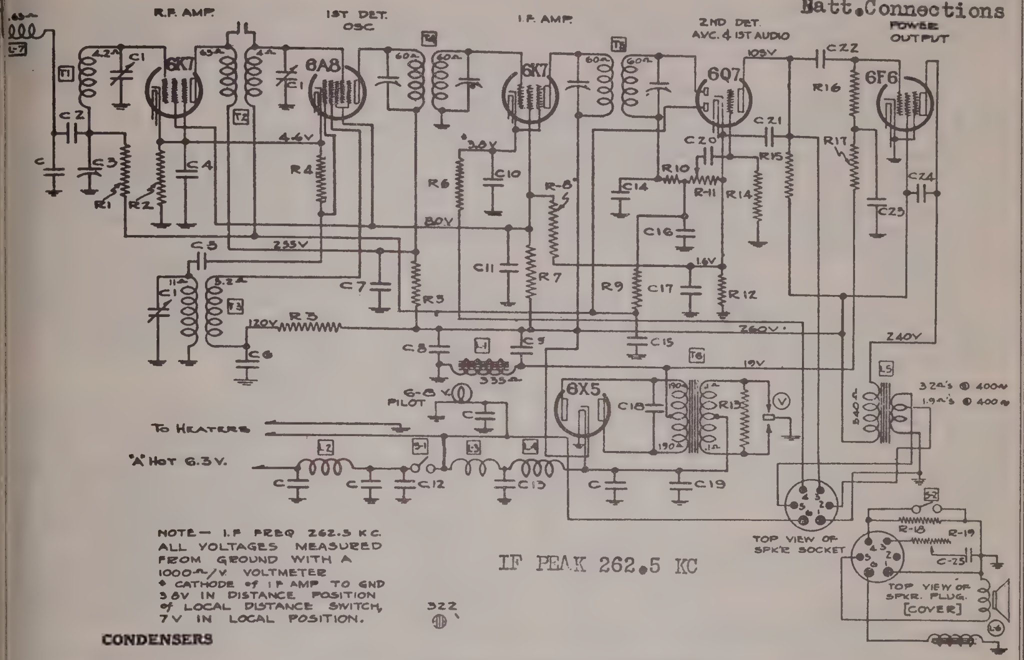
MODEL D744(1937)
Schematic, Voltage
Socket, Trimmers
Batt. Connections



NOTE— I.F FREQ 262.5 KC.
ALL VOLTAGES MEASURED FROM GROUND WITH A 1000-Ω/V. VOLTMETER
* CATHODE of I.F AMP TO GND 3.6V IN DISTANCE POSITION of LOCAL DISTANCE SWITCH, 7V IN LOCAL POSITION.

IF PEAK 262.5 KC

CONDENSERS

	Spark Plate
102-45	3 Gang Condenser
129-73	.002 Mica - MW-W - 10%
124-36	Series Pad
116-20	.1 x 200 v. - 20%
129-12	.00025 Mica - MT - 20%
116-19	.1 x 400 - 20%
116-19	.1 x 400 - 20%
119-34	8. mfd. - 350 W v.
119-34	4 mfd. 350 W v.
116-19	.05 x 200 v. - 20%
116-20	.25 x 200 v. - 20%
100-31	.5 x 120 v. - 10-50% - Braid leads
100-31	.5 x 120 v. - 10-50%
129-5	.0001 Ceramicon - 20%
116-19	.05 x 200 v. - 20%
129-5	.0001 Ceramicon - 20%
116-20	.02 x 200 - 20%
100-36	.01 x 1400 v. - 20% - 10% "A"
100-31	.5 x 120 v. - 10% - 50%
116-20	.02 x 200 - 20%
129-5	.0001 Ceramicon - 20%
100-55	.01 x 400 - 25%
100-48	.25 x 200 - 20%
100-54	.006 x 600 - 25%
100-11	.01 x 400 - 25%

C11, C17, C20 All in Block 116-20
C6, C10, C15 All in Block 116-19

RESISTORS

130-141	250M ohm - 1/3 w. Insulated
130-54	500 ohm - 1/3 w.
130-138	50M ohm - 1/2 w. Insulated
130-52	50M ohm - 1/3 w.
130-137	1500 ohm - 1/3 w. Insulated
130-154	1000 ohm - 1/3 w. Insulated
130-143	30M ohm - 1.2 w.
130-139	40M ohm - 1/3 w. Insulated
130-19	1 meg - 1/3 w.
130-162	50M ohm - 1/3 w. Insulated
101-73	250M ohm - Volume Control
130-153	700 ohm - 1/3 w.
130-84	200 ohm - 1/3 w.

R14	130-19	1 meg ohm - 1/3 w.
R15	130-11	250M ohm - 1/3 w.
R16	130-5	300M ohm - 1/3 w.
R17	130-11	250M ohm - 1/3 w.
R18	130-161	4000 ohm - 1/3 w. Insulated
R19	101-45	Tone Control 1 Meg ohm.

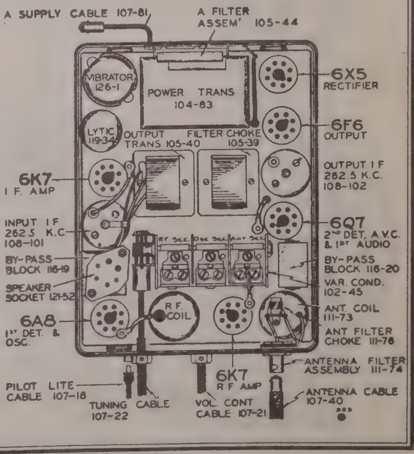
PARTS

L7	111-76	Antenna Filter Choke Assem
T1	111-73	Antenna Coil Complete
T2	109-36	R.F. Coil Complete
T3	110-59	Oscillator Coil Complete
T4	108-101	I.F. Input
T5	108-102	I.F. Output
T6	104-83	Power Transformer
L1	105-39	Filter Choke (335 ohms)
L2	105-26	"A" Choke
L3	105-24	"A" Choke
L4	105-19	"A" Choke
L5	105-40	Output transformer
L6	114-62	Speaker. Dynamic
S1		Switch on Volume Control
S2	125-28	Sensitivity switch.

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 148-3, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.



WESTERN AUTO SUPPLY CO.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

DESCRIPTION

Model No. 667 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 262.5 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

CITY-COUNTRY SWITCH

This switch is located on the chassis cover.

City—While driving in the city or close to broadcasting stations, it is best to turn the knob to the "city" position for least noise.

Country—When driving in the country, or when listening to distant stations, best results are obtained with the knob turned to the "country" position. In this position the sensitivity is at a maximum.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6F6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

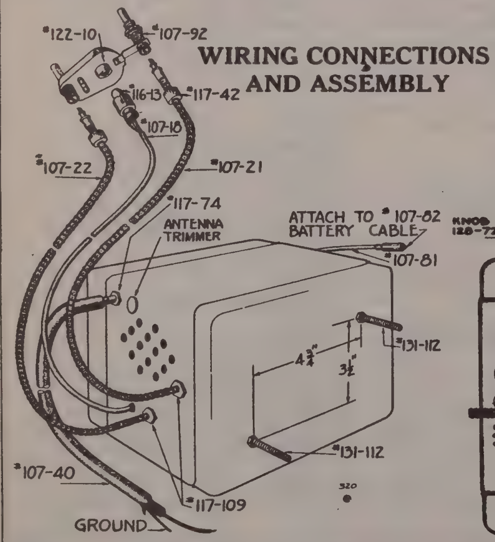
I.F. ALIGNMENT: (262.5 K.C.)

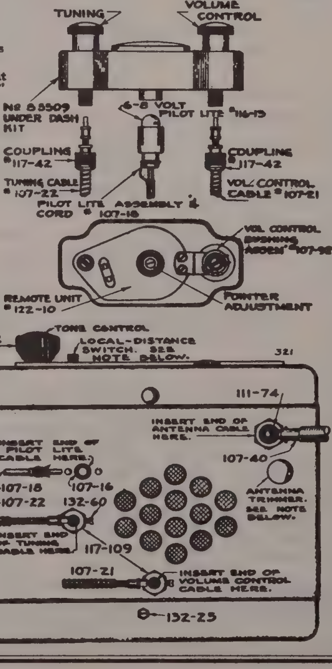
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 262.5 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-102 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-101 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view, Fig. 2).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view, Fig. 2).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad in the antenna circuit, rocking gang condenser to and fro at the same time adjusting series pad for maximum gain. This pad is mounted on the side of the antenna can.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

WIRING CONNECTIONS AND ASSEMBLY




TUNING
VOLUME CONTROL
Nº 83509 UNDER DASH KIT
6-8 VOLT PILOT LITE *116-13
COUPLING *117-42
COUPLING *117-42
TUNING CABLE *107-22
VOL. CONTROL CABLE *107-21
PILOT LITE ASSEMBLY & CORD *107-18
VOL. CONTROL BUSHING ASSEM *107-92
REMOTE UNIT *122-10
POINTER ADJUSTMENT
KNOB 128-72
TONE CONTROL
LOCAL-DISTANCE SWITCH. SEE NOTE BELOW.
321
111-74
INSERT END OF ANTENNA CABLE HERE.
107-40
INSERT END OF PILOT LITE CABLE HERE.
107-18
107-16
107-22
132-60
ANTENNA TRIMMER. SEE NOTE BELOW.
INSERT END OF TUNING CABLE HERE.
117-109
107-21
INSERT END OF VOLUME CONTROL CABLE HERE.
132-25

ADJUSTING ANTENNA TRIMMER

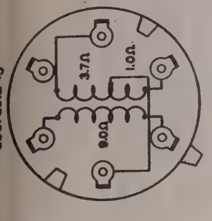
Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. See Fig. 1 for location of this trimmer.

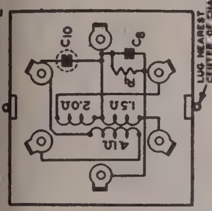
DIAL ADJUSTMENT

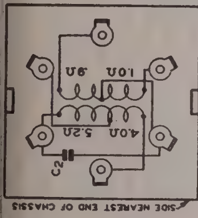
Tune set to some station of a known frequency (between 800 and 1200 K.C.), hold selector knob, then remove pilot light assembly from back of remote head and with a screw driver adjust the slotted screw through this opening and in this way

MODEL D745 (1936)
Schematic, Socket
Trimmers, Coils

WESTERN AUTO SUPPLY CO.







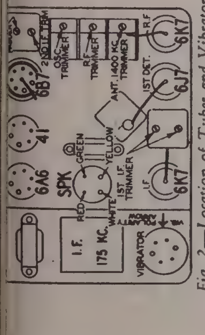


Fig. 2—Location of Tubes and Vibrator

Power Consumption - - 7.8 Amperes at 6.3 Volts

Power Output - - 6 Watts Undistorted at 6.3 Volts

Sensitivity - - - 1.0 Microvolt Absolute
(LD switch in distant position)

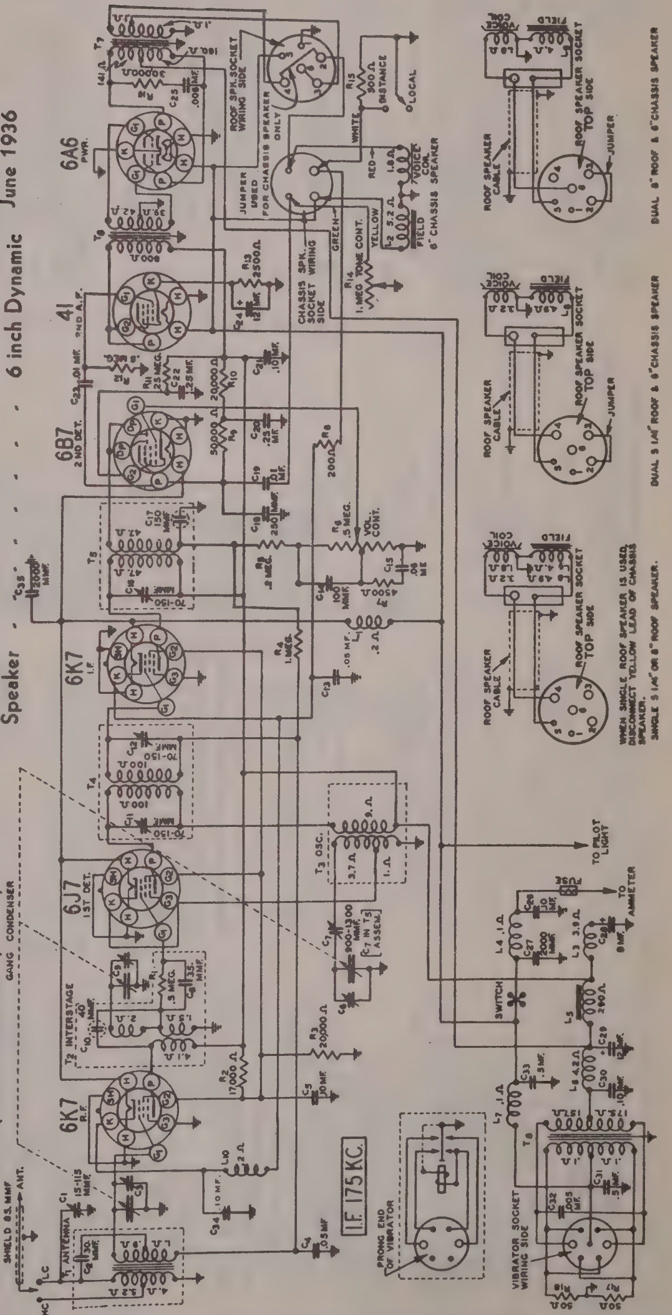
Selectivity - - 45 KC Broad at 1000 Times Signal

Tuning Frequency Range - - - 530 to 1575 KC

Intermediate Frequency - - - - - 175 KC

Speaker - - - - - 6 inch Dynamic

June 1936


6K7 R.F.
6J7 1ST DET.
6K7 I.F.
6B7 2ND DET.
41 2ND A.F.
6A6 PWR.
ANT.
SHIELD 85 MMF
GANG CONDENSER
T1 ANTENNA
T2 INTERSTAGE
T3 OSC.
T4
T5
T6
T7
I.F. 175 KC.
VOL. CONT.
TONE CONT.
DISTANCE
LOCAL
ROOF SPK. SOCKET WIRING SIDE
FOR CHASSIS SPEAKER ONLY
JUMPER USED FOR CHASSIS SPEAKER
CHASSIS SPK. SOCKET WIRING SIDE
VOICE COIL
FIELD
6" CHASSIS SPEAKER
TO PILOT LIGHT
TO AMMETER
FUSE
SWITCH
PRONG END OF VIBRATOR
VIBRATOR SOCKET WIRING SIDE
ROOF SPEAKER CABLE
ROOF SPEAKER SOCKET TOP SIDE
JUMPER
DUAL 8" ROOF & 6" CHASSIS SPEAKER
DUAL 5 1/4" ROOF & 6" CHASSIS SPEAKER
WHEN SINGLE ROOF SPEAKER IS USED, DISCONNECT YELLOW LEAD OF CHASSIS SPEAKER.
SINGLE 5 1/4" OR 8" ROOF SPEAKER.

WESTERN AUTO SUPPLY CO.

6 Tube Synchronous Vibrator Automobile Radio

VOLTAGES AT SOCKETS
Antenna Plug Withdrawn
L-D Switch in Distant Position
Battery 6.3 Volts under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.6	260	110	3
6J7	1st Det.	5.6	260	110	
6K7	I.F.	5.6	260	110	3
6B7	2nd Det.	5.6	55	50	
41	2nd A.F.	5.7	255	55	30
6A6	Pwr.	5.7	275		

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the R.F. interstage section of the tuning condenser. (See Fig. 2 for location of this section.)

Connect the ground lead of the signal generator to the chassis ground.

Turn the Local-Distance switch to the Distance position and keep it in this position for all adjustments.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1575 KC Adjustment

Set the signal generator for 1575 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used, connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.) The antenna plug must be correctly inserted, dependent on the capacity of the antenna used.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6K7 R.F. tube.

Turn the tuning condenser rotor until maximum output is obtained. Then turn the tuning condenser rotor back and forth, at the same time adjusting the 600-KC padder (see Fig. 2) until the peak of greatest intensity is obtained.

Re-connect the output of the signal generator to the shielded antenna lead through a 150 mmf. condenser (1500 mmf. if antenna is high capacity).

Adjust the 600 KC antenna trimmer to maximum. This trimmer is reached from the outside of the case

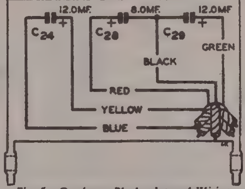


Fig. 5—Condenser Block—Internal Wiring

Adjusting Antenna 600 KC Trimmer

After the receiver is installed and the car antenna is connected, it will be necessary to adjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

As shown in this illustration, the antenna plug is inserted in one of two ways, depending on whether the car has a high or low capacity antenna. Full instructions are in the installation manual packed with each radio.

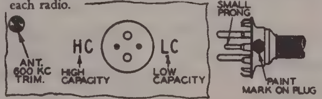


Fig. 3—Antenna Plug Insertion

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Replacement Parts

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the series number and this large letter

Part No.	Description	List Price
P-3A223	6J7 Tube Socket	$0.15
P-3A211	6K7 Tube Socket	.15
P-3A208	6A6 Tube Socket	.15
P-3A116	41 Tube Socket	.10
P-3A128	6B7 Tube Socket	.15
P-3A229	6 Prong Socket (External Speaker)	.15
P-3A226	Antenna Socket	.10
P-3A228	Vibrator Socket	.15
P-3A231	4 Prong Socket (Internal Speaker)	.10

SPEAKER

Part No.	Description	List Price
P-12A242	6" Dynamic Speaker	$4.35

Part No.	Code	Description	List Price
P-9A588	L4	"A" Line Reactor	.20
P-52X46	L5	"B" Reactor	.80
P-9A585	L6	"B" Reactor	.30
P-9A587	L7	Vibrator Reactor	.50
P-9A614	L10	Filament Choke	.20

RESISTORS

CARBON

Part No.	Code	Resistance	Wattage	List Price
P-A94504	R1	500,000 Ohms	0.2	$0.15
P-C94173	R2	17,000 Ohms	1.0	.15
P-B94203	R3	20,000 Ohms	0.5	.15
P-A95106	R4	1 Megohm	0.2	.10
P-A96204	R5	200,000 Ohms	0.2	.10
P-A94452	R7	4,500 Ohms	0.2	.15
P-A94201	R8	200 Ohms	0.2	.15
P-B95503	R9	50,000 Ohms	0.5	.10
P-A95203	R10	20,000 Ohms	0.2	.10
P-A95254	R11	250,000 Ohms	0.2	.10
P-A95504	R12	500,000 Ohms	0.2	.10
P-B94252	R13	2,500 Ohms	0.5	.15
P-B95101	R15	500 Ohms	0.5	.10
P-C95303	R16	30,000 Ohms	1.0	.10
P-[illegible]	R17	[illegible] Ohms	0.5	.15
P-[illegible]	R18	50 Ohms	0.5	.15

VARIABLE

Part No.	Code	Resistance	Description	List Price
P-36X217	R6	500,000 Ohms	Volume Control & Switch	1.00
P-40X212	R14	1 Megohm	Tone Control	.70

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	List Price
P-46X80	C4	.05 mf.	180	$0.15
P-46X181	C5	.10 mf.	240	.15
P-46X80	C13	.05 mf.	180	.15
[illegible]X186	C15	[illegible] mf.	180	.15
P-46X161	C19	.01 mf.	600	.15
P-46X189	C20	.25 mf.	360	.30
P-46X105	C21	.10 mf.	360	.20
P-46X143	C22	.25 mf.	360	.30
P-46X120	C23	.01 mf.	360	.15
P-46X101	C25	.006 mf.	600	.15
P-46X98	C26	.10 mf.	180	.20
P-46X106	C30	.10 mf.	360	.20
P-46X136	C31	.5 mf.	180	.40
P-46X183	C32	.0056 mf.	1,600	.20
P-46X136	C33	.5 mf.	180	.40
P-46X98	C34	.10 mf.	180	.20

ELECTROLYTIC

Part No.	Code	Capacitance	Voltage	Description	List Price
P-45X211	C24 C28 C29	12 mf. 8 mf. 12 mf.	25 450 450	Electrolytic Block	2.70

MOLDED

Part No.	Code	Capacitance	List Price
P-47X66	C2	30 mmf.	.15
P-47X53	C8	36 mmf.	.10
P-47X57	C14	100 mmf.	.10
P-47X65	C18	250 mmf.	.15
P-47X41	C27	2,000 mmf.	.20
P-47X41	C35	2,000 mmf.	.20

TRIMMER

Part No.	Code	Description	List Price
P-17A48	C1	25-115 mmf. Antenna Trimmer	.20
	C3	Antenna Trimmer—Part of Gang Condenser	
	C6	Oscillator Trimmer—Part of Gang Condenser	
P-17A46	C7 C16	900-1,300 mmf. 600 KC Oscillator Padding Cond. 70-150 mmf. 2nd I. F. Primary Trimmer	.55
	C9	Interstage Trimmer Part of Gang Condenser	
P-17A33	C11 C12	70-150 mmf. 70-150 mmf. } 1st I. F. Trimmer	.40

MISCELLANEOUS

Part No.	Code	Description	List Price
	C10	40 mmf. Integral Part of Interstage Transformer Assembly	
	C17	150 mmf. Integral Part of 2nd I. F. Transformer Assembly	
P-16A51		Three Section Gang Condenser Assembly complete with Drive Gears	$4.50

Part No.	Description	List Price
P-19A26	Vibrator Unit	$4.10
Specify Name and Model of Receiver	Chassis Case Only	3.80
	Chassis Case Cover Only	3.85
	Spring Clamp Button	.10
	Tone Control Knob	.10
	Local-Distance Switch Knob	.10
	8-32 x 3/16" Headless Cup Point Set Screw ... Doz.	.15
P-30X14	Grid Clip only—Glass Tube	.10
P-30X44	Grid Clip only—Metal Tube	.10
P-32X30	Tube Shield Base	.10
P-32X58	Tube Shield	.15
P-2A54	Local-Distance Switch	.40

TRANSFORMERS AND COILS

Part No.	Code	Description	List Price
P-9A580	T1	Antenna Transformer & Can Assembly	$1.60
P-9A581	T2	Interstage Transformer & Can Assembly	1.55
P-9A582	T3	Oscillator Coil & Can Assembly	.85
P-9A583	T4	1st I. F. Coil & Can Assembly	1.45
P-9A584	T5	2nd I. F. Coil & Can Assembly	1.80
P-50X32	T6	Input Transformer	1.30
P-51X43	T7	Output Transformer	1.60
P-53X124	T8	Power Transformer	3.10
P-9A586	L1 L3	Filament Reactor R.F. "B" Reactor } One Assembly	.55

CABLE AND FLEXIBLE SHAFT ASSEMBLIES

Part No.	Quan. Used	Description	List Price
P-18A40	2	20" Volume Control or Tuning Control Flexible Drive Shaft ... ea.	$1.10
P-18A42	2	25" Volume Control or Tuning Control Flexible Drive Shaft ... ea.	1.30
P-18A44	2	36" Volume Control or Tuning Control Flexible Drive Shaft ... ea.	1.65
P-13X252	1	Pilot Light Cable less Lamp	.65
P-13X253	1	48" Antenna Cable & Plug	.95
P-13X227	1	Battery Cable (long section with fuse receptacle)	.35
P-13X234	1	"A" Cable—Short Section Connected to Chassis (Part of Chassis Assembly)	.35

MOUNTING BOLT ASSEMBLY

Part No.	Quan. Used	Description	List Price
P-20X59	3	Double End Hex Bolts for Mounting Chassis to Dash ... ea.	.10
	3	5/16"—18 Spring Locknut for above Mounting Assembly ... doz.	.10
P-19X18	6	Flat Washers for above Mounting Assembly ... doz.	.15
	6	5/16"—18 Hex Nuts for above Mounting Assembly ... doz.	.15
	1	5/16" Shakeproof Lockwasher to Ground Chassis Case to Metal Dash Surface on Engine Side ... doz.	.10

MISCELLANEOUS MOUNTING ITEMS

Part No.	Quan. Used	Description	List Price
P-7A32	1	Pilot Light Bulb	.20
P-16X14	1	20 Ampere Fuse	.10
P-16X3	1	Fuse Shield	.10
P-21A6	1	Distributor Suppressor	.35
P-48X27	1	Generator Condenser	.45
P-21A5	1	Choke Condenser Unit (Not Shipped with Set)	1.50
P-21A7		Spark Plug Suppressors (Not Shipped with Set) ... ea.	.35

CONTROL HEAD AND PLATE ASSEMBLY

Part No.	Quan. Used	Description	List Price
*P-20A27	1	No. 4 Control Head only with ⅜" Hex Nut	3.00
*P-20A28	1	Volume Control Fitting complete with Retaining Spring, ⅜" Hex Nut and Lock Washer	.25
*	1	Dial Scale (Specify Name and Model of Radio)	.10
*P-15X46	1	Pointer	.10
*	1	Pointer Screw 3-48 x 5/16" ... doz.	.10
†P-17X13	1	Dial Crystal	.25
†		Control Knobs—Specify Car, Year and Model ... ea.	.25

NOTE: Prices of Instrument Panel Plate Kits are shown in Chart on Page 5.

* Shipped with each Set
†Shipped with Panel Kit

ROOF MOUNTING SPEAKER KITS

1936 BUICK, CHEVROLET, PONTIAC, OLDSMOBILE

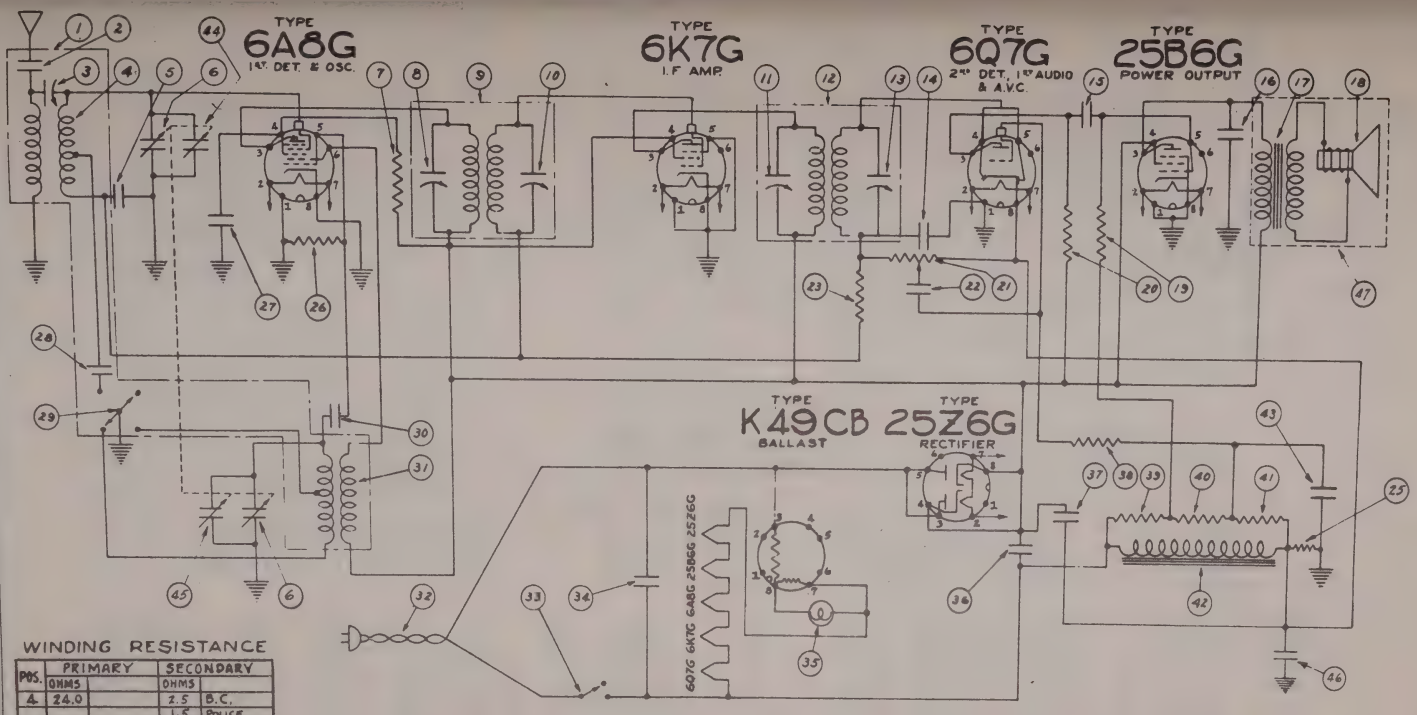
Part No.	Description	List Price
P-21A27	SPEAKER KIT ASSEMBLY COMPLETE	$5.35
	Includes	
P-12A234	5¼" Dynamic Speaker	3.05
P-23A56	Mounting Kit—Includes Trim Ring, Speaker Housing, Self Tapping Screws & Clamp Springs	2.00
P-13X248	Speaker Cable Assembly Complete	1.06
P-21A28	SPEAKER KIT ASSEMBLY COMPLETE	9.65
	Includes	
P-12A233	8" Dynamic Speaker	6.65
P-23A57	Mounting Kit—Includes Trim Ring and Self Tapping Screws	3.80
P-13X248	Speaker Cable Assembly Complete	1.06

1936 FORD—STANDARD AND DELUXE

Part No.	Description	List Price
P-21A29	SPEAKER KIT ASSEMBLY COMPLETE	4.15
	Includes	
P-12A234	5¼" Dynamic Speaker	3.05
P-23A58	Mounting Kit—Includes Hex Nuts, Lockwashers and Bolts	.40
P-13X248	Speaker Cable Assembly Complete	1.05

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR120
Schematic,Voltage



INT. FREQ. 455 K.C.

WINDING RESISTANCE

POS.	PRIMARY OHMS		SECONDARY OHMS	
4	24.0		2.5	B.C.
			1.5	POLICE
9	9.5		9.5	
12	18.5		18.5	
17	155			
18	4.5			
31	3.0		4.0	B.C.
			2.0	POLICE
42	375			

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO	PLATE	PIN NO.	SCREEN	PIN NO.	BIAS
6A8G	1ST. DET. & OSC.	6.3	2 To 7	98	1 To 3	48	1 To 4	
6K7G	I. F. AMPLIFIER	6.3	2 To 7	98	1 To 3	98	1 To 4	
6Q7G	2ND. DET., 1ST. AUD., A.V.C.	6.3	2 To 7	52	1 To 3			-1.2
25B6G	POWER OUTPUT	23.5	2 To 7	90	1 To 3	98	1 To 4	
25Z6G	RECTIFIER	23.5	2 To 7					
K49C	BALLAST							

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes .... 1 #6A8G, 1 #6K7G, 1 #6Q7G, 1 #25B6G, 1 #25Z6G, 1 #K49CB (Ballast) - Total 6
Power Supply Characteristics 105-125 volts D.C., or 105-125 volts, 50-60 cycle A.C.
Power Consumption .... 48 Watts
Total Power Output .... 2.3 Watts
Undistorted Power Output .... 1.35 Watts
Tuning Ranges .... (Broadcast Band 540-1500 KC.
(Short-wave Band 1500-3000 KC.
Line-Up Frequencies .... I.F. 455 KC., 1400 KC.

MODEL WR120
Alignment,Parts

WESTINGHOUSE ELEC. SUPPLY CO.

GENERAL DESCRIPTION

This model is a five-tube (plus a ballast tube), two-band superheterodyne receiver, designed to operate over the standard broadcast band, extending from 540 to 1500 KC., and a short-wave band extending from 1500 to 3000 KC.

The receiver uses a type 6A8G tube as a first detector-oscillator, a type 6K7G as an I.F. amplifier, a type 6Q7G as a second detector, A.V.C., and first audio, a type 25B6G as an output, a type 25Z6G as a rectifier and a K49CB as a ballast tube.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory reading with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position and wave-change switch to standard broadcast band.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measureable reading on the output meter when the test signal is applied to the grid of the type 6A8G first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four trimmer condensers on the top of the two I.F. coils (square housings) to maximum output.

ALIGNMENT OF OSCILLATOR AND R.F.

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the test oscillator and dial indicator to 1400 KC., and adjust the oscillator trimmer condenser (rear section of gang) to maximum output.

3. Apply the test signal to coil end of the antenna cable through a .0001 mfd. blocking condenser and adjust trimmer condenser (front section of gang) to maximum output.

4. Check sensitivity over the band.

5. Turn wave-change switch to the shortwave band and check the sensitivity over scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap which can be adjusted from the bottom without removing the receiver from the cabinet. This trimmer does not need to be adjusted unless there is code interference, in which case, adjustment is made to eliminate the undesired signal.

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	RC 95298	Composite coil	$ 2.35
2	CW 6-005	.005 mfd., 600 V. condenser	.15
3		Trimmer condenser - part of RC 95298	
4		Preselector coil - part of RC 95298	
5	SA 105327	.05 mfd., 200 V. dual condenser	.30
6	CG 9562	Variable condenser	3.00
7	RE 3333	33,000 ohm, 1/2 W. resistor	.10
8		Trimmer condenser - 80-200 mmf. - part of IC 95107	
9	IC 95107	1st I.F. coil - 455 KC.	1.50
10		Trimmer condenser - 80-200 mmf. - part of IC 95107	
11		Trimmer condenser - 35-130 mmf. - part of IC 95108	
12	IC 95108	2nd I.F. coil - 455 KC.	1.20
13		Trimmer condenser - 35-130 mmf. - part of IC 95108	
14	CM 956	.00025 mfd. mica condenser	.20
15	CW 6-005	.005 mfd., 600 V. condenser	.15
16	CW 6-005	.005 mfd., 600 V. condenser	.15
17	TR 9588	Output transformer	1.35
18	DM 9512	Diaphragm and coil assembly	1.50
19	RE 4743	470,000 ohm, 1/2 W. resistor	.10
20	RE 2243	220,000 ohm, 1/2 W. resistor	.10
21	VR 9549	Volume control	.80
22	CW 6-005	.005 mfd., 600 V. condenser	.15
23	RE 4743	470,000 ohm, 1/2 W. resistor	.10
25	RE 1003	10 ohm, 1/2 W. resistor	.10
26	RE 4733	47,000 ohm, 1/2 W. resistor	.10
27		.05 mfd., 200 V. dual condenser - part of SA 105327	
28	CW 6-005	.005 mfd., 600 V. condenser	.15
29	SW 9576	Wave-change switch	.35
30	CM 9513	.0001 mfd. mica condenser	.10
31		Oscillator coil assembly - part of RC 95298	
32	CB 9512	Line cable	.50
33		On-off switch - part of VR 9549	
34	CW 4-05	.05 mfd., 400 V. condenser	.15
35	LP 951	Dial lamp - 6-8 V.	.20
36	CE 9559	40 mfd., 150 V. electrolytic condenser	.75
37	CE 9560	30 mfd., 150 V. electrolytic condenser	.75
38	RE 4743	470,000 ohm, 1/2 W. resistor	.10
39	RE 4743	470,000 ohm, 1/2 W. resistor	.10
40	RE 4743	470,000 ohm, 1/2 W. resistor	.10
41	RE 6833	68,000 ohm, 1/2 W. resistor	.10
42		Field coil - part of SK 9567	
43	CW 2-25	.25 mfd., 200 V. condenser	.20
44		Trimmer condenser - part of CG 9562	
45		Trimmer condenser - part of CG 9562	
46	CW 2-10	.1 mfd., 200 V. condenser	.15
47	SK 9567	Speaker	4.00

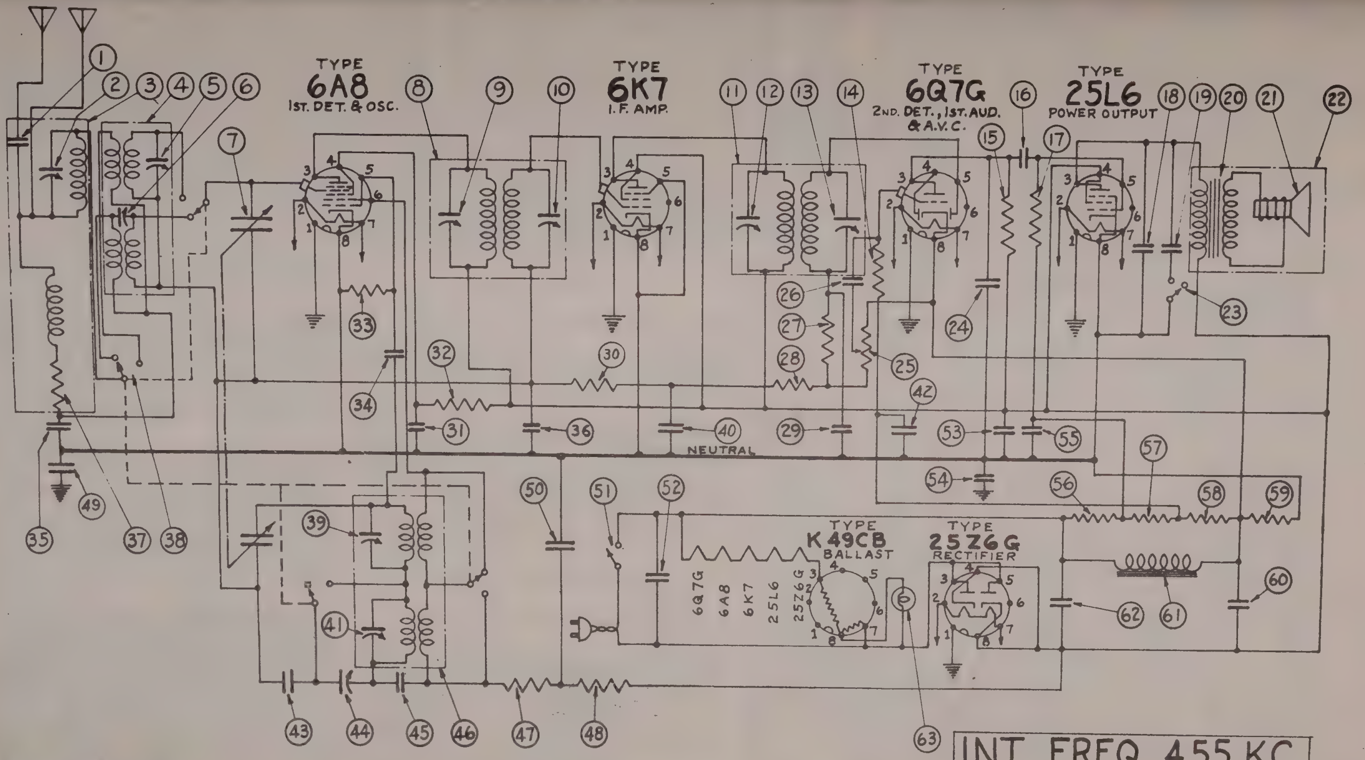
MISCELLANEOUS

Part #	Description of Parts	List Price
CV 95229	Celluloid cover for dial	.35
DS 9589	Celluloid dial scale	.70
FA 9519	Silk grill cloth	.15
FP 101869	Felt foot (4 used)	.05
IS 95216	Rubber pulley on drive shaft	.05
KA 9583	Cabinet	
KL 105344	"Hank" antenna cable	.20
KN 95127	Knob (3 used)	.12
NT 958	3/8" Pal nut for volume and switch	.05
PL 95112	Dial supporting plate	.25
PR 97160	Cord for dial drive ... Per Yard	.05
PU 9529	Dial drive pulley assembly	.25
SI 9571	Dial indicator pointer	.20
SP 9551	Spring for dial drive cord	.05
SP 9553	Spring clip for celluloid dial cover	.05
SO 956	Octal base tube socket (6 used)	.20
SO 9529	Dial light socket assembly	.15
TU 95170	Insulation tube for electrolytic condenser	.05

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR140
Schematic, Voltage



INT. FREQ. 455 K.C.

WINDING RESISTANCE

POS.	PRIMARY OHMS		SECONDARY OHMS	
3	10.0		10.0	
4	34.5	B.C.	4.0	B.C.
	0.5	S.W.	0.2	S.W.
8	9.0		9.0	
11	9.0		9.0	
20	155		0.2	
21			4.5	
46	1.0	B.C.	4.0	B.C.
	1.0	S.W.	0.5	S.W.
61	375			

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes .	1 #6A8, 1 #6K7, 1 #6Q7G, 1 #25L6, 1 #25Z6G, 1 #K49CB - Total 6
Power Supply Characteristics	105-125 V., DC. or 105-125 V., 50-60 cycle A.C.
Power Consumption	45 Watts
Total Power Output	2.2 Watts
Undistorted Output	1.2 Watts
Tuning Ranges	(Broadcast Band 535- 1,720 KC. (Short-wave Band 5,800-17,500 KC.
Line-Up Frequencies	I.F. 455 KC., 1500 KC., 600 KC., 15,000 KC.

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO.	PLATE	PIN. NO.	SCREEN	PIN. NO.	OSC. PLATE	CATH
6A8	1ST DET. & OSC.	6.1	2 TO 7	105	3 TO 8	45	4 TO 8	97	—
6K7	I F AMP.	5.9	2 TO 7	105	3 TO 8	105	4 TO 8	—	—
6Q7G	2ND DET. 1ST AUD. & A.V.C.	6.3	2 TO 7	45	3 TO 8	—	—	—	0.7
25L6	POWER OUTPUT	21.2	2 TO 7	98	3 TO 8	105	4 TO 8	—	—
25Z6G	RECTIFIER	22.3	2 TO 7	—	—	—	—	—	105
K49CB	BALLAST	—	—	—	—	—	—	—	—

WESTINGHOUSE ELEC. SUPPLY CO.

GENERAL DESCRIPTION

This model is a five-tube (plus ballast tube), A.C.-D.C., two-band superheterodyne receiver designed to operate over the standard broadcast band, extending from 535-1720 KC., and a short-wave band extending from 5800-17,500 KC.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory readings with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position, the wave-change switch to standard broadcast band and the dial pointer to approximately 600 KC.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four I.F. trimmer condensers underneath the chassis (under the square coil housings) to maximum output.

BROADCAST BAND

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the test oscillator and dial indicator at 1500 KC., and adjust the oscillator trimmer (the rear trimmer on the coil fastened to the back plate of the chassis).

3. Set the test oscillator and dial pointer to 600 KC.

4. Adjust the oscillator lag condenser (on the base near the antenna coil) for maximum output, at the same time rocking the gang condenser.

5. Reset test oscillator and dial pointer to 1500 KC., and recheck operation #2.

6. Connect the test oscillator to the blue antenna lead through a .0002 mfd. condenser and adjust the antenna trimmer (the bottom condenser on the coil on the top of the chassis).

7. Check sensitivity and calibration over the scale.

ALIGNMENT OF THE SHORT-WAVE BAND

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 15,000 KC., and adjust the short-wave oscillator trimmer (the trimmer on the inside end of the coil on the back plate of the chassis). Two positions may be found. Use the one with the least capacity, that is, with the trimmer screw farthest out.

3. Adjust the short-wave antenna trimmer (the top condenser on the coil on the top of the chassis).

4. Check sensitivity and calibration over the scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap (the upright coil under the chassis) which is adjusted to eliminate a signal at the I.F. frequency (455 KC.) applied to the antenna. If there is code interference which is known to originate near the 455 KC. channel, this trimmer may be adjusted to minimize the undesired signal.

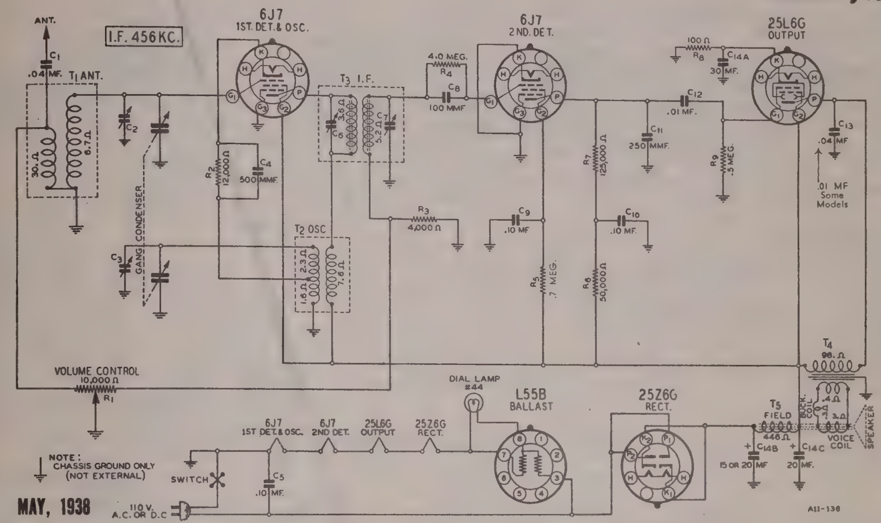
BA 9525	Speaker baffle	$ .05
CV 954	Tube shield	.10
CV 95232	1st I.F. coil cover	.25
CV 95233	2nd I.F. coil cover	.25
CV 95261	Base plate	1.25
DS 9585	Dial scale	1.60
FP 108003	Felt knob washer	.05
IS 95216	Rubber drive bushing	.05
KA 9593	Cabinet	
KN 95128	Knob - small (push-on type) .	.12
KN 95129	Knob - large (push-on type) .	.12
KN 95150	Knob - small (set screw type)	.12
KN 95151	Knob - large (set screw type)	.12
PL 95115	Escutcheon dial plate	1.50
PL 95128	Dial supporting plate	.30
PR 97160	Dial drive cord Per Yard	.05
PU 9544	Dial drive pulley	.40
SC 953	Felt foot and mounting screw	.05
SH 9550	Dial drive shaft	.20
SI 9575	Dial pointer	.20
SO 956	Octal tube socket (5 used) ..	.20
SO 9539	Dial lamp socket	.35
SP 9551	Dial cord spring	.05

PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1		.00005 mfd. mica condenser - part of RC 95296	$
2		Trimmer condenser 100-200 mmf. - part of RC 95296	
3	RC 95296	Trap coil assembly	1.25
4	RC 95356	Preselector coil assembly	1.60
5		Trimmer condenser 4-25 mmf. - part of RC 95356	
6		Trimmer condenser 4-25 mmf. - part of RC 95356	
7	CG 9565	Gang condenser	3.75
8	IC 95109	1st I.F. coil - 455 KC.	1.20
9		Trimmer condenser - part of IC 95109	
10		Trimmer condenser - part of IC 95109	
11	IC 95110	2nd I.F. coil - 455 KC.	1.20
12		Trimmer condenser - part of IC 95110	
13		Trimmer condenser - part of IC 95110	
14	RE 1053	1 meg., 1/2 W. resistor	.10
15	RE 2243	220,000 ohm, 1/2 W. resistor	.10
16	CW 6-005	.005 mfd., 600 V. condenser	.15
17	RE 4743	470,000 ohm, 1/2 W. resistor	.10
18	CW 4-01	.01 mfd., 400 V. condenser	.15
19	CW 2-10	.1 mfd., 200 V. condenser	.15
20	TR 9588	Output transformer	2.00
21	DM 9537	Speaker diaphragm	1.75
22	SK 9596	Speaker	.55
23	SW 9595	Tone control	.15
24	CW 6-001	.001 mfd., 600 V. condenser	.15
25	VR 9547	Volume control - .5 meg.	.80
26	CW 6-005	.005 mfd., 600 V. condenser	.15
27	RE 4733	47,000 ohm, 1/2 W. resistor	.10
28	RE 1053	1 meg., 1/2 W. resistor	.10
29	CM 9513	100 mmf. mica condenser	.10
30	CW 2-10	.1 mfd., 200 V. condenser	.15
31	CW 2-10	.1 mfd., 200 V. condenser	.15
32	RE 3933	39,000 ohm, 1/2 W. resistor	.10
33	RE 4733	47,000 ohm, 1/2 W. resistor	.10
34	CM 9513	100 mmf. mica condenser	.10
35	CW 4-01	.01 mfd., 400 V. condenser	.15
36	CW 2-05	.05 mfd., 200 V. condenser	.15
37		10,000 ohm, 1/2 W. resistor - part of RC 95296	
38	SW 9574	Wave-change switch	.70
39		Trimmer condenser 4-35 mmf. - part of RC 95301	
40	CW 2-10	.1 mfd., 200 V. condenser	.15
41		Trimmer condenser 4-35 mmf. - part of RC 95301	
42	CW 2-10	.1 mfd., 200 V. condenser	.15
43	CM 959	2000 mmf. mica condenser	.25
44	CS 9585	Oscillator series (lag) condenser - 225-700 mmf.	.35
45	CW 6-005	.005 mfd., 600 V. condenser	.15
46	RC 95301	Oscillator coil assembly	1.50
47	RE 2223	2200 ohm, 1/2 W. resistor	.10
48	RE 2223	2200 ohm, 1/2 W. resistor	.10
49	CW 6-10	.1 mfd., 600 V. condenser	.15
50	CE 9575	8 mfd., 150 V. electrolytic condenser	.70
51		On-off switch - part of VR 9547	
52	CW 6-10	.1 mfd., 600 V. condenser	.15
53	CW 2-10	.1 mfd., 200 V. condenser	.15
54	CW 6-10	.1 mfd., 600 V. condenser	.15
55	CW 2-25	.25 mfd., 200 V. condenser	.20
56	RE 8243	820,000 ohm, 1/2 W. resistor	.10
57	RE 2243	220,000 ohm, 1/2 W. resistor	.10
58	RE 3333	33,000 ohm, 1/2 W. resistor	.10
59	RE 1003	10 ohm, 1/2 W. resistor	.10
60	CE 9574	30 mfd., 150 V. electrolytic condenser	.90
61		Speaker field (not serviced)	
62	CE 9557	40 mfd., 150 V. electrolytic condenser	1.00
63	LP 951	Dial lamp - 6-8 V., .2 Amp.	.20
64	RE 4723	4700 ohm, 1/2 W. resistor	.10
65	RE 1053	1 meg., 1/2 W. resistor	.10

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR150
Early,Late
Schematic,Voltage
Alignment,Socket
Trimmers,Notes



MAY, 1938

CIRCUIT

This radio, popularly known as an AC-DC set, is, as the name implies, built to operate from either a 117 volt AC or DC power supply.

An R.F. transformer with tuned secondary feeds into a 6J7 tube which functions as the 1st detector and oscillator. The oscillating circuit is resonant at 456 KC above the frequency to which the R.F. transformer secondary is tuned.

The output of this tube is fed through an iron core I.F. transformer into another 6J7 tube which functions as the 2nd detector.

The volume control is of the variable antenna input and I.F. gain type.

Resistance coupling is used between the 2nd detector and the output stage which uses a 25L6G tube.

A 25Z6G rectifier tube is used. For AC operation, the filter unit consists of the rectifier tube, filter condensers and the speaker field which serves as a choke. For DC operation, the rectifier tube acts as a low resistance series resistor.

The heaters of the 4 tubes and the ballast tube are in series across the line. The dial lamp is in parallel with one section of the ballast tube resistance.

CAUTION—The metal chassis is connected to one side of the line through the switch. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis is grounded, and the metal chassis comes in contact with an external ground, a line short circuit will result.

In any service work, therefore, on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid coming in contact with any ground.

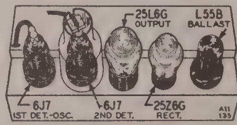
Pilot Lamp—Use ONLY a No. 44 dial lamp. This lamp draws .25 amperes at 6.3 volts.

25 Cycle Models—For 25 cycle operation, the 3 section electrolytic condenser is replaced by one with values as shown:

C14A	30 mf.	25	Dry Electrolytic— 60 CYCLE MODELS
C14B	15 or 20 mf.	200	
C14C	20 mf.	120	
C14A	30 mf.	25	Dry Electrolytic— 25-40 CYCLE MODELS
C14B	60 mf.	200	
C14C	30 mf.	200	

DISTORTION — Early Models — If distortion is encountered at medium or low volume levels in the early models, change the .5 megohm 2nd detector screen series resistor (R 5) to a .7 megohm resistor.

Speaker	5" Dynamic
Tuning Frequency Range	530 to 1730 KC
Sensitivity	180 Microvolts Average
Power Consumption	48 Watts (At 117 volts AC Supply)
Power Output	.8 Watts Undistorted
Selectivity	30 KC Broad at 100 times Signal
Intermediate Frequency	456 KC



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

SIGNAL GENERATOR				
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Illustration)
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	I.F. (C6) & (C7)
1730 KC	Antenna Lead	200 mmf.	Turn rotor to full open	Oscillator (C3)
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C2)

The following equipment is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas — .1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

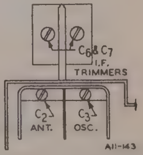
VOLTAGES AT SOCKETS FOR 117 VOLT AC LINE

See Note Below Regarding Voltages when Operated on DC
Volume Control Maximum—Antenna Lead Grounded—Readings taken with 1000 Ohm-per-volt Meter.

		Voltage Between Socket Prong and Ground (Unless Otherwise Indicated)							
TUBE	FUNCTION	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6J7	1st Det. & Osc.		6.3(1)	98	98			6.3(1)	6.0
6J7	2nd Det.		6.3(1)	10	13			6.3(1)	
25L6G	Output		24(1)	92	98			24(1)	5
25Z6G	Rectifier		24(1)	117(2)	125	117(2)		24(1)	125
L55B	Ballast			56.6(3)				56.6(3)	4.5(4)

(1) AC voltage across terminals 2 and 7.
(2) AC voltage to ground.
(3) AC voltage across terminals 3 and 7.
(4) AC voltage across terminals 7 and 8.

DC OPERATION—Filament and ballast tube voltages will be the same as AC (for 117 volt line). The plate, screen and bias voltages will be slightly lower than those shown above. When operated on DC, the rectifier tube acts as a low resistance series resistor with a drop of approximately 6 volts between plate and cathode.

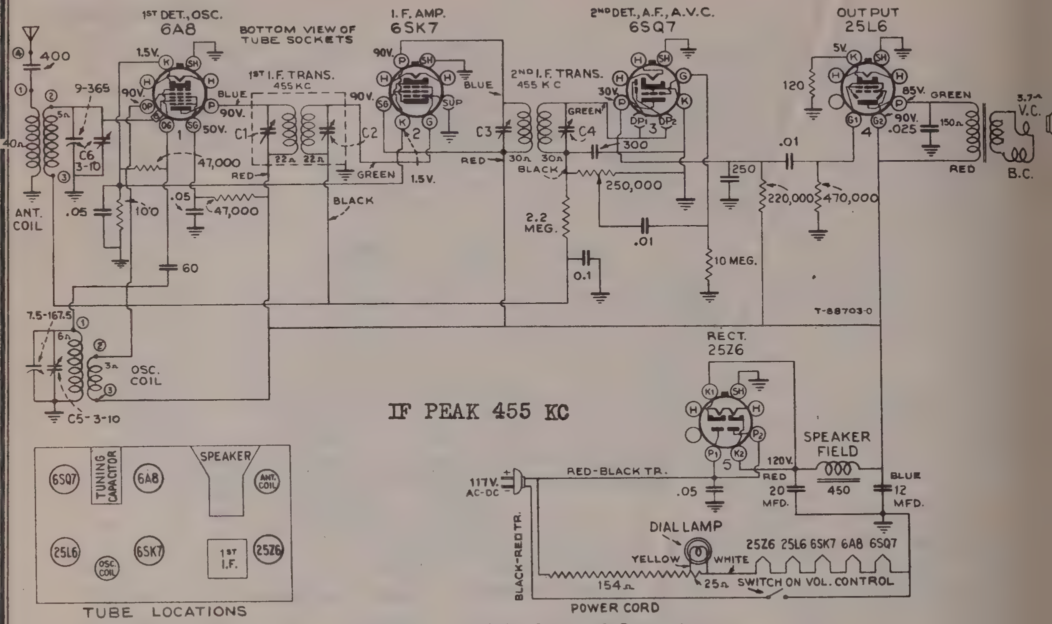


CAUTION—In any service work on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground.

MODELS WR165W,WR165I
WR165M

WESTINGHOUSE ELEC. SUPPLY CO.

Schematic,Voltage
Alignment,Socket
Trimmers,Lead Dres



Electrical and Mechanical Specifications

FREQUENCY RANGE	530-1,720 kc
INTERMEDIATE FREQUENCY	455 kc

WR-165-W, Molded plastic cabinet, walnut finish, with ivory dial and walnut knobs.

WR-165-I, Molded ivory plastic cabinet with ivory dial and red knobs.

WR-165-M, Solid mahogany wood cabinet, maple finish, with ivory dial and walnut knobs.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 50 watt
D-C Rating	105-125 volts, direct current, 50 watt

POWER OUTPUT (125 volt, 60 cycle supply)

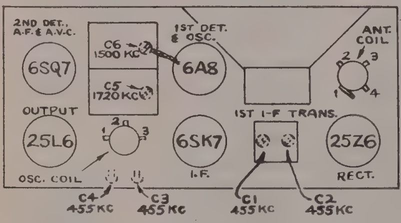
Undistorted	1.5 watt
Maximum	2.0 watt

LOUDSPEAKER

Type	4-inch Electrodynami
Dial Lamp (1)	Mazda 47, 6.3 volts, .15 am

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.



Trimmer Locations

Test-Oscillator.—Connect the low side of the test-oscillator to th receiver chassis, through a .01 mfd. capacitor, and keep the outpu as low as possible. The antenna should be rolled up and kept a least one foot from chassis during alignment.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	6A8 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal.	C6 (antenna)

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 6SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.
3. Keep leads away from adjusting screws to allow easy access.
4. Dress output plate lead along front apron and away from 6A8.
5. Dress parts at ends of chassis to clear cabinet bosses.

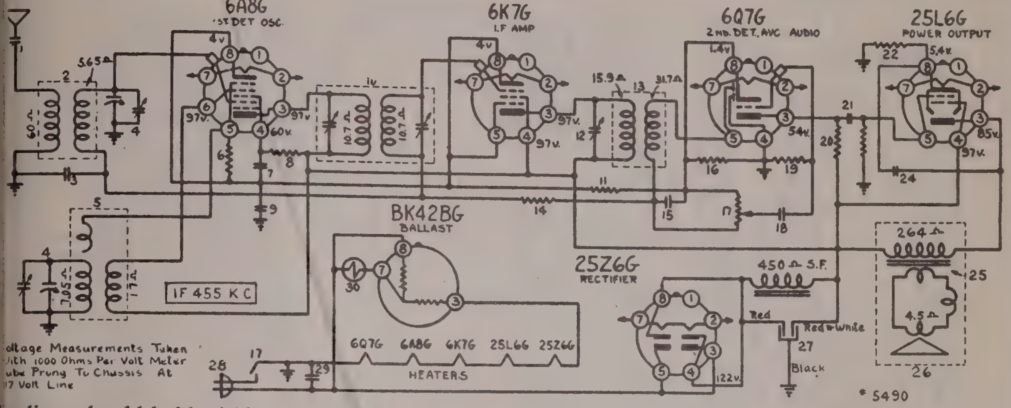
Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Resistor in Power Cord.—The power cord contains a resistor which becomes warm during operation.

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR152
MODEL WR166A
Schematics,Voltage

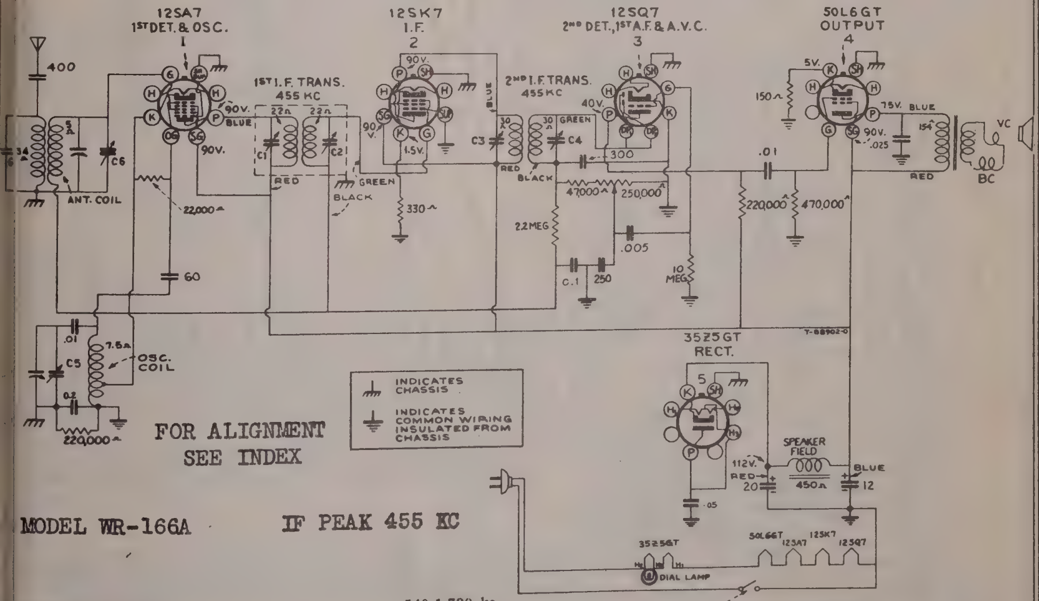


oltage Measurements Taken
ith 1000 Ohms Per Volt Meter
ube Prong To Chassis At
17 Volt Line

eadings should hold within ± 20%.

MODEL — W R 152

Power Supply	105—125 volts, DC or 50—60 cycles AC
Tuning Range	540—1720 K.C.
Line up Frequencies	I.F. 455 K.C., 1720 K.C., 1400 K.C.
Power Output	Two watts



FOR ALIGNMENT
SEE INDEX

MODEL WR-166A

IF PEAK 455 KC

requency Range	540-1,720 kc
termediate Frequency	455 kc
ower Output (125 volt, 60 cycle supply)	
ndistorted	0.5 watts
aximum	1.25 watts
udspeaker	
ype	4-inch Electrodynamic

Dial Lamp (1)	Mazda 47, 6.3 volts, .15 amp.
Power Supply Ratings	
A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

MODEL WR152
Alignment,Chassis
Socket,Trimmers,Parts

WESTINGHOUSE ELEC. SUPPLY CO.

FIG. No. 1

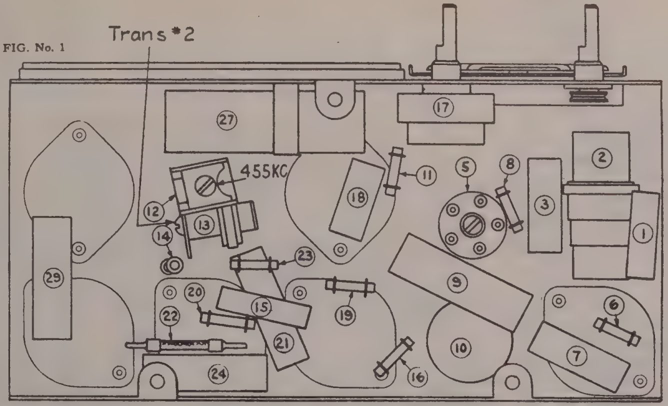


DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1	D3137	.001 mf.—400 v. Condenser	.15
2	D5497	Antenna Coil Assembly	1.00
3	D580	.05 mf.—200 v. Condenser	.15
4	D5485	Variable Condenser inc. Trimmers	1.75
5	D4875	Oscillator Coil Assembly	1.00
6	D631	50,000 ⅓ watt Resistor	.15
7	D580	.05 mf.—200 v. Condenser	.15
8	D617	20,000 ⅓ watt Resistor	.15
9	D2792	.2 mf.—200 v. Condenser	.15
10	D2972	1 St. I.F. Transformer Assembly	2.00
11	D2605	200 ohm ⅓ watt Resistor	.15
12	D1611	5—35 mmf. Trimmer Condenser	.15
13	D5004	2 nd. I.F. Transformer Assembly	1.00
14	D624	1 meg.⅓ watt Resistor	.15
15	D4810	.0005 mf.—400 v. Condenser	.15
16	D2689	100 ohm ⅓ watt Resistor	.15
17	D5486	½ meg. Volume Control and ON-OFF Switch	1.25
18	D565	.01 mf.—200 v. Condenser	.15
19	D624	1 meg. ⅓ watt Resistor	.15
20	D598	200,000 ohm ⅓ watt Resistor	.15
21	D2600	.02 mf.—600 v. Condenser	.15
22	D4813	120 ohm ½ watt Flexohm Resistor	.15
23	D615	½ meg. ⅓ watt Resistor	.15
24	D5500	.04 mf.—600 v. Condenser	.15
25	D5484T	Output Transformer	1.00
26	D5484	Speaker, 5 in., complete	3.00
27	D5499	16—20 mf. CCCW 150 WV Condenser	1.00
28	D1732	Line Cord and Plug	.25
29	D5500	.04 mf.—600 v. Condenser	.15
30	D530	Dial Lamp, .15 amp., 6.3 volt, Mazda No. 40	.10
	D3268	8 Prong Tube Socket	.10
	D4395	Drive Cable, 9 in.	.10
	D2908	Drive Cable Spring	.10
	D5488	Dial Scale	.30
	D5489	Pointer	.15
	D5493	Knob	.05
	D5503	Dial Escutcheon	.30
	D3333	Escutcheon Screws, set of 4	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Alinement Procedure

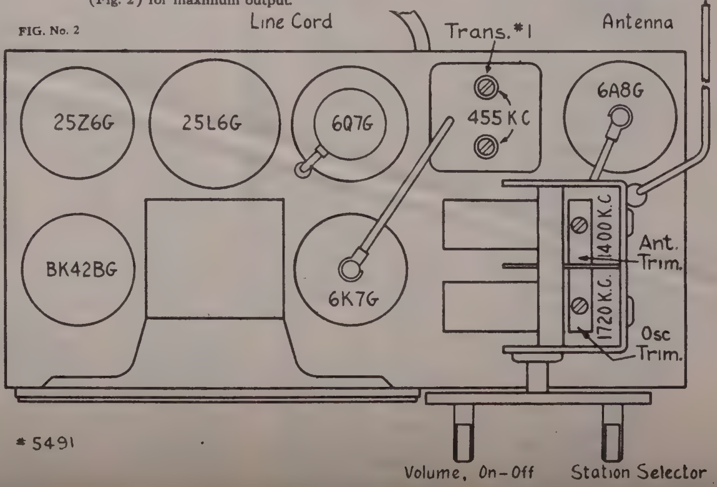
Connect a high impedance AC voltmeter across the voice coil terminals of the loud speaker. The volume control should be set a few degrees back of maximum volume position. Always use a weak signal from the signal generator, strong signals tend to cause improper adjustment.

See Fig. 1 and 2 for location of all trimmers.

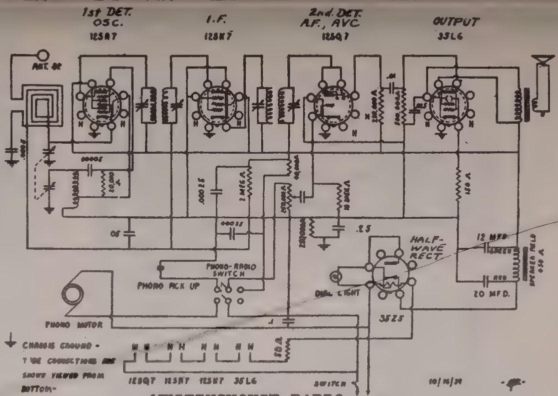
I.F.: Connect the generator ground to receiver chassis through a .1 mf condenser. Using a .1 mf condenser in series with the high side of the generator, apply a 455 K.C. signal to the grid of the 6K7G I.F. amplifier tube, and aline transformer Trimmer No. 12 (Fig. 1) to maximum output. Next connect generator to the grid of the 6A8G tube and aline both trimmers of transformer No. 1 (Fig. 2) for maximum output.

R.F.: Connect the high side of the generator to the antenna through a 100 mmf. condenser. Turn the variable condenser to minimum capacity, feed a 1720 K.C. signal in from the generator and adjust oscillator trimmer (Fig. 2) for top frequency. Next tune the receiver to about 1400 K.C., feed in signal from generator and adjust the antenna trimmer (Fig. 2) for maximum output.

FIG. No. 2



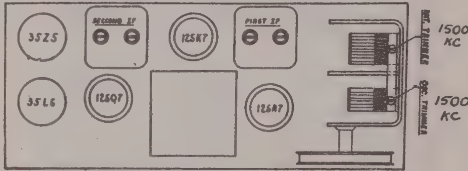
MODEL WR475
Schematic, Socket
Trimmers, Alignment



WESTINGHOUSE RADIO
Model WR-475

Frequency Range....................540-1,720 kc

Intermediate Frequency.................455 kc



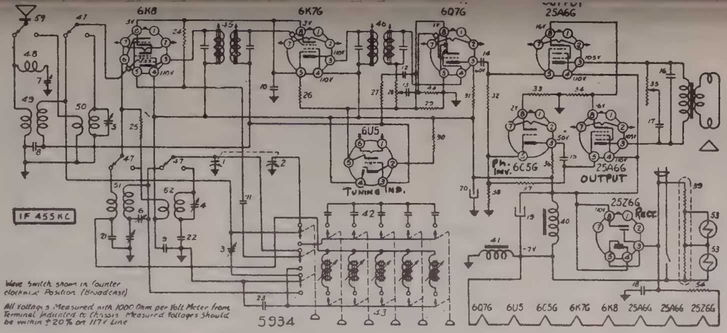
CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

Dial Lamp (1)......Mazda 47, 6-8 Volt, .15 amp.

MODEL WR162
Schematic, Voltage
Alignment, Socket
Trimmers, Dial Data

Power Supply Ratings
105-125 Volts, 60 cycles, Radio 30 Watts and
Phonograph motor 30 watts.

LOUDSPEAKER
Type...................4-inch electro dynamic
Voice-coil impedance.....3.2 ohms at 400 cycles
Power Output (125 volt, 60 cycle supply)
Undistorted.........................0.5 watts
Maximum.............................1.2 watts
PHONOGRAPH..........Synchronous (Self starting)
Records..........10-inch and 12-inch, 78 r.p.m.
Pickup, crystal, 200,000 ohms at 1,000 c.p.s.
Average output of pickup...........2½ volts at 1,000 c.p.s.



Wave Switch shown in Counter clockwise Position (Broadcast)

All Voltages Measured with 1000 Ohm per Volt Meter from Terminal Indicated to Chassis. Measured Voltages Should be within ± 20% on 117V Line

WR162

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

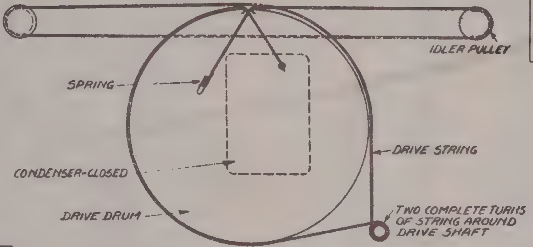


DIAGRAM SHOWING METHOD OF STRINGING DRIVE DRUM

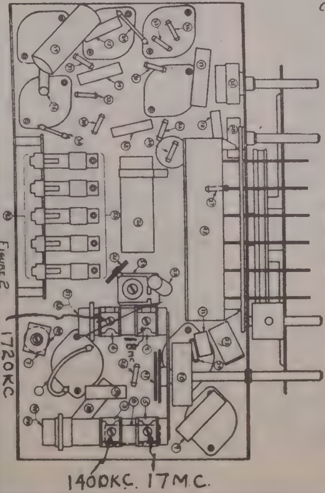


Figure 2

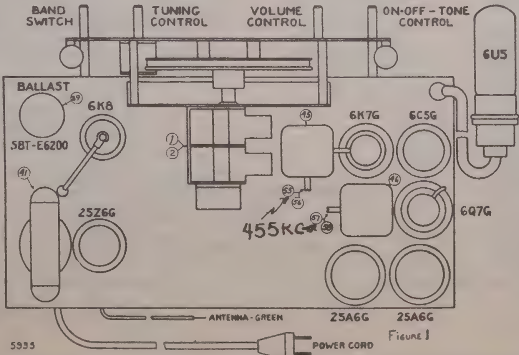


Figure 1

WESTINGHOUSE ELEC. SUPPLY CO.

MODELS WR-162 and WR-262

Electrical Specifications

Power Supply	105-125 volts, 60 cycles A.C.—unless otherwise specified.
Tuning Range	540 to 1720, 5800 to 18,000 K.C.
Line up Frequencies	I.F. 455 K.C., 1720 K.C., 1400 K.C., 600 K.C., 18,000 K.C., 17,000 K.C.
Power Output	Three watts

MODEL WR-162

PARTS LIST

DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1, 2	D-5531	Variable Condenser	$2.60
3, 4, 5	D-5562	1-10 MMF Trimmer	.20
59	D-824	.002 MF 600V Condenser	.15
6	D-3157	3-35 MMF Trimmer	.20
7	D-3272	30-140 MMF Trimmer	.25
8, 9, 10	D-572	.1 MF 200V Condenser	.15
11	D-2780	50 MMF Mica Condenser	.20
12	D-4810	.0005 MF 400V Condenser	.15
13	D-568	.01 MF 400V Condenser	.15
14, 15	D-576	.02 MF 400V Condenser	.15
16	D-3138	.001 MF 800V Condenser	.15
19	D-5780	20 MF 150V Electrolytic Condenser	1.00
17, 18	D-2600	.02 MF 600V Condenser	.15
19	D-5780	20 MF 150 V Electrolytic Condenser	2.00
20	D-5968	45 MF 150V Electrolytic Condenser	1.25
21	D-5565	500 MMF Special 3% Tolerance	.20
22	D-2793	.006 MF 600V 5% Condenser	.15
23	D-5564	270 MMF Special 2% Tolerance	.25
24	D-631	50,000 ohm 1/3 Watt Resistor	.15
25	D-617	20,000 ohm 1/3 watt Resistor	.15
26	D-3004	150,000 ohm 10% 1/3 watt Resistor	.15
27, 44	D-624	1 Megohm 1/3 watt Resistor	.15
28	D-5576	500,000 ohm Volume Control	1.00
29	D-3808	50 ohm ¾ watt Resistor	.20
31, 32	D-2730	200,000 ohm 1/3 watt Resistor	.15
33	D-2883	5,000 ohm 1/3 watt Resistor	.15
34	D-3937	500 ohm ½ watt Resistor	.20
35	D-5575	100,000 ohm Tone Control and Switch	1.25
36	D-2880	100,000 ohm 1/3 watt 10% Resistor	.15
37	D-602	250,000 ohm 1/3 watt Resistor	.15
38	D-2688	60,000 ohm 1/3 watt Resistor	.15
39	D-5938	Ballast Lamp	1.00
48	D-5556	Wave Trap Coil	.30
49, 50	D-5554	Antenna Coil	1.65
51, 52	D-5555	Oscillator Coil	1.50
45	D-5548	1st IF Transformer	2.20
46	D-5549	2nd IF Transformer	2.20
47	D-5551	Wave Switch	.80
41	D-4295	Filter Choke, 130 Ohm	1.25
42	D-5542	5 Gang Trimmer	1.35
54	D-4301	35 ohm 4 watt Resistor	.30
43	D-5544	Push Button Switch	2.75
53	D-5557A	Push Button Coil Assembly (These coils cannot be furnished separately)	3.00

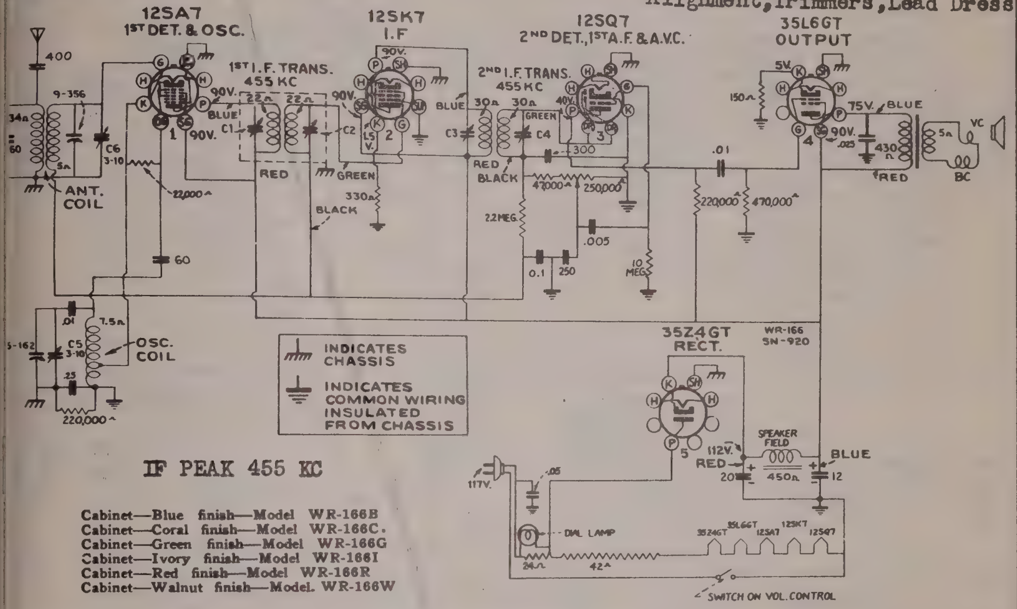
MODEL WR-262

DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1, 2	D-5531	410 MMF Variable Condenser	$2.60
3, 4, 5	D-5562	1-10 MMF Trimmer	.20
6	D-3157	3-35 MMF Trimmer	.20
7	D-3272	10-140 MMF Trimmer	.25
8, 9, 68	D-572	.1 MF 200V Condenser	.15
10	D-2792	.2 MF 200V Condenser	.15
11	D-2780	50 MMF Mica Condenser	.20
12, 13	D-4810	.0005 MF 400V Condenser	.15
14, 15	D-576	.02 MF 400V Condenser	.15
16	D-2695	.003 MF 600V Condenser	.15
17	D-5563	.03 MF 600V Condenser	.15
18	D-3135	.003 MF 800V Condenser	.15
19	D-2793	.006 MF 600V Condenser	.15
20	D-5565	.0005 MF Special Condenser	.20
21	D-5564	270 MMF Special Condenser	.25
22	D-5553	8 MF 200 W.V., 20 MF 35 W.V.— Electrolytic Condenser	1.00
23	D-598	20,000 ohm 1/3 W. Resistor	.15
24	D-4530	30,000 ohm 1 W. Resistor	.20
25	D-636	40,000 ohm 1/3 W. Resistor	.15
26, 27	D-2689	100 ohm 1/3 W. Resistor	.15
28, 29, 35	D-624	1 Megahm 1/3 W. Resistor	.15
30	D-598	200,000 ohm 1/3 W. Resistor	.15
31	D-615	500,000 ohm 1/3 W. Resistor	.15
32	D-3353	250 ohm 2 W. Resistor	.20
33	D-5576	500,000 ohm Volume Control	1.00
34	D-5575	100,000 ohm Tone Control and ON-OFF Switch	1.25
36	D-631	50,000 ohm 1/3 W. Resistor	.15
37	D-5101	16 MF 225 W.V. Reg. Electrolytic Condenser	1.00
38	D-3285	16 MF 350 W.V. Electrolytic Condenser	1.00
40	D-2560	400 MMF Padder Condenser	.35
67	D-634	500 ohm 1/3 W. Resistor	.15
65, 66	D-563	.05 MF 400V Condenser	.15
69	D-2688	60,000 ohm 1/3 W. Resistor	.15
70	D-603	100,000 ohm 1/3 W. Resistor	.15
41	D-5548	First I.F. Assembly	2.20
42	D-5549	Second I.F. Assembly	2.20
43	D-5550	Power Transformer	3.60
44	D-5567-T	Output Transformer	1.10
45	D-5567	6-inch Speaker	3.75
46	D-1732	Line Cord and Plug	.25
47		Push Button Oscillator Coils—	
	D-5557	Low Frequency	.60
	D-5558	Medium Frequency	.60
	D-5559	High Frequency	.60
48	D-5542	Trimmer Condenser Assembly For Push Buttons	1.35
49	D-5551	Band Switch	.80
50	D-5544	Push Button Switch	2.75
51	D-530	Dial Lamps, 6.3 V., .15 amp., Mazda No. 40	.10
52, 53	D-5554	Antenna Coil Assembly	1.65
54, 55	D-5555	Oscillator Coil Assembly	1.50
56	D-5556	Wave Trap Coil	.30
	D-2163	Dial Drive Cable, 36"	.10
	D-5560	Dial Pointer	.15
61	D-2981	Tuning Tube Cable and Socket	.60
	D-3268	8-prong Octal Tube Socket	.10
	D-5569	Dial Escutcheon	1.90
	D-5573	Tuning Tube Escutcheon	.60

DEL WR166A
ocket,Trimmers
lignment
DEL 166L
lignment,Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO

MODELS WR166B,WR166C
WR166G,WR166I,WR166R
WR166W
Schematic,Socket,Voltage
Alignment,Trimmers,Lead Dress



IF PEAK 455 KC

Cabinet—Blue finish—Model WR-166B
Cabinet—Coral finish—Model WR-166C.
Cabinet—Green finish—Model WR-166G
Cabinet—Ivory finish—Model WR-166I
Cabinet—Red finish—Model WR-166R
Cabinet—Walnut finish—Model. WR-166W

Electrical and Mechanical Specifications

EQUENCY RANGE.............................. 530-1,720 kc

al Lamp (1)..................... Mazda 47, 6.3 volts, .15 amp.

WER SUPPLY RATINGS

C Rating................ 105-125 volts, 50-60 cycles, 30 watts

C Rating............. 105-125 volts, direct current, 30 watts

INTERMEDIATE FREQUENCY.............................. 455 kc

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted.. 0.75 watts

Maximum.. 1.5 watts

LOUDSPEAKER

Type.................................. 4-inch Electrodynamic

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, nd turn the receiver volume control to maximum.

Precautionary Lead Dress

. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.

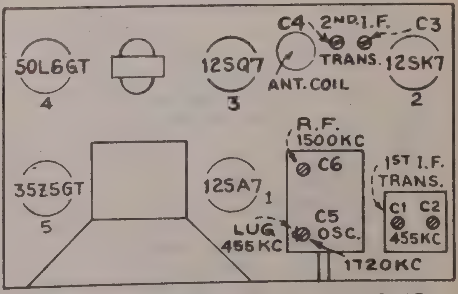
. Dress electrolytic capacitor against rear apron.

Test-Oscillator.—Connect the low side of the test-oscillator to the eceiver chassis, through a .01 mfd. capacitor, and keep the output as w as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Antenna.—The set is equipped with a length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

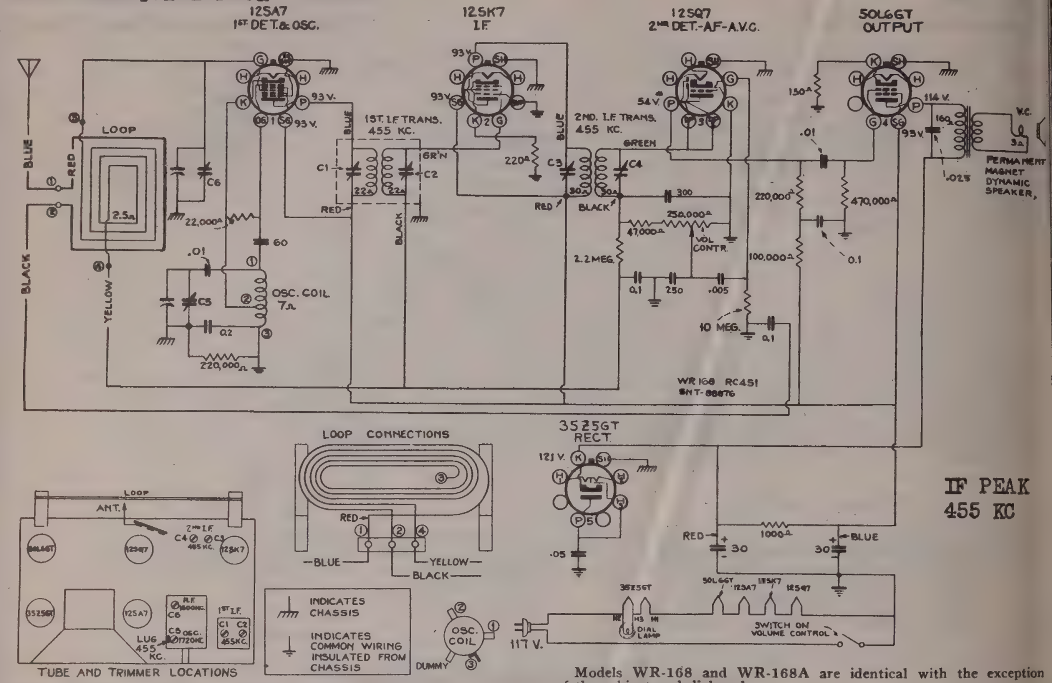


TUBE AND TRIMMER LOCATIONS

NOTE: 35L6GT is used in No.4 socket in Model WR-166.

MODELS WR168,WR168A
Schematic,Voltage,Socket
Alignment,Trimmers
Lead Dress,Dial Data

WESTINGHOUSE ELEC. SUPPLY CO.



Power Output (125 volt, 60 cycle supply)

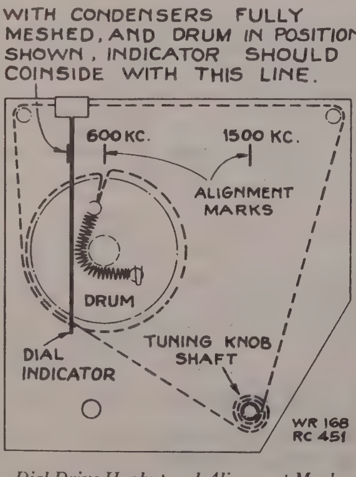
Undistorted	0.75 watts
Maximum	1.5 watts

Loudspeaker

Type	5-inch permanent magnet dynamic

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, and 1,500 kc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left mark on the dial scale.


WITH CONDENSERS FULLY MESHED, AND DRUM IN POSITION SHOWN, INDICATOR SHOULD COINSIDE WITH THIS LINE.
600 KC.
1500 KC.
ALIGNMENT MARKS
DRUM
TUNING KNOB SHAFT
DIAL INDICATOR
WR 168
RC 451

Dial Drive Hookup and Alignment Marks

Models WR-168 and WR-168A are identical with the exception of the cabinet and dial scale.

Frequency Range	530-1,720 kc
Intermediate Frequency	455 kc
Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp.

Power Supply Ratings

A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current 30 watts

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

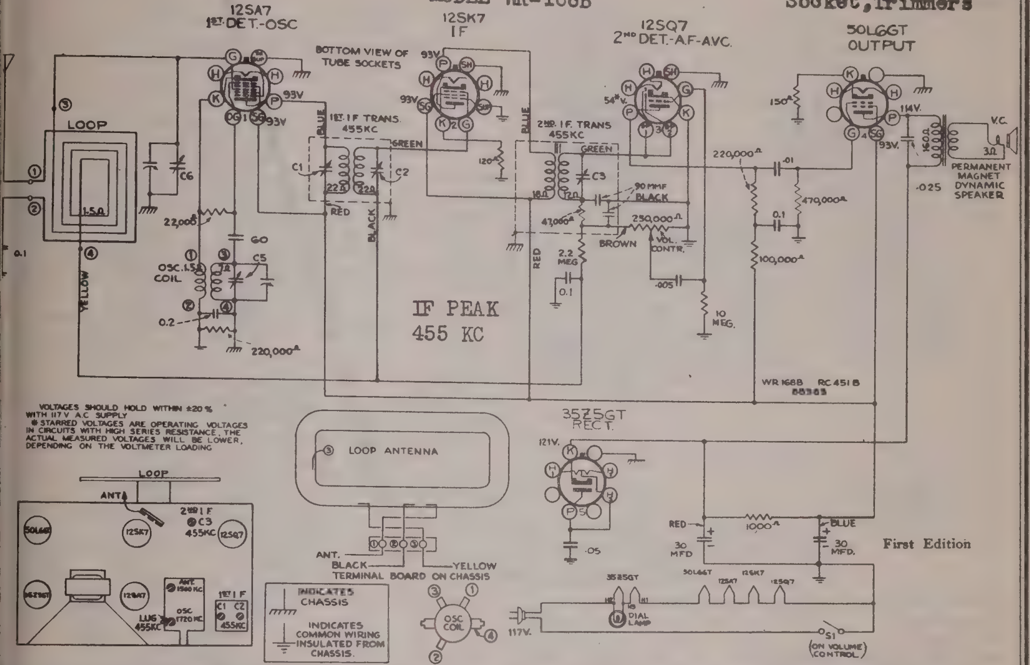
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	1,500 kc cal. mark	C6 (antenna)

Precautionary Lead Dress.—1. The oscillator grid lead, R-F grid lead and diode plate lead should be kept separated as far as possible. 2. Dress blue 1st I-F lead under volume control close to chassis. 3. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR168B
MODEL WR262
Schematics, Voltage
Socket, Trimmers

MODEL WR-168B



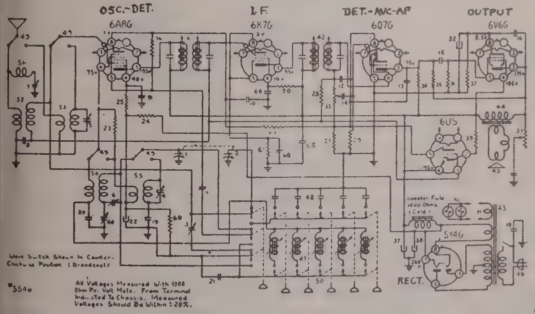
VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V A.C SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

First Edition

For SPECIFICATIONS, ALIGNMENT, LEAD DRESS and DIAL DRIVE DATA, see MODEL WR-168.

MODEL – WR262

FOR SPECIFICATIONS AND PARTS
SEE INDEX
FOR STRINGING DRIVE DRUM
SEE MODEL WR-162
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII
IF PEAK 455 KC



Wave Switch Shown In Counter-Clockwise Position (Broadcast)

All Voltages Measured With 1000 Ohm Per Volt Meter. From Terminal Indicated To Chassis. Measured Voltages Should Be Within ±20%.

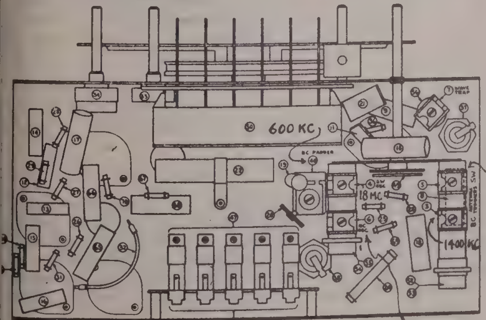


Figure 2.

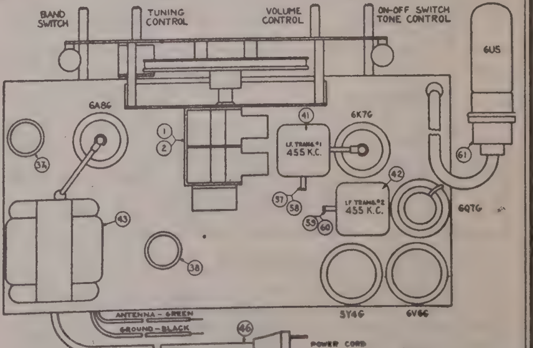
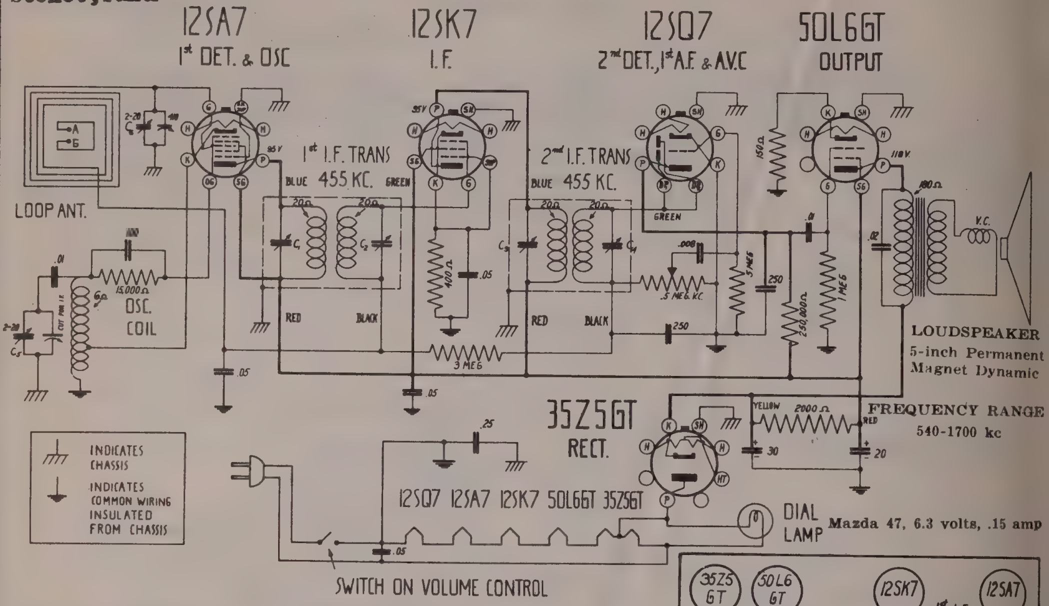
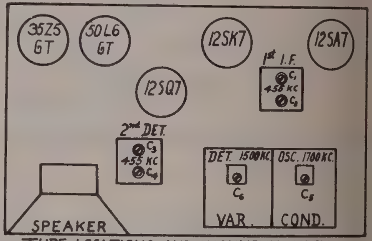


Figure 1

MODEL WR169
Schematic,Voltage
Alignment,Trimmers
Socket,Tuner

WESTINGHOUSE ELEC. SUPPLY CO.





TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	1.0 watts
Maximum	1.75 watts

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 40-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

Tube Changing

The tubes can be changed by removing the back and taking off the wing nuts which hold the loop antenna in place. The loop antenna may then be detached from the back of the chassis.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator

Connect the low side of the test oscillator to the binding post on the loop antenna marked "GND."

Steps	Connect high side of test-oscillator to—	Tune test-osc to—	Adjust dial pointer to—	Adjust the following for max. peak output—
1	Binding post marked "ANT."	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2		1,700 kc	Right end of scale (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Important

When aligning the receiver, it is important to keep the loop antenna attached to the receiver by means of the wing nuts. Keep metallic objects away from the loop. Keep the output signal from the test-oscillator as low as possible during alignment of the receiver.

Push Button Adjustment

The five buttons above the two control knobs are the push button knobs. To adjust any one of these knobs to the desired station, proceed as follows. Pull out the square knob. Loosen up the adjusting screw by turning it one or two complete turns counterclockwise. The screw should not be loosened more than two turns as it may come out. Tune in the desired station with the tuning control. Replace the screw driver blade in the adjusting screw slot and push the screw in as far as it will go. Hold the screw driver in this position and at the same time readjust the tuning knob to be sure the station is tuned to exact resonance. Tighten the screw while holding the tuning control so that the station setting doesn't shift. Replace the knob with the proper station tab placed in the recess.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c reversal of the plug may reduce hum.

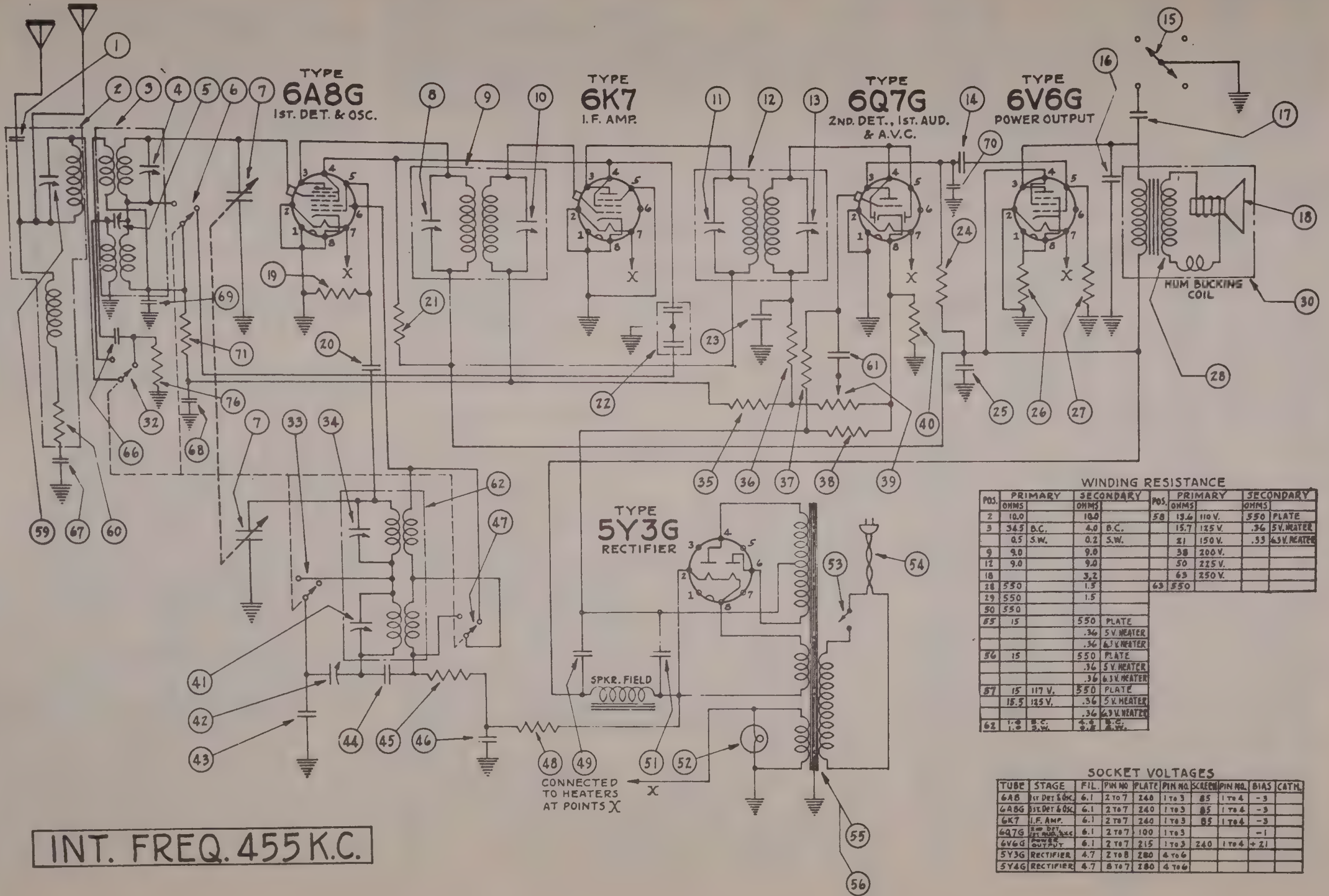
Loop Antenna

This receiver is equipped with a loop antenna which makes the use of an outside aerial unnecessary. In some locations additional radio pick-up may be desired. To accomplish this, an antenna may be attached to the binding post marked "ANT." on the back of the cabinet. A ground wire should be connected to the binding post marked "GND."

Since the loop antenna has a directional effect, it may be found necessary at times to turn the receiver for best reception.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR224
Schematic ,Voltage
Resistance



INT. FREQ. 455 K.C.

WINDING RESISTANCE

POS.	PRIMARY OHMS	PRIMARY	SECONDARY OHMS	SECONDARY	POS.	PRIMARY OHMS	PRIMARY	SECONDARY OHMS	SECONDARY
2	10.0		10.0		58	13.6	110 V.	550	PLATE
3	34.5	B.C.	4.0	B.C.		15.7	125 V.	.36	5 V. HEATER
	0.5	S.W.	0.2	S.W.		21	150 V.	.33	6.3 V. HEATER
9	9.0		9.0			38	200 V.		
12	9.0		9.0			50	225 V.		
18			3.2			63	250 V.		
28	550		1.5		63	550			
29	550		1.5						
50	550								
55	15		550	PLATE					
			.36	5 V. HEATER					
			.36	6.3 V. HEATER					
56	15		550	PLATE					
			.36	5 V. HEATER					
			.36	6.3 V. HEATER					
57	15	117 V.	550	PLATE					
	15.5	125 V.	.36	5 V. HEATER					
			.36	6.3 V. HEATER					
62	1.0 1.0	B.C. S.W.	4.0 0.2	B.C. S.W.					

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	BIAS	CATH.
6A8	1ST DET & OSC.	6.1	2 TO 7	240	1 TO 3	85	1 TO 4	-3	
6A8G	1ST. DET & OSC.	6.1	2 TO 7	240	1 TO 3	85	1 TO 4	-3	
6K7	I.F. AMP.	6.1	2 TO 7	240	1 TO 3	85	1 TO 4	-3	
6Q7G	2ND DET. 1ST AUD. AVC	6.1	2 TO 7	100	1 TO 3			-1	
6V6G	POWER OUTPUT	6.1	2 TO 7	215	1 TO 3	240	1 TO 4	+21	
5Y3G	RECTIFIER	4.7	2 TO 8	280	4 TO 6				
5Y4G	RECTIFIER	4.7	8 TO 7	280	4 TO 6				

MODEL WR224
Alignment, Parts

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes .... 1 #6A8G 1 #6K7, 1 #6Q7G, 1 #6V6G, 1 #5Y3G - Total 5
Power Supply Characteristics .... 105-125 volts, 50-60 cycle A.C.
Power Consumption .... 50 Watts
Total Power Output .... 4 Watts
Undistorted Power Output .... 2.25 Watts
Tuning Ranges .... (Broadcast Band 535 to 1,720 KC.
(Short-wave Band 5,800 to 17,000 KC.
Line-Up Frequencies .... I.F. 455 KC., 600 KC., 1500 KC., 15,500 KC.

GENERAL DESCRIPTION

This model is a five-tube, alternating current, two-band superheterodyne receiver designed to operate over the standard broadcast band, extending from 535 to 1720 KC., and a short-wave band, extending from 5800 to 17,000 KC.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory readings with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position, the wave-change switch to standard broadcast band and the dial pointer to approximately 600 KC.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four I.F. trimmer condensers underneath the chassis (under the square coil housings) to maximum output.

ALIGNMENT OF OSCILLATOR AND R.F.

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the test oscillator and dial indicator at 1500 KC., and adjust the oscillator trimmer (the rear trimmer on the coil fastened to the back plate of the chassis).

3. Set the test oscillator and dial pointer to 600 KC.

4. Adjust the oscillator lag condenser (on the base near the antenna coil) for maximum output, at the same time rocking the gang condenser.

5. Reset test oscillator and dial pointer to 1500 KC., and recheck operation #2.

6. Connect the test oscillator to the blue antenna lead through a .0002 mfd. condenser and adjust the antenna trimmer (the bottom condenser on the coil on the top of the chassis).

7. Check sensitivity and calibration over the scale.

ALIGNMENT OF THE SHORT-WAVE BAND

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 15,500 KC., and adjust the short-wave oscillator trimmer (the trimmer on the inside end of the coil on the back plate of the chassis). Two positions may be found. Use the one with the least capacity, that is, with the trimmer screw farthest out.

3. Adjust the short-wave antenna trimmer (the top condenser on the coil on the top of the chassis).

4. Check sensitivity and calibration over the scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap (the upright coil under the chassis) which is adjusted to eliminate a signal at the I.F. frequency (455 KC.) applied to the antenna. If there is code interference which is known to originate near the 455 KC. channel, this trimmer may be adjusted to minimize the undesired signal.

PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	CM 9546	.00005 mfd. mica condenser	$ .15
2	RC 95296	Wave trap coil assembly	1.25
3	RC 95300	Antenna coil assembly	1.60
4		Trimmer condenser - part of RC 95300	
5		Trimmer condenser - part of RC 95300	
6,32 33,47	SW 9574	Switch (wave-change)	.70
7	CG 9565	Variable condenser	3.75
8		Trimmer condenser - part of IC 95109	
9	IC 95109	1st I.F. coil assembly (455 KC.)	1.20
10		Trimmer condenser - part of IC 95109	
11		Trimmer condenser - part of IC 95110	
12	IC 95110	2nd I.F. coil assembly (455 KC.)	1.20
13		Trimmer condenser - part of IC 95110	
14	CW 6-005	.005 mfd., 600 V. condenser	.15
15	SW 9572	Switch (tone control)	.40
16	CW 6-01	.01 mfd., 600 V. condenser	.15
17	CW 6-05	.05 mfd., 600 V. condenser	.15
18	DM 9526	Speaker diaphragm assembly	1.50
19	RE 4733	47,000 ohm, 1/2 W. resistor	.10
20	CM 9513	.0001 mfd. mica condenser	.10
21	RE 3333	33,000 ohm, 1/2 W. resistor	.10
22	CW 9535	.1-.1 mfd., 400 V. dual condenser	.30
23	CM 9513	.0001 mfd. mica condenser	.10
24	RE 2243	220,000 ohm, 1/2 W. resistor	.10
25	CW 4-10	.1 mfd., 400 V. condenser	.15
26	RE 271412	.270 ohm, 1 W. resistor	.12
27	RE 4743	470,000 ohm, 1/2 W. resistor	.10
28	TR 95141	Output transformer	1.50
30	SK 9572	Speaker	4.75
34		Trimmer condenser - part of RC 95301	
35	RE 1053	1 meg., 1/2 W. resistor	.10
36	RE 4733	47,000 ohm, 1/2 W. resistor	.10
37	RE 1053	1 meg., 1/2 W. resistor	.10
38	RE 1803	18 ohm, 1/2 W. resistor	.10
39	VR 9553	Volume control, 1/2 meg.	1.00
40	RE 1803	18 ohm, 1/2 W. resistor	.10
41		Trimmer condenser - part of RC 95301	
42	CS 9585	Trimmer condenser (225-700 mmf.)	.35
43	CM 959	.002 mfd. mica condenser	.25
44	CW 6-005	.005 mfd., 600 V. condenser	.15
45	RE 223413	22,000 ohm, 1 W. resistor	.12
46	CE 9568	8 mfd., 450 V. electrolytic condenser	.70
48	RE 1033	10,000 ohm, 1/2 W. resistor	.10
49	CE 9562	18 mfd., 300 V. electrolytic condenser	.80
50		Speaker field coil (not serviced separately)	
51	CE 9554	18 mfd., 450 V. electrolytic condenser	.85
52	LP 9510	Dial lamp - 6.3 V. .25 amp.	.15
53		Switch - part of VR 9553	
54	CB 9512	Line cable assembly	.50
55	TR 95128	Power transformer - 105-125 V., 50-60 cycle	5.00
56	TR 95131	Power transformer - 105-125 V., 25 cycle	6.00
59		Trimmer condenser - part of RC 95296	
60	RE 1033	10,000 ohm, 1/2 W. resistor	.10
61	CW 6-005	.005 mfd., 600 V. condenser	.15
62	RC 95301	Oscillator coil assembly	1.50
66	CW 2-02	.02 mfd., 200 V. condenser	.15
67	CM 9546	.00005 mfd. mica condenser	.15
68	CW 2-05	.05 mfd., 200 V. condenser	.15
69	CM 9525	.0027 mfd. mica condenser	.30
70	CW 6-001	.001 mfd., 600 V. condenser	.15
71	RE 4743	470,000 ohm, 1/2 W. resistor	.10
76	RE 1033	10,000 ohm, 1/2 W. resistor	.10

uns A,B,C,etc.,
ocket,Trimmers
rive Cord,Notes

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR258
MODEL WR260

General Description

Model WR-258 is a five-tube, a-c, superheterodyne reeiver employing push-button tuning for five stations in the roadcast band. The tuning range covers standard broadcast nd state police calls. Features of this receiver are: Autoatic volume control, magnetically tuned i-f transformers, agnetically tuned oscillator coils for each push button, 6-to-1 ratio vernier tuning, illuminated slide-rule dial, and a 5-inch dust-proofed dynamic speaker.

Model WR-260 employs all features of the WR-258 and in addition has a tuning band covering from 1,550 to 3,500 kc for aviation and police reception. It also has a two-point tone control.

Electrical Specifications

REQUENCY RANGE (Model WR-258)

3roadcast	540-1,720 kc

FREQUENCY RANGES (Model WR-260)

Broadcast	540-1,550 kc
Police	1,550-3,500 kc

Five Electric Tuning Positions	550-1,500 kc

(Runs A and B,
1 station between approximately 550-980 kc
2 stations between approximately 650-1,080 kc
2 stations between approximately 850-1,500 kc

(Runs C and above,
2 stations between approximately 550-980 kc
1 station between approximately 650-1,080 kc
2 stations between approximately 850-1,500 kc

ilot Lamp (1)	Mazda No. 44, 6.3 volts, 0.25 ampere

OWER SUPPLY RATINGS

ating A	105-125 volts, 50-60 cycles, 50 watts
ating B	105-125 volts, 25-60 cycles, 50 watts

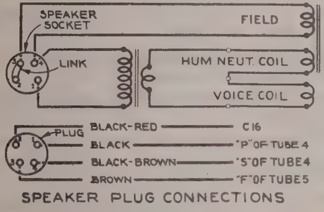
OWER OUTPUT

Jndistorted	1.0 watt
Aaximum	1.5 watts

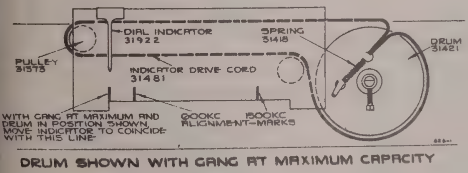
LOUDSPEAKER

Type	5-inch Electrodynamic
Voice Coil Impedance	84326-2 4.4 ohms at 400 cycles 84377-1 3.4 ohms at 400 cycles

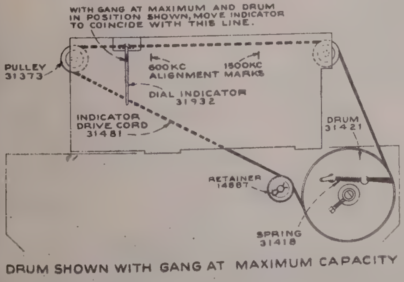
Loudspeaker.—The loudspeaker voice-coil may be centered in the normal manner by using three narrow feelers to obtain equal spacing of the air-gap. The dust cover must be removed before centering, and may be done by gently cutting it free from the cone, being careful not to cut or damage the cone while doing so.



WR-260 Loudspeaker Wiring

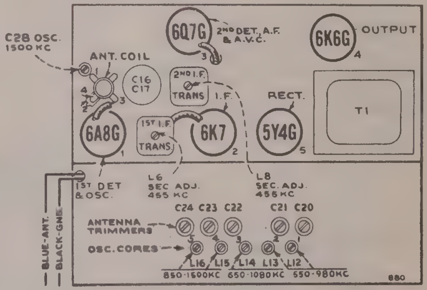

DIAL INDICATOR 31922
SPRING 31418
DRUM 31421
PULLEY 31373
INDICATOR DRIVE CORD 31481
WITH GANG AT MAXIMUM AND DRUM IN POSITION SHOWN, MOVE INDICATOR TO COINCIDE WITH THIS LINE
600KC 1500KC ALIGNMENT MARKS
DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

WR-258 Arrangement of Pointer Drive Cord

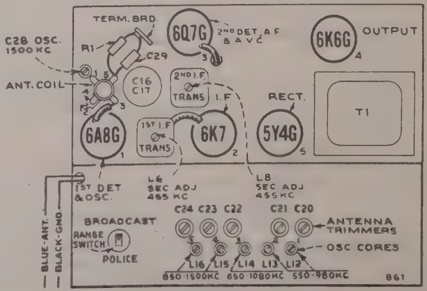

WITH GANG AT MAXIMUM AND DRUM IN POSITION SHOWN, MOVE INDICATOR TO COINCIDE WITH THIS LINE.
PULLEY 31373
600KC 1500KC ALIGNMENT MARKS
DIAL INDICATOR 31932
INDICATOR DRIVE CORD 31481
DRUM 31421
RETAINER 14887
SPRING 31418
DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

WR-260 Arrangement of Pointer Drive Cord

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing



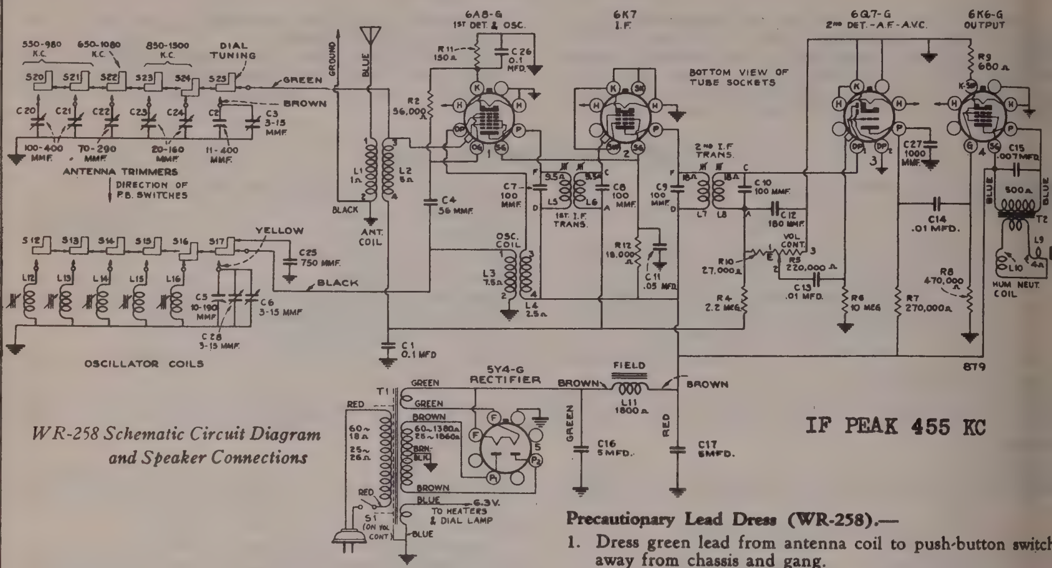
WR-258 Tube and Trimmer Locations



WR-260 Tube and Trimmer Locations

MODEL WR258(All Runs)
Schematic, Voltage
Chassis Wiring
Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.

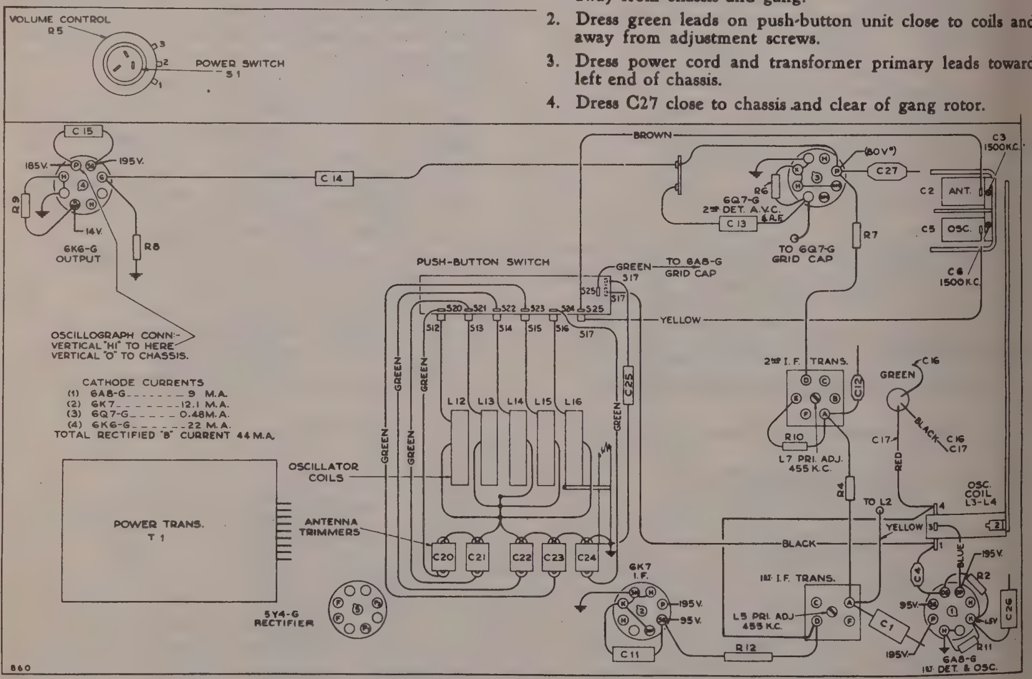


WR-258 Schematic Circuit Diagram and Speaker Connections

IF PEAK 455 KC

Precautionary Lead Dress (WR-258).—

1. Dress green lead from antenna coil to push-button switc away from chassis and gang.
2. Dress green leads on push-button unit close to coils an away from adjustment screws.
3. Dress power cord and transformer primary leads towar left end of chassis.
4. Dress C27 close to chassis and clear of gang rotor.



CATHODE CURRENTS
(1) 6A8-G .... 9 M.A.
(2) 6K7 .... 12.1 M.A.
(3) 6Q7-G .... 0.48 M.A.
(4) 6K6-G .... 22 M.A.
TOTAL RECTIFIED "B" CURRENT 44 M.A.

WR-258 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

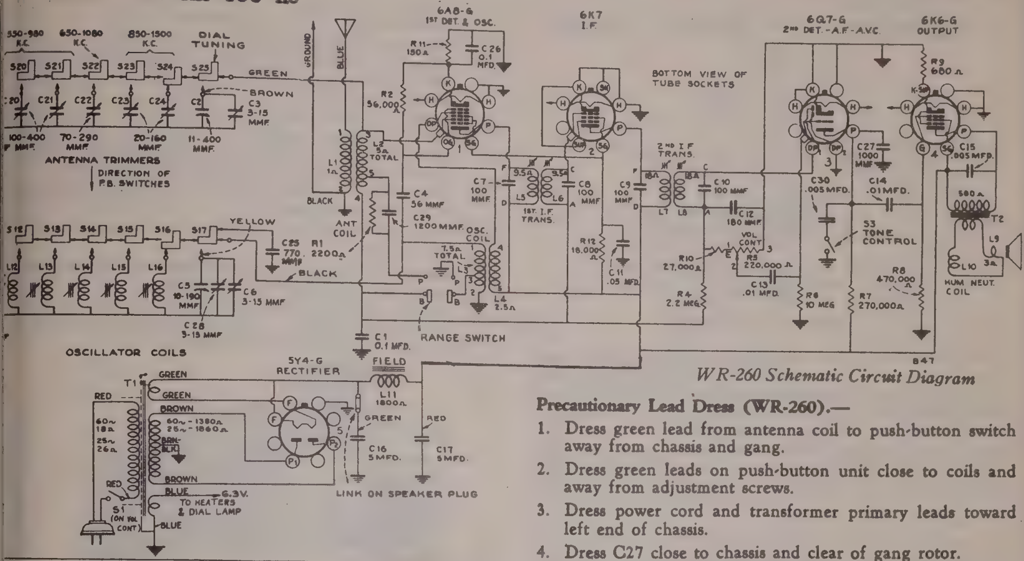
* NOTE: Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing curren through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will no be affected by measuring with an ordinary high-resistance voltmeter.

hassis Wiring
ead Dress

WESTINGHOUSE ELEC. SUPPLY CO

MODEL WR260(All Runs)
Schematic,Voltage

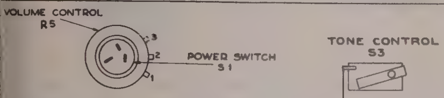
IF PEAK 455 KC

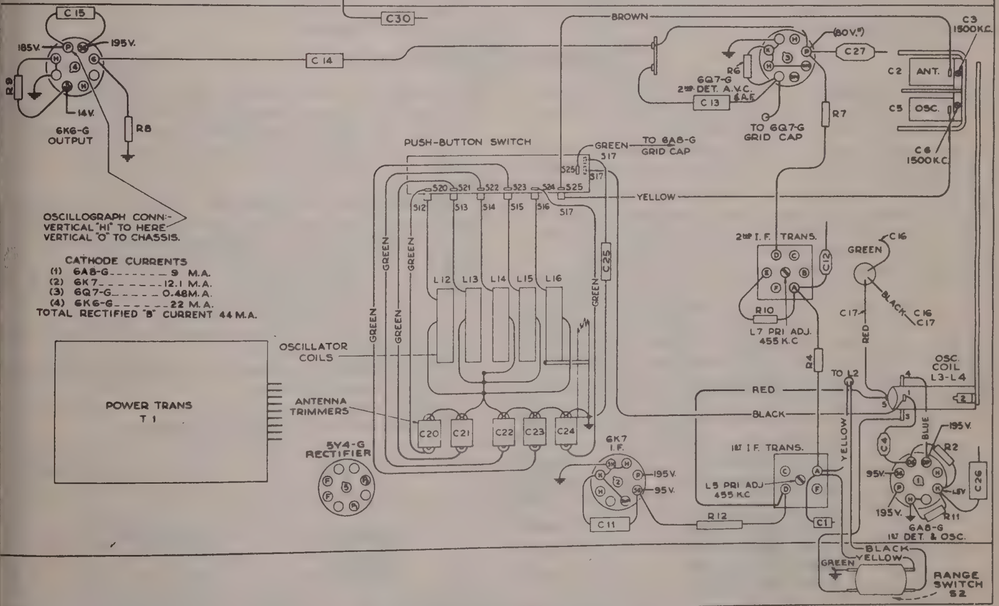


WR-260 Schematic Circuit Diagram

Precautionary Lead Dress (WR-260).—

1. Dress green lead from antenna coil to push-button switch away from chassis and gang.
2. Dress green leads on push-button unit close to coils and away from adjustment screws.
3. Dress power cord and transformer primary leads toward left end of chassis.
4. Dress C27 close to chassis and clear of gang rotor.
5. Keep bus lead from oscillator coil to range switch as short and direct as possible.
6. Dress leads from range switch away from oscillator coil.
7. Dress R1 and C29 away from antenna coil.





WR-260 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

Measurements made to chassis unless otherwise indicated, ith set tuned to quiet point and volume control at mini- um. Values should hold within approximately ±20% with 17-volt a-c supply.

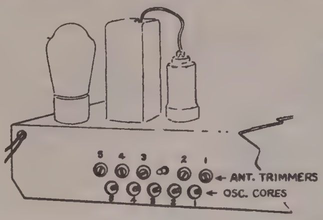
***NOTE:** Values with star (*) are operating voltages in rcuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

MODEL WR258
MODEL WR260

WESTINGHOUSE ELEC. SUPPLY CO.

Runs A,B,C,etc.
Alignment,Tuner

Adjustments for Electric Tuning



Nos. 1, 2*—Approximately 550-980 kc.
No. 3—Approximately 650-1,080 kc.
Nos. 4, 5—Approximately 850-1,500 kc.

Push Button Adjustments

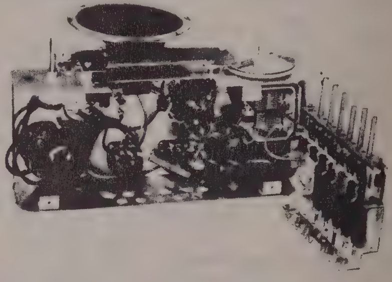
*** NOTE: On runs A and B, the range of No. 2 push button is approx. 650 to 1,080 kc. C21 is 70-290 mmfd. Use Part No. 31416 capacitor bank and Part No. 31384 coil (L13) for replacements. On runs C and above, the range of No. 2 push button is approx. 550 to 980 kc. C21 is 100-400 mmfd. Use Part No. 32066 capacitor bank and Part No. 31415 coil (L13) for replacements. The run letter is stamped on rear apron of chassis after code number — examples: 8T29B, 8023C, etc., also the letters "MOD" are stamped on rear apron of runs C or later.**

These models have six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations in the standard-broadcast range. The station buttons connect to separate magnetically tuned oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool. Allow at least five minutes warm-up period before making adjustments. Use a regular antenna for the preliminary adjustments. The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning (right-hand) button, and manually tune in the first station on the list. On Model WR-260, set range switch on rear of set to "Broadcast" position (switch up).
3. Push in station-button No. 1 (left-hand) and adjust No. 1 oscillator core (L12) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.
4. Adjust No. 1 antenna trimmer (C20) for maximum output on this station.
5. Adjust for each of the remaining four stations in the same manner.

(Clockwise adjustment of oscillator cores and antenna trimmers tunes the circuits to lower frequencies.)

6. Make a final careful adjustment of the oscillator cores and antenna trimmers, using one or two feet of wire as an antenna to ensure sharp peaking.



The Push-Button Assembly is fastened to the chassis by only two screws, and may be quickly and easily swung out for convenient access to the sockets and other parts, as shown in the above illustration.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Marks. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

Drum and Dial Indicator Adjustment. — As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing in the direction shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

After completion of alignment, seal the i-f core-adjustment screws with household cement.

The dial tuning (right hand) push button must be pushed in for steps 1 to 3, inclusive.

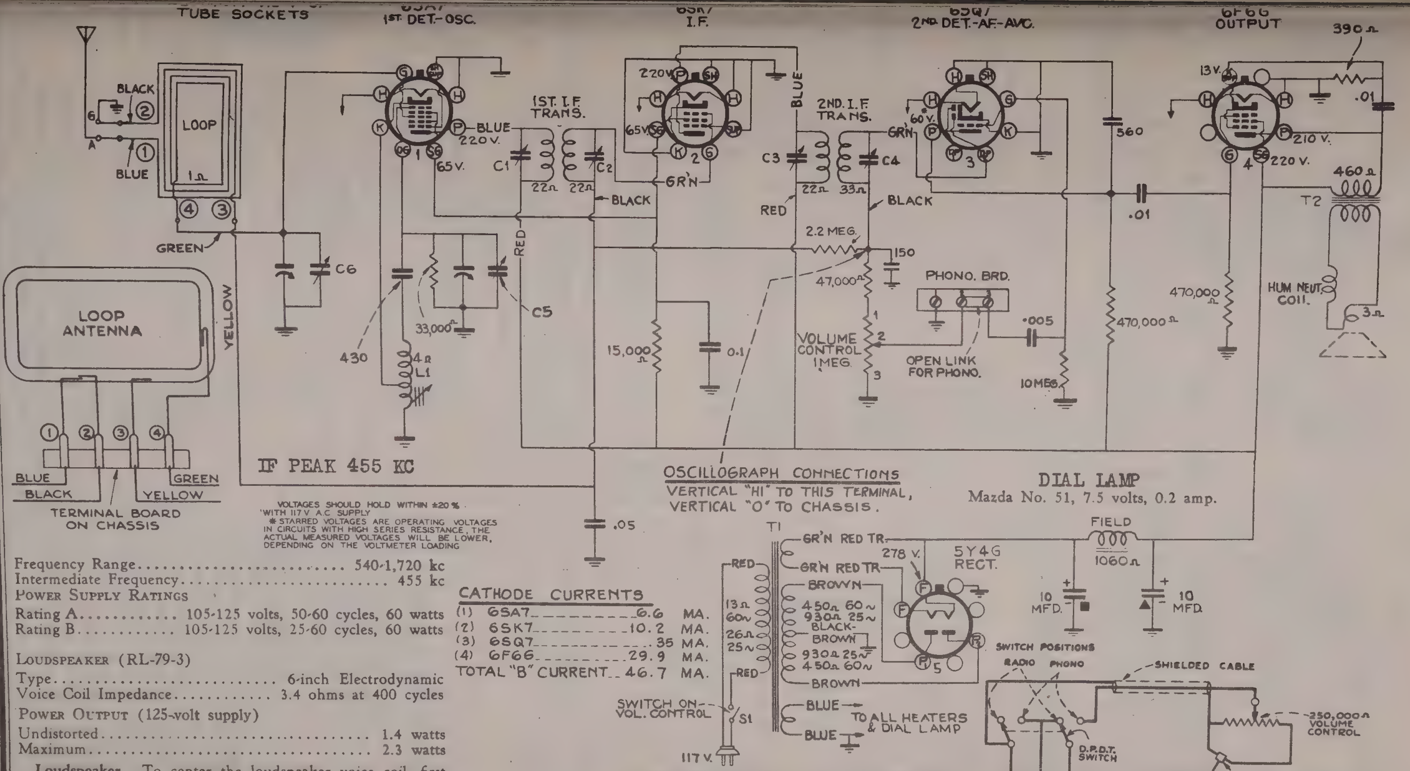
On Model WR-260, set range switch to "Broadcast" position (switch up) and tone control clockwise.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark	C6 (osc.)† C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

† The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR270
Schematic, Voltage
Phono. Data



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V A.C SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE, THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

Frequency Range........................ 540-1,720 kc
Intermediate Frequency........................ 455 kc

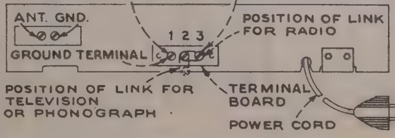
Power Supply Ratings
Rating A............ 105-125 volts, 50-60 cycles, 60 watts
Rating B............ 105-125 volts, 25-60 cycles, 60 watts

Loudspeaker (RL-79-3)
Type........................ 6-inch Electrodynamic
Voice Coil Impedance............ 3.4 ohms at 400 cycles

Power Output (125-volt supply)
Undistorted.............................. 1.4 watts
Maximum.............................. 2.3 watts

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

TELEVISION OR PHONOGRAPH CONNECTIONS


ANT. GND.
GROUND TERMINAL
1 2 3
POSITION OF LINK FOR RADIO
POSITION OF LINK FOR TELEVISION OR PHONOGRAPH
TERMINAL BOARD
POWER CORD

Back of Chassis

CATHODE CURRENTS

(1)	6SA7	6.6	MA.
(2)	6SK7	10.2	MA.
(3)	6SQ7	.35	MA.
(4)	6F6G	29.9	MA.
	TOTAL "B" CURRENT	46.7	MA.

Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch →

Phonograph Terminal Board.—A 3-terminal board is located on the rear of the chassis for connecting a phonograph pickup, or Record Player, into the audio amplifier of the receiver. The accompanying schematic shows connections for a high-impedance pickup with a switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "A" terminal on the rear of the chassis. The "G" terminal may be connected to a good ground such as a water pipe.

Phonograph or Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a record player or television attachment into the audio-amplifying circuit. The cable from the attachment should be connected to terminals 1 and 3. The shielded or ground lead going to terminal 1. When using the attachment the connection link is disconnected and volume is controlled by the control on the phonograph or television attachment.

MODEL WR270
Alignment, Socket
Trimmers, Tuner
Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR17C
Tuner Data

Alignment Procedure

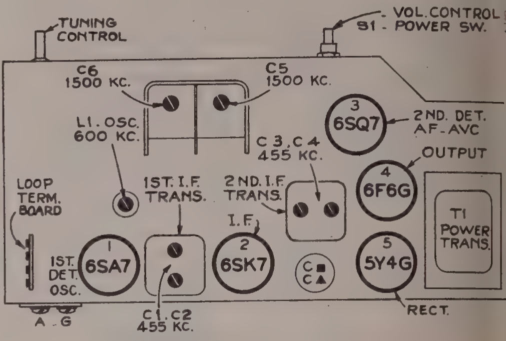
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.



Tube and Trimmer Locations

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna Terminal	455 kc	Quiet Point between 1,720-1,500 kc	C3 and C4 (2nd I-F Trans.)
2				C1 and C2 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C6 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.)*
5	Repeat step 3.			

Note.—Oscillator tracks above signal.

* Rock gang condenser slightly while adjusting L1.

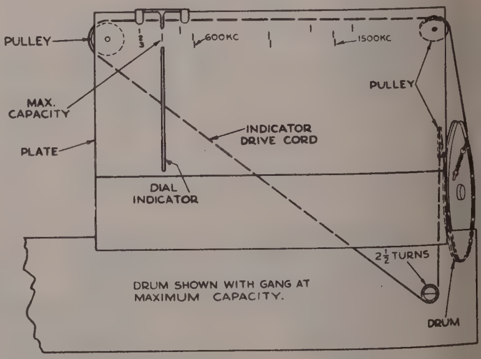
PRECAUTIONARY LEAD DRESS.—

1. Power cord leads must be dressed away from 6SQ7 socket, and toward end of chassis.
2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.
5. Green lead from gang to 6SA7 socket must be dressed toward side apron away from other parts.

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push buttons by turning counter-clockwise about one turn from their tight position so they turn freely.
2. Check to be sure the link connection on back of chassis is in "Radio" position (connected between terminals 2 and 3).
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses above the push-buttons.

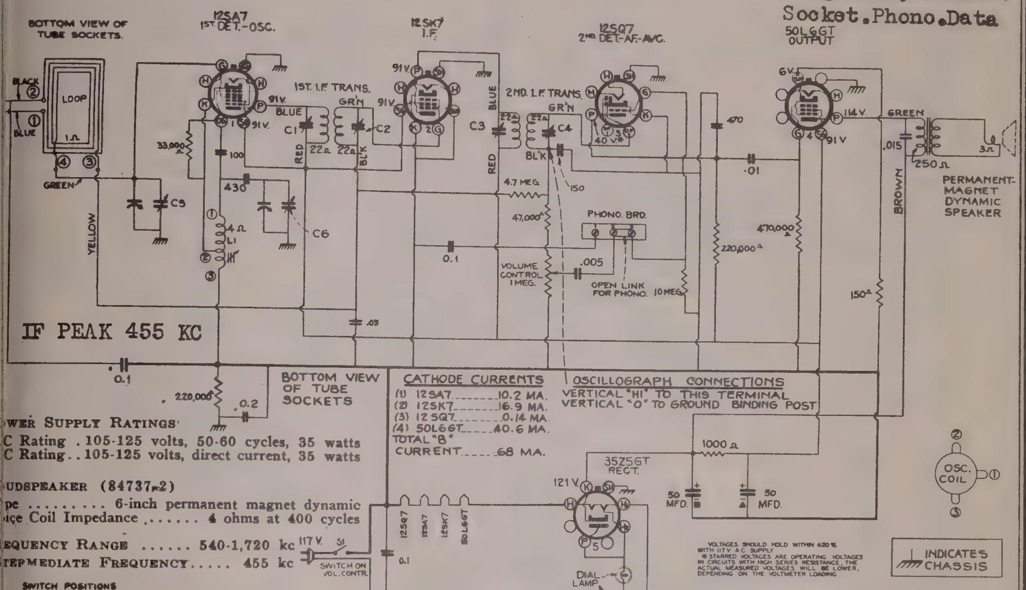


Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR170
Schematic, Voltage
Alignment, Trimmers
Socket. Phono. Data



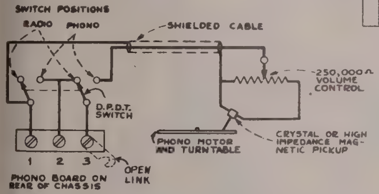
WER SUPPLY RATINGS
C Rating . 105-125 volts, 50-60 cycles, 35 watts
C Rating . . 105-125 volts, direct current, 35 watts

UDSPEAKER (84737-2)
pe . . . . 6-inch permanent magnet dynamic
ice Coil Impedance . . . . 4 ohms at 400 cycles

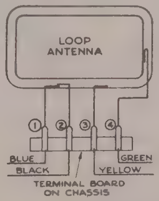
EQUENCY RANGE . . . . . . 540-1,720 kc
TERMEDIATE FREQUENCY . . . . . 455 kc

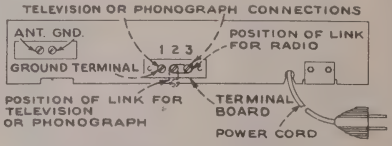
Mazda No. 51, 7.5 volt, 0.2 amp.

POWER OUTPUT (125 volts, 60 cycle supply)
Undistorted . . . . 0.8 watts
Maximum . . . . 1.4 watts

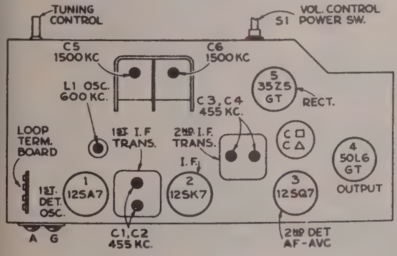

SWITCH POSITIONS
RADIO
PHONO
SHIELDED CABLE
250,000Ω VOLUME CONTROL
D.P.D.T. SWITCH
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP
1 2 3
OPEN LINK
PHONO BOARD ON REAR OF CHASSIS

ecord Player Connections, Using a Double-Pole, Double-Throw Toggle Switch

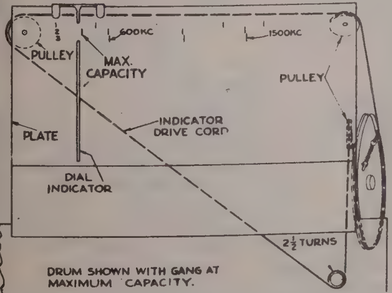



TELEVISION OR PHONOGRAPH CONNECTIONS
ANT. GND.
1 2 3
POSITION OF LINK FOR RADIO
GROUND TERMINAL
POSITION OF LINK FOR TELEVISION OR PHONOGRAPH
TERMINAL BOARD
POWER CORD

Back of Chassis



Tube and Trimmer Locations



Dial-Indicator and Drive Mechanism

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the schematic drawing.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver ground binding post, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should be set 1/16 inch to the left of the extreme left (low frequency) mark on the dial scale.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	Ant. terminal	455 kc	Quiet Point between 1,720-1,500 kc	C3 and C4 (2nd I-F trans.)
2	Ant. terminal			C1 and C2 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C6 (osc.) C5 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.) (Rock in)
5	Repeat step 3.			

NOTE.—Oscillator tracks above signal.

MODEL WR366

Schematic, Lead Dress

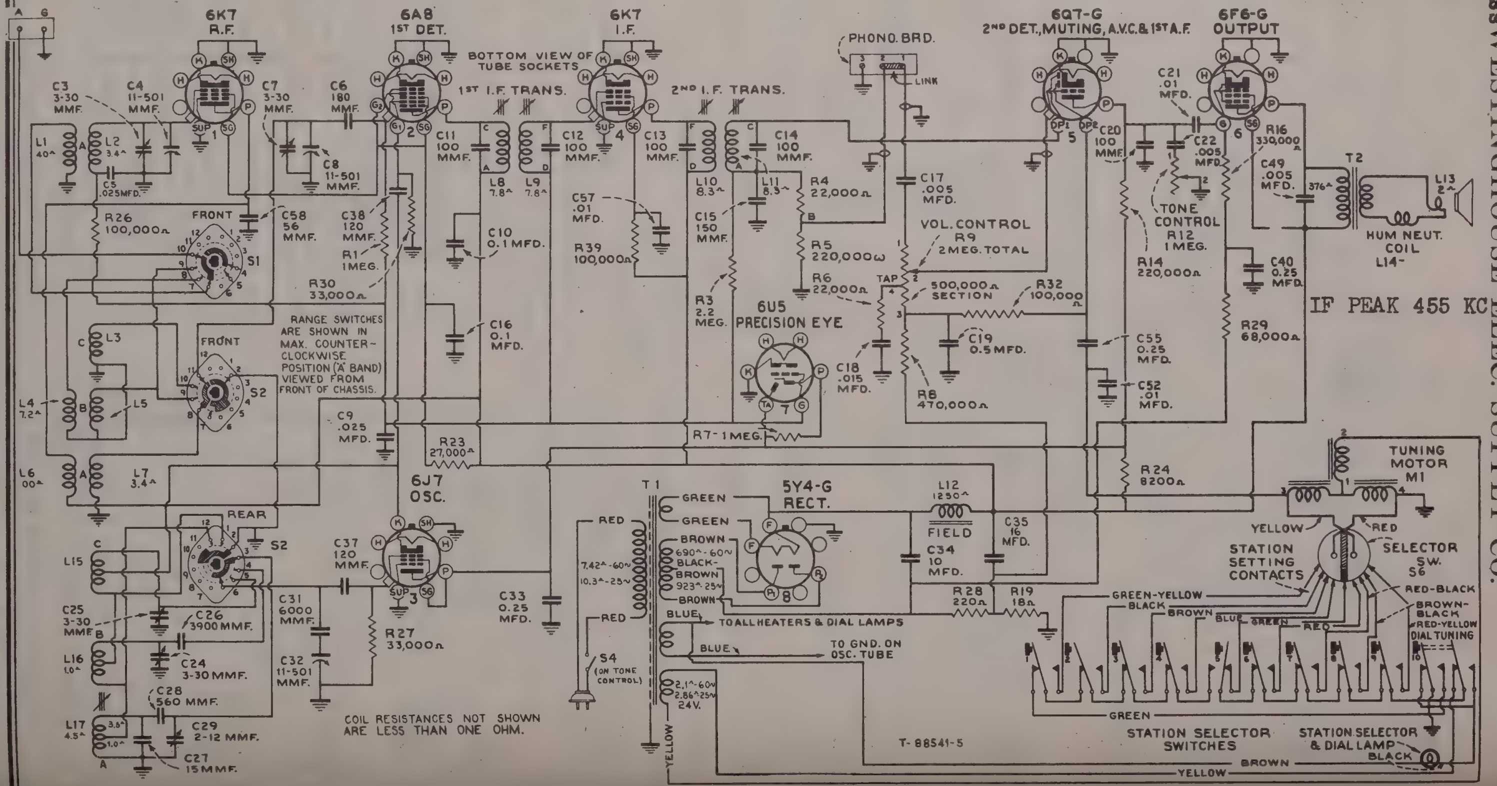
WESTINGHOUSE ELEC. SUPPLY CO.

*** NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

Precautionary Lead Dress.—

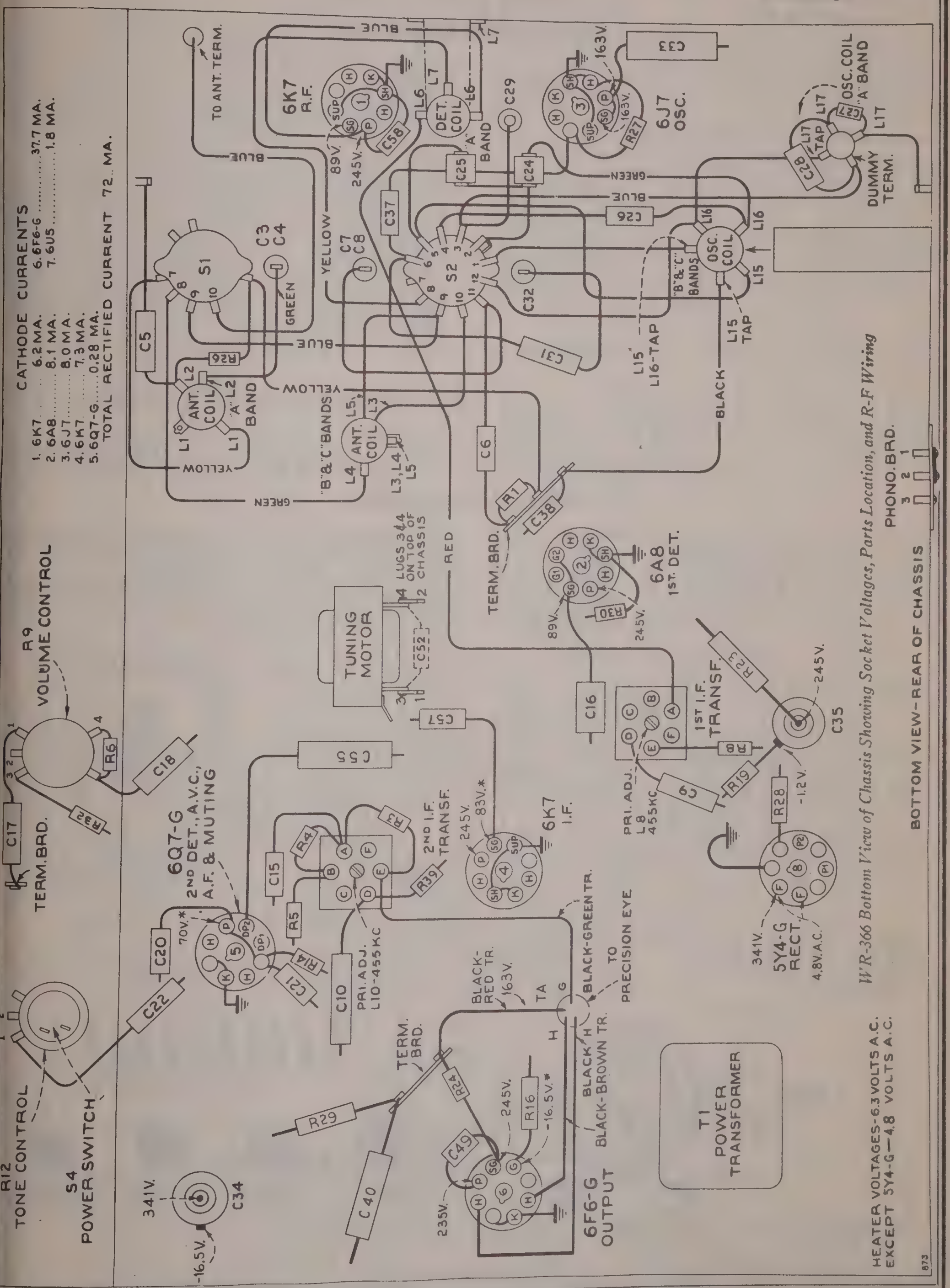
1. Leads from the oscillator section of the range switch to the oscillator coils and mica trimmers should be kept as short as possible and dressed away from other parts and wiring.
2. The leads on C31 connecting between the range switch and the oscillator section of the gang should be made as short as possible.
3. The leads from the power transformer and the power cord to the power switch (S4) should be twisted together and dressed away from other wiring.
4. The yellow lead connecting to the transformer motor winding at the rectifier socket should be dressed away from the phono terminals.



WR-366 Schematic Circuit Diagram

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR366
Chassis Wiring
Voltage



CATHODE CURRENTS

1. 6K7	6.2 MA.	6. 6F6-G	37.7 MA.
2. 6A8	8.1 MA.	7. 6U5	1.8 MA.
3. 6J7	8.0 MA.		
4. 6K7	7.3 MA.		
5. 6Q7-G	0.28 MA.		

TOTAL RECTIFIED CURRENT 72. MA.

HEATER VOLTAGES-6.3 VOLTS A.C.
EXCEPT 5Y4-G—4.8 VOLTS A.C.

WR-366 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

MODEL WR366
MODEL WR368
Socket,Trimmers
Drive Cord Data

WESTINGHOUSE ELEC. SUPPLY CO.

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"Medium Wave" (B)	2.3-7 mc
"Short Wave" (C)	7-22 mc

R-F ALIGNMENT FREQUENCIES

"Short Wave" (C)	20 mc (osc., ant.)
"Medium Wave" (B)	6.1 mc (osc.)
"Standard Broadcast" (A)	600 kc (osc.), 1,500 kc (osc., ant.)

Intermediate Frequency.. 455 k

TUBE COMPLEMENT (WR-366)

(1)	RCA-6K7	R-F Amplifier
(2)	RCA-6A8	First Detector
(3)	RCA-6J7	Heterodyne Oscillator
(4)	RCA-6K7	I-F Amplifier
(5)	RCA-6Q7-G	2nd Det., 1st A.F., A.V.C.
(6)	RCA-6F6-G	Power Output
(7)	RCA-6U5	Precision Eye
(8)	RCA-5Y4-G	Rectifier

TUBE COMPLEMENT (WR-368)

(1)	RCA-6K7	R-F Amplifie
(2)	RCA-6A8	First Detecto
(3)	RCA-6J7	Heterodyne Oscillato
(4)	RCA-6K7	I-F Amplifie
(5)	RCA-6Q7-G	2nd Det., 1st A.F., A.V.C
(6)	RCA-6F5	Phase Inverte
(7)	RCA-6F6-G	Power Outpu
(8)	RCA-6F6-G	Power Outpu
(9)	RCA-6U5	Precision Ey
(10)	RCA-5U4-G	Rectifie

Pilot Lamps (3)........................ Center, Mazda No. 47, 6-8 V., 0.15 amp.; Sides, Mazda No. 44, 6.3 V., 0.25 amp

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 80 watts (WR-366), 120 watts (WR-368)
Rating B	105-125 volts, 25-30 cycles, 80 watts (WR-366), 120 watts (WR-368)

POWER OUTPUT	WR-366	WR-368
Undistorted	2.5 watts	10 watts
Maximum	5 watts	12 watts

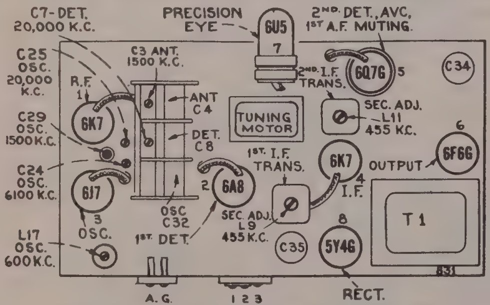
LOUDSPEAKER

Type	12-inch Electrodynami
Voice Coil Impedance	2.2 ohms at 400 cycle

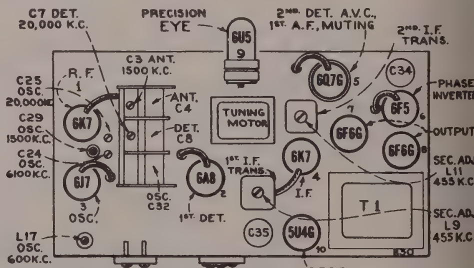
General Description

Model WR-366 is an eight-tube, three-band, superheterodyne receiver employing electric motor tuning for nine broadcast stations and a Precision Eye for precise manual tuning. The tuning ranges cover the standard broadcast band, Municipal and State Police bands, and the American and Foreign short-wave broadcast bands. Among its features are: Continuously variable tone control, illuminated slide-rule dial, automatic volume control, magnetically-tuned i-f transformers, r-f amplifier stage, phonograph terminal board, separate oscillator tube, and bass compensation.

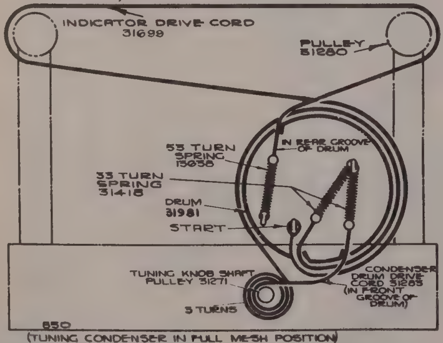
The Model WR-368 is a ten-tube, three-band, superheterodyne receiver with all of the features of the WR-36 and in addition employing push-pull output with a phas inverter and a power output of 12 watts.



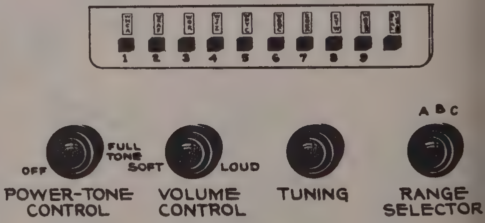
WR-366 Tube and Trimmer Locations



WR-368 Tube and Trimmer Locations



Drive Cord Arrangement for Tuning Condenser and Dial Indicator



Location of Controls

Tuner Assembly Data, Part 1

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR366
MODEL WR368
MODEL WR370

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc: This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

Oscillation of Tuning Mechanism

The principal of operation necessitates that the mechanism go through several quick reversals on arriving at the desired station frequency and before reaching a dead stop. Three of four reversals are normal. The number of reversals and consistency of operation depends mainly on the flywheel friction adjustment, however, in some cases the selector disc and station setting contacts are involved. The following suggestions may be helpful where excessive pointer oscillation is experienced.

Oscillation on Certain Buttons Only

(1) Check contact tip of selector assembly for loose fit in body. See that nose of contact is not burned nor distorted out of correct shape. Replace tip if necessary; do not attempt to file the tips.

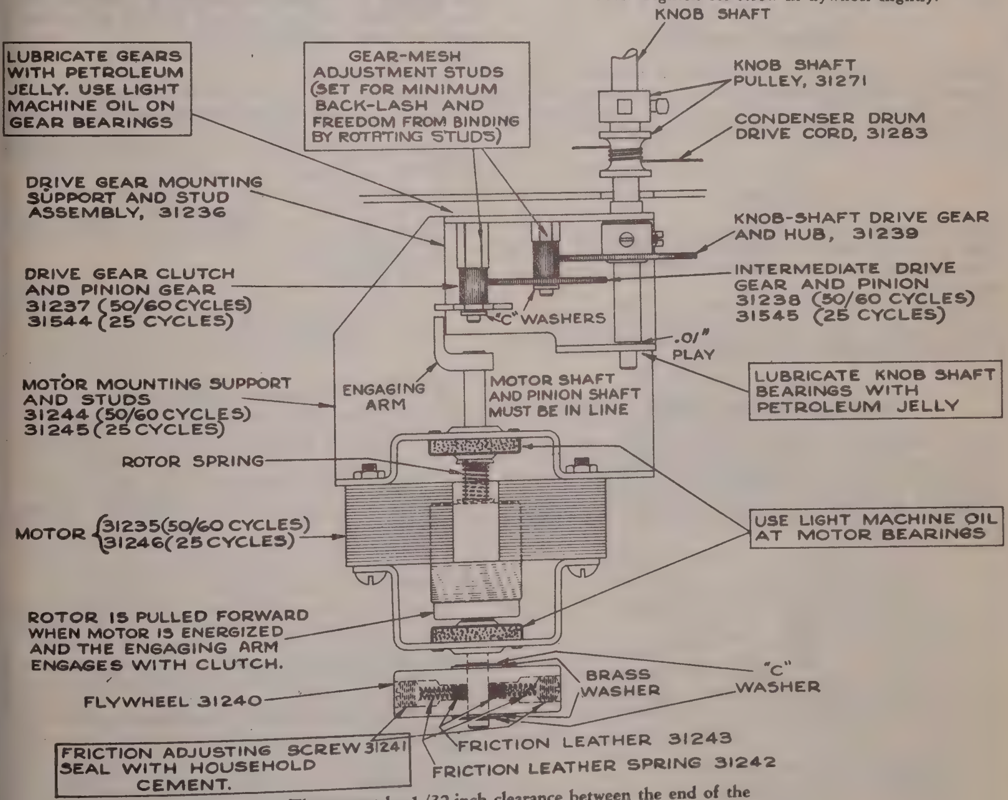
(2) Clean the insulating gap of selector disc, being sure to remove all metal particles and metallic fragments from beveled edges of the brass. Each contact should be checked to assure that clearance exists (approx. .010-in) between it and the disc when stopped in position on the station.

(3) Inspect the insulating gap to see that it has not changed shape due to bending or warping. Replace the disc if cleaning and adjustment fail to give correct operation.

Oscillation On All Buttons

(1) Slow oscillation indicates friction adjustment of flywheel is too tight. Loosen set screw in flywheel slightly.

(2) Rapid oscillation indicates friction adjustment is too loose. Tighten set screw in flywheel slightly.


KNOB SHAFT
LUBRICATE GEARS WITH PETROLEUM JELLY. USE LIGHT MACHINE OIL ON GEAR BEARINGS
GEAR-MESH ADJUSTMENT STUDS (SET FOR MINIMUM BACK-LASH AND FREEDOM FROM BINDING BY ROTATING STUDS)
KNOB SHAFT PULLEY, 31271
CONDENSER DRUM DRIVE CORD, 31283
DRIVE GEAR MOUNTING SUPPORT AND STUD ASSEMBLY, 31236
KNOB-SHAFT DRIVE GEAR AND HUB, 31239
DRIVE GEAR CLUTCH AND PINION GEAR 31237 (50/60 CYCLES) 31544 (25 CYCLES)
INTERMEDIATE DRIVE GEAR AND PINION 31238 (50/60 CYCLES) 31545 (25 CYCLES)
"C" WASHERS
.01" PLAY
MOTOR MOUNTING SUPPORT AND STUDS 31244 (50/60 CYCLES) 31245 (25 CYCLES)
ENGAGING ARM
MOTOR SHAFT AND PINION SHAFT MUST BE IN LINE
LUBRICATE KNOB SHAFT BEARINGS WITH PETROLEUM JELLY
ROTOR SPRING
MOTOR {31235 (50/60 CYCLES) 31246 (25 CYCLES)
USE LIGHT MACHINE OIL AT MOTOR BEARINGS
ROTOR IS PULLED FORWARD WHEN MOTOR IS ENERGIZED AND THE ENGAGING ARM ENGAGES WITH CLUTCH.
BRASS WASHER
"C" WASHER
FLYWHEEL 31240
FRICTION ADJUSTING SCREW 31241 SEAL WITH HOUSEHOLD CEMENT.
FRICTION LEATHER 31243
FRICTION LEATHER SPRING 31242

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

Motor and Gear Mechanism

MODEL WR366
MODEL WR368
MODEL WR370

WESTINGHOUSE ELEC. SUPPLY CO.

Data, Part 2
Tuner, Notes

(3) If definite adjustment cannot be reached, remove spring from behind flywheel set screw and increase its length by stretching; replace and make the necessary adjustments. Install a new spring if necessary.

(4) See that leather friction pad is not binding in its hole, and that it is saturated with lubricant. "Neats-Foot" oil should be used for this purpose.

(5) Incorrect balance of the flywheel sometimes prevents correct adjustment. The standard service replacement flywheel Part No. 31240 may be used to definitely eliminate this cause.

(6) The number of oscillations varies somewhat with line voltage. Avoid making adjustments at very low (105v) or very high (125v) voltages. Adjustments made at 115-118 volts provide good operation of the rated range.

(7) Stability of adjustment is slightly better if made after a brief run-in period.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the beveled operating-end at the left (viewed from rear).

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

Muting Circuit

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Lubrication

Motor bearings and **gear bearings**; use light machine oil.

Gear faces; use "Pure Oil No. 611" or petroleum jelly.

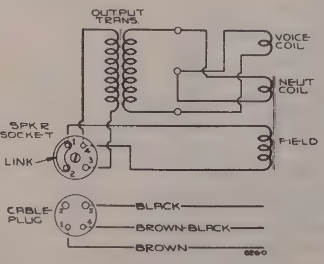
Dial indicator pulleys and **rails**; use "Castordag" or petroleum jelly.

Selector disc; apply thin film of petroleum jelly.

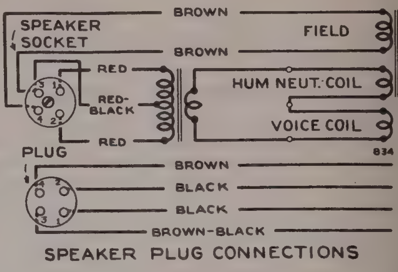
Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

Push Button Adjustments

Push buttons which stick in the escutcheon may be corrected by centering the rubber retainer-bumper in the rear of the buttons and cementing the rubber in place with plasticon. If the buttons do not lock in place, the chassis may be too far back in the cabinet or the latch bar spring may be out of place.



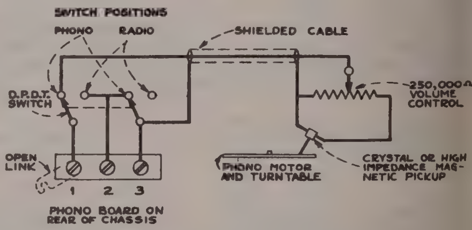
WR-366 Loudspeaker Wiring



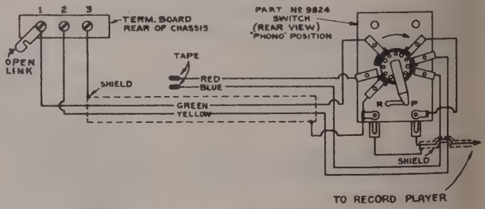
WR-368 Loudspeaker Wiring

Removing Speaker from Cabinet.—Hold the nuts, located between the speaker and baffle, with a pair of long-nose pliers while removing the speaker nuts. Normal shrinkage of the wood baffle may loosen the nuts so that the screws will otherwise turn while removing the speaker.

Centering the Speaker Voice-Coil.—The speaker voice-coil may be centered in the normal manner by using three narrow feelers to obtain equal spacing of the air-gap. The dust cover must be removed before centering. This may be done by gently cutting it free from the cone, being careful not to cut or damage the cone while doing so. After adjustment, a dust cover should be carefully cemented in place to prevent entrance of foreign material.


SWITCH POSITIONS
PHONO
RADIO
SHIELDED CABLE
D.P.D.T. SWITCH
250,000Ω VOLUME CONTROL
OPEN LINK
1
2
3
PHONO MOTOR AND TURNTABLE
CRYSTAL OR HIGH IMPEDANCE MAGNETIC PICKUP
PHONO BOARD ON REAR OF CHASSIS

Phonograph Connections, Using a Double-Pole, Double-Throw Switch


1
2
3
TERM. BOARD REAR OF CHASSIS
PART Nº 9824 SWITCH (REAR VIEW) "PHONO" POSITION
OPEN LINK
TAPE
SHIELD
RED
BLUE
GREEN
YELLOW
R
P
SHIELD
TO RECORD PLAYER

Model WR-366 Model WR-368
Phonograph Connections, Using a Part No. 9824 Switch

Phonograph Terminal Board.—A 3-terminal board is located on the rear of the chassis for connecting a phonograph pickup, or Record Player, into the audio amplifier of the receiver. The upper diagram shows connections for a high-impedance pickup with a switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch. The volume control is optional since the radio volume control may be used to control record volume. The lower diagram shows Part No. 9824 switch and cable, and connections from cable to the phono terminal board. The pickup leads connect to terminals on the switch as shown.

ALIGNMENT PROCEDURE

Cathode-Ray Alignment is the preferable method. Connect vertical "Hi" input to terminal No. 2 on phono board and vertical "0" to terminal No. 3.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Dial-Indicator Adjustment.—Before aligning this receiver it is essential to slide the indicator pointer along the drive cable until it points to the lowest frequency mark on "A" band, (520 kc) with the gang condenser fully meshed.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L10, L11 (2nd I-F Transformer)
2	6A8 det. grid cap, in series with .01 mfd.	455 kc		L8, L9 (1st I-F Transformer)
3	Antenna Terminal in series with 300 ohms.	20 mc	20 mc. "C" band	C25 (osc.)* C7 (det.)†
4	Antenna Terminal in series with 300 ohms.	6.1 mc	6.1 mc "B" band	C24 (osc.)**
5	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
6	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L17 (osc.)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	1.500 kc "A" band	C29 (osc.)

* Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 19.09 mc, at which point a weaker signal should be received.

** Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 5.19 mc, at which point a weaker signal should be received.

† Rock gang condenser and use maximum capacity peak if two peaks can be obtained with C7.

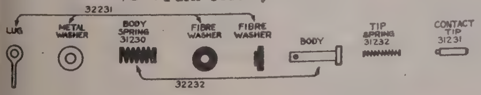
Note that oscillator tracks above (higher frequency) signal on all bands.

ADJUSTMENTS FOR ELECTRIC TUNING

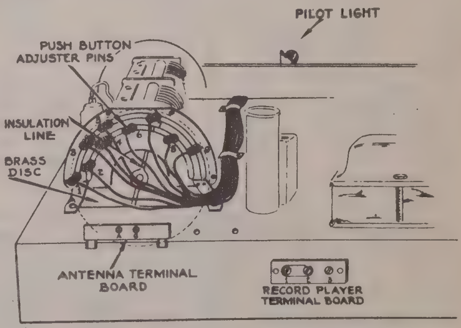
Push buttons No. 1 to 9 are electric tuning station buttons. The right hand push button is for dial tuning.

1. Make a list of the desired nine stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.*
4. Manually tune in the first station on the list, using the Precision Eye for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (left). Both buttons will stay down, central dial lamp will light brightly or dully, depending on which side of the disc the contact is located. Move station-setting contact No. 1 to the insulating line on the disc at rear of gang. When the contact is correctly centered on the insulating line, the central dial lamp will go out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

*WR-370 → Turn Fidelity Control maximum counter-clockwise.



Component Parts of Station-Setting Contact

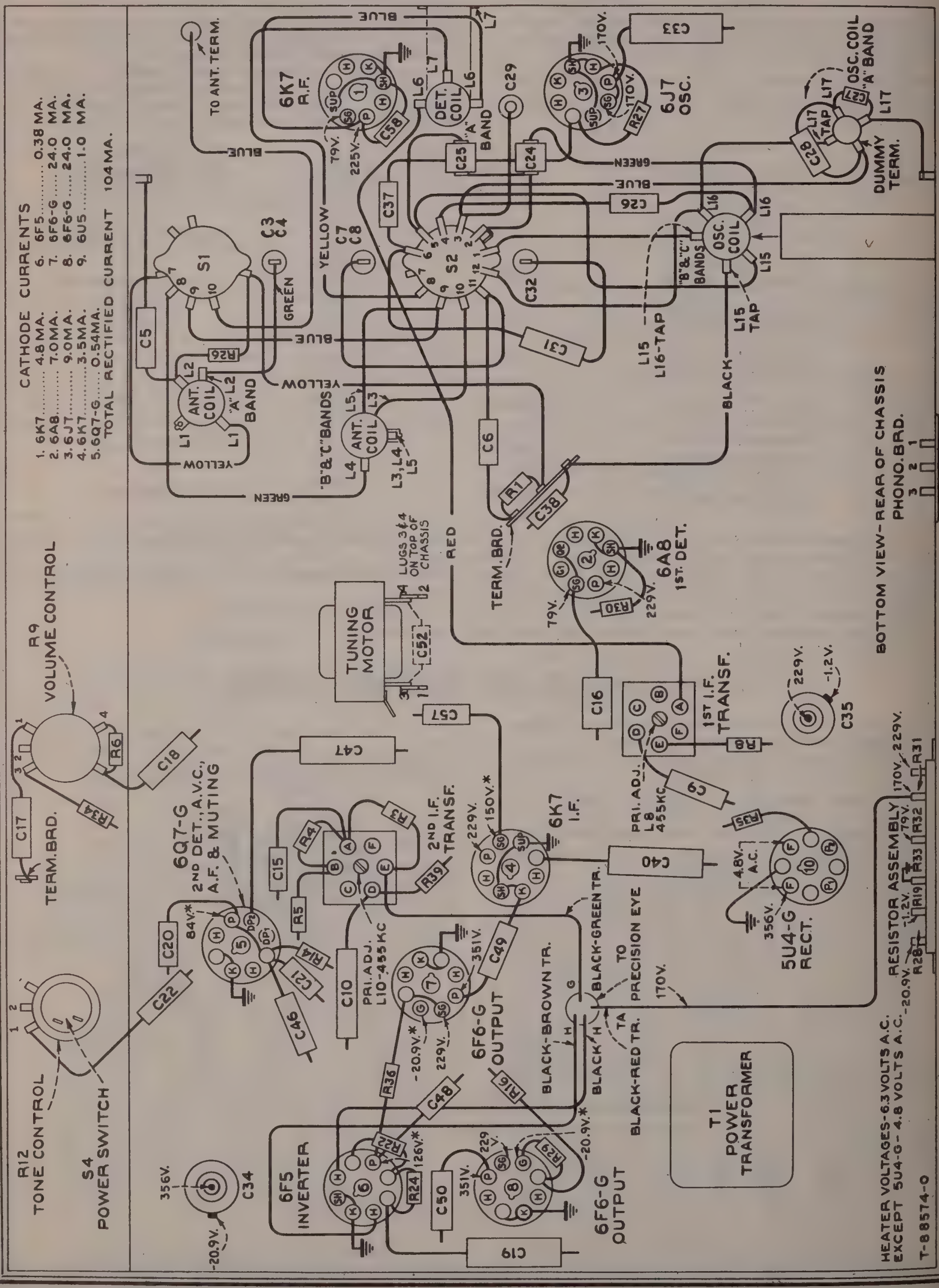


Station Button	Color of Lead To Station-Setting Contact
No. 1	Green-yellow
No. 2	Black
No. 3	Brown
No. 4	Blue
No. 5	Green
No. 6	Red
No. 7	Red-black
No. 8	Brown-black
No. 9	Red-yellow

Station-Setting Contacts and Selector Disc

MODEL WR368
Chassis Wiring
Voltage

WESTINGHOUSE ELEC. SUPPLY CO.



WR-368 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

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circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

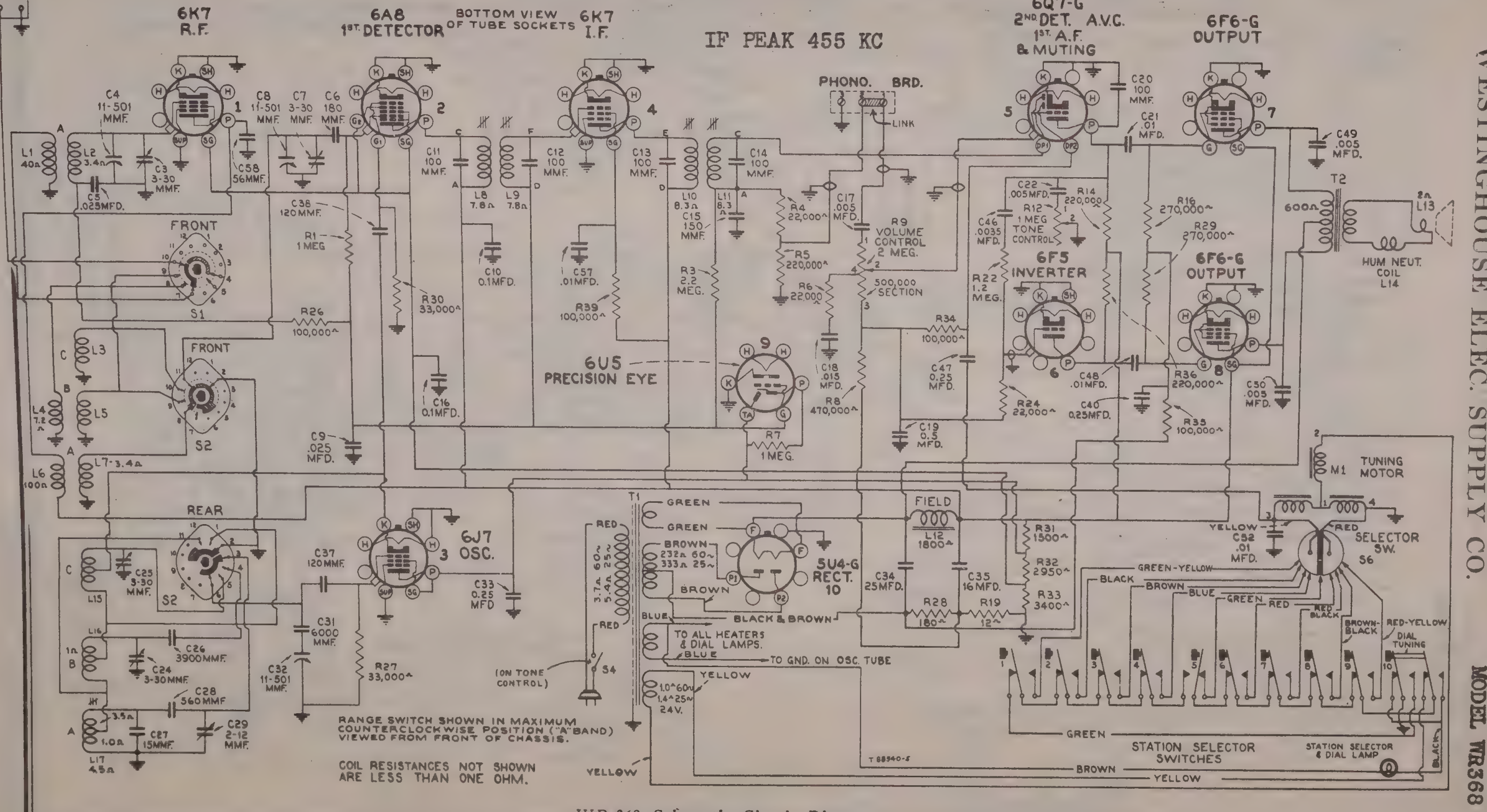
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

ohematic
ead Dress

1. Leads from the oscillator section of the range switch to the oscillator coils and mica trimmers should be kept as short as possible and dressed away from other parts and wiring.
2. The leads on C31 connecting between the range switch and the oscillator section of the gang should be made as short as possible.
3. The leads from the power transformer and the power cord to the power switch (S4) should be twisted together and dressed away from other wiring.
4. The .005 capacitor (C50) from the plate of tube No. 8 to chassis must be dressed away from the grid lead and R22 on tube No. 6.
5. The yellow lead connecting to the transformer motor winding at the rectifier socket should be dressed away from the phono terminals.

WESTINGHOUSE ELEC. SUPPLY CO.

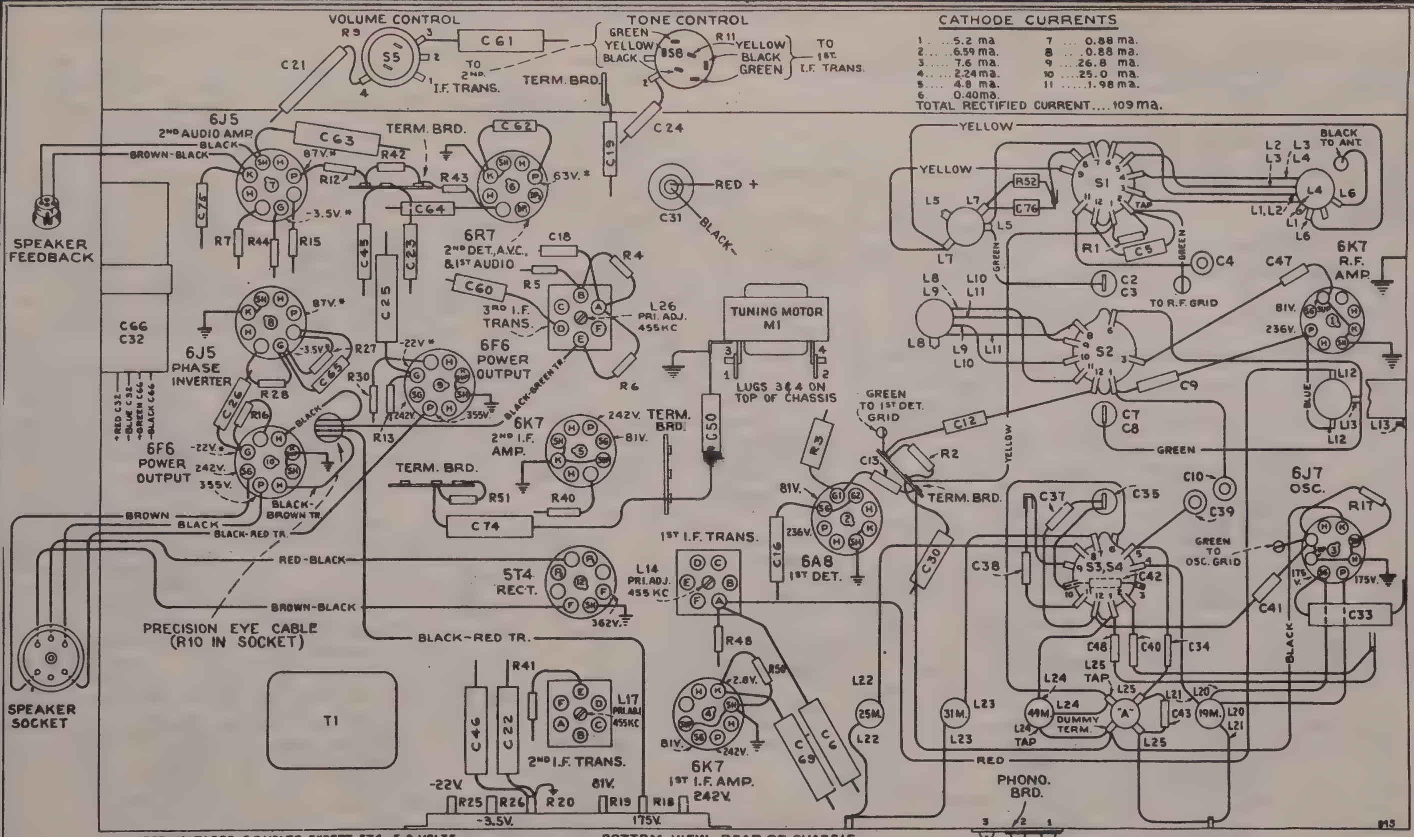
MODEL WR368



WR-368 Schematic Circuit Diagram

MODEL WR370
Chassis Wiring
Voltage, Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.



ALL HEATER VOLTAGES 6.3 VOLTS EXCEPT 5T4–5.0 VOLTS

BOTTOM VIEW—REAR OF CHASSIS

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

Precautionary Lead Dress.—

(1) Leads on spread-band antenna and r-f coils and trimming capacitors should be kept short as possible and separated from each other.

(2) Keep black lead from L25 away from C38 and L24.

(3) Keep black lead from L25 to cathode lug on 6J7 away from chassis and adjacent parts.

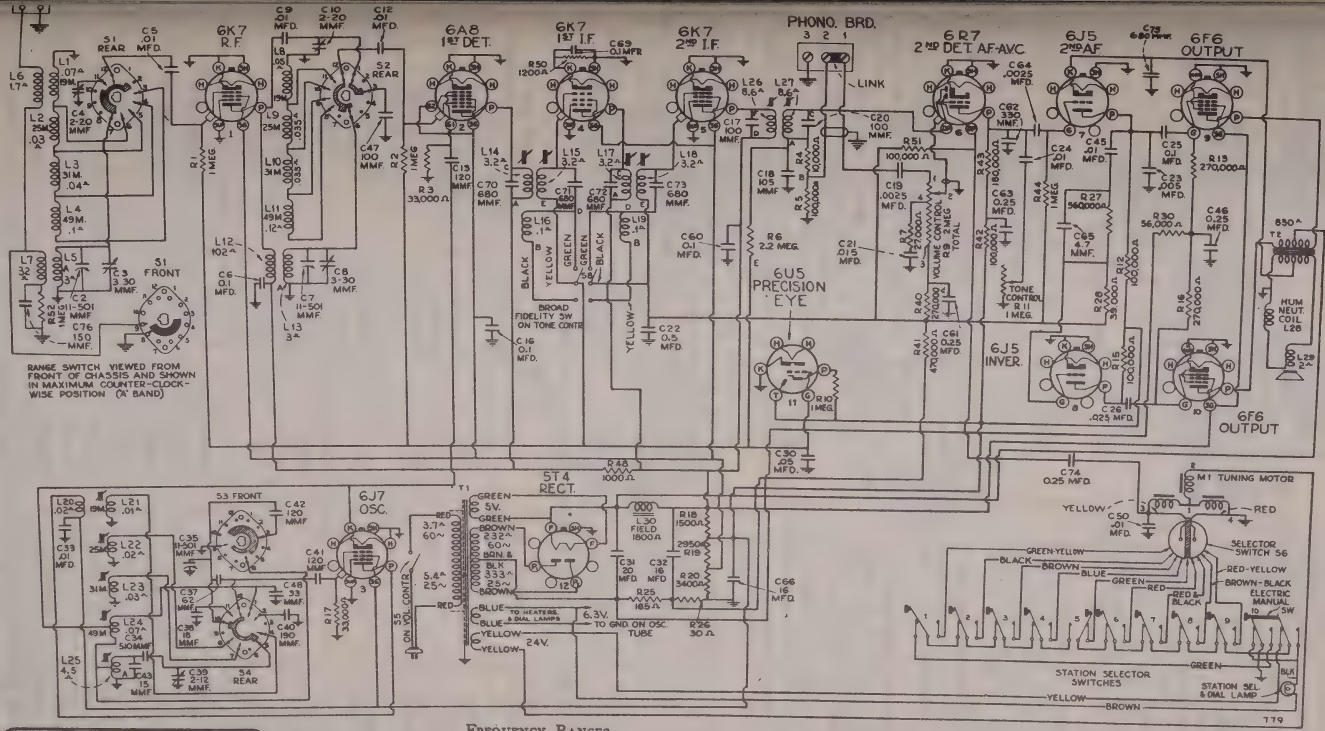
(4) The power cord lead and the primary lead of the power transformer which connect to the power switch should be twisted together, and kept away from Volume Control terminals.

(5) Keep C13 away from the 6A8 control grid lead and from the chassis.

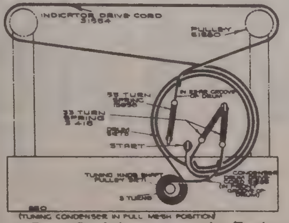
(6) The three leads from the first i-f transformer to fidelity switch should be twisted and kept short but away from adjacent parts. The same applies to the leads from

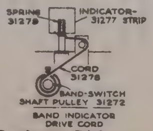
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR370
Schematic, Drive Cord
Speaker Data



IF PEAK 455 KC


INDICATOR DRIVE CORD 31364
PULLEY
START
TUNING KNOB SHAFT PULLEY
TUNING CONDENSER IN FULL MESH POSITION



Drive Cord Arrangement for Tuning Condenser, Dial Indicator, and Band Switch

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"49 Meter" Band	5.92-6.23 mc
"31 Meter" Band	9.48-9.69 mc
"25 Meter" Band	11.68-11.94 mc
"19 Meter" Band	15.08-15.39 mc

LOUDSPEAKER

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

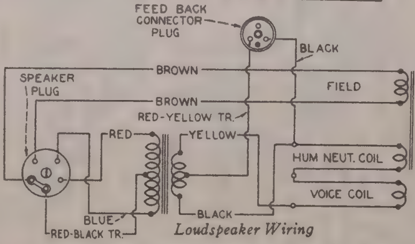
POWER OUTPUT

Undistorted	10 watts
Maximum	12 watts

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 125 watts
Rating B	105-125 volts, 25-30 cycles, 125 watts

Pilot Lamps (5)........... Center top and center bottom, Mazda No. 47, 6-8 V., 0.15 amp.; Top left, top right and bottom right, Mazda No. 44, 6.3 V., 0.25 amp.



Loudspeaker Wiring

NOTE: Due to inverse feedback used on this receiver, it is very important to connect speaker, speaker cable, and feedback cable, exactly as shown.

MODEL WR370
Alignment,Trimmers

WESTINGHOUSE ELEC. SUPPLY CO.

Socket,Notes

Cathode-Ray Alignment is the preferable method. Connect vertical "Hi" input to terminal No. 2 on phono board and vertical "0" to terminal No. 3.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

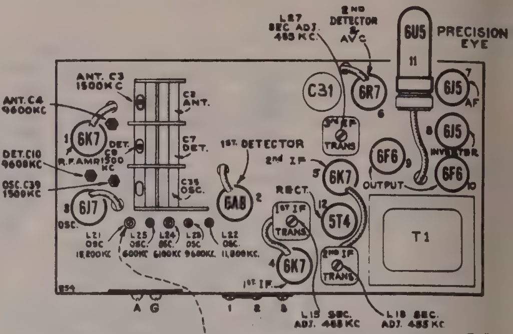
As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the core of the oscillator coil for each band so that these stations come in at the correct points on the dial.



CAUTION: THIS ADJ. SCREW MUST PROJECT AT LEAST 3/4" FROM TOP OF CHASSIS TO PREVENT SHORTING +B.

Tube and Trimmer Locations

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the core of the oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Steps	Connect the high side of test-oscillator to—	Tune Test-Oscillator to—	Range Selector	Set Tuning Gang to—	Adjust the following for max. peak output
1	Turn Fidelity Control to Maximum Counter-clockwise position.				
2	6K7 2nd I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L26, L27 (3rd I-F transformer)
3	6K7 1st I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L17, L18 (2nd I-F transformer)
4	6A8 1st-det. grid cap in series with .01 mfd.	455 kc	"A"		L14, L15 (1st I-F transformer)
5	Antenna Terminal in series with 200 mmf.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.) C8 (det.) C3 (ant.)
6	Antenna Terminal in series with 200 mmf.	600 kc	"A"	600 kc (30.0°)	L25 (osc.)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.)
8	Antenna Terminal in series with 300 ohms.	6,100 kc	"49M"	6,100 kc (106°)	L24 (osc.)*
9	Antenna Terminal in series with 300 ohms.	9,600 kc	"31M"	9,600 kc (102°)	L23 (osc.)** C10 (det.) C4 (ant.)
10	Antenna Terminal in series with 300 ohms.	11,800 kc	"25M"	11,800 kc (90.0°)	L22 (osc.)**
11	Antenna Terminal in series with 300 ohms.	15,200 kc	"19M"	15,200 kc (78.0°)	L21 (osc.)**

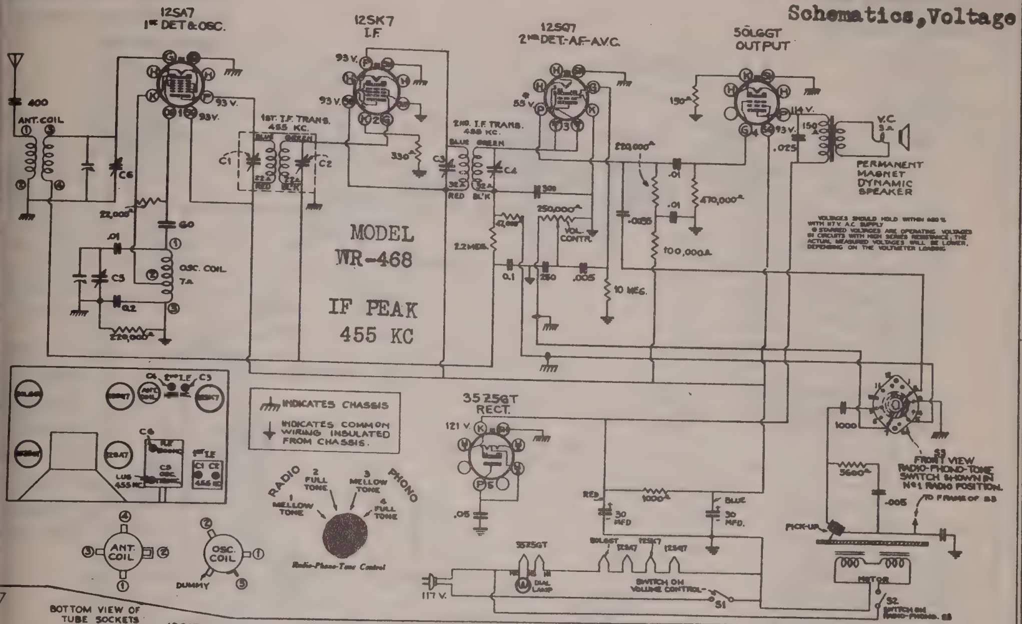
* Use maximum inductance peak (plunger in) if two peaks can be obtained.

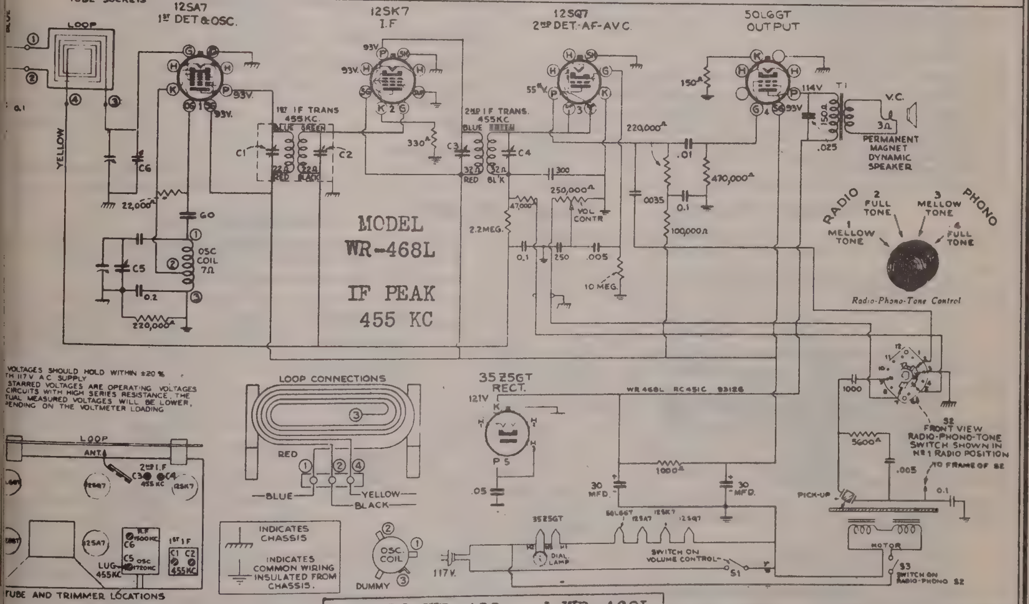
** Use minimum inductance peak (plunger out) if two peaks can be obtained.

Note that oscillator tracks above signal frequency on all bands except "49M," where it tracks below.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR468
MODEL WR468L
Schematics,Voltage





MODELS WR-468 and WR-468L

REQUENCY RANGE	540-1,720 kc
OWER OUTPUT (125 volt, 60 cycle supply)	
ndistorted	.75 watts
aximum	1.3 watts
OUDSPEAKER	
ype	5-inch Permanent Magnet Dynamic
oice-Coil Impedance	3.4 ohms at 400 cycles
HONOGRAPH	Synchronous (manual starting)
ecords	10-inch and 12-inch, 78 r.p.m.
ckup	Crystal, 100,000 ohms at 1,000 c.p.s.
verage Output of Pickup	1½ volts at 1,000 c.p.s. across ½ meg. load

Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

First Edition

A-6	105-125 volts, 60 cycles, 40 watts

WR-468

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

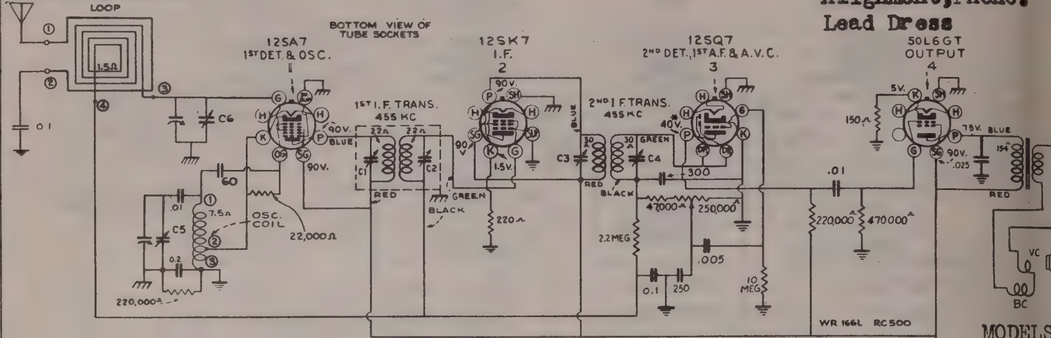
WR-468L

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it should be connected to the blue antenna lead on the rear of the chassis.

MODELS WR166L
WR166LB,WR166LC
WR166LG,WR166LI
WR166LR,WR166LW

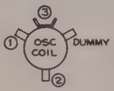
WESTINGHOUSE ELEC. SUPPLY CO.

Schematic,Voltage
Socket,Trimmers
MODELS WR468,WR468
Alignment,Phono.
Lead Dress



IF PEAK 455 KC

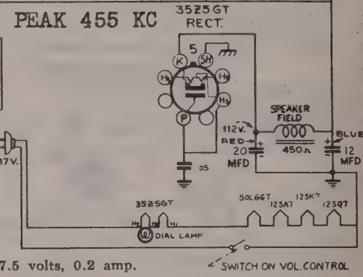
VOLTAGES SHOULD HOLD WITHIN ±20 % WITH 117 V. A.C SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING



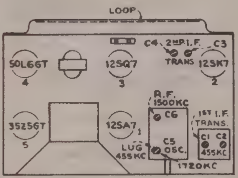
INDICATES CHASSIS

INDICATES COMMON WIRING INSULATED FROM CHASSIS

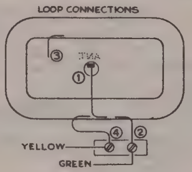
MODELS
WR-166L
WR-166L
WR-166L
WR-166L
WR-166L
WR-166L
WR-166L



Mazda 51, 7.5 volts, 0.2 amp.



TUBE & TRIMMER LOCATIONS



FREQUENCY RANGE........................... 540-1,720 kc

INTERMEDIATE FREQUENCY............................ 455 kc

POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted.. 0.5 watts
Maximum.. 1.25 watts

LOUDSPEAKER
Type.................................. 4-inch Electrodynamic

POWER SUPPLY RATINGS

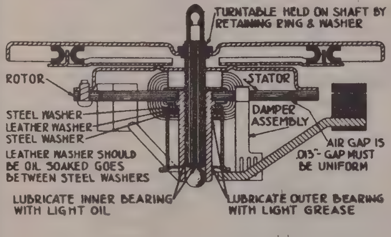
A-C Rating. .... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating.............. 105-125 volts, direct current, 30 watts

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT." terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

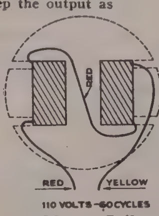
Alignment Procedure WR-468, WR-468L

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.


TURNTABLE HELD ON SHAFT BY RETAINING RING & WASHER
ROTOR
STATOR
STEEL WASHER
LEATHER WASHER
STEEL WASHER
LEATHER WASHER SHOULD BE OIL SOAKED GOES BETWEEN STEEL WASHERS
DAMPER ASSEMBLY
AIR GAP IS .013" GAP MUST BE UNIFORM
LUBRICATE INNER BEARING WITH LIGHT OIL
LUBRICATE OUTER BEARING WITH LIGHT GREASE

Cross Section of Motor Assembly



Motor Coil Assembly and Connections

Phonograph Service Data

The motor is started by turning the radio-phono tone control to either 3rd or 4th position clockwise and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather and steel washers are in the proper position.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against chassis apron.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I- transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Power Supply.—Although this model employs an ac-dc chassis, is not suitable for use on dc, as this would damage the motor.

5. The damper spring must fit without binding or chattering the slot in the stator. The stator must be free to deflect in eith direction between the limits of the damper spring. The damper sprin must exert approximately equal force in restoring the stator to i mid-position when the stator is deflected manually in each directio

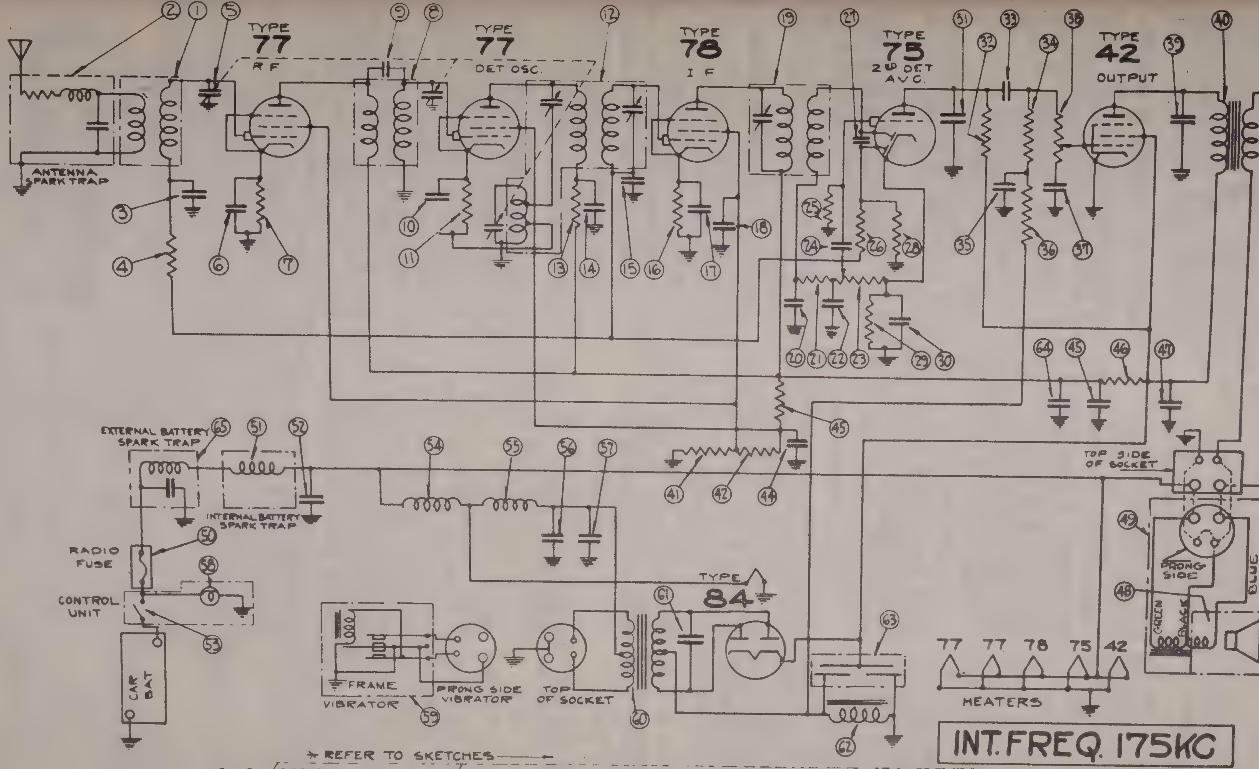
Removing Rotor.—The rotor and turntable assembly simply res on the ball bearing at bottom of vertical bearing. Remove by lif ing up.

Rotor Adjustment.—Loosen the three screws that hold the roto to the turntable, insert three 13-mil shims at equal distances aroun the gap between the rotor and stator, and then carefully tighten th three screws.

Lubrication.—Oiling points are indicated in the diagram.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR502
Schematic,Voltage



★ REFER TO SKETCHES

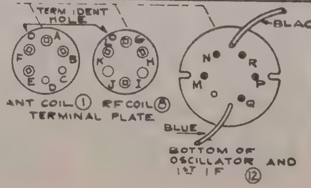
WINDING RESISTANCE

PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT ★	SECONDARY RESIST.	SECONDARY IDENT ★
①	ANT COIL	21 Ω	A To B	2 5 Ω	E To F
⑧	RF COIL	72 Ω	L To G	4 Ω	H To J
⑫	OSCILLATOR	6 Ω	M To P		
⑫	1ST I F	70 Ω	R To BLUE	67 Ω	BLACK To GREEN
⑲	2ND I F	90 Ω	RED To BLUE	86 Ω	GREEN To BLACK
㊵	OUTPUT	550 Ω	GREEN To BROWN		
(62)	CHOKE	325 Ω	BLACK To GND.		
(60)	POWER	3 Ω	BLACK To GREEN	860 Ω	RED To BLUE

SOCKET VOLTAGE

TUBE	STAGE	FIL	PLATE	CATH	SCREEN	OUTPUT GRID BIAS MEASURED ACROSS (62) POWER PACK CHOKE
77	RF	6 0	186	1 8	84	
77	DET-OSC	6 0	185	9	135	
78	I F	6 0	190	6 5	84	
75	2ND DET	6 0	117	1 5		
42	OUTPUT	6 0	226	0	242	-15
84	RECTIFIER	6 0				

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω PER VOLT



MODEL WR502
Service Data
Vibrator Adjustments

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR 503
Service Notes

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ------------------2 #77, 1 #78, 1 #75, 1 #42, 1 #84 - Total 6
Battery Current (6.3 Volt Battery) ---------------------------------- 6.5 Amperes
Tuning Range --- 540 to 1600 K.C.
Maximum Undistorted Output -- 3.0 Watts
Maximum Output --- 4.0 Watts
Line-Up Frequencies ------------------------------ I.F. 175 K.C., 1400 K.C., 1600 K.C.

GENERAL DESCRIPTION

The Model WR 502 Car-Radio has been designed, manufactured, and tested with special regard for the requirements of automobile radio. The electrical, mechanical and acoustical features of the set have been decided upon after extensive tests in automobiles to determine the proper requirements for greatest satisfaction.

The Model WR 502 receiver is a single-unit compact radio chassis, power pack, and speaker with a separate remote control. The set is contained in a cylindrical housing and is provided with many features which result in improved tone quality, attractive appearance, mechanical stability and desirable service features.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type, using a type 77 tube as an R.F. amplifier, a type 77 as a combined first detector-oscillator, a type 78 as an I.F. amplifier, a type 75 used as a combination second detector, A.V.C., and first audio amplifier, a type 42 as an output amplifier, and a type 84 as a rectifier in the power supply.

The Model WR 502 is equipped with three spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; an external spark trap, connected in series with the battery cable; and an antenna spark trap, provided in the antenna circuit. These spark traps make the installation of auxiliary suppression equipment unnecessary in most cars.

SERVICE DATA

TROUBLES THAT CAN BE LOCATED AND REMEDIED WITHOUT REMOVING THE RECEIVER FROM THE HOUSING OR CAR

DIAL LIGHT DOES NOT LIGHT

Dial light may be loose in socket, broken or burned out. Socket on end of lead in rear of control head can be pulled straight out.

FUSE BLOWN

Check the fuse in the container on the receiver ammeter feed lead.

SET INOPERATIVE AND TUBES DO NOT LIGHT

Remove the speaker cover and disconnect the speaker plug. Remove the vibrator, all the tubes, and disconnect the dial light cable from the chassis. Check with an ohmmeter from "Hot A" side of battery cable (male bayonet connector inside the fuse-container housing) to ground. Should this show an open circuit when the line switch is closed, obviously a tube or the vibrator is shorted and these parts can be checked separately to determine which is defective. On the other hand, if the ohmmeter shows a closed circuit, the chassis should be removed from the housing and checked.

INSENSITIVE OR WEAK

Check the car antenna for poor connections and grounds. Also check tubes and the receiver alignment.

INTERMITTENT RECEPTION

This is usually caused by a poor connection from the set antenna lead to the car antenna lead-in, and this joint should always be checked when intermittent reception occurs.

MICROPHONIC OR INTERMITTENT

Tap each tube lightly with a small piece of wood or an insulated screw driver handle. The offending tube when tapped will usually howl very loudly if microphonic or will give intermittent results if defective.

LOW POWER OUTPUT

Check tubes and the vibrator. Usually caused by the latter.

RECEPTION CUTS OFF AT CERTAIN SETTINGS OF DIAL-SCALE POINTER

This condition is usually caused by some foreign metallic substance shorting a section of the condenser gang. These particles are often too small to be seen but can be removed by blowing them out with an air pressure hose or an ordinary hand pump. Great care must be taken not to destroy the thin mica insulators assembled under the trimmers on top of the condenser gang.

POOR TONE QUALITY

Foreign material is apt to become lodged between the speaker voice coil and the field core. This hampers the movement of the speaker diaphragm. As the rear of the speaker is open, this space can be blown out clean with an air hose.

BUZZING SOUND IN SPEAKER

This can be remedied in many cases by the method described above. It can also be caused by a loose winding on the voice coil. In such a case the turns of this winding should be carefully pushed together, and a thin coating of collodion or coil cement should be applied to hold the windings in place.

RATTLES

Check receiver for loose cover thumb screws, tube shield, and housing screws. Rattles seemingly in the radio receiver, are often traced to loose parts in the bulkhead or dashboard of the car.

VIBRATOR NOISE

(Be sure that this is checked with the car engine OFF and the antenna disconnected.) Check the spring contact on the receiver housing and cover, and particularly the vibrator top spring. Clean and adjust the vibrator according to the instructions given in another section of these service notes.

SET INOPERATIVE
TUBES LIGHT AND VIBRATOR BUZZES

A. Check the B voltage (approximately 240 volts) from the middle terminal of the electrolytic filter condenser to ground on the chassis. This point is easily reached with the speaker cover removed. If no voltage or low voltage is observed, test the vibrator and 84 rectifier tube. If voltage is still incorrect, the receiver should be removed from the housing.

B. With the speaker plugged in, remove the clip from the grid of the 75 tube and touch the clip to the grid cap of the 75 tube several times in succession. A clicking noise should be heard in the speaker. This is a practical test for the audio amplifier and speaker. If this clicking noise is not heard, the 75 and 42 tubes should be tested and the voltage checked at the plates of these tubes. The speaker should be checked with a volt-ohmmeter by testing across the prongs of the speaker plug for continuity. While making this test, the cable should be moved back and forth to show up any possible intermittent open circuit in the speaker cable. Check the voice coil and field coil for resistance.

If the audio and speaker are still dead, the chassis should be removed from the housing.

If the audio and speaker are working correctly, test the remaining tubes and check the voltage at each socket.

In the event that the chassis has to be removed from the car for repairs, this can easily be done as follows: Disconnect all external cables and the flexible shafts from the receiver. Remove the speaker cover and pull out the speaker plug. Remove the screws around the outside of the housing and pull the chassis straight out, being careful not to damage the antenna cable. The chassis can be removed in many cars in this manner without the necessity of unbolting the chassis housing from the car.

LOCATING TROUBLE IN CHASSIS

To locate a short, open or defective unit which causes low or no "B" voltage, isolate the power pack from the receiver section by disconnecting the two red leads (coming from the receiver section) from each end of the 5000-ohm resistor, #46, in the power pack. Check the voltage from the input side of the resistor to ground, which should be approximately 250 volts. If this voltage is incorrect, the trouble is definitely in the power pack and all component parts should be checked.

Conversely, if the voltage reading proves to be correct, the trouble is in the receiver section and all its parts should be checked.

In locating a short or open in the filament circuit, the power pack can be disconnected from the filament supply of the receiver section by removing the red wire on the top terminal of the "off" and "on" switch connected to the 42 tube. This will connect only the power pack in the filament circuit and if the short or open no longer exists, it will prove that the trouble is in the receiver section.

WEAK OR INSENSITIVE AFTER RE-ALIGNMENT

Check coils and associated circuits in the deficient "stage" of the receiver for proper resistance values.

LOW POWER OUTPUT WITH B VOLTAGE CORRECT

Check the speaker field coil, voice coil and associated audio circuit for resistance continuity and defective condensers.

All riveted component parts can be removed by merely punching out the rivets with a small diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four drive screws, two located directly over the resistor and condenser strip and the other two in back of the condenser gang on the power pack shield. In replacing the power transformer be sure to tighten the screws securely and replace the shield braid bond or vibrator noise will be present.

INSTRUCTIONS FOR ADJUSTING VIBRATOR
MODEL WR-502 ONLY.

After the vibrator has been in use for some time, it may refuse to start operating. This is an indication of worn Tungsten contact points; but, since a reserve of Tungsten has been provided, a simple adjustment can be made to prolong the life of the vibrator.

1. Remove the vibrator unit from its housing by removing the tension spring with a pair of round nosed pliers.

2. Remove the rubber sock, being careful not to bend the wires at the soldered connections.

3. Lay the vibrator on a piece of white paper so that when viewed from above it appears exactly as shown in Fig. 1.

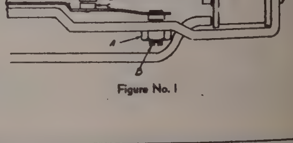


Figure No. 1

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR502
Alignment, Socket
Trimmers, Parts

4. Loosen lock nut "A" and turn screw "B" clockwise until .005" of light can be seen between contacts "C" and "D". If the contact points are somewhat roughened, light cannot be seen across their entire diameter, even though they are correctly respaced, that is within .005" of touching each other.

5. A simple check on the correctness of the spacing adjustment is obtained by pressing lightly against the center of the read with a small nail in the direction and location shown by arrow "E". When the reed is thus moved so as to close contacts "C" and "D", the weight "F" on the free end of the reed should move 1/64" from its "at rest" position. This check should be made after lock nut "A" has been firmly retightened.

6. Do not readjust the spacing between contacts "G" and "H" unless the Tungsten is nearly all worn away. In this case, re-adjustment may be made the same as for contacts "C" and "D".

7. In re-inserting the vibrator into its rubber sock, be very careful to turn the "flats" of the sock hole so that they are parallel to the flat side of the vibrator frame. This provides ample space in the sock for the free movement of the reed. Make certain that the slot in the prong terminal plate engages the small projection on the inside edge of the housing. Then replace the tension spring. THESE INSTRUCTIONS DO NOT APPLY TO ANY OTHER TYPES OF VIBRATORS.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments are tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator is available. In such a case, proceed as follows, referring to Fig. #2.

1. Set test oscillator to 175 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3. ohms.

4. Apply test signal to grid of 78 I.F. tube through a .5 mfd. blocking condenser and adjust trimmer "A" to maximum output reducing output of test oscillator as required.

5. Apply test signal to grid of 77 first detector-oscillator and adjust trimmers "B" and "C" to maximum output.

6. Set test oscillator to 1600 K.C. and rotate condenser gang until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the bottom of the gang and close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

7. Adjust trimmer "D" to maximum output and then remove the paper gauge.

8. Set test oscillator and condenser gang to 1400 K.C.

9. Apply test signal to grid of 77 R.F. tube and adjust trimmer "E" to maximum output.

10. Apply test signal to antenna lead through a .0002 mfd. condenser and adjust trimmer "F" to maximum output.

11. Check sensitivity at several points.

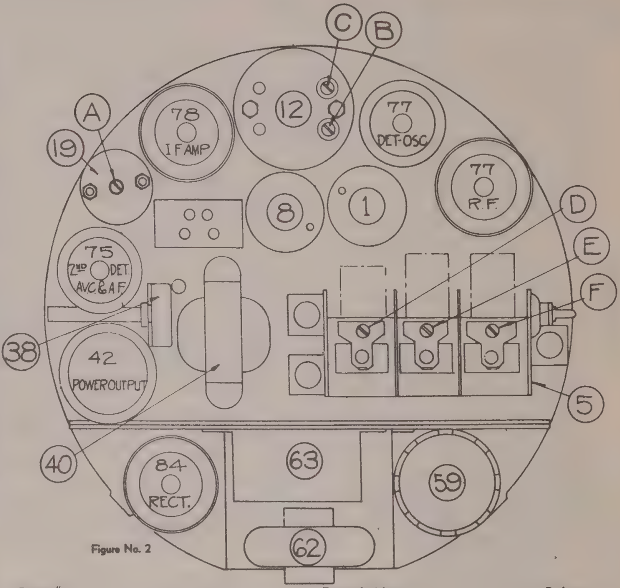


Figure No. 2

Part #	Description	Price
CH 9592	Chassis assembly	$
CU 9517	Tuning unit (less shafts)	2.75
SK 955	Speaker	5.50
	NUTS	
FP 106639	Thumb nut for antenna and battery cable	.10
NT 104935	Nut for mounting studs	.05
	SCREWS & STUDS	
FP 104892	Thumb screws on housing cover	.05
FP 106571	Mounting studs	.05
SC 1026 CA	Self-tapping screw (#6 x 1 inch long)	.05
SC 101700	Self-tapping screw (#7 x 1/4 inch long)	.05
	SOCKETS	
SA 104617	Tube socket - 6 prong	.20
SA 104616	Tube socket - 5 prong	.15
SO 953	Tube socket - 4 prong	.15
BE 956	Base for tube shield	.05
CV 954	Tube shield - long	.10
CV 9516	Tube shield - short	.10
	WASHERS, BUSHINGS & SPACERS	
WA 2-12 CA	Mounting washer	.05
WA 7-10	Mounting lock washer	.05
IS 1002	Rubber bushing for variable condenser	.05
FP 104086	Spacer for speaker plug	.05
SR 953	Spacer for variable condenser rubber bushing	.05
	SPEAKER PARTS (SK 955)	
CL 9513	Speaker field coil	1.10
DM 951	Diaphragm and voice coil assembly	1.25
FA 958	Silk speaker grill cloth	.15
CB 9528	Speaker cable with 4 prong plug	.45
SA 107279	Cover for speaker plug	.10
SA 107278	Speaker plug	.10
	MISCELLANEOUS	
SH 9537	Variable condenser shaft with pinion	.30
KT 956	Spark plug suppressor kit	2.60
DS 956	Dial indicator disc	.35
SW 9541	Switch assembly complete with cables	1.95
SP 958	Spring base for vibrator	.20
FP 105425	Cover for female section of antenna connector	.05
SH 9533	Drive shafts (2 used)	1.50
SA 106754	Coil suppressor	.45
SA 105300	Condenser	.80
FP 105426	Bushing and ferrule for antenna and fuse connectors	.05
FP 105427	Spring in antenna and fuse connector	.05
IS 105428	Insulation washer for fuse and antenna connectors	.05
FP 105429	Fuse container	.05
IS 105430	Insulation tube in fuse container	.05
FP 105431	Male section of antenna connector	.05
FP 79381	Clamp for spark trap and antenna cables	.05
KN 9531	Knob for tone control	.10
GE 9512	Split gear on variable tuning condenser	.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

WESTINGHOUSE ELEC. SUPPLY CO.

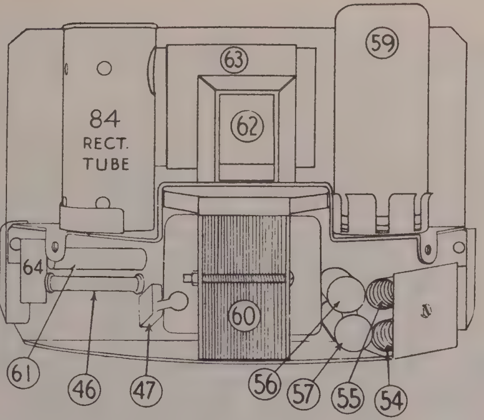


Figure No. 3

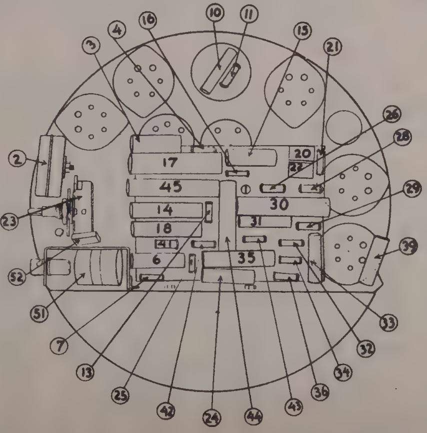


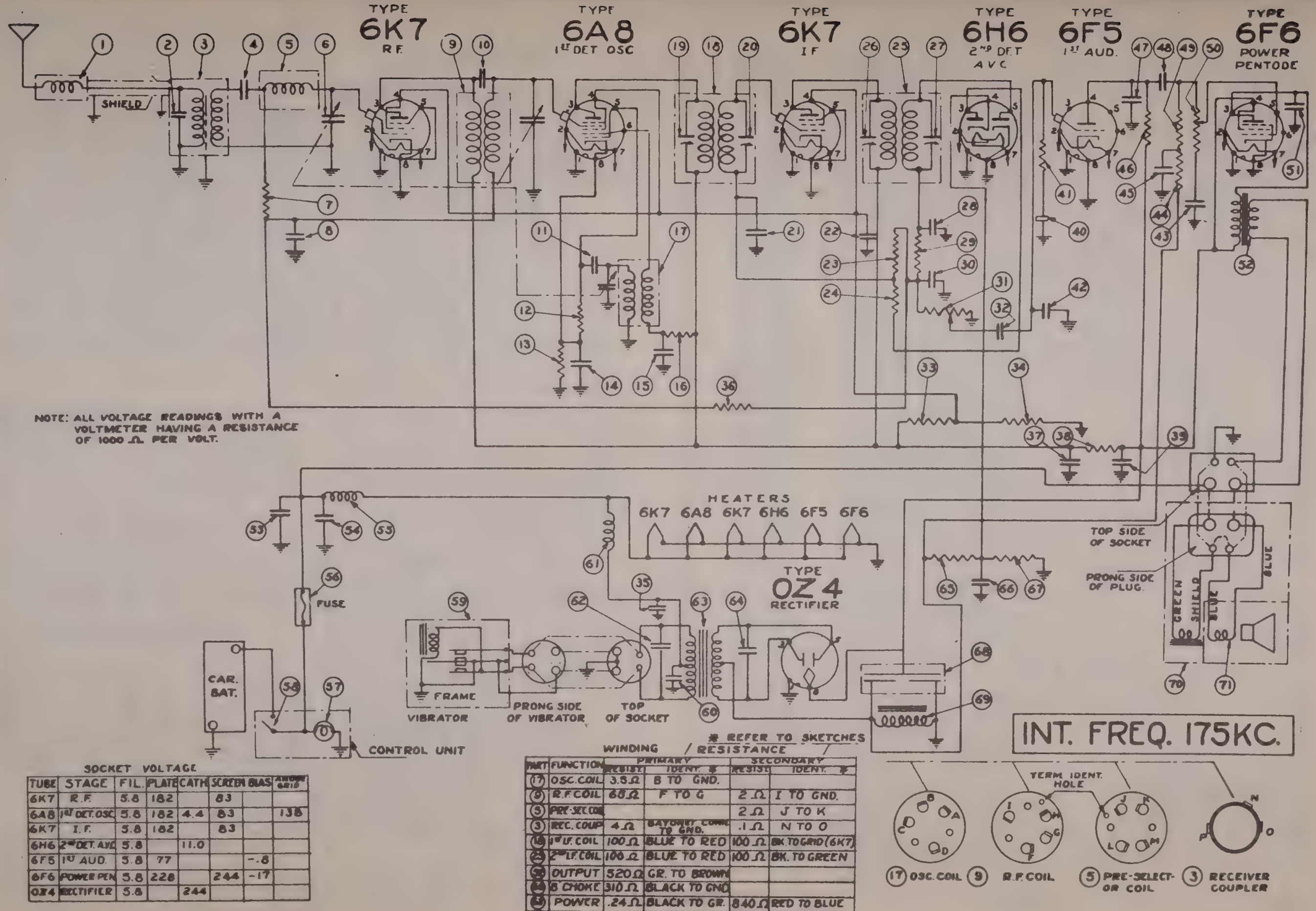
Figure No. 4

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

Dia. #	Part #	Description	Price
1	RC 95128	Antenna coil	$ .75
2	CC 958	Antenna spark trap	1.80
3	SA 106386	.05 mfd., 200 V. condenser	.20
4	SA 105278	100,000 ohm, 1/4 W. resistor	.15
5	CG 9542	3 gang condenser	3.75
6	SA 106386	.05 mfd., 200 V. condenser	.20
7	SA 105264	500 ohm, 1/4 W. resistor	.15
8	RC 95130	R.F. coil	.95
9		Twisted wire	
10	SA 103852	.002 mfd., 600 V. condenser	.20
11	SA 105247	7500 ohm, 1/4 W. resistor	.15
12	RC 95132	Composite coil	2.20
13	SA 105245	2000 ohm, 1/4 W. resistor	.15
14	SA 102492	.05 mfd., 400 V. condenser	.20
15	SA 106386	.05 mfd., 200 V. condenser	.20
16	SA 105270	2500 ohm, 1/4 W. resistor	.15
17	SA 102497	.25 mfd., 200 V. condenser	.20
18	CW 951	.1 mfd., 200 V. condenser	.20
19	IC 951	I.F. coil	1.50
20	CM 9513	.0001 mfd. mica condenser	.10
21	SA 105276	50,000 ohm, 1/4 W. resistor	.15
22	CM 9513	.0001 mfd. mica condenser	.10
23	VR 9524	Volume control	.85
24	SA 103659	.005 mfd., 400 V. condenser	.20
25	SA 105281	1 meg., 1/4 W. resistor	.15
26	SA 105246	1/2 meg., 1/4 W. resistor	.15
27	CM 9513	.0001 mfd. mica condenser	.10
28	SA 105246	1/2 meg., 1/4 W. resistor	.15
29	SA 105249	5000 ohm, 1/4 W. resistor	.15
30	SA 102497	.25 mfd., 200 V. condenser	.20
31	SA 103852	.002 mfd., 600 V. condenser	.20
32	SA 105278	100,000 ohm, 1/4 W. resistor	.15
33	SA 103659	.005 mfd., 400 V. condenser	.20
34	SA 105279	1/4 meg., 1/4 W. resistor	.15
35	CW 951	.1 mfd., 200 V. condenser	.20
36	SA 105279	1/4 meg., 1/4 W. resistor	.15
37	SA 106403	.001 mfd., 600 V. condenser	.20
38	VR 9525	Tone control	.75
39	CW 952	.005 rfd., 600 V. condenser	.20
40	TR 952	Output transformer	1.15
41	SA 105277	75,000 ohm, 1/4 W. resistor	.15
42	SA 105274	20,000 ohm, 1/4 W. resistor	.15
43	SA 105274	20,000 ohm, 1/4 W. resistor	.15
44	SA 102492	.05 mfd., 400 V. condenser	.20
45	SA 102496	.25 mfd., 400 V. condenser	.20
46	SA 107572	5000 ohm, 1 W. resistor	.20
47	CM 951	.001 mfd. mica condenser	.25
48	DM 951	Speaker diaphragm	1.25
49	SK 955	Speaker	5.50
50	FU 951	Fuse (20 amperes)	.05
51	RC 9512	Filter choke	.35
52	CM 953	.00005 mfd. mica condenser	.15
53	SW 9539	Switch assembly complete less cables	1.10
54	SA 105452	Filter choke	.20
55	SA 105452	Filter choke	.20
56	CW 958	.5 mfd., 200 V. condenser	.35
57	CW 958	.5 mfd., 200 V. condenser	.35
58	LP 956	Pilot light - (6 V.-.20 amperes)	.20
59	VI 951	Vibrator	3.75
60	TR 953	Power transformer	3.50
61	SA 106804	.008 mfd., 1600 V. condenser	.20
62	TR 951	"B" choke	.95
63	CE 951	6 and 10 mfd. electrolytic condenser	2.60
64	CM 951	.001 mfd. mica condenser	.25
65	CC 954	Spark trap	1.65

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR503
Schematic
Voltage



NOTE: ALL VOLTAGE READINGS WITH A VOLTMETER HAVING A RESISTANCE OF 1000 Ω PER VOLT.

WINDING / RESISTANCE

REFER TO SKETCHES

PART	FUNCTION	PRIMARY		SECONDARY	
		RESIST.	IDENT. #	RESIST.	IDENT. #
⑰	OSC. COIL	3.5 Ω	B TO GND.		
⑨	R.F. COIL	68 Ω	F TO G	2 Ω	I TO GND.
⑤	PRE-SEL. COIL			2 Ω	J TO K
③	REC. COUP.	4 Ω	BAYONET CONN. TO GND.	.1 Ω	N TO O
[illegible]	1ST I.F. COIL	100 Ω	BLUE TO RED	100 Ω	BK. TO GRID (6K7)
[illegible]	2ND I.F. COIL	100 Ω	BLUE TO RED	100 Ω	BK. TO GREEN
[illegible]	OUTPUT	520 Ω	GR. TO BROWN		
[illegible]	B CHOKE	310 Ω	BLACK TO GND		
[illegible]	POWER	.24 Ω	BLACK TO GR.	840 Ω	RED TO BLUE
①	ANT. LOAD	5 Ω	BLACK TO BLACK		

SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	BIAS	ANODE GRID
6K7	R.F.	5.8	182		83		
6A8	1ST DET. OSC.	5.8	182	4.4	83		138
6K7	I.F.	5.8	182		83		
6H6	2ND DET. AVC	5.8		11.0			
6F5	1ST AUD.	5.8	77			-.8	
6F6	POWER PEN.	5.8	228		244	-17	
OZ4	RECTIFIER	5.8		244			

WESTINGHOUSE ELEC. SUPPLY CO.

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes .... 1#6A8, 2#6K7, 1#6H6, 1#6F5, 1#6F6, 1#0Z4 - Total 7
Battery Current (6.3 Volt Battery) .... 6.5 Amperes
Tuning Range .... 540 to 1600 K.C.
Maximum Undistorted Output .... 3.0 Watts
Maximum Output .... 4.0 Watts
Line-Up Frequencies .... I.F. 175 K.C., 1400 K.C., 1600 K.C.

GENERAL DESCRIPTION

The Model WR-503 Westinghouse All-Metal Tube Car-Radio is a seven tube superheterodyne receiver, which has been designed, manufactured and tested with special consideration for the requirements of automobile radio. The electrical, mechanical and acoustical features of this set have been developed only after extensive tests in automobiles to determine the proper requirements for greatest satisfaction.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type, employing a type 6K7 tube as a R.F. amplifier, a type 6A8 as a combined first detector-oscillator, a type 6K7 as an I.F. amplifier, a type 6H6 used as a combination second detector and A.V.C., a type 6F5 tube as a first audio amplifier, a type 6F6 as an output amplifier, and a type 0Z4 as a rectifier in the power supply.

The Model WR-503 is equipped with two spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; and an antenna spark trap provided in the antenna circuit. The use of these spark traps makes the installation of additional suppression equipment unnecessary in most cars.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator and an output meter are available. Then proceed as follows, referring to Figs. 1 and 2. NOTE: Before aligning the gang-condenser trimmers on the bottom of the gang condenser, it will be necessary to remove the three rubber plugs from the bottom of the receiver housing. The setting of the trimmer on the TOP of the gang condenser should NOT BE DISTURBED.

1. Set test oscillator to 175 K.C.

2. Set gang condenser to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3.0 ohms.

4. Apply test signal to grid cap of 6K7 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers #26 and #27 to maximum output, reducing output of test oscillator as required.

5. Apply test signal to grid cap of 6A8 first detector-oscillator and adjust trimmers #19 and #20 to maximum output.

6. Set test oscillator to 1600 K.C. and rotate gang condenser until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the top of the gang and close the rotor down to this spacing. This is the exact setting of the gang condenser for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependant upon it.

7. Adjust trimmer "A" to maximum output and then remove the paper gauge.

8. Set test oscillator and gang condenser to 1400 K.C.

9. Apply test signal to grid cap of 6K7 R.F. tube and adjust trimmer "B" to maximum output.

10. Apply test signal to antenna lead thru a .0002 mfd. condenser and adjust trimmer "C" to maximum output.

11. Check sensitivity at several points.

SERVICE DATA

TROUBLES THAT CAN BE LOCATED AND REMEDIED WITHOUT REMOVING THE RECEIVER FROM THE HOUSING OR CAR. SEE MODEL WR-502.

LOCATING TROUBLE IN CHASSIS

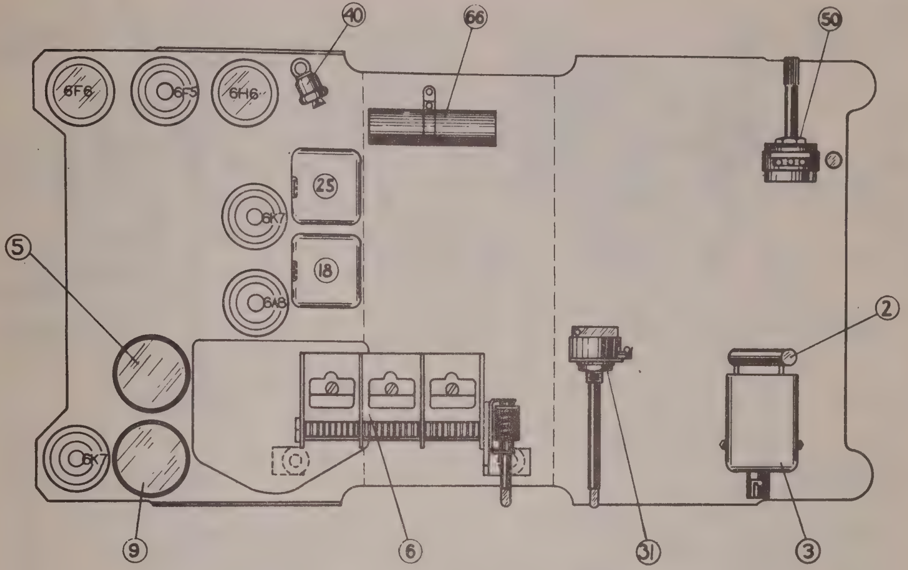
SEE MODEL WR-502.

Dia. #	Part #	Description	List Prices
1		Antenna loading coil - part of RC 95155	$
2		.000075 mfd. condenser - part of RC 95147	
3	RC 95147	Receiver coupler	1.20
4	SA 106277	.01 mfd., 400 V. condenser	.20
5	RC 95149	Preselector coil	.95
6	CG 9537	Variable condenser assembly	3.75
7	RE 9534	100,000 ohm, 1/4 W. resistor	.10
8	SA 106386	.05 mfd., 200 V. condenser	.20
9	RC 95151	R.F. coil	1.25
10	CM 952	.00001 mfd., mica condenser	.20
11	CM 9513	.0001 mfd., mica condenser	.10
12	SA 105276	50,000 ohm, 1/4 W. resistor	.15
13	SA 105264	500 ohm, 1/4 W. resistor	.15
14	SA 106386	.05 mfd., 200 V. condenser	.20
15	SA 106277	.01 mfd., 400 V. condenser	.20
16	SA 105272	10,000 ohm, 1/4 W. resistor	.15
17	RC 95153	Oscillator coil assembly	.70
18	IC 9555	1st I.F. coil	1.75
19		30-100 mmf. condenser - part of IC 9555	
20		30-100 mmf. condenser - part of IC 9555	
21	SA 106386	.05 mfd., 200 V. condenser	.20
22	CW 951	.1 mfd., 200 V. condenser	.20
23	SA 105246	1/2 meg., 1/4 W. resistor	.15
24	SA 105281	1 meg., 1/4 W. resistor	.15
25	IC 9556	2nd I.F. coil	1.75
26		30-100 mmf. condenser - part of IC 9556	
27		30-100 mmf. condenser - part of IC 9556	
28	CM 9513	.0001 mfd. mica condenser	.10
29	SA 105276	50,000 ohm, 1/4 W. resistor	.15
30	CM 9513	.0001 mfd. mica condenser	.10
31	VR 9527	.25 meg. volume control	.75
32	SA 103659	.005 mfd., 400 V. condenser	.20
33	SA 99777	25,000 ohm, 1 W. resistor	.20
34	SA 100512	50,000 ohm, 1/2 W. resistor	.15
35	CW 958	.05 mfd., 200 V. condenser	.35
36	SA 105246	1/2 meg., 1/4 W. resistor	.15
37	SA 102496	.25 mfd., 400 V. condenser	.20
38	SA 106531	4000 ohm, 1 W. resistor	.20
39	CM 951	.001 mfd. mica condenser	.25
40	BY 952	Grid bias cell	.20
41	SA 105281	1 meg., 1/4 W. resistor	.15
42	CM 9519	.0005 mfd.mica condenser	.20
43	SA 106403	.001 mfd., 600 V. condenser	.20
44	SA 105279	250,000 ohm, 1/4 W. resistor	.15
45	SA 102497	.25 mfd., 200 V. condenser	.20
46	SA 105279	250,000 ohm, 1/4 W. resistor	.15
47	SA 106403	.001 mfd., 600 V. condenser	.20
48	CW 9524	.008 mfd., 600 V. condenser	.20
49	SA 105279	250,000 ohm, 1/4 W. resistor	.15
50	VR 9525	250,000 ohm tone control	.75
51	CW 9524	.008 mfd., 600 V. condenser	.20
52	TR 9543	Output transformer	1.15
53	CW 957	.5 mfd., 120 V. condenser	.40
54	CM 953	.00005 mfd. mica condenser	.15
55	RC 95157	Choke coil	.25
56	FU 951	20 ampere fuse	.05
57	LP 951	Pilot light	.20
58	SW 9539	On-off switch assembly	1.10
59	VI 955	Vibrator	3.45
60	CW 958	.5 mfd., 200 V. condenser	.35
61	RC 95156	Choke coil	.25
62	CW 9523	.5 mfd., 120 V. condenser	.40
63	TR 9547	Power transformer	3.50
64	CW 9522	.005 mfd., 1600 V. condenser	$ .20
65	SA 105272	10,000 ohm, 1/4 W. resistor	.15
66	CE 9524	10 mfd. electrolytic condenser	.70
67	SA 105284	30,000 ohm, 1/4 W. resistor	.15
68	CE 951	6 & 10 mfd. electrolytic condenser	2.60
69	TR 951	"B" choke	.95
70	SK 955	Speaker assembly	5.50
71	DM 951	Diaphragm assembly	1.25

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

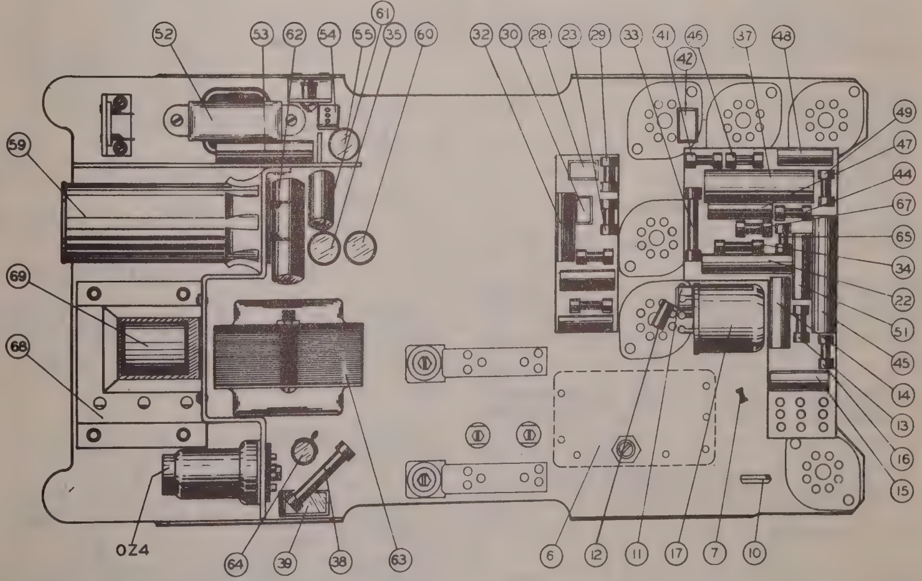
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR503
Chassis, Socket
Trimmers



OUTSIDE VIEW OF CHASSIS WITH END BASE PLATES OPENED OUT

Figure No. 1

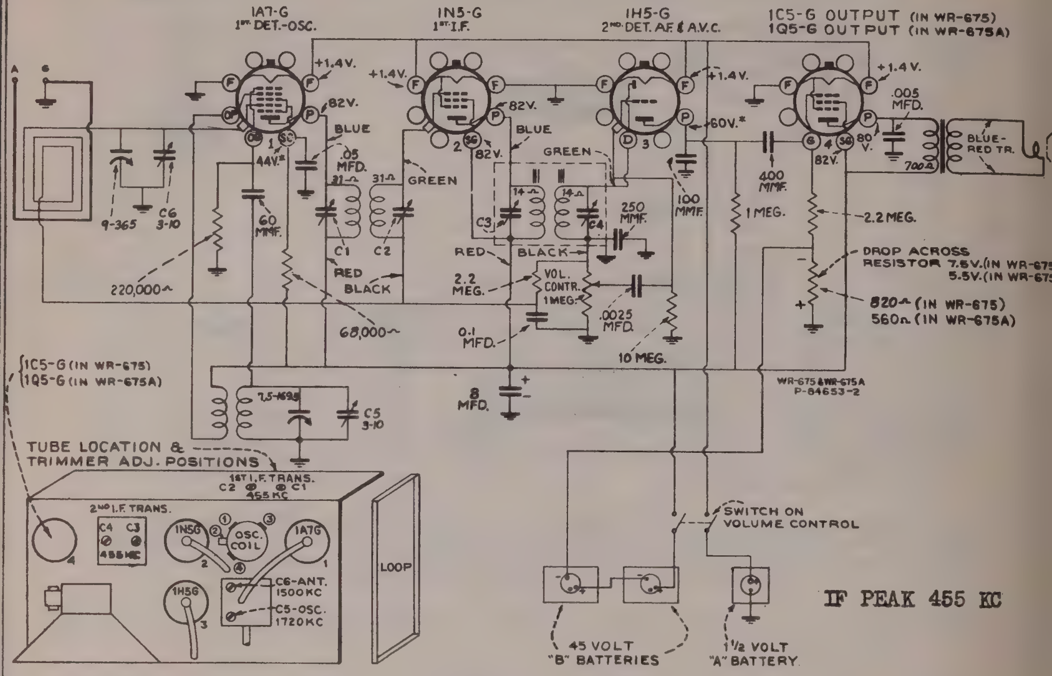


INSIDE VIEW OF CHASSIS WITH END BASE PLATES OPENED OUT

Figure No. 2

MODELS WR675,WR675A
Schematic,Voltage
Socket,Trimmers
Alignment

WESTINGHOUSE ELEC. SUPPLY CO.



IF PEAK 455 KC

Note: Values with star (*) are operating voltages. Values not starred are actual measured voltages.

Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately ± 20% with rated battery voltage.

Frequency Range.............................. 550-1,720 kc
Intermediate Frequency..............................455 kc

Batteries Required

"A," one 1.5 volt dry plug-type "A," 2⅝-in. x 3⅞-in. x 5⅝-in. (Eveready No. 741 or equivalent)
"B," two 45 volt dry plug-type "B," 2⅜-in. x 4-in. x 5½-in. (Eveready No. 762 or equivalent)

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. Connect low side of oscillator to ground terminal on bottom of set.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be at calibration mark above "55" on dial.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 550 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna terminal thru 220 mmf. capacitor	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Current Consumption

"A," 0.24 ampere—"B," 9.0 milliamperes

Power Output

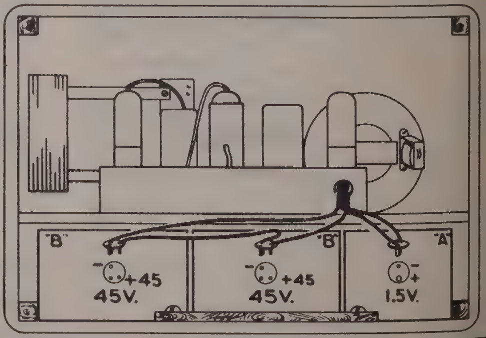
Undistorted.. 0.10 watt
Maximum.. 0.21 watt

Loudspeaker

Type........................ 5-inch permanent-magnet dynamic
Voice-coil Impedance.................. 3.2 ohms at 400 cycles

Precautionary Lead Dress.—The spiral shield on the I.F. grid lead should be brought as close as possible to the grid cap.

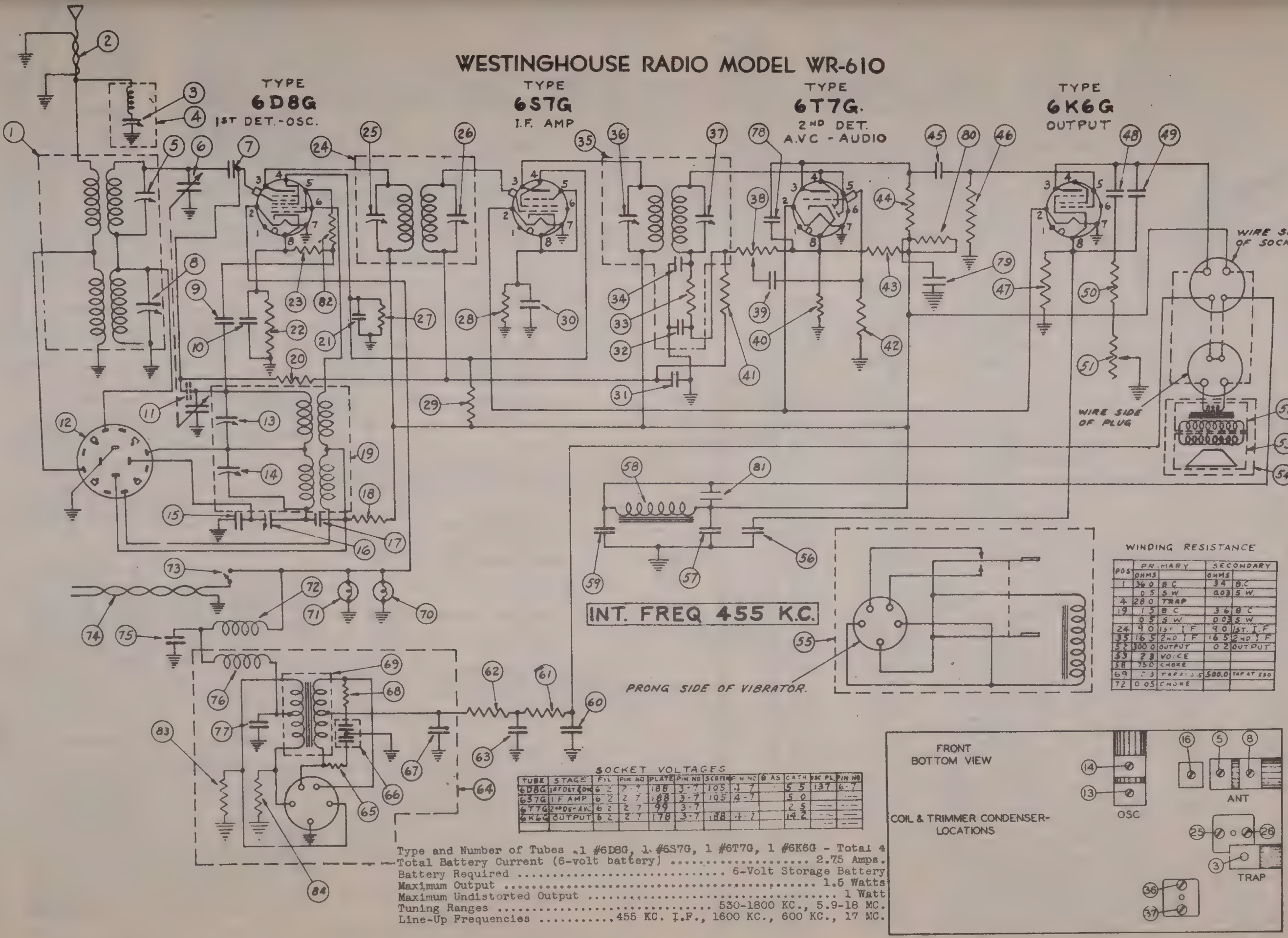
Antenna.—An antenna and ground may be connected to "A" and "G" at bottom of cabinet. If total length of antenna and lead-in is more than 150 feet, connect a 300 mmf capacitor in series with lead-in.



WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR610
Schematic, Voltage
Trimmers

WESTINGHOUSE RADIO MODEL WR-610



COIL & TRIMMER CONDENSER-LOCATIONS

WINDING RESISTANCE

POS	PRIMARY		SECONDARY	
	OHMS		OHMS	
1	36.0	B.C	3.4	B.C
	0.5	S.W	0.03	S.W.
4	28.0	TRAP		
19	1.5	B.C	3.6	B.C
	0.5	S.W	0.03	S.W
24	9.0	1ST I.F	9.0	1ST. I.F
35	16.5	2ND I.F	16.5	2ND I.F
52	300.0	OUTPUT	0.2	OUTPUT
53	2.3	VOICE		
58	750	CHOKE		
69	0.3	TAP AT 0.5	500.0	TAP AT 250
72	0.05	CHOKE		

SOCKET VOLTAGES

TUBE	STAGE	FIL	PIN NO	PLATE	PIN NO	SCREEN	PIN NO	BIAS	CATH	OSC PL.	PIN NO
6D8G	1ST DET & OSC	6.2	2-7	188	3-7	105	4-7		5.5	137	6-7
6S7G	I F AMP	6.2	2-7	188	3-7	105	4-7		5.0		---
6T7G	2ND DET-AVC	6.2	2-7	99	3-7				2.5	---	---
6K6G	OUTPUT	6.2	2-7	178	3-7	188	4-7		14.2	---	---
										---	---

Type and Number of Tubes 1 #6D8G, 1 #6S7G, 1 #6T7G, 1 #6K6G - Total 4
Total Battery Current (6-volt battery) .... 2.75 Amps.
Battery Required .... 6-Volt Storage Battery
Maximum Output .... 1.5 Watts
Maximum Undistorted Output .... 1 Watt
Tuning Ranges .... 530-1800 KC., 5.9-18 MC.
Line-Up Frequencies ....455 KC. I.F., 1600 KC., 600 KC., 17 MC.

WESTINGHOUSE ELEC. SUPPLY CO.

GENERAL DESCRIPTION

This model is a four-tube, two-band superheterodyne receiver designed to be operated with only a six-volt storage battery. The receiver employs a type 6D8G tube as a combined first detector-oscillator, a type 6S7G tube as an intermediate frequency amplifier, a type 6T7G tube as a combined second detector, A.V.C. first audio amplifier, and a type 6K6G tube as an audio output amplifier. The power for this model is supplied by a six-volt storage battery. The plate voltage is secured by the use of a combined vibrator and mechanical rectifier built as a part of the chassis.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align this receiver, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function, making proper alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. Before attempting to align the chassis, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers.

I.F. ADJUSTMENTS (455 KC.)

1. Connect the receiver to the storage battery by connecting the red lead to the positive terminal and the black lead to the negative terminal of the battery.

2. Set the volume control to the maximum position, the tone control to the treble position, the wave-change switch to the broadcast band position and the dial indicator to approximately 600 KC.

3. Set the test oscillator to 455 KC., and apply the test signal to the grid of the type 6D8G detector-oscillator tube through a .5 mfd. condenser.

4. Adjust the four I.F. trimmer condensers #25, #26, #36 and #37 to maximum output.

BROADCAST BAND ADJUSTMENTS

1. With the gang condenser closed, check the dial pointer to make sure that it is exactly horizontal.

2. Set the test oscillator and dial pointer to 1600 KC.

3. With the oscillator still connected to the grid of the detector-oscillator tube, adjust the broadcast oscillator trimmer #14.

4. Connect the test oscillator to the blue antenna lead through a .0002 condenser.

5. Adjust the antenna trimmer #8.

6. Turn the test oscillator and dial pointer to 600 KC.

7. Adjust the oscillator series (lag) condenser #16. This is accomplished by turning the gang condenser back and forth slightly, at the same time adjusting the series (lag) condenser until a maximum is reached.

8. Recheck operation #3 and #5.

9. Check calibration and sensitivity over the scale.

SHORT-WAVE BAND ADJUSTMENTS

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 17 MC. (17,000 KC.).

3. Adjust the oscillator trimmer #13. Two positions on the trimmer condenser will be found. The one with the least capacity or with the plates farthest out should be used.

4. Adjust the antenna trimmer condenser #5.

WAVE TRAP ADJUSTMENTS

This receiver is provided with a wave trap and the trimmer condenser #3 on this coil should be adjusted to minimize a 455 KC. signal applied to the antenna.

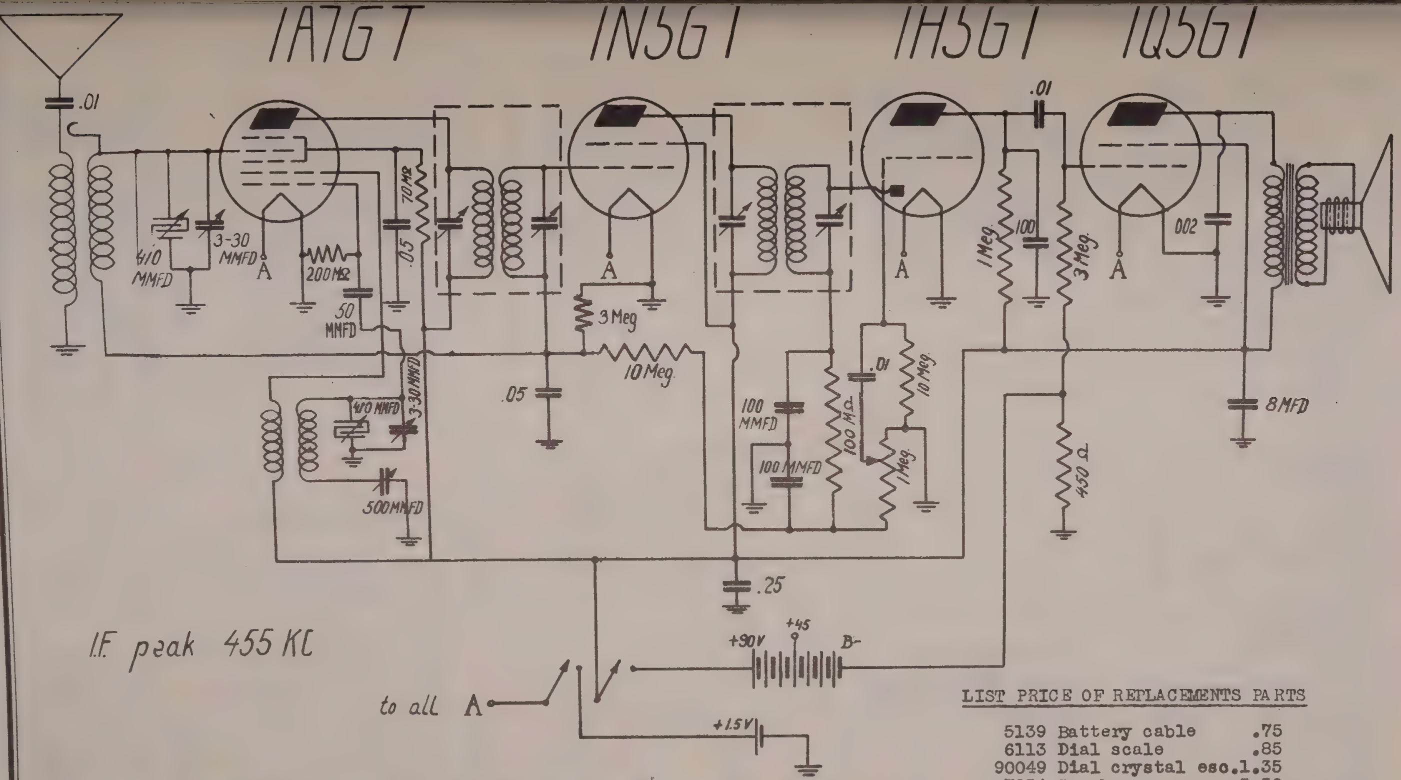
Under actual operating conditions, this trimmer may be adjusted slightly to minimize interfering signals which are known to be on or near the 455 KC. channel.

Dia. #	Part #	Description of Parts	List Price
1	RC 95290	Preselector coil assembly	$ 1.75
2	CB 95159	Cable assembly	.20
3		Trimmer condenser 30-60 mmf. - part of RC 95289	
4	RC 95289	Trap coil assembly	.75
5		Trimmer condenser 4-35 mmf. - part of RC 95290	
6	CG 9567	Variable condenser	3.75
7	CM 9513	100 mmf. mica condenser	.10
8		Trimmer condenser 4-35 mmf. - part of RC 95290	
9	CM 9513	100 mmf. mica condenser	.10
10	CW 4-05	.05 mfd., 400 V. condenser	.15
11		Capacity turn	
12	SW 9591	Wave-change switch	.85
13		Trimmer condenser 2-12 mmf. - part of RC 95291	
14		Trimmer condenser 4-35 mmf. - part of RC 95291	
15	SA 107801	.0025 mfd. mica condenser	.30
16	CS 9585	Oscillator series (lag) condenser 225-700 mmf.	.35
17	CW 4-01	.01 mfd., 400 V. condenser	.15
18	RE 1033	10,000 ohm, 1/4 W. resistor	.10
19	RC 95291	Oscillator coil assembly	1.60
20	RE 1053	1 meg., 1/2 W. resistor	.10
21	CW 4-10	.1 mfd., 400 V. condenser	.15
22	RE 4713	470 ohm, 1/2 W. resistor	.10
23	RE 4733	47,000 ohm, 1/2 W. resistor	.10
24	IC 95122	1st I.F. coil assembly	1.75
25-26		Trimmer condenser 80-200 mmf. - part of IC 95122	
27	RE 4733	47,000 ohm, 1/2 W. resistor	.10
28	RE 4713	470 ohm, 1/2 W. resistor	.10
29	RE 1533	15,000 ohm, 1/2 W. resistor	.10
30	CW 9537	.05 mfd., 400 V. condenser	.30
31		.05 mfd., 400 V. condenser - part of CW 9537	
32		100 mmf. mica condenser - part of IC 95123	
33		47,000 ohm, 1/2 W. resistor - part of IC 95123	
34		100 mmf. mica condenser - part of IC 95123	
35	IC 95123	I.F. coil assembly (diode)	2.25
36-37		Trimmer condenser 30-100 mmf. - part of IC 95123	
38	VR 9560	Volume control - .5 meg.	1.10
39	CW 4-02	.02 mfd., 400 V. condenser	.15
40	RE 4723	4700 ohm, 1/2 W. resistor	.10
41	RE 1053	1 meg., 1/2 W. resistor	.10
42	RE 1053	1 meg., 1/2 W. resistor	.10
43	RE 4743	470,000 ohm, 1/2 W. resistor	.10
44	RE 2243	220,000 ohm, 1/2 W. resistor	.10
45	CW 4-02	.02 mfd., 400 V. condenser	.15
46	RE 4743	470,000 ohm, 1/2 W. resistor	.10
47	RE 6813	680 ohm, 1/2 W. resistor	.10
48	CW 4-02	.02 mfd., 400 V. condenser	.15
49	CW 6-002	.002 mfd., 600 V. condenser	.15
50	RE 1023	1000 ohm, 1/2 W. resistor	.10
51	VR 9559	Tone control - 20,000 ohm	.75
52	TR 95157	Output transformer	2.00
53	DM 9535	Diaphragm assembly	2.75
54	SK 9589	Speaker assembly	6.00
55	VI 9512	Vibrator	4.25
56	CE 9550	40 mfd., 25 V. electrolytic condenser	.75
57	CE 9573	8 mfd., 250 V. electrolytic condenser	.75
58	TR 9526	Choke	1.25
59	CE 9573	8 mfd., 250 V. electrolytic condenser	.75
60	CW 4-10	.1 mfd., 400 V. condenser	.15
61-62	RE 3903	39 ohm, 1/2 W. resistor	.10
63	CW 2-50	.5 mfd., 200 V. condenser	.25
64	PP 952	Power pack assembly (not serviced complete)	
65	RE 6803	68 ohm, 1/2 W. resistor	.10
66	CW 9539	.02-.02 mfd., 1000 V. condenser	.40
67	CW 9513	.05 mfd., 200 V. condenser	.10
68	RE 6803	68 ohm, 1/2 W. resistor	.10
69	TR 95106	Power transformer	4.50
70-71	LP 9516	Dial lamp - 6.3 V., .15 Amp.	.20
72	RC 95288	Choke	.25
73		On-off switch - part of VR 9560	
74	CB 9556	"A" battery cable	.80
75	CW 2-50	.5 mfd., 200 V. condenser	.15
76	RC 95288	Choke	.25
77	CW 9523	.5 mfd., 120 V. condenser	.40
78	CM 9519	500 mmf. mica condenser	.20
79	CW 4-25	.25 mfd., 400 V. condenser	.20
80	RE 2233	220,000 ohm, 1/2 W. resistor	.10
81	CW 4-25	.25 mfd., 400 V. condenser	.20
82-83-84	RE 1013	100 ohm, 1/2 W. resistor	.10

BE 956	Tube shield base		
BK 95182	Electrolytic condenser bracket (large)		
BK 95283	Electrolytic condenser bracket (small)		
CV 954	Tube shield		
CV 95226	I.F. coil cover		
DS 95124	Dial scale		
FP 108003	Felt washer under knob		
IS 1002	Rubber bushing (dial bracket)		
IS 95123	Gang condenser mounting bushing		
IS 95228	Rubber mounting bushing (power pack and chassis)		
IS 95231	Rubber dial drive bushing	SA 104616	Socket (vibrator)
KA 95115	Cabinet	SA 107257	Socket (speaker)
KN 95129	Knob (3 used)	SA 107395	Speaker mounting screw
KN 95151	Knob (wave-change - 1 used)	SH 9557	Drive shaft
PL 95116	Dial escutcheon plate	SI 9579	Dial pointer
PL 95130	Dial plate	SO 956	Socket (octal)
PR 97160	Dial drive cord	SO 9534	Dial lamp socket
PU 9533	Dial drive pulley	SP 9545	Spring cup (vibrator)
NT 958	3/8" Pal nut	SP 9551	Dial drive cord spring

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR677
Schematic



This is a battery operated superheterodyne receiver with full automatic volume control. It is designed to function with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is **550-1650** kilocycles. The battery recommended is the EVEREADY #748, BURGESS #17GD60, RAY-O-VAC #AB82, or the equivalent. **A permanent magnet dynamic speaker is used in this receiver.**

TUBES

R C A - 1A7GT (1), R C A - 1N5GT (1), R C A - 1H5GT (1), R C A-1Q5GT (1).
See diagram on label under cabinet for location of tubes.

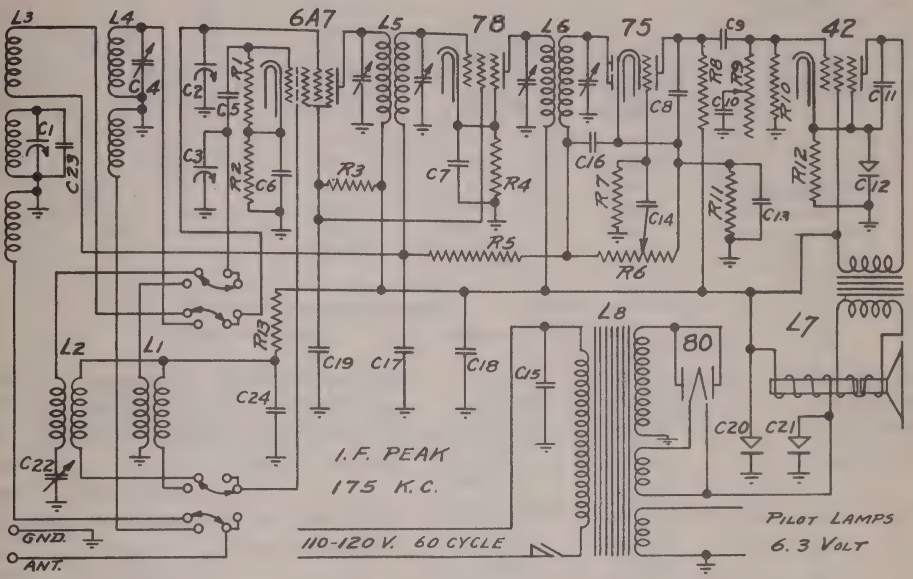
LIST PRICE OF REPLACEMENTS PARTS

5139	Battery cable	.75
6113	Dial scale	.85
90049	Dial crystal esc.	1.35
7254	Speaker	5.50
8819	Knob	.10
9944	Drive drum	.15
9945	Drive spring	.08
9943	Pointer	.30
1481	Antenna coil	.50
1515	Oscillator coil	.50
1496A	I.F. Coil	1.25
1497A	Second detector coil	1.25
2422A	Two gang Var. cond.	2.50
2463	8 mfd. elect.	.70
3480	comb. vol. cont.	1.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

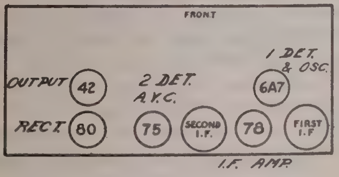
WILCOX-GAY CORP.

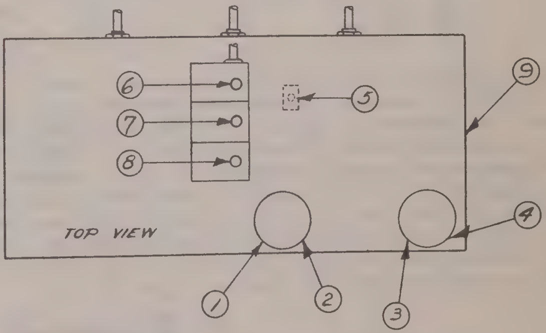
MODELS 7G5,7GB5
Schematic,Socket
Trimmers



25-2124

LOCATION OF TUBES





FOR VOLTAGE and ALIGNMENT
SEE INDEX

CODE	PART NO.	RESISTORS
R1	53-941	20,000 Ohm Type M Resistor
R2	53-2014	200 Ohm Type M Resistor
R3	53-1042	25,000 Ohm Type M Resistor
R4	53-1062	250 Ohm Wirewound Resistor
R5	53-926	1 Meg Ohm Type M Resistor
R6	19-2007	500,000 Ohm Volume Control & Switch
R7	53-925	500,000 Ohm Type M Resistor
R8	53-924	250,000 Ohm Type M Resistor
R9	19-2009	250,000 Ohm Tone Control
R10	53-925	500,000 Ohm Type M Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-1063	500 Ohm Wirewound Resistor
R13	53-920	10,000 Ohm Type M Resistor

		CONDENSERS
C1,C2,C3	77-2011	3 Gang Tuning Condenser
C4	78-2010	3-30 Mmfd. Trimmer Condenser
C5	76-2002	.00005 Mfd. Condenser
C6	75-2005	.1 Mfd. 200 V. Paper Condenser
C7	75-2005	.1 Mfd. 200 V. Paper Condenser
C8	76-265	.001 Mfd. Mica Condenser
C9	75-2005	.1 Mfd. 200 V. Paper Condenser
C10	75-2003	.01 Mfd. 400 V. Paper Condenser
C11	75-2001	.002 Mfd. 600 V. Paper Condenser

CODE	PART NO.	CONDENSERS (Cont'd.)
C12	18-928	25 Mfd. 25 V. Dry Elect. Condenser
C13	75-2005	.1 Mfd. 200 V. Paper Condenser
C14	75-2005	.1 Mfd. 200 V. Paper Condenser
C15	75-2003	.01 Mfd. 400 V. Paper Condenser
C16	76-307	.0005 Mfd. Mica Condenser
C17	75-2005	.1 Mfd. 200 V. Paper Condenser
C18	75-2012	.5 Mfd. 400 V. Paper Condenser
C19	75-2005	.1 Mfd. 200 V. Paper Condenser
C20	18-2006	16 Mfd. 250 W. V. Elect. Condenser
C21	18-2005	12 Mfd. 325 W. V. Elect. Condenser
C22	78-2031	600-1350 Mmfd. Trimmer Condenser
C23	76-2003	.00001 Mfd. Mica Condenser
C24	75-2003	.01 Mfd. 400 V. Paper Condenser

		INDUCTANCES
L1	17-2149	Foreign Band Oscillator Coil Assembly
L2	17-2150	Broadcast Oscillator Coil Assembly
L3	17-2151	Broadcast Preselector Coil Assembly
L4	17-2152	Foreign Band Preselector Coil Assembly
L5	68-2031	First I. F. Transformer Assembly
L6	68-2042	Second I. F. Transformer Coil Assembly
L7	64-2045	5" Speaker, 1500 Ohm Field, 42 Tube Trans.-7G5
L7	64-2046	6½" Speaker, 1500 Ohm Field, 42 Tube Trans.-7GB5
L8	80-2009	Power Transformer for 110-120 V. 60 Cycle

MODELS 7G5,7GB5
MODEL 7J7
MODEL 7K7
Alignment,Voltage

WILCOX-GAY CORP.

MODEL 7J7 - 7K7

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PLATE TO GROUND	2 GRID TO GROUND
78	R-F Amplifier	290	90	3.8		
6A7	1st Det. & Osc.	290	90	3.6	180	- 18
78	I-F Amplifier	290	90	3.7		
78	I-F Amplifier	260	90	3.4		
75	2nd Det. & AVC	145		15.		
42	Power Output	275	290	20.		
80	Rectifier					

B+ Voltage 290 V. - Speaker Field Drop 85 V.
Meter 1000 ohms per volt - 750 volt Scale

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT SIGNAL
Connect a 100,000 ohm resistor from plate of 2nd I-F tube to gnd. Remove grid clip from 6A					
Control Grid of 6A7	456 KC	1400 KC	Broadcast (Left)	1	Max.^{1}
" " " "	" "	" "	" "	2,3,4,5,6^2	Max.
Disconn. 100,000 ohm resistor and DO NOT make any other adj. of I-F Amp. Conn. Grid Clip to 6A7.					
*Antenna & Ground Post	1400 KC	1400 KC	Broadcast (Left)	7,8,9	Max.
" " "	600 "	600 "	" "	10^3	Max.
" " "	5 MC	5 MC	Police (Center)	11,12,13	Max.
" " "	2 "	2 "	" "	14	Max.
" " "	15 "	15 "	Foreign (Right)	15,16,17^4	Max.

Volume Control in "Full On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
NOTES - (1) Maintain a midscale reading on output meter across primary of output transforme by adjustment of the signal generator. (2) Repeat above procedure and critically trim eac adjustment to absolute resonance to insure perfect alignment. The I.F. sensitivity should be from 15 to 25 microvolts. (3) Investigate ganging of trimmers No. 7, 8, 9 and 10 at 600 KC, 800 KC, 1000 KC, 1200 KC and 1400 KC and any discrepancy of ganging or scale tracking should be corrected by bending slotted side plates of the variable condenser. (4) Investigate ganging of trimmers 15, 16, and 17 at 10 MC and 6 MC to ascertain whether or not the circuits are tracked.

MODEL 7G5 - 7GB5

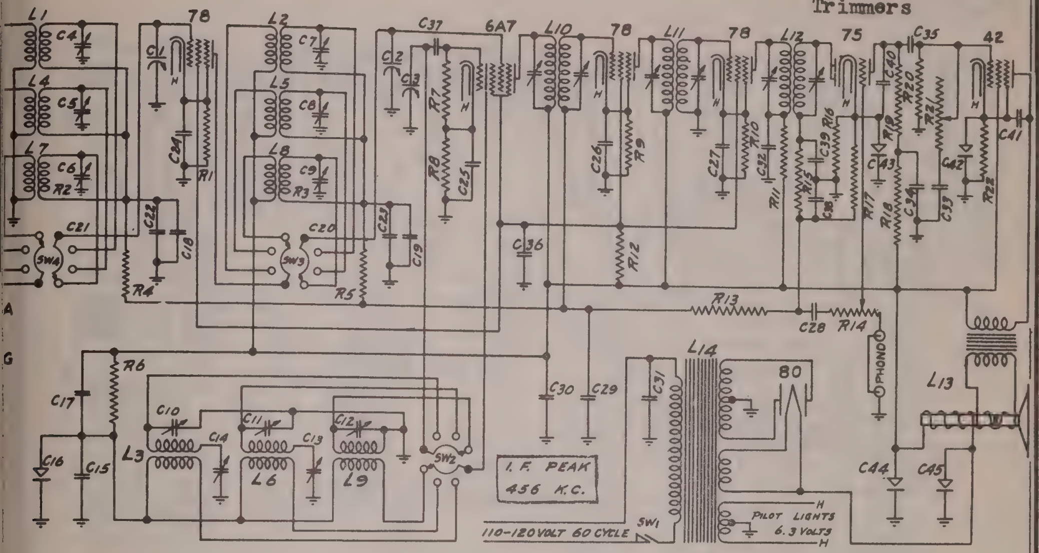
TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PLATE TO GROUND	2 GRID TO GROUND
6A7	1st Det. & Osc.	205	72	2.4	155	- 6.5
78	I-F Amplifier	205	72	2.		
75	2nd Det. & AVC	72		1.3		
42	Power Output	190	207	14		
80	Rectifier					

B+ Voltage 207 - Speaker Field Voltage 70
Line Voltage was 120 - Meter 1000 ohms per volt

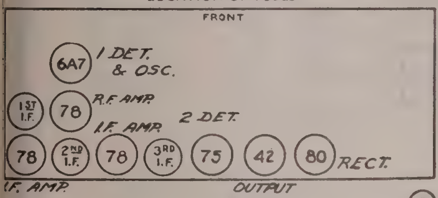
SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT SIGNAL
Remove Grid Clip from 6A7.					
Control Grid of 6A7	175 KC	1400 KC	Broadcast (Left)	1,2,3,4^2	Max.^{1}
Connect Grid Clip to 6A7.					
*Antenna & Ground Post	600 "	600 "	" "	5	Max.^{1}
" " "	1400 "	1400 "	" "	6,7,8	Max.^{1}
" " "	600 "	600 "		5	Max.^{1}
" " "	15 MC	15 MC	Foreign (Right)	9	Max.^{1}

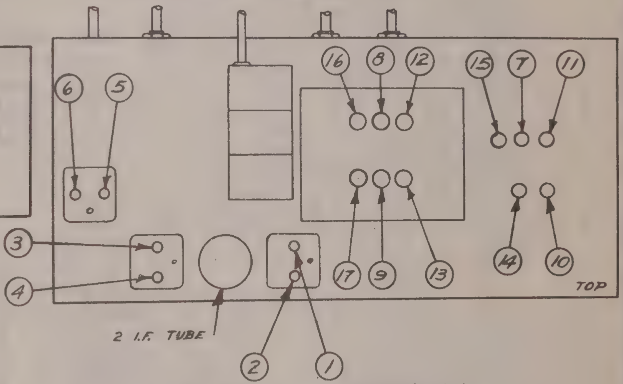
WILCOX-GAY CORP.

MODEL 7J7
Schematic, Socket
Trimmers



LOCATION OF TUBES





FOR ALIGNMENT AND VOLTAGE
DATA SEE INDEX

CODE	PART NO.	RESISTORS
R1	53-1063	500 Ohm Wirewound Resistor
R4	53-923	100,000 Ohm Type M Resistor
R5	53-923	100,000 Ohm Type M Resistor
R6	53-941	20,000 Ohm Type M Resistor
R7	53-941	20,000 Ohm Type M Resistor
R8	53-1062	250 Ohm Wirewound Resistor
R9	53-1063	500 Ohm Wirewound Resistor
R10	53-1063	500 Ohm Wirewound Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-195	25,000 Ohm Type J Resistor
R13	53-926	1 Meg Ohm Type M Resistor
R14	19-2008	500,000 Ohm Volume Control
R15	53-898	50,000 Ohm Type M Resistor
R16	53-925	500,000 Ohm Type M Resistor
R17	53-919	5,000 Ohm Type M Resistor
R18	53-923	100,000 Ohm Type M Resistor
R19	53-924	250,000 Ohm Type M Resistor
R20	53-925	500,000 Ohm Type M Resistor
R21	19-2009	250,000 Ohm Tone Control
R22	53-1063	500 Ohm Wirewound Resistor

		CONDENSERS
C1, C2, C3	77-2011	3 Gang Tuning Condenser
C4, C5, C6	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C7, C8, C9	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C10, C11, C12	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C13, C14	78-2028	600 and 1600 Mmfd. 2 Gang Trimmer Cond.
C15	75-2003	.01 Mfd. 400 V. Paper Condenser
C16	18-2004	4 Mfd. 450 W. V. Electrolytic Condenser
C17	76-662	.002 Mfd. Mica Condenser
C18	76-662	.002 Mfd. Mica Condenser
C19	76-662	.002 Mfd. Mica Condenser
C22	75-2005	.1 Mfd. 200 V. Paper Condenser
C23	75-2005	.1 Mfd. 200 V. Paper Condenser
C24	75-2005	.1 Mfd. 200 V. Paper Condenser
C25	75-2005	.1 Mfd. 200 V. Paper Condenser
C26	75-2005	.1 Mfd. 200 V. Paper Condenser
C27	75-2005	.1 Mfd. 200 V. Paper Condenser
C28	75-2005	.1 Mfd. 200 V. Paper Condenser
C29	75-2005	.1 Mfd. 200 V. Paper Condenser
C30	75-2012	.5 Mfd. 400 V. Paper Condenser

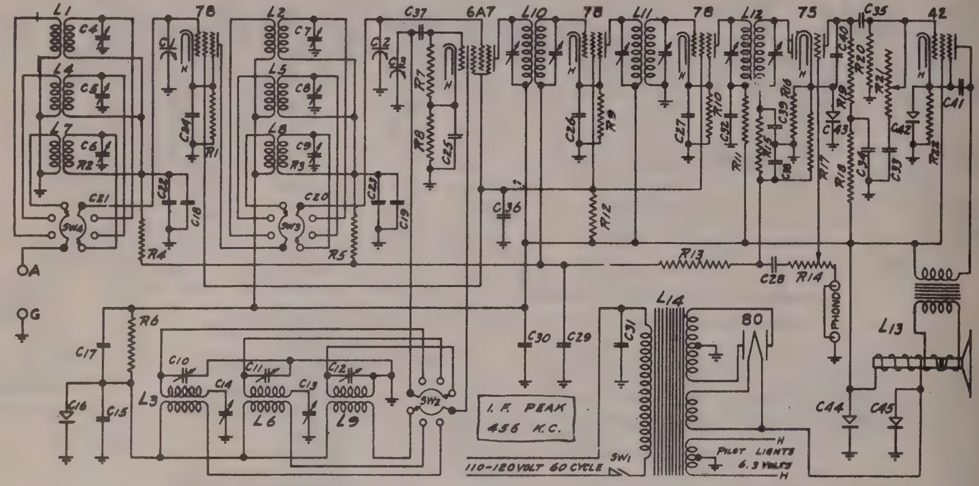
CODE	PART NO.	CONDENSERS (Cont'd.)
C31	75-2003	.01 Mfd. 400 V. Paper Condenser
C32	75-2003	.01 Mfd. 400 V. Paper Condenser
C33	75-2003	.01 Mfd. 400 V. Paper Condenser
C34	75-2007	.1 Mfd. 400 V. Paper Condenser
C35	75-2007	.1 Mfd. 400 V. Paper Condenser
C36	75-2007	.1 Mfd. 400 V. Paper Condenser
C37	76-2002	.00005 Mfd. Mica Condenser
C38	76-2001	.0001 Mfd. Mica Condenser
C39	76-2001	.0001 Mfd. Mica Condenser
C40	76-265	.001 Mfd. Mica Condenser
C41	75-2002	.004 Mfd. 600 V. Paper Condenser
C42	18-928	25 Mfd. 25 V. Electrolytic Condenser
C43	18-928	25 Mfd. 25 V. Electrolytic Condenser
C44	18-2005	12 Mfd. 325 W. V. Elect. Condenser
C45	18-721	8 Mfd. 450 W. V. Elect. Condenser

		INDUCTANCES
L1	17-2163	Broadcast Antenna Coil Assembly
L2	17-2165	Broadcast R. F. Coil Assembly
L3	17-2176	Broadcast Oscillator Coil Assembly
L4	17-2168	Police Band Antenna Coil Assembly
L5	17-2169	Police Band R. F. Coil Assembly
L6	17-2177	Police Band Oscillator Coil Assembly
L7	17-2171	Foreign Band Antenna Coil Assembly
L8	17-2172	Foreign Band R. F. Coil Assembly
L9	17-2178	Foreign Band Oscillator Coil Assembly
L10	68-2049	First I. F. Transformer Assembly
L11	68-2049	Second I. F. Transformer Assembly
L12	68-2050	Third I. F. Transformer Assembly
L13	64-2050	8" Speaker, 1000 Ohm Field, 42 Tube Trans.
L14	[illegible]	110-120 V. 60 Cycle Power Transformer

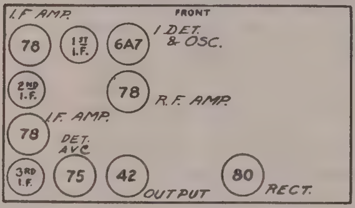
		SWITCHES
SW1	66-2014	Power Line Off-On Switch
SW2	66-2015	Front Panel of Band Switch
SW3	66-2015	Center Panel of Band Switch
SW4	66-2015	Rear Panel of Band Switch

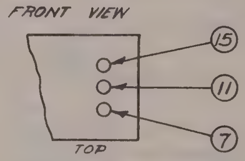
MODEL 7K7
Schematic, Socket
Trimmers

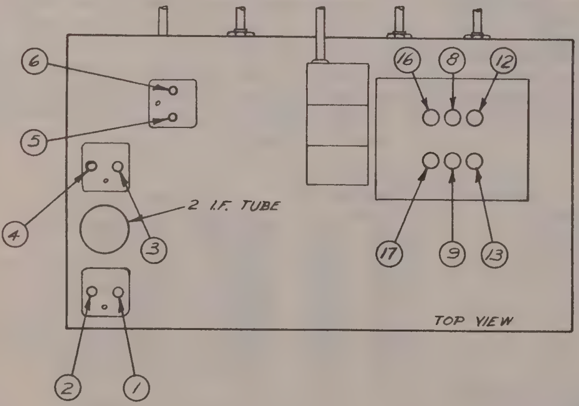
WILCOX-GAY CORP.

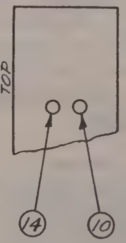


LOCATION OF TUBES









FOR ALIGNMENT AND VOLTAGE
DATA SEE INDEX

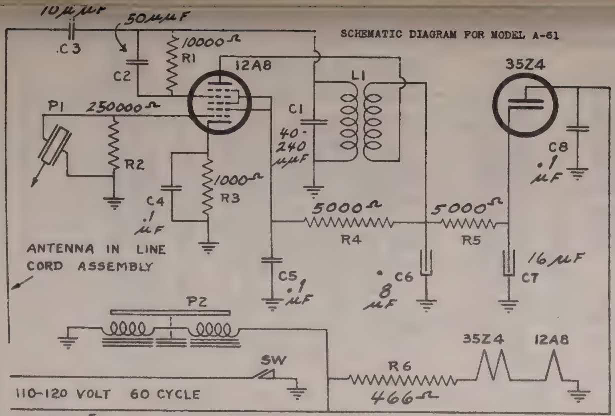
CODE	PART NO.	RESISTORS
R1	53-1063	500 Ohm Wirewound Resistor
R4	53-923	100,000 Ohm Type M Resistor
R5	53-923	100,000 Ohm Type M Resistor
R6	53-941	20,000 Ohm Type M Resistor
R7	53-941	20,000 Ohm Type M Resistor
R8	53-1062	250 Ohm Wirewound Resistor
R9	53-1063	500 Ohm Wirewound Resistor
R10	53-1063	500 Ohm Wirewound Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-195	25,000 Ohm Type J Resistor
R13	53-926	1 Meg Ohm Type M Resistor
R14	19-2006	500,000 Ohm Volume Control
R15	53-898	50,000 Ohm Type M Resistor
R16	53-925	500,000 Ohm Type M Resistor
R17	53-919	5,000 Ohm Type M Resistor
R18	53-923	100,000 Ohm Type M Resistor
R19	53-924	250,000 Ohm Type M Resistor
R20	53-925	500,000 Ohm Type M Resistor
R21	19-2009	250,000 Ohm Tone Control
R22	53-1063	500 Ohm Wirewound Resistor
		CONDENSERS
C1, C2, C3	77-2011	3 Gang Tuning Condenser
C4, C5, C6	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C7, C8, C9	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C10, C11, C12	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C13, C14	78-2028	600 and 1600 Mmfd. 2 Gang Trimmer Cond.
C15	75-2003	.01 Mfd. 400 V. Paper Condenser
C16	18-2004	4 Mfd. 450 W. V. Elect. Condenser
C17	76-662	.002 Mfd. Mica Condenser
C18	76-662	.002 Mfd. Mica Condenser
C19	76-662	.002 Mfd. Mica Condenser
C22	75-2005	.1 Mfd. 200 V. Paper Condenser
C23	75-2005	.1 Mfd. 200 V. Paper Condenser
C24	75-2005	.1 Mfd. 200 V. Paper Condenser
C25	75-2005	.1 Mfd. 200 V. Paper Condenser
C26	75-2005	.1 Mfd. 200 V. Paper Condenser
C27	75-2005	.1 Mfd. 200 V. Paper Condenser
C28	75-2005	.1 Mfd. 200 V. Paper Condenser
C29	75-2005	.1 Mfd. 200 V. Paper Condenser
C30	75-2012	.5 Mfd. 400 V. Paper Condenser
C31	75-2003	.01 Mfd. 400 V. Paper Condenser
C32	75-2003	.01 Mfd. 400 V. Paper Condenser
C33	75-2003	.01 Mfd. 400 V. Paper Condenser
C34	75-2007	.1 Mfd. 400 V. Paper Condenser
C35	75-2007	.1 Mfd. 400 V. Paper Condenser
C36	75-2007	.1 Mfd. 400 V. Paper Condenser
C37	76-2002	.00005 Mfd. Mica Condenser
C38	76-2001	.0001 Mfd. Mica Condenser
C39	76-2001	.0001 Mfd. Mica Condenser
C40	76-265	.001 Mfd. Mica Condenser
C41	75-2002	.004 Mfd. 600 V. Paper Condenser
C42	18-928	25 Mfd. 25 V. Elect. Condenser
C43	18-928	25 Mfd. 25 V. Elect. Condenser
C44	18-2005	12 Mfd. 325 W. V. Elect. Condenser
C45	18-721	8 Mfd. 450 W. V. Elect. Condenser

		INDUCTANCES
L1	17-2163	Broadcast Antenna Coil Assembly
L2	17-2165	Broadcast R. F. Coil Assembly
L3	17-2167	Broadcast Oscillator Coil Assembly
L4	17-2168	Police Band Antenna Coil Assembly
L5	17-2169	Police Band R. F. Coil Assembly
L6	17-2170	Police Band Oscillator Coil Assembly
L7	17-2171	Foreign Band Antenna Coil Assembly
L8	17-2172	Foreign Band R. F. Coil Assembly
L9	17-2173	Foreign Band Oscillator Coil Assembly
L10	68-2049	First I. F. Transformer Assembly
L11	68-2049	Second I. F. Transformer Assembly
L12	68-2050	Third I. F. Transformer Assembly
L13	64-2051	12" Speaker, 1000 Ohm Field, 42 Tube Trans
L14	80-2022	110-120 V. 60 Cycle Power Transformer
		SWITCHES
SW1	56-2014	Power Line Off-On Switch
SW2	66-2015	Front Panel of Band Switch
SW3	66-2015	Center Panel of Band Switch
SW4	66-2015	Rear Panel of Band Switch

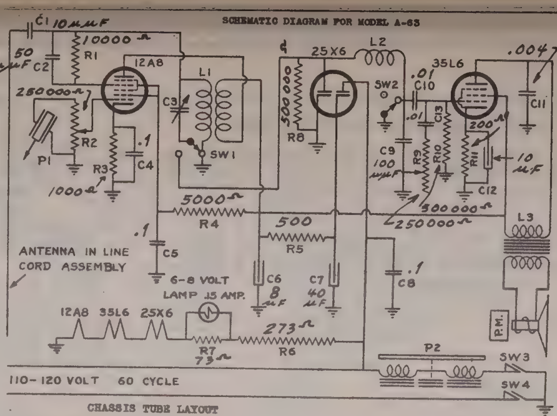
WILCOX-GAY CORP.

MODEL A61
MODEL A63
MODEL A64

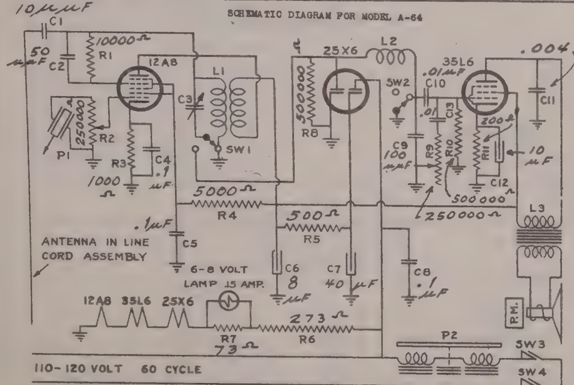
SCHEMATIC DIAGRAM FOR MODEL A-61



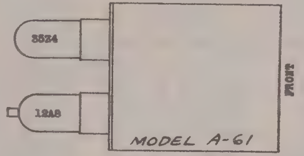
SCHEMATIC DIAGRAM FOR MODEL A-63



SCHEMATIC DIAGRAM FOR MODEL A-64

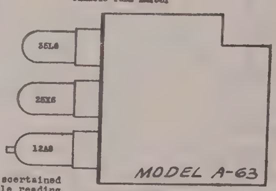


CHASSIS TUBE LAYOUT



BOTTOM VIEW OF CHASSIS

CHASSIS TUBE LAYOUT



BOTTOM VIEW OF CHASSIS

This combination record player and phonograph unit is designed to reproduce all current brands of laterally cut records through any radio receiver, or through the unit itself. (MODEL A-61 IS NOT A COMBINATION UNIT BUT SIMPLY A WIRELESS RECORD PLAYER) *

The unit when used with a radio receiver does not need the connection of any wires, and the clarity and faithfulness of the reproduction will depend on the qualities of the radio receiver. With the use of the "Remote Phono" switch it can also be used as a phonograph, thus enabling one to enjoy this fine unit when radio receiver reproduction is not desired or available.

On the front of the record player toward the right hand side, will be noted three knobs. The knob farthest to the right is the "Master" switch and volume control. Turned to the right a slight click will be heard, and the pilot light will be seen to have become lighted under the tone arm. The remainder of the right hand turn of the control will be for volume control purposes. Rotated to the right, it increases volume; and rotated to the left, the volume is decreased. It should initially be set to the maximum right hand position so that the maximum volume from the record player is obtainable. The control farthest to the left is the "Motor" switch and tone control and operates the table. This knob should be turned to the right when it is desired that the table revolve, and turned to the left when it is desired to stop the table to change records. The center knob is the "Remote-Phono" switch. This switch when turned to "Remote" adjusts the unit for reproduction through a radio receiver, and when turned to "Phono", the adjustment is such that the unit itself will reproduce the record being played.

The radio receiver should now be turned on, and first, it should be ascertained whether or not there is a vacant space at 540 kilocycles, if not, the scale reading of the radio receiver should be varied across the dial from 540 to 750 kilocycles, and a place selected that is free from a radio station. The volume and tone controls should be adjusted as usual.

To place the unit in operation, the master switch and volume control should be turned to its maximum right hand position, a record should then be placed on the table, and the motor switch and tone control turned on so that the table will rotate. The "Remote-Phono" switch should then be turned to "Remote" position..

A new needle should be placed in the pickup arm and the arm set gently on the outside of the record.

To the left of the motor control knobs is a small metal cap. This should be pried up with the screw driver furnished for adjustment, the screw driver inserted into the screw immediately below the hole thus opened. This adjustment should be revolved first in a left hand direction until the record is heard to play from the radio receiver, then it should be varied back and forth across this point until the record player is tuned exactly to the radio receiver. The metal cap can then snapped into the adjustment hole. At any subsequent time the record player may be tuned in at this dial position on the receiver.

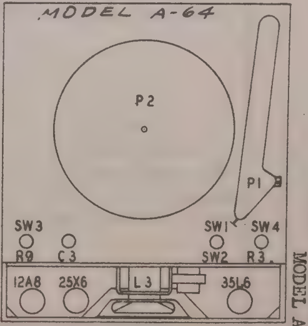
The volume control should be operated mainly on the receiver, however if it is more convenient to bring about this control at the record player, the right hand control may be used, otherwise it should always be left in its maximum position.

When it is desired to operate the record player when radio interference is extremely high, it may be necessary to connect a wire from the wire seen to protrude from the plug of the record player, to the antenna of the radio receiver. Do not make a metallic connection at this point, but simply wrap the wire around the antenna wire to the receiver three or four turns. This will provide sufficient signal intensity to conquer any static condition, and will in no way interfere with the normal operation of the radio receiver.

In case it is difficult to find a cleared channel, or if noise is present, the player may be moved closer to the radio set or its antenna to overcome these conditions.

Change needles regularly for best results.

Be sure to tune your set accurately to the record player and don't overlook the necessity of having a cleared channel for operation.



*NOTES SIMILAR FOR MODEL A-61

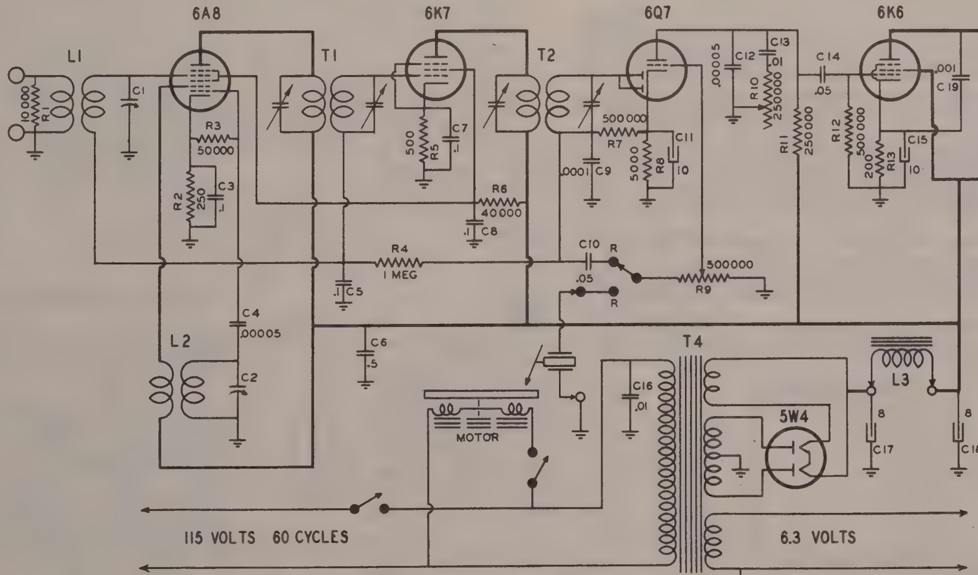
MODEL A69
Schematic, Socket
Trimmers

WILCOX-GAY CORP.

25-2169

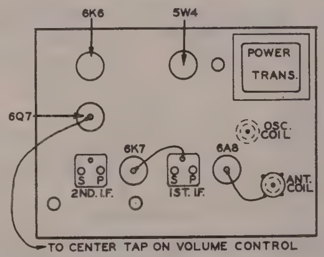
SCHEMATIC DIAGRAM

MODEL A-69



NOTE: To obtain the correct part quickly, please specify Model Number; Serial Number; and Part Number desired.
See List.

TUBE SOCKET LAYOUT MODEL A-69



77-2007	C1	R.F. TUNING COND.
	C2	OSC. TUNING COND.
75-2005	C3	.1 MFD. 200 V. PAPER COND.
76-2011	C4	.00005 MFD. 1000 V. MICA COND.
75-2005	C5	.1 MFD. 200 V. PAPER COND.
75-2012	C6	.5 MFD. 400 V. PAPER COND.
75-2005	C7	.1 MFD. 200 V. PAPER COND.
75-2005	C8	.1 MFD. 200 V. PAPER COND.
76-2012	C9	.0001 MFD. 1000 V. MICA COND.
75-2004	C10	.05 MFD. 400 V. PAPER COND.
18-2012	C11	10 MFD. 25 V. DRY ELECT. COND.
76-2011	C12	.00005 MFD. 1000 V. MICA COND.
75-2003	C13	.01 MFD. 400 V. PAPER COND.
75-2004	C14	.05 MFD. 400 V. PAPER COND.
18-2012	C15	10 MFD. 25 V. DRY ELECT. COND.
75-2003	C16	.01 MFD. 400 V. PAPER COND.
18-2015	C17	8 MFD. 400 W.V. DRY ELECT. COND.
18-2015	C18	8 MFD. 400 W.V. DRY ELECT. COND.
75-2014	C19	.001 MFD. 600 V. PAPER COND.
17-2219	L1	ANTENNA COIL ASSEMBLY
17-2210	L2	OSCILLATOR COIL ASSEMBLY
64-2068	L3	8" SPKR. - 1500 OHM FIELD COIL
53-920	R1	10,000 OHM 1/4 WATT RESISTOR
53-1062	R2	250 OHM 1/2 WATT RESISTOR
53-898	R3	50,000 OHM 1/4 WATT RESISTOR
53-926	R4	1 MEGOHM 1/4 WATT RESISTOR
53-1063	R5	500 OHM 1/2 WATT RESISTOR
53-921	R6	40,000 OHM 1/4 WATT RESISTOR
53-925	R7	500,000 OHM 1/4 WATT RESISTOR
53-919	R8	5,000 OHM 1/4 WATT RESISTOR
19-2014	R9	500,000 OHM VOLUME CONT. & SWITCH
19-2009	R10	250,000 OHM TONE CONTROL
53-924	R11	250,000 OHM 1/4 WATT RESISTOR
53-925	R12	500,000 OHM 1/4 WATT RESISTOR
53-2031	R13	500 OHM 1 WATT RESISTOR
68-2053	T1	FIRST I.F. TRANS. ASSEMBLY
68-2054	T2	SECOND I.F. TRANS. ASSEMBLY
64-2068	T3	8" SPKR. WITH SINGLE 6K6 TRANS.
80-2030	T4	POWER TRANSFORMER
26-2067		DIAL DRIVE ASSEMBLY
56-2133		DIAL SCALE
58-2032		DRIVE SHAFT ASSEMBLY
23-2017		NEEDLE CUP
52-2146		PHONOGRAPH PICKUP ARM ASSEM.
52-2113		PHONOGRAPH MOTOR
52-2114		TURNTABLE
28-2038		ESCUTCHEON & CRYSTAL
23-2024		CRYSTAL CARTRIDGE
57-2056		NEEDLE SCREW
20-2034		INDEX CORD & SPRING ASSEM.
27-2021		DIAL DRIVE DRUM ASSEM.
52-2093		POINTER ASSEMBLY.
40-2027		KNOB, PLAIN
40-2044		KNOB WITH YELLOW DOT
67-2041		SCALE MOUNTING STUDS
57-2072		TOP CHASSIS MTG. SCREW 8-32 X 1½ BRONZE
73-2038		MOTOR MTG. CUSHIONS WITH SHOULDER
73-2039		MOTOR MTG. CUSHIONS WITHOUT SHOULDER
66-2029		PHONO-RADIO SWITCH
73-2047		FINISHING WASHERS FOR CHASSIS MTG. SCREWS
66-2026		MOTOR "OFF-ON" SWITCH
5-2250		ARM REST BRACKET

WILCOX-GAY CORPORATION

CHARLOTTE, MICHIGAN, U. S. A.

MODEL A-69

WILCOX-GAY CORP.

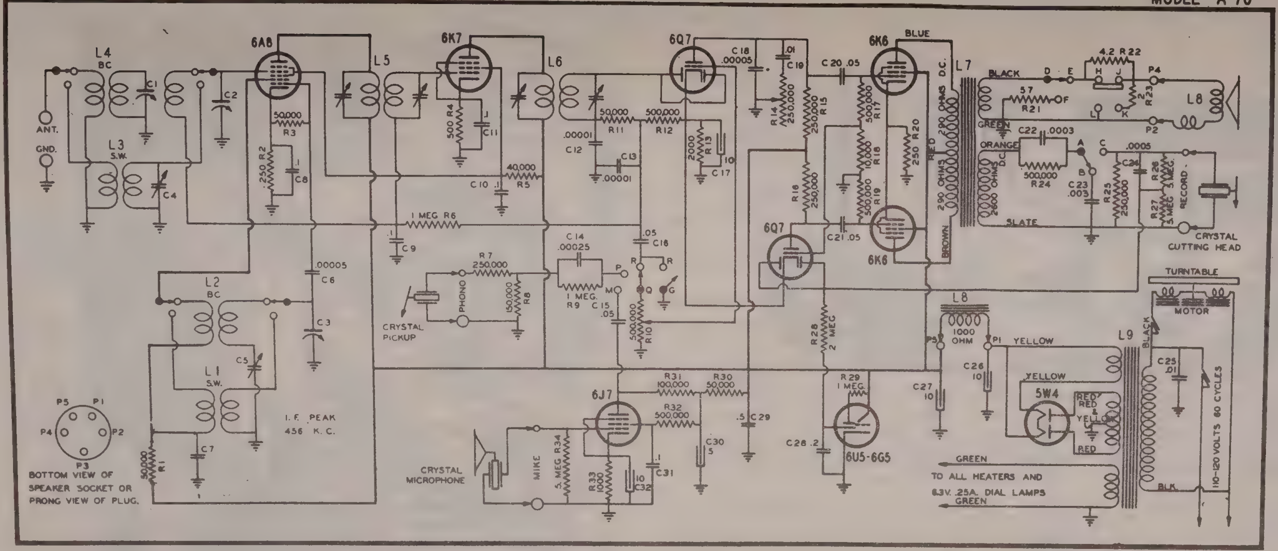
MODELS A70,A81,A82
Chassis 9J9
Schematic,Switch Data

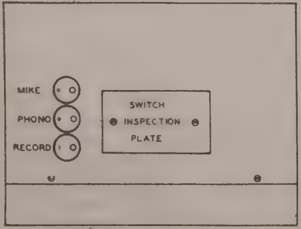
CHASSIS MODEL 9J9

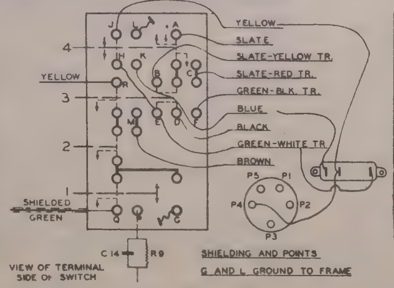
25-2170

SCHEMATIC DIAGRAM

MODEL A-70



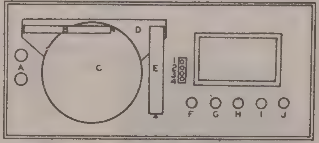




VIEW OF TERMINAL SIDE OF SWITCH

SHIELDING AND POINTS G AND L GROUND TO FRAME

1 OPENS Q-R, CLOSES Q-P, R-G
2 OPENS Q-R, CLOSES Q-M
3 OPENS Q-R, D-E, A-B
CLOSES Q-M, D-F, A-C
4 FIRST POS. OPENS A-B, CLOSES A-C
REMAINS CLOSED H-J
4 SECOND POS. OPENS H-J, CLOSES K-L
REMAINS CLOSED A-C
TO USE RADIO ONLY-ALL PLUNGERS UP
CIRCUITS CLOSED Q-R, D-E, A-B, H-J
CIRCUITS OPEN Q-P, D-F, A-C, K-L, Q-M, G-R



A—NEEDLE CUPS · B—PHONO ARM ASSEMBLY · C—TURNTABLE D—MOTOR & ARM PLATE · E—CUTTER ARM ASSEMBLY · F—MOTOR CONTROL G—MASTER SWITCH & VOLUME CONTROL · H·TONE CONTROL I—BAND SWITCH · J—TUNING CONTROL
1—TO USE AS PHONOGRAPH
2—TO USE AS PUBLIC ADDRESS
3—TO RECORD MICROPHONE
4—TO RECORD RADIO

DATE DEC. 12,'39

MODELS A70,A81,A82
Chassis 9J9
Chassis,Voltage

WILCOX-GAY CORP.

VOLTAGE CHART

MODEL A-70 RECORDIO - Line Voltage 115 V. - P1 to Gnd. 360 V. - P5 to Gnd. 260 V. P1 to P5 (spkr. field) 100 V. - Aerial disconnected. All voltages measured against chassis ground except as noted.

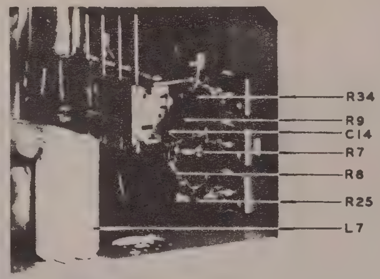
TUBE	POSITION	PLATE	SCREEN	CATHODE
6A8	1st Det.	260	80	2.8
	Osc.	260		
6K7	L.F.	260	80	3.8
6Q7	2nd Det.	100*		1.8
6Q7	Inverter	100*		1.8
6J7	Mike Amp.	35 to 60*	35*	1.3
6K6	Output	250	260	17.5

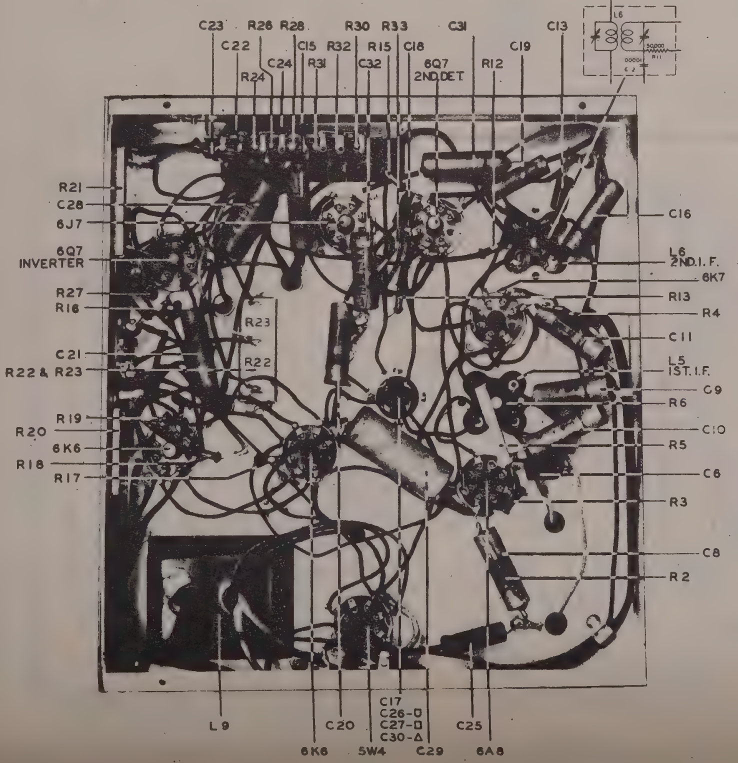
* Not actual voltages due to large values of resistance in circuit between supply voltage and point of measurement. These voltages may vary considerably, depending upon the resistance of voltmeter used.

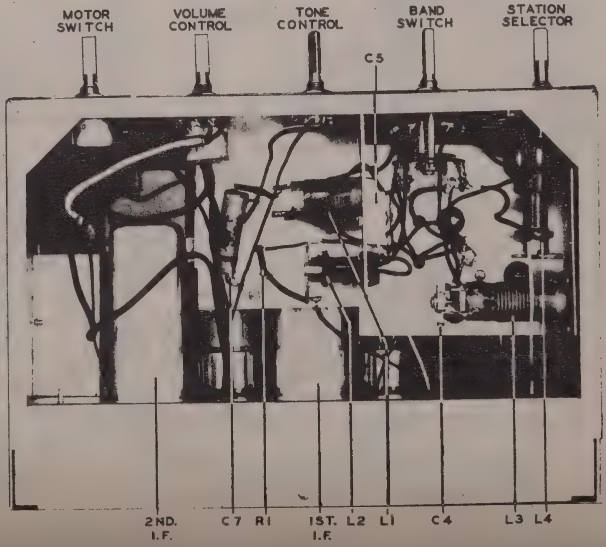
MODEL No.A70-A81-A82
DATE 1-17-40

CHASSIS 9J9

PARTS LAYOUT-







FOLLOWER ARM AND LATERAL FEED SCREW ADJUSTMENT

The follower arm assembly shown in FIGURE 7, consists of a steel channel, at one end of which is attached the pivot post, and at the other end a flat phosphor bronze spring, with a portion of the spring bent at a right angle to form the knife-edge tongue which engages the lateral feed screw.

The worm of the turn-table spindle engages the pinion at the end of the lateral feed screw within the gear housing, and as the feed screw revolves, the knife-edge tongue follows the spiral grooves of the feed screw, causing the follower arm to be moved laterally toward the center of the assembly.

The recording arm assembly is mounted at the upper end of the follower arm pivot post, so that as the follower arm moves in a horizontal plane beneath the recorder assembly mounting plate, the recording arm is caused to move laterally above the mounting plate, in the same direction and at the same rate of travel.

The lateral movement of the recording arm, as related to the rotation of the turn-table is such that 109 grooves per inch are cut into the record surface.

ADJUSTMENT OF PIVOT POST HEIGHT

The recording arm assembly is mounted on the upper end of the pivot post, and held in correct position by means of the two hex-head set screws as illustrated in FIGURE 8.

The end of the pivot post should be flush with the bushing on the top side of the arm platform (FIGURES 4,7, and 8) and when the recording arm is lowered to its horizontal position, a small gap should exist between the pivot post bushings X and Y, FIGURE 4. A few drops of light lubricating oil applied to the pivot post between the bushings will provide smooth movement in the raising and lowering of the recording arm.

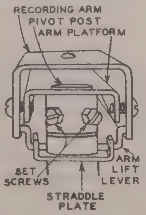


FIG. 8

FOLLOWER ARM HORIZONTAL ADJUSTMENT

Before tightening the hex-head set screws, note that the recording arm is in correct position with respect to the follower arm, so that as the follower arm touches the follower arm stop, the cutting stylus will rest on the outside black line near the center of the record. This will provide a maximum playing time of approximately 2-1/5 minutes for the 6½ inch disc, 3-1/2 minutes for the 8 inch, and 5 minutes for the 10 inch disc.

NOTE: Removal of the straddle plate will allow for greater ease in making the above adjustments.

In the event any adjustment is made which necessitates resetting the hex-head set screws, it is recommended that a check is made as to the height of the recording arm above the record surface and an adjustment of the arm height made if necessary,

FOLLOWER ARM VERTICAL ADJUSTMENT

With the recording arm lowered to a position so that the bottom of the nose of the arm is 2 inches above the turn-table, the tongue of the phosphor bronze spring should just clear the lateral feed screw.

The adjustment for this height may be accomplished by slightly bending up or down, as required, the flat part of the follower arm near the riveted end of the phosphor bronze spring.

PHOSPHOR BRONZE SPRING ADJUSTMENT

As the recording arm is lowered to recording position, it will be noted that the follower arm is also lowered, causing the phosphor bronze spring tongue to become firmly seated in the bottom of the spiral groove of the lateral feed screw.

The pressure of the phosphor bronze spring,bearing against the lateral feed screw should be sufficiently great so that the knife-edge tongue will not have a tendency to climb out of the grooves in the feed screw, which would result in unevenly spaced grooves cut into the record surface. In extreme cases of insufficient spring pressure bearing against the lateral feed screw, the cutting stylus may have a tendency to cut through into the adjacent previously cut groove.

The pressure should not be so great, however (caused by the follower arm being bent downward too far) that the phosphor bronze spring will be lifted away from the end of the adjusting screw, as the arm is lowered.

It can be seen from the preceeding paragraphs covering the follower arm vertical adjustment and the phosphor bronze spring adjustment, that these two adjustments are somewhat interlocking that is - one adjustment slightly affects the other.An adjustment of the phosphor bronze spring screw, so that the phosphor bronze spring assumes the shape and position shown in FIGURE 7, is usually satisfactory, provided the vertical adjustment has been correctly made.

LATERAL FEED SCREW ADJUSTMENT

An adjustment is provided on the worm and gear housing, to take up the end play of the lateral feed screw. To make this adjustment, loosen the large hexagonal lock nut and turn the slotted screw slowly to the right until all end play of the feed screw is eliminated. Then back off the adjustment slightly and tighten the lock nut. A very slight amount of end play in the feed screw should be noticeable after the lock nut has been tightened.

MODELS A70,A81,A82
MODEL A72
Recorder Notes,Part 1

WILCOX-GAY CORP.

ADJUSTMENT OF CUTTING ARM AND HEAD

When the RECORDIO leaves the factory, all adjustments have been correctly made. To assure this condition, a final check, by observing the over-all performance of the instrument in the making of recordings, is given each RECORDIO before being released for shipment.

It is realized, however, that during shipment, or due to improper handling after installation has been made, adjustments may become altered so that the instrument will not function properly without correction.

These bulletins have been prepared to serve as an aid to the service man in placing the equipment in proper operating condition, when necessary. Also instructive information is included, which may be passed on to other users of RECORDIO, to promote a better understanding of its operation and care.

DEPTH OF CUT

The depth of cut may be observed by holding the record in such a position that a light is reflected from the grooves. If the depth of cut is correct, the grooves will appear to be about as wide as the spaces between them.

The correct depth of cut will produce a thread cut from the record surface that is firm, altho' neither coarse and stiff, nor light and "fluffy".

Provided a new cutting stylus, or one known to be in perfect condition, is being used, the correct depth of cut may be gauged by permitting the cuttings to remain upon the record until completed, then rolling the cuttings in to a hard ball. The size of the ball thus obtained should be approximately, 3/8 inch in diameter, for the 6½ inch record.

EFFECT OF DULL CUTTING STYLUS

With proper care, the cutting stylus will cut dozens of records satisfactorily, before being dulled so that replacement is necessary.

Many times it may be apparent from casual observation, that because an incorrect cut is being made, an adjustment is in order to bring about correct depth of cut, -whereas the trouble may be due to the cutting stylus having become dulled, either accidentally, or through natural wear.

It is well to FIRST TRY A NEW CUTTING STYLUS before making any adjustments, to preclude the necessity for a complete readjustment. Adjustments made with a dulled cutting stylus being used, will have very little effect upon the depth of cut.

The point and cutting edges of the stylus are razor sharp, and it is obvious that if the cutting stylus should bump or scrape against the turn-table or other metal object, it would be dulled and rendered useless.

During periods of inoperation, the recording arm should always be returned to its normal horizontal position to the right of the turn-table.

THE CUTTING STYLUS SHOULD NEVER BE PERMITTED TO REST ON THE TURN-TABLE Its point is infinitesimally small, and compared to its normal pressure of approximately 1½ ounces against the record surface (equivalent to several hundred pounds per square inch) it can readily be realized that if this stylus pressure were exerted against a metal surface, its razor sharp point would be crushed or flattened. A magnifying glass is usually required to observe the damaged condition of the stylus point.

A study of FIGURE 1 will serve to stress the importance of careful adjustment of the depth of cut, and the necessity for using a sharp cutting stylus.

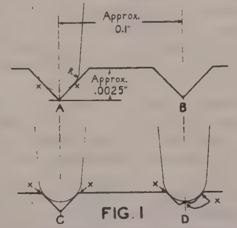


FIG. I

Line R represents radius of ball-point play-back needle.

A and B - perfectly cut grooves.

C- shallow groove due to improper adjustment

D- shallow imperfect groove due to dulled cutting stylus.

Note width of space between grooves as compared to width of grooves.

Note points of contact X between play back needle point and groove surface.

DEPTH OF CUT ADJUSTMENT

The depth of cut is regulated by an adjustment of the flat head screw on the top of the recording arm, FIGURE 2.

Turning the screw to the right (clockwise) increases the depth of cut.

Turning the screw to the left (counter-clockwise) decreases the depth of cut.

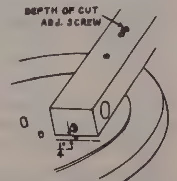


FIG. 2

An examination of the recording arm assembly will show the function of the coil spring attached to the cutting head is to oppose the weight or pressure of the cutting stylus against the record surface, so as to allow cutting a groove of definite depth. For example, it will be seen that turning the screw to the right changes the angle on which the spring acts, so that the groove depth is increased. Turning the screw to the left changes the angle on which the spring acts, so that the groove depth is decreased. It will be seen that the actual spring tension remains very nearly the same and the angle of the axis on which it operates is changed to bring about the possibility of adjusting the depth of cut. (CONTINUED)

WILCOX-GAY CORP.

MODELS A70,A81,A82
MODEL A72
Recorder Notes,Part 2

In some of the early RECORDIO models the adjusting screw was threaded throughout its full length, altho' only the lower portion of the screw over a span of approximately 3/8 inch contributes to the useful range of adjustment. If the adjusting screw is turned in a clockwise direction so as to raise the spring holding lug to the upper threaded portion of the screw, the adjustment will have passed through a "dead-center" position, which will cause a bobbing up-and-down movement of the cutting head.

If it is found that when using a new cutting stylus, the depth of cut is too shallow, and the adjusting screw has been turned to the full clockwise position in the later models, or to the upper limit of the useful range in the older models, this is an indication that the balance spring is too strong. Its tension may be decreased by spreading the coils of the spring with a pair of diagonal cutting pliers.

CAUTION: Care should be used in removing and replacing the cutting head, when occasion arises, so that the balance spring is not stretched to a length that will prevent its returning to normal length and tension.

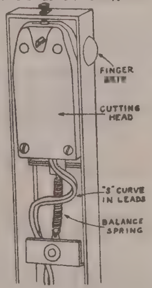


FIG. 3

When the cutting head is in proper adjustment, and the recording arm is raised to a position approximately 25 to 30 degrees from the vertical plane, the cutting head should float freely in its mounting, with equal up and down movement. The balance spring holding lug should be in a position on the adjusting screw approximately 1/4 inch from the shelf which holds the riveted end of the screw. (FIG.7)

Observe that the leads connecting to the cutting head are shaped to form an "S", FIGURE 3, and that these wires are kept in the clear - not touching the balance spring. Also, the wire leads should not be permitted to droop (arm horizontal) so that they will rub on the turn-table. Also observe that the holding tongues of the finger grips on the nose of the recording arm, are bent back sufficiently so as not to interfere with free movement of the cutting head.

HEIGHT OF RECORDING ARM ADJUSTMENT

The components of the recording arm assembly are positioned so that the cutting head is parallel, and the stylus is perpendicular to the record surface (FIGURE 7), which condition obtains ONLY with the nose of the recording arm adjusted to the correct height of 1/4 inch above the record surface.

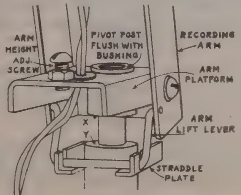


FIG. 4

An adjustable stop (arm height adjusting screw, FIGURES 4 & 7) is mounted on the arm platform to provide a means for adjusting the height of the recording arm. With a blank record on the turn-table and a Wilcox-Gay cutting stylus inserted in the cutting head, the arm height adjustment should be made so that the bottom of the recording arm is 1/4 inch from the record surface as shown in FIGS. 2&7.

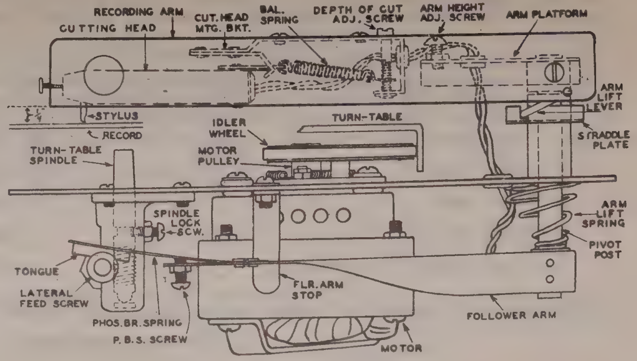


FIG. 7

The connecting wires from the cutting head should not be allowed to double up between the arm and arm platform, but should feed freely through the hole in the platform as the arm is lowered. Otherwise, the wires doubled up may prevent the arm from coming to rest on the head of the height adjusting screw.

There is little likelihood that the arm height adjusting screw will get out of adjustment due to the lock nut becoming loosened. However, there is the possibility that the recording arm may be roughly handled by the operator. If the arm were to be forced backwards after having been raised to its vertical position,- or if, while being lowered to its horizontal position to the right of the turn-table, the arm were dropped or forced downward, the plate on which all of the recording mechanism is mounted, may be bent or sprung slightly. This would destroy the 1/4 inch height adjustment, and readjustment of the arm height adjusting screw would be necessary to bring the nose of the recording arm to exactly 1/4 inch above the record surface.

Also, the straddle plate (FIGURES 4 and 7) may be bent down, which would effect the arm height adjustment. In this event, the straddle plate should be removed and straightened. This is most easily accomplished with the recording arm in the lowered position. Grasp the heel of the arm with the left hand and raise the arm horizontally, at the same time removing the arm lift lever from the slots in the straddle plate. The straddle plate may now be removed by sliding it towards the rear.

The importance of the arm height adjustment may be judged by a study of FIGURE 7. Note that the balance spring serves to hold the knife-edge

(CONTINUED)

MODELS A70,A81,A82
Record Notes,Part 3
Alignment,Trimmers

WILCOX-GAY CORP.

MODEL A72
Recorder Notes,Part 3

MODELS A70, A81 and A82 NOTES CONTINUED

pivot of the cutting head mounting, fully seated in the "V" shape trunnion bearing of the cutting head mounting bracket. Also, that the "pull of the spring is slightly downward, as well as horizontal.

The initial tension and length of the balance spring must be such that when adjusted to the proper tension to produce the correct depth of cut, the spring holding lug will be positioned on the adjusting screw as shown, to create a slight downward "pull" on the cutting head mounting.

As the stylus end of the cutting head is raised and lowered slightly, when cutting records which are not perfectly flat, the cutting stylus varies from its perpendicular plane, and the angle of the cutting edges of the stylus also vary. This tends to produce a varying depth of cut which would place a varying load on the motor, resulting in a variation in the average pitch or tone of the recorded music or speech. This effect is commonly called "wow". However the spring tension, and consequently the stylus pressure, also varies. This variation in stylus pressure opposes the effect of the varying stylus position, resulting in a substantially uniform depth of cut.

It can be seen that if the balance spring were adjusted to a horizontal position with respect to the plane of the cutting head - -

(a) - the downward "pull" of the spring would be lost, resulting in a pronounced variation in the depth of cut when cutting a record having a slightly warped surface.

(b) - the cutting stylus would have a tendency to chatter or dig into the record, due to the "dead-center" position of the spring.

It can also be seen that if the arm were adjusted to an incorrect height above the record surface, the cutting stylus would not be perpendicular, and the tendency towards a greater variation in the depth of cut, which would be more pronounced, would not be fully compensated by the counteracting effect of the varying tension of the balance spring.

MODEL No. A-70
DATE DEC. 12, '39

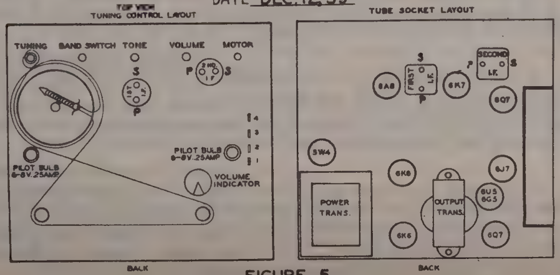


FIGURE 5

MODEL A70

Chassis Model 9J9

An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push-button No. 4 "To Record Radio".

(b) Disconnect cutting-head from chassis.

(c) Adjust volume control to near maximum.

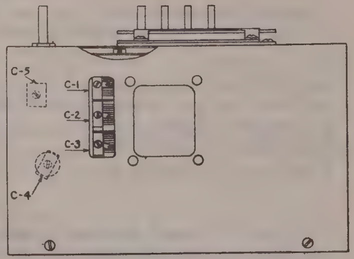


FIG. 6

Connect signal generator to control grid of 6A8 tube. Make connection to side of middle section, (C2) of condenser gang. (FIG. 6)

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	FIGURE NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd. I.F.-S*	5
" "	" "	"	" " -P	5
" "	" "	"	1st. I.F.-S	5
" "	" "	"	" " -P	5

Connect signal generator to ANT. and GND. terminals.

Turn condenser gang to full maximum capacity and check position of dial pointer with reference line on the scale, just to the right of 550 K.C. calibration.

600 K.C.	600 K.C.	Broadcast	L.F. Pad. (C-5)	6
1400 K.C.	1400 K.C.	"	Osc. (C-3)	6
1400 K.C.	1400 K.C.	"	Det. (C-2)	6
1400 K.C.	1400 K.C.	"	Pre-Sel. (C-1)	6
Not used. **	15-16 M.C.	Short Wave	Pre-Sel. (C-4)	6

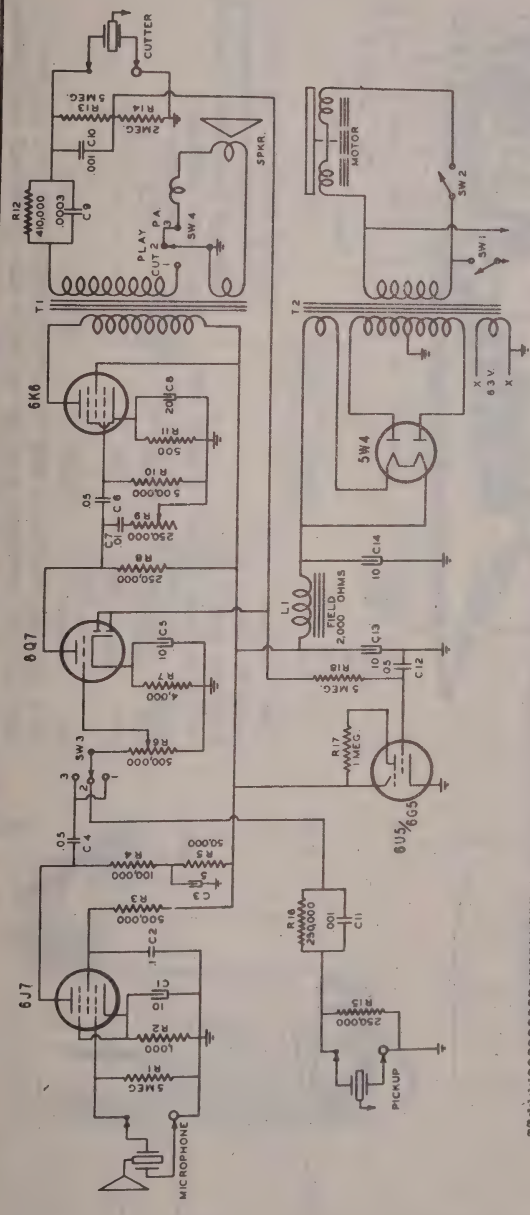
*If the trimming condenser on the secondary of the second I.F. transformer is adjusted throughout its full range, two "peaks" will be observed. The correct peak is the one of lowest capacity in the adjustment of the trimmer. The I.F. trimming condensers when properly adjusted will rest at approximately one and one half turns from the fully closed position.

**Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer for greatest noise.

WILCOX-GAY CORP.

MODEL A72 Recordio
Chassis 9Q5
Schematic

CHASSIS 9Q5 SCHEMATIC DIAGRAM MODEL A-72

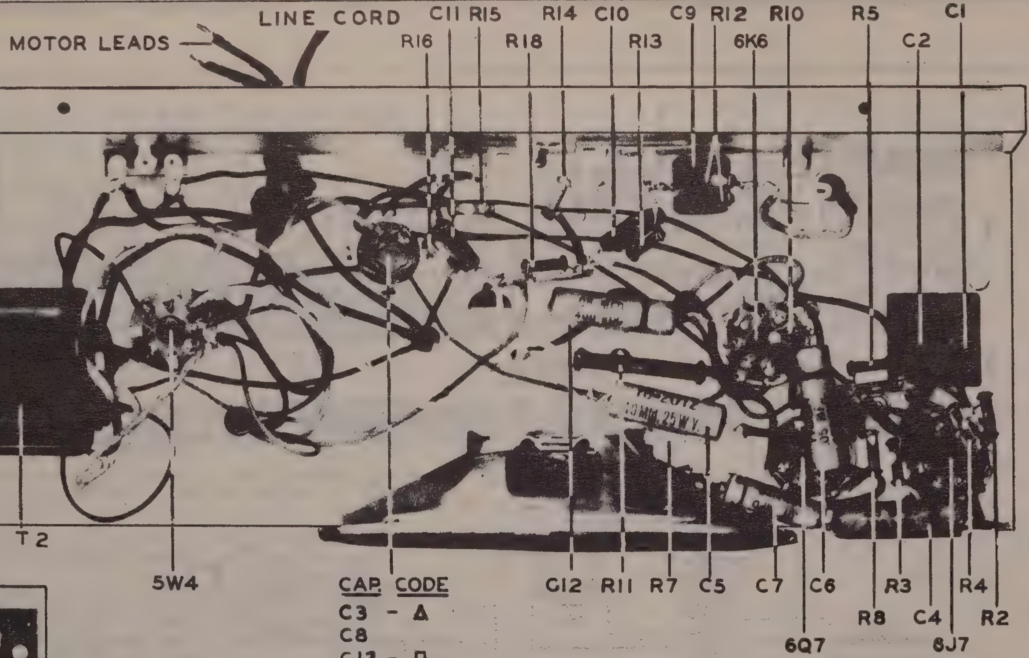


PART NO.	CODE	NAME
18-2012	C1	10 MFD. 25 W.V. ELECT. COND.
75-2005	C2	.1 MFD. 200 VOLT PAPER COND.
18-2017	C3	5 MFD. 350 W.V. ELECT. COND.
75-2004	C4	.05 MFD. 400 W.V. PAPER COND.
18-2012	C5	10 MFD. 25 W.V. ELECT. COND.
75-2004	C6	.05 MFD. 400 W.V. PAPER COND.
75-2003	C7	.01 MFD. 400 W.V. PAPER COND.
18-2017	C8	20 MFD. 25 W.V. ELECT. COND.
76-2017	C9	.0003 MFD. 3000 VOLT MICA COND.
76-2015	C10	.001 MFD. 1000 VOLT MICA COND.
76-2015	C11	.001 MFD. 1000 VOLT MICA COND.
75-2004	C12	.05 MFD. 400 W.V. PAPER COND.
18-2017	C13	10 MFD. 450 W.V. ELECT. COND.
18-2017	C14	10 MFD. 450 W.V. ELECT. COND.
64-2069	L1	6½" SPEAKER WITH 2000 OHM FIELD
53-2020	R1	5 MEGOHM 1/4 WATT RESISTOR
53-2023	R2	1,000 OHM 1/4 WATT RESISTOR
53-925	R3	500,000 OHM 1/4 WATT RESISTOR
53-923	R4	100,000 OHM 1/4 WATT RESISTOR
53-898	R5	50,000 OHM 1/4 WATT RESISTOR
19-2014	R6	500,000 OHM VOL. CONTROL & SWITCH
53-1149	R7	4,000 OHM 1/4 WATT RESISTOR
53-924	R8	250,000 OHM 1/4 WATT RESISTOR
19-2009	R9	250,000 OHM TONE CONTROL
53-925	R10	500,000 OHM 1/4 WATT RESISTOR
53-2031	R11	500 OHM 1 WATT RESISTOR
53-926 53-1235	R12	410,000 OHM 1 MEGOHM 700,000 Ohm } IN PARALLEL
53-2020	R13	5 MEGOHM 1/4 WATT RESISTOR
53-2024	R14	2 MEGOHM 1/4 WATT RESISTOR
53-924	R15	250,000 OHM 1/4 WATT RESISTOR
53-924	R16	250,000 OHM 1/4 WATT RESISTOR
53-926	R17	1 MEGOHM 1/4 WATT RESISTOR
53-2020	R18	5 MEGOHM 1/4 WATT RESISTOR
19-2014	SW1	MASTER SWITCH ON VOLUME CONTROL
66-2023	SW2	MOTOR OFF-ON SWITCH
66-2028	SW3 SW4	P.A. - CUT - PLAY SWITCH
81-2008	T1	OUTPUT TRANSFORMER
80-2030	T2	POWER TRANSFORMER
2-2007		FOLLOWER ARM ASSEMBLY
2-2008		RECORDER ARM ASSEMBLY
2-2009		PICKUP ARM ASSEMBLY
2-2010		IDLER ARM
5-2321		CUTTING HEAD MTG. BRACKET ASSEM.
7-2037		SNAP BUTTON (NICKLE PLATED)
9-2012		SHIELDED MICROPHONE CABLE ASSEM.
16-2005		IDLER WHEEL STUD CLIP
20-2026		LINE CORD
20-2027		MOTOR CORD
23-2022		NEEDLE CUP & COVER
23-2023		CRYSTAL CUTTING HEAD
23-2024		MB2 CRYSTAL CARTRIDGE
23-2029		CUTTING HEAD CUSHIONS
27-2024		2 7/8 DIA. DISC
40-2045		SELECTOR SWITCH KNOB
40-2046		VOLUME CONTROL KNOB
40-2047		MOTOR SWITCH KNOB
40-2049		TONE CONTROL KNOB
46-2002		ARM LIFT LEVER
47-2002		MICROPHONE
47-2003		MICROPHONE STAND
47-2005		MICROPHONE HANDLE
47-2006		RECORDER MOTOR 110 V. 60 CYCLE AC
48-409		8-32 X 5/16 HEX NUTS
48-1393		WING NUT (10/32)
48-2009		PICKUP ARM MTG. NUT
48-2010		MOTOR ASSEMBLY NUTS
51-2059		ROCKER PLATE
51-2063		PIVOT POST STRADDLE PLATE
51-2065		ROCKER CLAMPING PLATE
51-2075		PIVOT SADDLE PLATE & BUSHING ASSEM.
51-2083		ESCUTCHEON PLATE
52-2128		10" TURNTABLE
52-2129		2 PRONG PLUG (MALE)
52-2133		RECORD DRAG PIN
52-2139		MOTOR PULLEY
55-2007		RECORDER ASSEM. UNIT
57-2030		BINDING HEAD SCREW
57-2056		NEEDLE SCREW
57-2069		MACHINE SCREW (8-32 X 5/8)
57-2070		MACHINE SCREW (8-32 X 1/4)
57-2077		FEED SCREW ASSEM.
57-2080		FEED SCREW
58-2036		TURNTABLE SHAFT
66-2023		OFF-ON SWITCH
66-2028		TWO POLE THREE POSITION SWITCH
67-2046		PIVOT POST RETURN SPRING
67-2048		BAFFLE SCREEN
67-2049		CUTTING ARM SPRING
67-2050		DRAG PIN SPRING
67-2053		VENTILATING SCREEN
67-2057		TURNTABLE DRIVE WHEEL TENSION SPRING
73-1336		LOCKWASHERS (9/16 O.D.)
73-2051		THRUST WASHER FOR IDLER WHEEL
73-2052		MOUNTING WASHER FOR IDLER ARM
78-2020		IDLER WHEEL
87-2004		LID SUPPORT
87-2010		FINGER GRIPS (5/8 DIA.)

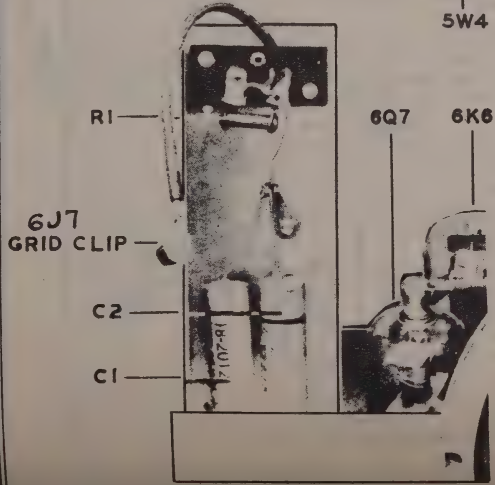
DATE 1-17-40

MODEL A72 Recordio
Chassis ,Voltage
Socket

WILCOX-GAY CORP.



CAP. CODE
C3 - ▲
C8
C13 - □
C14 - ▯



VOLTAGE CHART

Line Voltage 118
C-14 to Gnd. 315
C-13 to Gnd. 235
C-13 to C-14 (spkr. field) 80

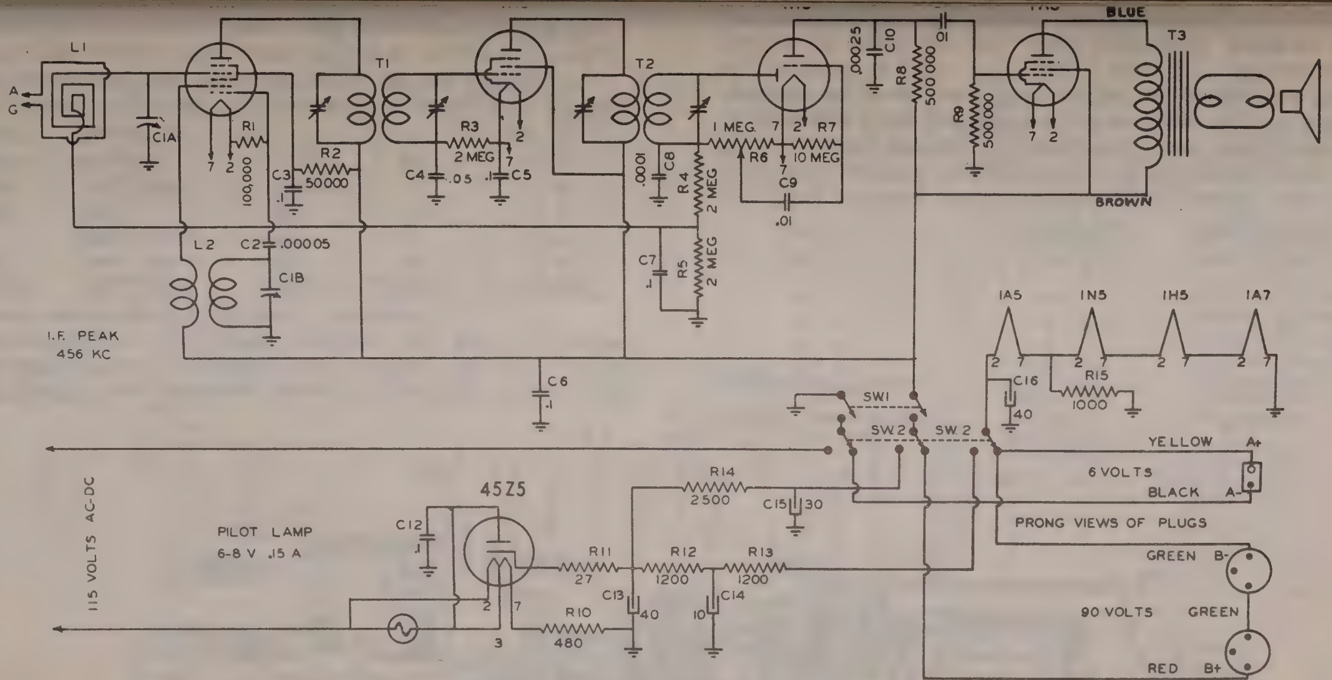
Volume Control at min.
All voltage measurements made against Gnd.(chassis) except as noted.

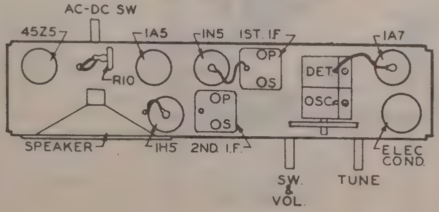
TUBE	POSITION	PLATE	SCREEN	Cathode
6J7	Mike Amp.	45*	40*	1.2
6Q7	Amp.-Vol. Ind. Rect.	72*		1.4
6K6	Output	222	235	15.0

*Not actual voltages due to large values of resistance in the circuit between supply voltage and point of measurement. These voltage values may vary considerably, depending upon the resistance of voltmeter used.

WILCOX-GAY CORP.

MODEL A73
Chassis 9E5
Schematic, Socket
Trimmers



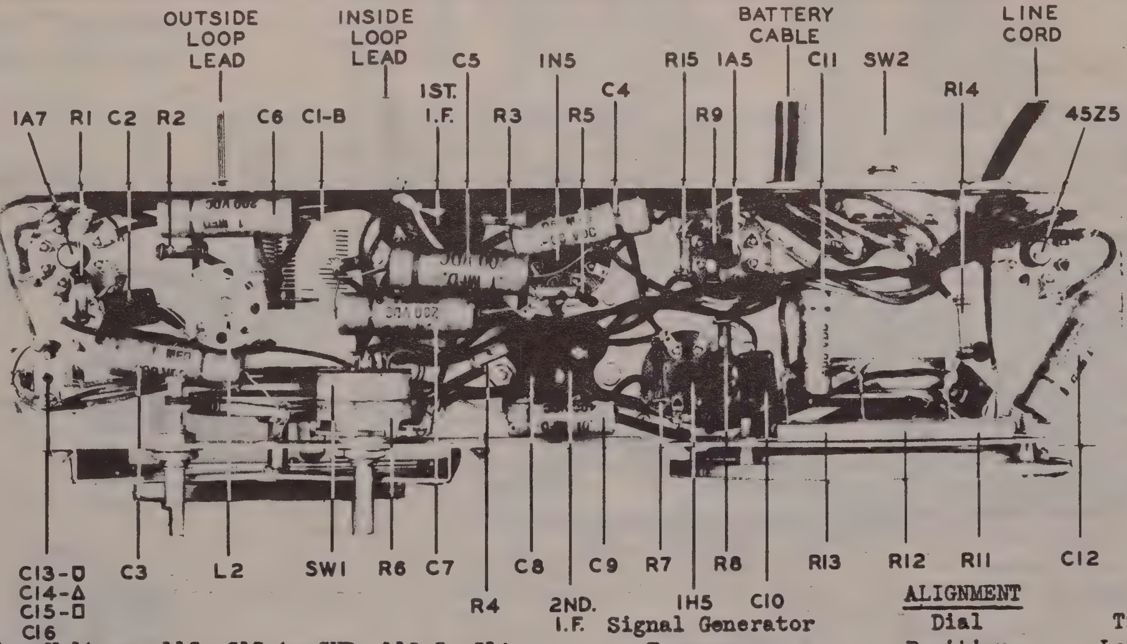


77-2022	C1	2 GANG VARIABLE COND.
76-2011	C2	.00005 MFD. 1000 V. MICA COND.
75-2005	C3	.1 MFD. 200 V. PAPER COND.
75-2005	C4	.05 MFD. 200 V. PAPER COND.
75-2005	C5	.1 MFD. 200 V. PAPER COND.
75-2005	C6	.1 MFD. 200 V. PAPER COND.
75-2005	C7	.1 MFD. 200 V. PAPER COND.
76-2012	C8	.0001 MFD. 1000 V. MICA COND.
75-2003	C9	.01 MFD. 400 V. PAPER COND.
76-2013	C10	.00025 MFD. 1000 V. MICA COND.
75-2003	C11	.01 MFD. 400 V. PAPER COND.
75-2005	C12	.1 MFD. 200 V. PAPER COND.
18-2018	C13	40 MFD. 150 V. DRY ELECT. COND.
18-2018	C14	10 MFD. 150 V. DRY ELECT. COND.
18-2018	C15	30 MFD. 150 V. DRY ELECT. COND.
18-2018	C16	40 MFD. 50 V. DRY ELECT. COND.
17-2246	L1	LOOP ANTENNA ASSEMBLY
17-2251	L2	OSCILLATOR COIL ASSEMBLY
53-924	R1	100,000 OHM 1/4 WATT RESISTOR
53-898	R2	50,000 OHM 1/4 WATT RESISTOR
53-2024	R3	2 MEGOHM 1/4 WATT RESISTOR
53-2024	R4	2 MEGOHM 1/4 WATT RESISTOR
53-2024	R5	2 MEGOHM 1/4 WATT RESISTOR
19-2017	R6	1 MEGOHM VOL. CONT. & SWITCH
53-2008	R7	10 MEGOHM 1/4 WATT RESISTOR
53-925	R8	500,000 OHM 1/4 WATT RESISTOR
53-925	R9	500,000 OHM 1/4 WATT RESISTOR
53-2036	R10	480 OHM 10 WATT RESISTOR
53-2035	R11	27 OHM 1/4 WATT RESISTOR
53-2035	R12	1,200 OHM 3 WATT RESISTOR
53-2035	R13	1,200 OHM 3 WATT RESISTOR
53-2002	R14	2,500 OHM 1/4 WATT RESISTOR
53-2023	R15	1,000 OHM 1/4 WATT RESISTOR
68-2051	T1	FIRST I.F. TRANSFORMER
68-2052	T2	SECOND I.F. TRANSFORMER
64-2073	T3	5" SPKR. SINGLE 1A5 TRANS. & PERM. MAG. FIELD
19-2017	SW1	D.P.S.T. SWITCH & VOL. CONT.
66-2033	SW2	3 P.D.T. SWITCH, BATT. AC-DC
7-2038		DIAL BEZEL
20-2032		INDEX CORD & SPRING ASSEM.
39-2010		OFF-ON INDICATOR
40-2028		CONTROL KNOBS.
40-2050		BATT. AC-DC SWITCH KNOB
51-2089		BEZEL PLATE
52-2141		TWO PRONG PLUG
52-2142		THREE PRONG PLUG
52-2144		POINTER
56-2149		DIAL SCALE

MODEL No. A-73
DATE 2-5-40

MODEL A73
Voltage,Alignment
Chassis,Socket

WILCOX-GAY CORP.



VOLTAGE: Line Voltage, 115; C13 to GND, 113.5; C14 to GND, 60; C16 to GND, 5.6; C15 to GND, 90. Aerial disconnected. Vol. cont. at min. All volt. measurements made against ground (chassis).

Tube	Position	Plate	Screen	Cathode*
1A7	1st. Det.	88	45	1.4
	Oscillator	88		
1N5	I.F.	88	90	4.2
1H5	2nd. Det.	32.5**		2.8
1A5	Output	83.5	90	5.6
45Z5	Rectifier			115.0

(*) Cath. volt. of all tubes with exception of 45Z5 is measured from filament prong #2 to ground.

(**) Not actual volt. due to large value of resistance in plate cir. May vary considerably due to resistance of voltmeter used.

ALIGNMENT

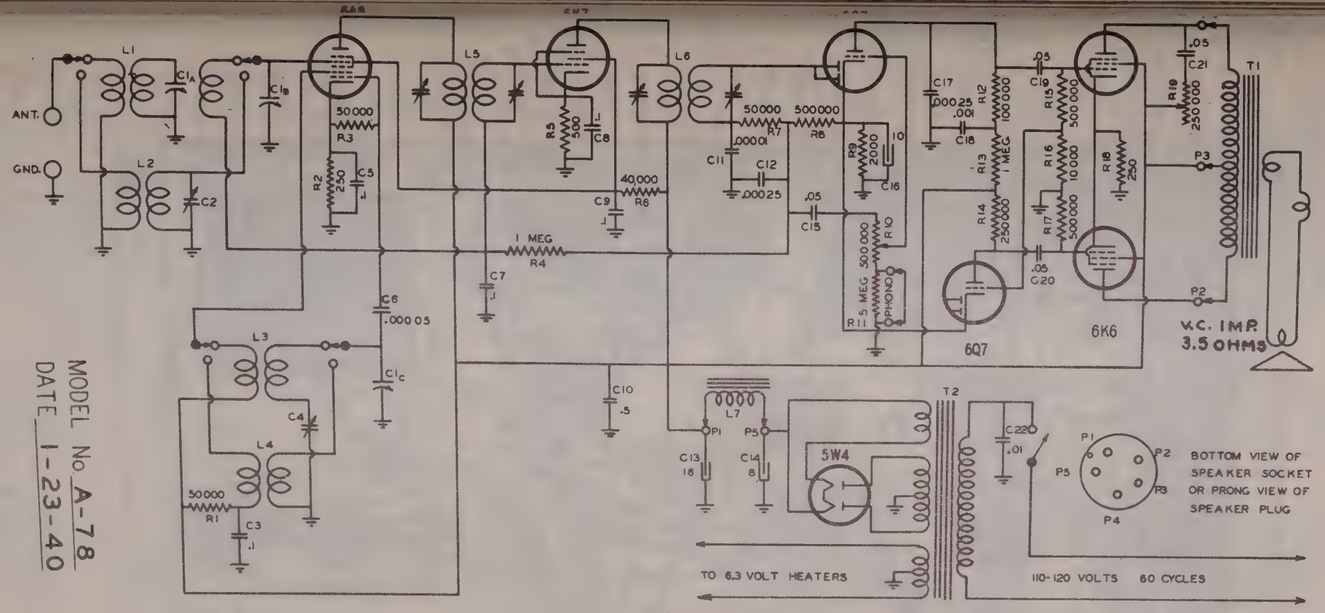
Signal Generator Frequency	Dial Position	Trimmer Location
456 KC	1500 KC	2nd I.F.--S
" "	" "	" " P
" "	" "	1st I.F.--S
" "	" "	" " P
1400 KC	1400 KC	Osc. C1-B
1400 KC	1400 KC	Det. C1-A*

(*) C1-A trimmer is located on rear cover, and is connected across loop antenna. NOTE: An adj. of this trimmer should be made each time the receiver is changed from use with loop antenna to use with outside antenna, and vice versa. As resonance is approached by adj. of trims., sig. gen. attenuator should be adj. for min. sig. that will provide a low reading on the output indicator.

ODEL A79
lignment,Voltage

WILCOX-GAY CORP.

MODEL A78
Chassis 9P7
Schematic,Socket,Voltage
Trimmers,Alignment



MODEL No. A-78
DATE 1-23-40

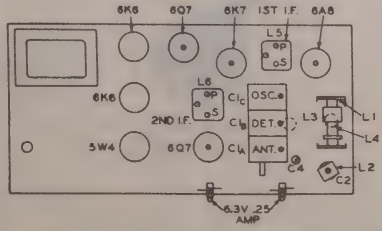
VOLTAGE AND ALIGNMENT DATA

SIGNAL GENERATOR	DIAL	WAVE BAND SWITCH	TRIMMER
456 KC	1500 KC	Broadcast	(4) I-F
600 "	600 "	"	Padder C-4
1400 "	1400 "	"	Det. C1-B; Ant. C1-A Osc. C1-C
Not Used*	15-16 MC	Short Wave	Ant. C-2

(*) Conn. Ant. to receiver & adj. dial so no station is received. Advance vol. cont. until fair noise vol. is received. Adj. trim. for greatest noise.

TUBE	POSITION	PLATE	SCREEN	CATHODE
6A8	1st Det.	225	80	2.8
	Osc.	225		
6K7	I.F.	225	80	3.2
6Q7	2nd Det.	33*		1.2
6Q7	Inverter	65*		1.2
6K6	Output	220	225	15.0

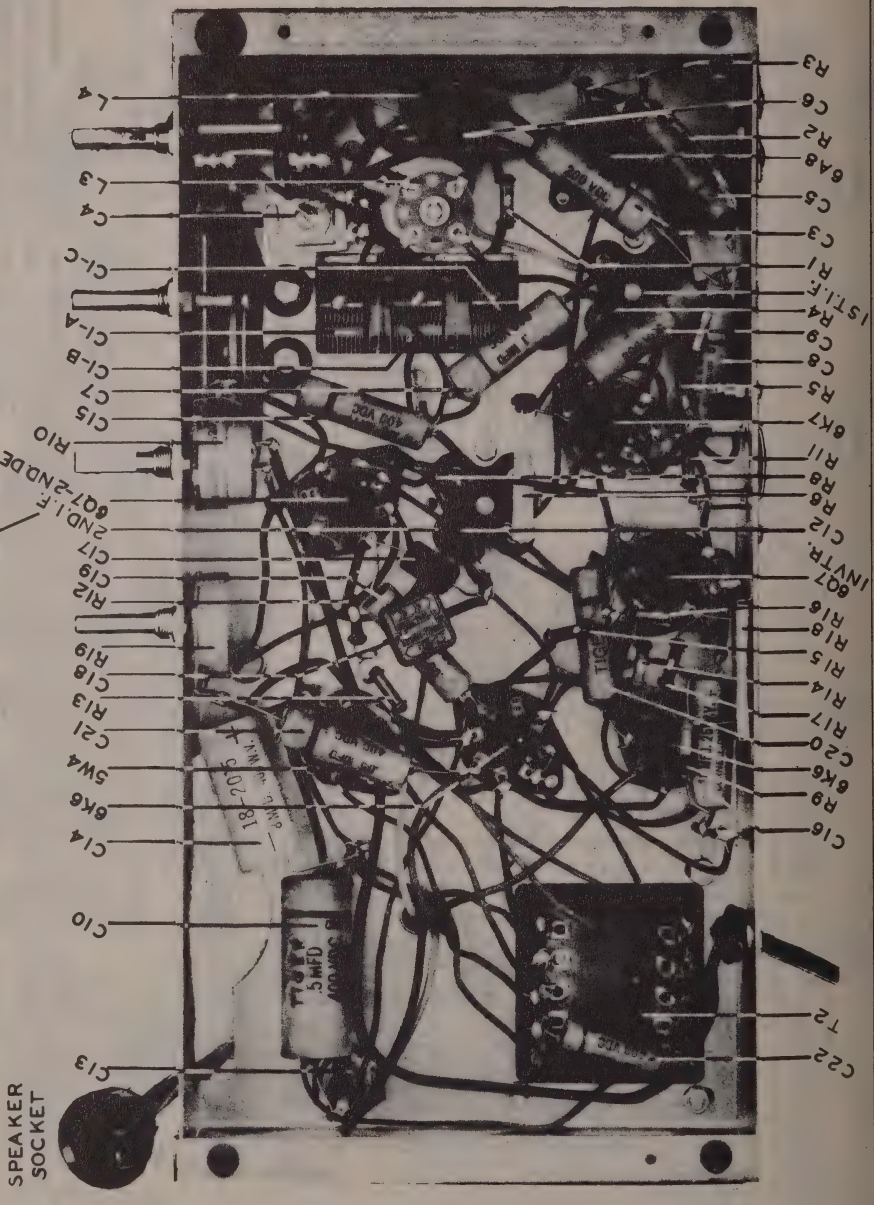
(*) Not actual voltages due to large values of resistance in circuit bet. supply volt. & point of measurement. Values vary considerably depending upon resistance of voltmeter used.

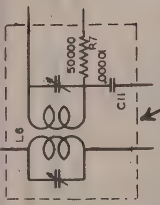


MODEL A78
Chassis

WILCOX-GAY CORP.

MODEL No. A-78
DATE 1-22-40

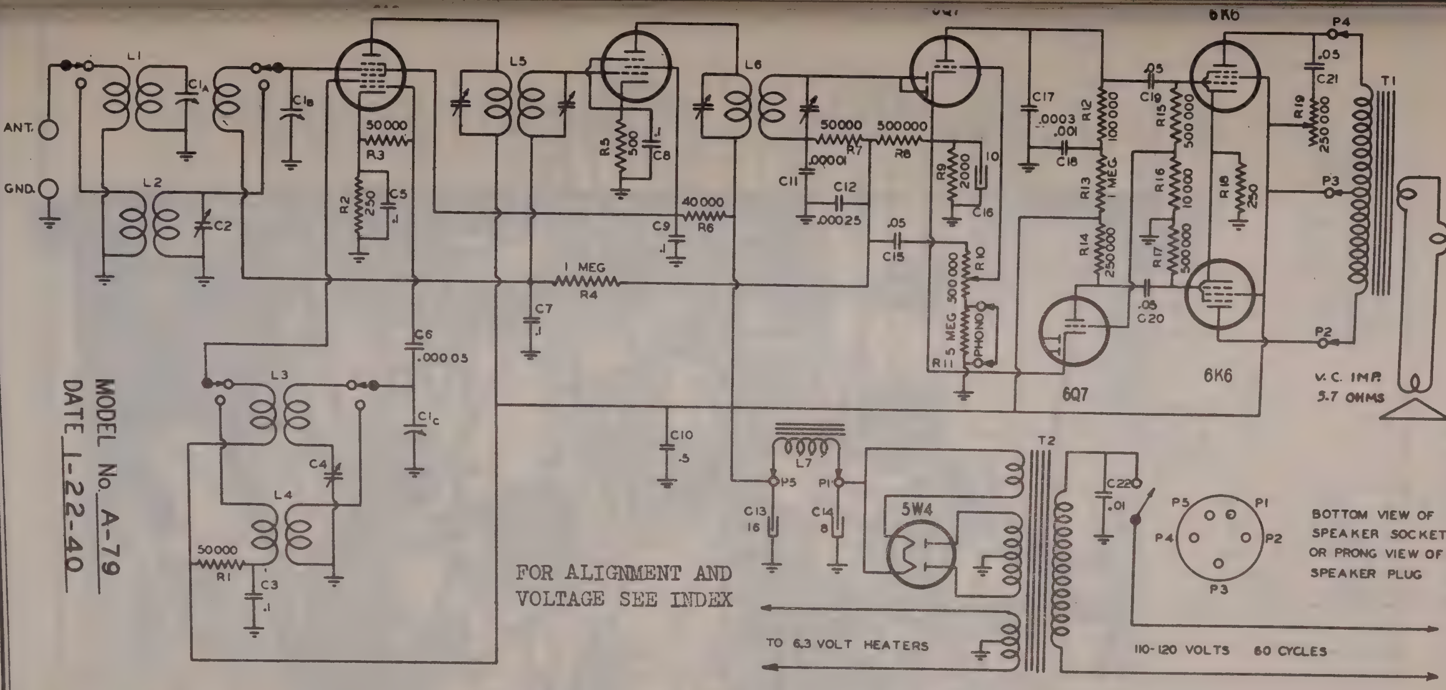




PARTS LAYOUT - CHASSIS 9P7

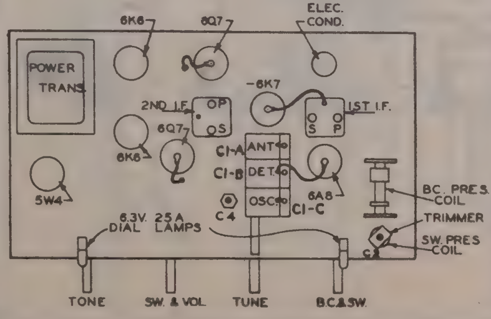
WILCOX-GAY CORP.

MODEL A79
Chassis 9N7



MODEL No. A-79
DATE 1-22-40

FOR ALIGNMENT AND VOLTAGE SEE INDEX



PART NO	CODE	NAME
77-2019	C1	3 GANG VARIABLE COND.
78-2010	C2	SHORT WAVE R.F. TRIMMER COND.
75-2005	C3	.1 MFD. 200 VOLT PAPER COND.
78-2035	C4	BC OSC. SERIES TRIMMER
75-2005	C5	.1 MFD. 200 VOLT PAPER COND.
76-2011	C6	.00005 MFD. 1000 VOLT MICA COND.
75-2005	C7	.1 MFD. 200 VOLT PAPER COND.
75-2005	C8	.1 MFD. 200 VOLT PAPER COND.
75-2005	C9	.1 MFD. 200 VOLT PAPER COND.
75-2012	C10	.5 MFD. 400 VOLT PAPER COND.
76-2010	C11	.00001 MFD. 1000 VOLT MICA COND.
76-2013	C12	.00025 MFD. 1000 VOLT MICA COND.
19-2006	C13	16 MFD. 250 W.V. ELECT. COND.
18-2015	C14	8 MFD. 400 W.V. ELECT. COND.
75-2004	C15	.05 MFD. 400 VOLT PAPER COND.
18-2012	C16	10 MFD. 25 VOLT ELECT. COND.
76-2009	C17	.0003 MFD 1,000 VOLT MICA
76-2015	C18	.001 MFD. 1000 VOLT MICA COND.
75-2004	C19	.05 MFD. 400 VOLT PAPER COND.
75-2004	C20	.05 MFD. 400 VOLT PAPER COND.
75-2004	C21	.05 MFD. 400 VOLT PAPER COND.
75-2003	C22	.01 MFD. 400 VOLT PAPER COND.

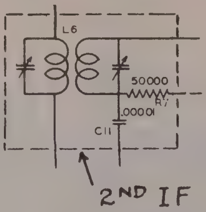
PART NO.	CODE	NAME
64-2070	T1	12" SPEAKER 6K6 PP OUTPUT TRANS.
80-2022	T2	POWER TRANSFORMER
53-898	R1	50,000 OHM 1/4 WATT RESISTOR
53-1062	R2	250 OHM 1/2 WATT RESISTOR
53-898	R3	50,000 OHM 1/4 WATT RESISTOR
53-926	R4	1 MEGOHM 1/4 WATT RESISTOR
53-1063	R5	500 OHM 1/2 WATT RESISTOR
53-2032	R6	40,000 OHM 1 WATT RESISTOR
53-898	R7	50,000 OHM 1/4 WATT RESISTOR
53-925	R8	500,000 OHM 1/4 WATT RESISTOR
53-1144	R9	2,000 OHM 1/4 WATT RESISTOR
19-2014	R10	500,000 OHM VOLUME CONTROL
53-2020	R11	5 MEGOHM 1/4 WATT RESISTOR
53-923	R12	100,000 OHM 1/4 WATT RESISTOR
53-926	R13	1 MEGOHM 1/4 WATT RESISTOR
53-924	R14	250,000 OHM 1/4 WATT RESISTOR
53-925	R15	500,000 OHM 1/4 WATT RESISTOR
53-920	R16	10,000 OHM 1/4 WATT RESISTOR
53-925	R17	500,000 OHM 1/4 WATT RESISTOR
53-2011	R18	250 OHM 2.5 WATT RESISTOR
19-2009	R19	250,000 TONE CONTROL

PART NO.	CODE	NAME
17-2243	L1	BROADCAST ANT. COIL ASSEM.
17-2242	L2	SHORT WAVE ANT. COIL ASSEM.
17-2227	L3	BROADCAST OSC. COIL ASSEM.
17-2149	L4	SHORT WAVE OSC. COIL ASSEM.
68-2051	L5	FIRST I.F. TRANS. ASSEM.
68-2056	L6	SECOND I.F. TRANS. ASSEM.
64-2070	L7	12" SPEAKER; 1,000 OHM FIELD
5-2182		SCALE MTG. SADDLE BRACKET
5-2183		SCALE MTG. CLAMP BRACKET
20-2029		INDEX CORD & SPRING ASSEM.
27-2021		DRIVE DRUM ASSEM.
28-2038		ESCUTCHEON & CRYSTAL
57-2078		ESCUTCHEON SCREWS
40-2027		KNOBS
52-2143		POINTER ASSEMBLY
56-2145		GLASS SCALE
56-2013		WAVE BAND SWITCH

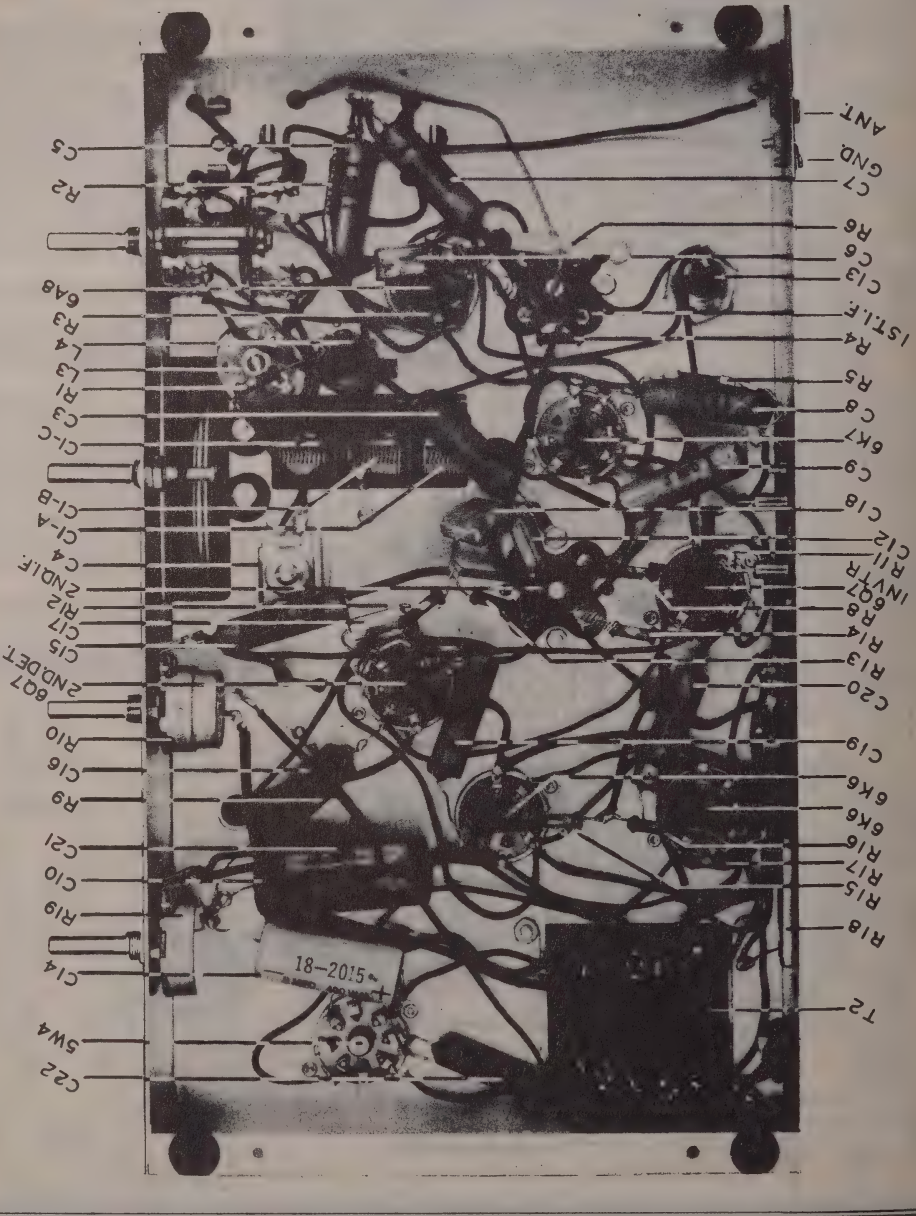
MODEL A79
Chassis

WILCOX-GAY CORP.

CHASSIS 9N7

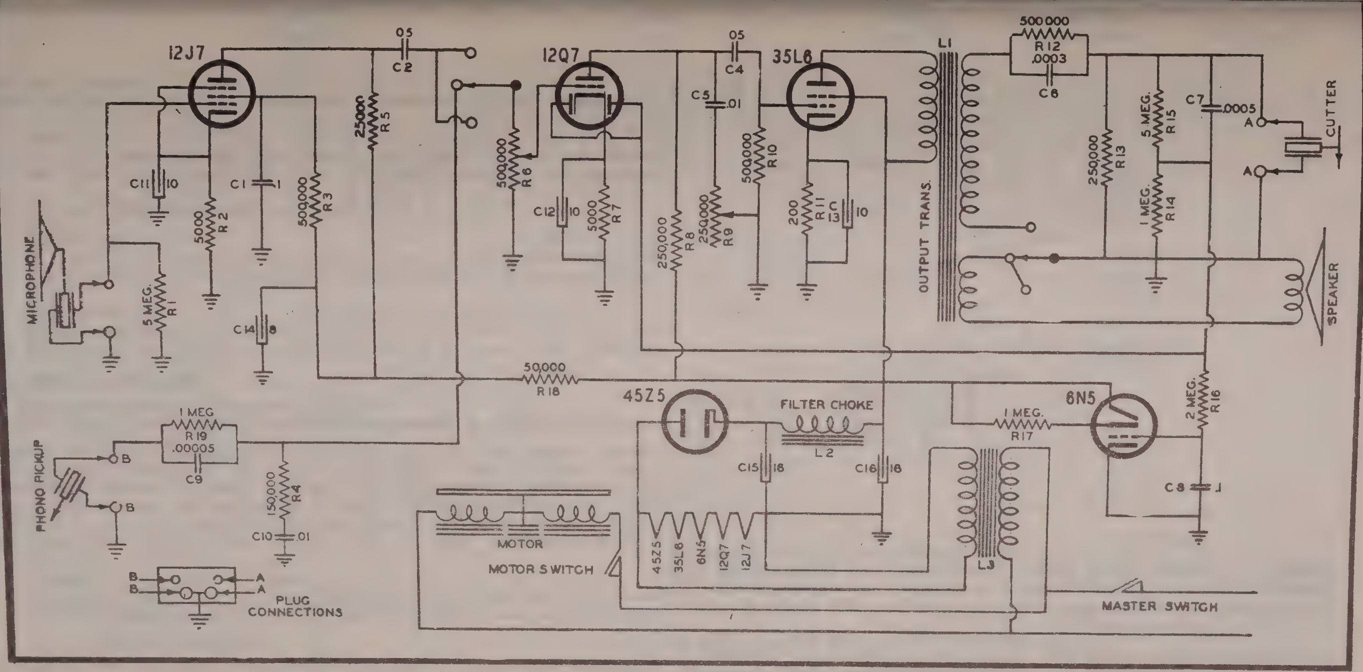


MODEL No. A-79
DATE 1-22-40

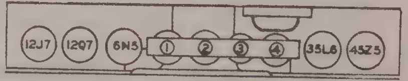


WILCOX-GAY CORP.

MODEL A71
Schematic



PART NO.	CODE	NAME
53-2020	R1	5 Meg. 1/4 Watt Carbon Resistor
53-919	R2	5,000 Ohm Resistor
53-925	R3	500,000 Ohm Resistor
53-2033	R4	150,000 Ohm Resistor
53-[illegible]8	R5	50,000 Ohm Resistor
19-2007	R6	500,000 Ohm Volume Control & Switch
53-919	R7	5,000 Ohm Resistor
53-924	R8	250,000 Ohm Resistor
19-2009	R9	250,000 Ohm Tone Control
53-925	R10	500,000 Ohm Resistor
53-2014	R11	200 Ohm Resistor
53-925	R12	500,000 Ohm Resistor
53-924	R13	250,000 Ohm Resistor
53-926	R14	1 Megohm Resistor
53-2020	R15	5 Meg. 1/4 Watt Carbon Resistor
53-2024	R16	2 Megohm Resistor
53-926	R17	1 Megohm Resistor
53-898	R18	50,000 Ohm Resistor
53-926	R19	1 Megohm Resistor
75-2005	C1	.1 Mfd. 200 Volt Cond.
75-2004	C2	.05 Mfd. 400 Volt Cond.
75-2004	C4	.05 Mfd. 400 Volt Cond.
75-2003	C5	.01 Mfd. 400 Volt Cond.
76-2009	C6	.0003 Mfd. Mica 1000 Volt Cond.
76-2014	C7	.0005 Mfd. Mica 1000 Volt Cond.
75-2005	C8	.1 Mfd. 200 Volt Cond.
76-2011	C9	.00005 Mfd. Mica 1000 Volt Elect. Cond.
75-2003	C10	.01 Mfd. 400 Volt Cond.
18-2012	C11	10 Mfd. 25 Volt Elect. Cond.
18-2012	C12	10 Mfd. 25 Volt Elect. Cond.
18-2012	C13	10 Mfd. 25 Volt Elect. Cond.
18-2011	C14	8 Mfd. 150 Volt Elect. Cond.
18-2010	C15	20 Mfd. 150 Volt Elect. Cond.
18-2010	C16	20 Mfd. 150 Volt Elect. Cond.
64-2067		Speaker
66-2023		Switch, 110 Volt
66-2028		Switch, 2 Pole, 3 Position
14-2002	L2	Filter Choke
81-2007	L1	Output Transformer
80-2032	L3	Isolation Transformer



1—MASTER SWITCH & VOLUME CONTROL
2—MOTOR SWITCH
3—TONE CONTROL
4—PUBLIC ADDRESS—PHONOGRAPH—RECORDING SWITCH

MODEL A72
A-F Service Note
MODELS Record Players
Motor Data

WILCOX-GAY CORP.

ALL RECORD PLAYERS
DATE 4-30-40

LUBRICATION OF ELECTRIC MOTORS IN WILCOX-GAY RECORD PLAYERS AND PHONOGRAPHS

In record player and phonograph models in which the turn-table shaft is driven directly through a reduction worm gearing housed within the motor assembly - -

1 - The motor should be demounted from the motor board.

2 - Remove the three screws surrounding the turn-table shaft.

3 - Remove the shaft and worm gear assembly, and clean the assembly by washing in kerosene or other grease solvent.

4 - Wash out the worm and gear housing of the motor assembly in a similar manner.

5 - Make an application of 600-W motor lubricant to both the worm and gear, and place a small quantity of the same lubricant in the gear housing.

NOTE: An oil hole is provided on some of the motors in these models, so that lubricant may be added, however it is better to follow the above procedure especially in cases where the increased power demand placed upon the motor, because of a "dried out" condition of the lubricant, has become great enough to cause a noticeable reduction in turn-table r.p.m.

Motors used in those models in which the turn-table is rim driven through an idler wheel, may be lubricated as follows:

1 - Remove turn-table.

2 - Apply several drops of electric motor oil to the side of the motor shaft, allowing the oil to run down into the upper bearing.

3 - Oil the idler wheel bearing, using only one or two drops of the oil so that it will not run out onto the rubber rim of the wheel.

4 - Oil the turn-table spindle bearing.

5 - The lower motor bearing may be lubricated by saturating the felt wick which surrounds the lower end of the motor shaft.

NOTE: Electric motor oil may be procured at any automobile service station.

AUDIO OSCILLATION

MODEL No. A-72
DATE 4-24-40

In some of the earlier model A-72 Portable Recordios, an audio oscillation may be noticed to occur with the volume control turned to near maximum position, when the 3-position switch is in the "CUT" position.

This oscillation manifests itself by a flickering of the magic eye (6U5) and will appear in the playback of records which have been cut under this condition, as a "motor-boating" sound of an intensity nearly equal to that of the recorded voice or music.

To correct this audio oscillation, disconnect the 500,000 ohm 6J7 screen grid resistor (R3) from the hum filter composed of C3 and R5, and connect it directly to B+.

Figure 9 shows the original circuit, and Figure 10 represents the circuit after the change has been made. It will be observed that this change has been incorporated in the schematic diagram appearing in Service Bulletin No. 10.

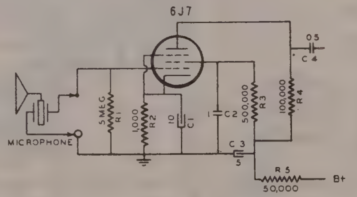


FIG. 9

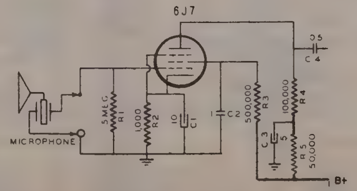
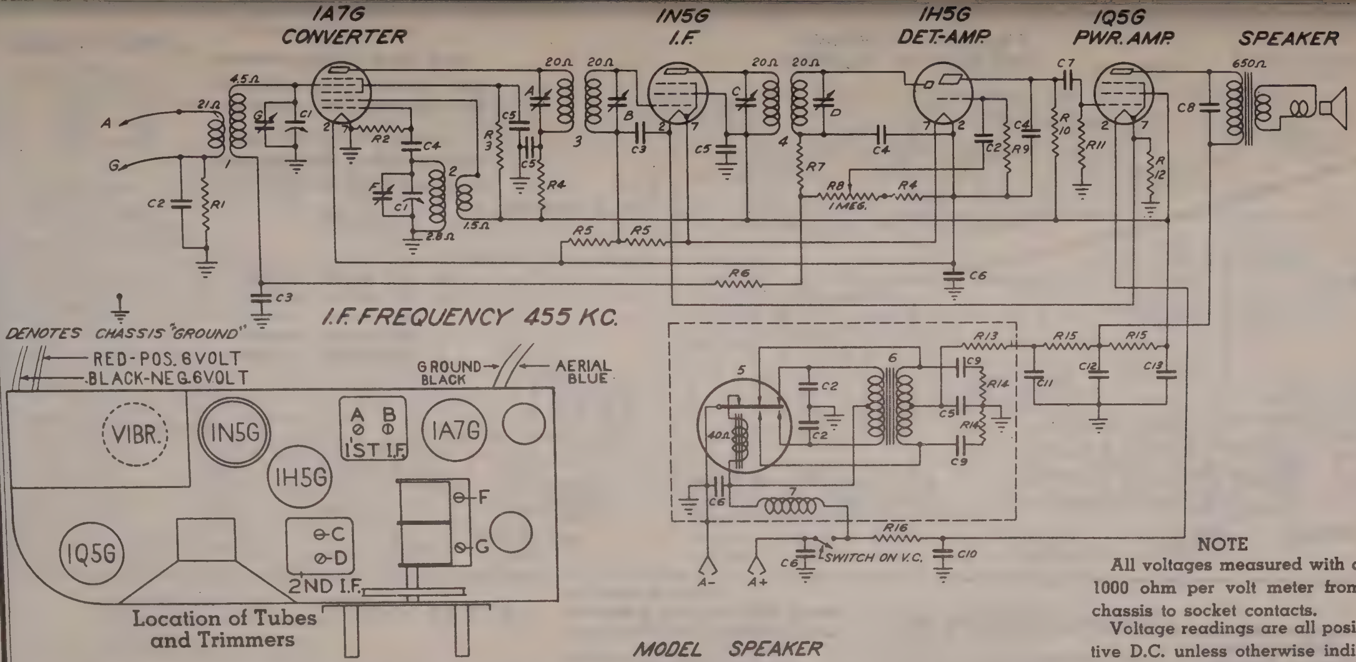


FIG. 10

ZENITH RADIO CORP.

MODELS 4B422,4B466,4B468
Chassis 5417 4B437
Schematic,Socket,Voltage
Trimmers



I.F. FREQUENCY 455 KC.

Location of Tubes and Trimmers

MODEL	SPEAKER	
4B422	49-345	5"
4B437	49-328	6½"
4B466	49-342	10"
4B468	49-359	8"

FOR ALIGNMENT

SEE INDEX

NOTE

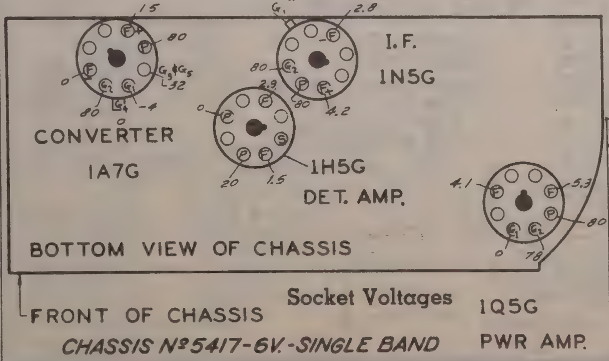
All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts.

Voltage readings are all positive D.C. unless otherwise indicated.

Antenna disconnected volume control full on.

Battery voltage 6 volt.

Battery consumption — .4 ampere.



BOTTOM VIEW OF CHASSIS

Socket Voltages

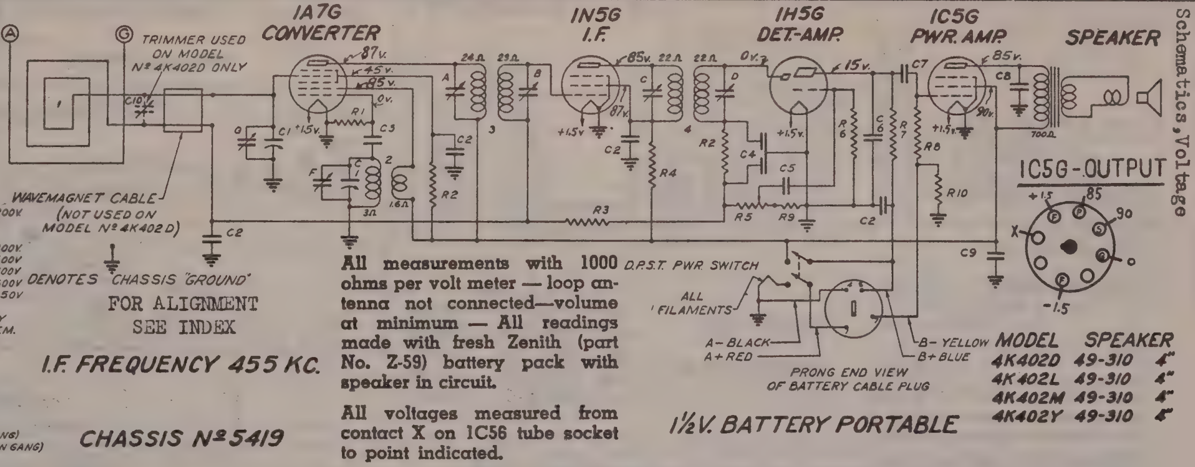
CHASSIS Nº 5417-6V.-SINGLE BAND

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R2	63-595	100M OHM	¼ W.			
C2	22-826	.01 MFD.	200V.	R3	63-594	68M OHM	¼ W.	1	20-208	ANTENNA COIL ASSEMBLY
C3	22-829	.05 MFD.	200V.	R4	63-583	1000 OHM	¼ W.	2	S 6381	OSCILLATOR COIL ASSEM.
C4	22-162	.0001 MFD.	600V.	R5	63-296	220M OHM	¼ W.	3	95-589	1ST I.F. TRANS.
C5	22-828	.05 MFD.	400V.	R6	63-669	3.9 MEGOHM	¼ W.	4	95-590	2ND I.F. TRANS.
C6	22-199	.5 MFD.	200V.	R7	63-593	47M OHM	¼ W.	5	190-17	VIBRATOR
C7	22-243	.01 MFD.	400V.	R8	63-1079	VOLUME CONTROL		6	95-635	POWER TRANSFORMER
C8	22-448	.004 MFD.	600V.	R9	63-604	10 MEGOHM	¼ W.	7	S 5043	CHOKE ASSEMBLY
C9	22-966	.04 MFD.	600V.	R10	63-271	1 MEGOHM	¼ W.			
C10	22-961	500 MFD. ELECTROLYTIC	15 V.	R11	63-600	2.2 MEGOHM	¼ W.			
C11	22-742	15 MFD. "	250 V.	R12	63-1060	90 OHM WIREWOUND	1 W.			
C12		15 MFD. "	250V.	R13	63-577	100 OHM	¼ W.	A		1ST I.F. TRANS. PRI.
C13		10 MFD. "	250V.	R14	63-697	100 OHM	¼ W.	B		1ST I.F. TRANS. SEC.
				R15	63-605	1000 OHM	½ W.	C		2ND I.F. TRANS. PRI.
				R16	63-1061	7 OHM	½ W.	D		2ND I.F. TRANS. SEC.
								F		B'DCAST OSC (ON GANG)
R1	63-597	470M OHM	¼ W.					G		ANT. B'DCAST (ON GANG)

MODELS 4K402D,4K402L,4K402M
Chassis 5419 4K402Y
MODELS 5G401D,5G401L,5G401M
Chassis 5537 5G401Y
Schematics,Voltage

ZENITH RADIO CORP.

DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-652	120 M OHM	¼ W.
R2	63-593	47 M OHM	¼ W.
R3	63-669	3.9 MEGOHM	¼ W
R4	63-583	1000 OHM	¼ W
R5	63-1034	VOLUME CONTROL	
R6	63-604	10 MEGOHM	¼ W
R7	63-271	1 MEGOHM	¼ W
R8	63-600	2.2 MEGOHM	¼ W.
R9	63-587	4700 OHM	¼ W
R10	63-238	1000 OHM	¼ W.
C1	22-885	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V
C3		100 MMFD.	
C4		DUAL 100 MMFD	
C5	22-826	.01 MFD.	200V.
C6	22-162	.0001 MFD.	600V
C7	22-243	.01 MFD.	400V
C8	22-448	.004 MFD.	600V
C9	22-684	8 MFD. ELECTROLYTIC	150V
C10	22-882	TRIMMER COND	
1		WAVEMAGNET ASSEMBLY	
2	S7029	OSCILLATOR COIL ASSEM.	
3	S7030	1ST I.F TRANS. ASSEM.	
4	95-606	2ND I.F TRANS	
A		1ST I.F TRANS. PRI.	
B		1ST I.F TRANS. SEC.	
C		2ND I.F TRANS PRI	
D		2ND I.F TRANS. SEC	
F		BROADCAST OSC. (ON GANG)	
G		ANTENNA BROADCAST (ON GANG)	



DENOTES "CHASSIS GROUND"

FOR ALIGNMENT
SEE INDEX

All measurements with 1000 ohms per volt meter — loop antenna not connected—volume at minimum — All readings made with fresh Zenith (part No. Z-59) battery pack with speaker in circuit.

All voltages measured from contact X on 1C56 tube socket to point indicated.

MODEL	SPEAKER	
4K402D	49-310	4"
4K402L	49-310	4"
4K402M	49-310	4"
4K402Y	49-310	4"

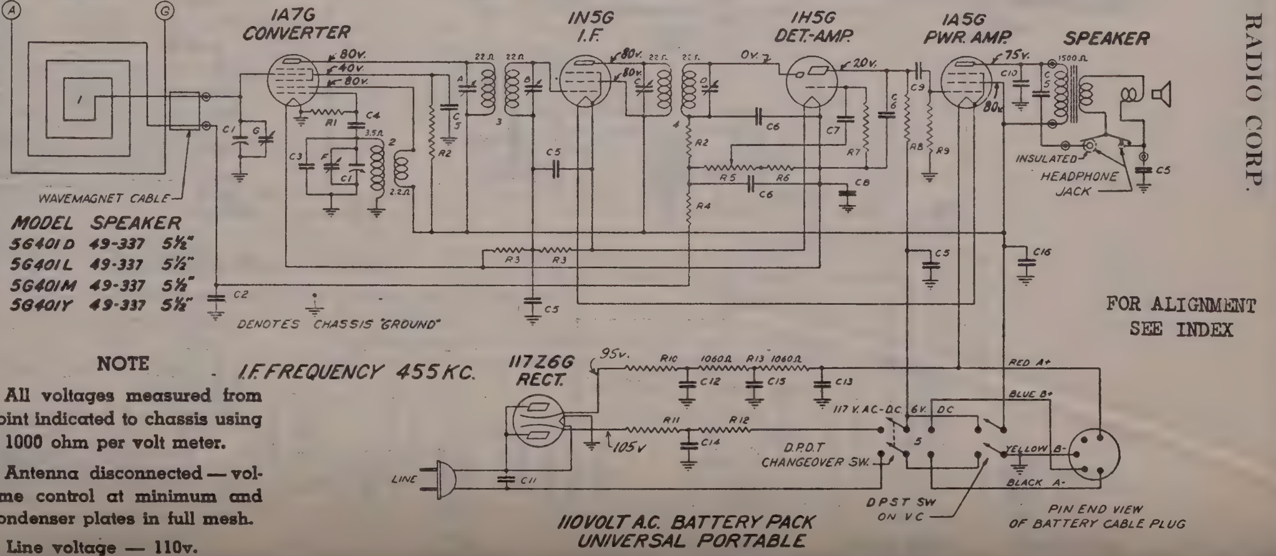
I.F. FREQUENCY 455 KC.

1½V. BATTERY PORTABLE

CHASSIS Nº 5419

DIAG Nº	PART Nº	DESCRIPTION	
C1	22-800	TWO GANG VARIABLE	
C2	22-138	.2 MFD	200V
C3	22-802	30 MMFD.	600V
C4	22-182	.00025 MFD	600V
C5	22-829	.05 MFD	200V
C6	22-162	.0001 MFD	600V
C7	22-826	.01 MFD	200V
C8	22-350	.25 MFD	200V
C9	22-243	.01 MFD	400V
C10	22-492	.002 MFD	600V
C11	22-869	.05 MFD	400V
C12	22-918	40 MFD ELECTROLYTIC	150 V
C13		20 MFD "	25 V
C14	22-871	20 MFD ELECTROLYTIC	150V
C15		20 MFD "	150V
C16		20 MFD	150V
R1	63-652	120 M OHM	⅛ W
R2	63-593	47 M OHM	¼ W
R3	63-296	220 M OHM	¼ W
R4	63-669	3.9 MEGOHM	¼ W
R5	63-1026	VOLUME CONTROL	
R6	63-587	4700 OHM	¼ W
R7	63-604	10 MEGOHM	¼ W
R8	63-271	1 MEGOHM	¼ W
R9	63-600	2.2 MEGOHM	¼ W
R10	63-1022	150 OHM WIREWOUND	1 W
R11	63-605	1000 OHM	½ W
R12	63-803	2200 OHM	½ W
R13	63-1033	2-SECTION CANDOHM	
1		WAVEMAGNET ASSEMBLY	
2	57027	OSC COIL ASSEMBLY	
3	95-593	1ST IF TRANS	
4	95-594	2ND IF "	
5	85-190	POWER SWITCH	
A		1ST IF TRANS PRI	
B		1ST IF " SEC	
C		2ND I.F " PRI	
D		2ND IF " SEC	
F		BROADCAST OSC (ON GANG)	
G		ANTENNA B'DCAST ( )	

CHASSIS Nº5537



DENOTES "CHASSIS GROUND"

MODEL	SPEAKER	
5G401D	49-337	5½"
5G401L	49-337	5½"
5G401M	49-337	5½"
5G401Y	49-337	5½"

NOTE

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage — 110v.

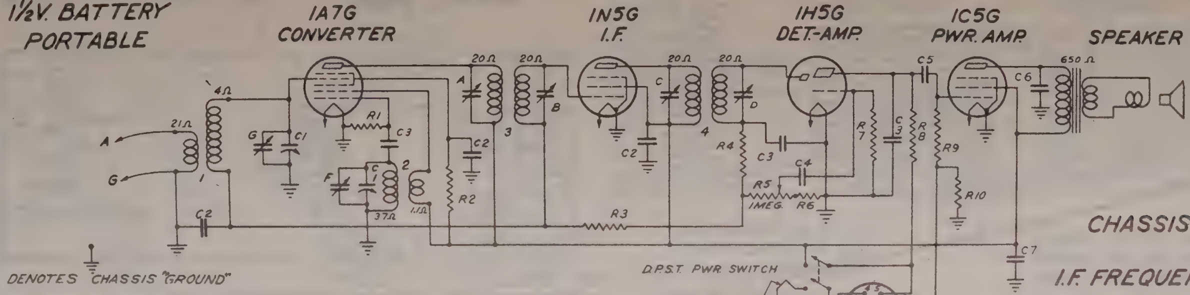
I.F. FREQUENCY 455 KC.

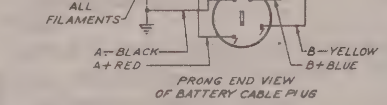
FOR ALIGNMENT
SEE INDEX

110VOLT A.C. BATTERY PACK UNIVERSAL PORTABLE

ZENITH RADIO CORP.

MODELS 4K422,4K435,4K465
Chassis 5420 4K466
Schematic,Voltage,Socket
Alignment,Trimmers

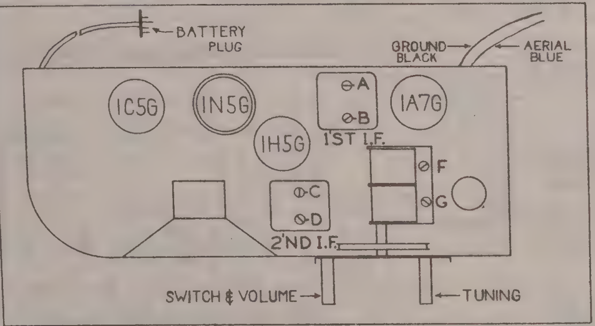




PRONG END VIEW OF BATTERY CABLE PLUG

CHASSIS Nº 5420

I.F. FREQUENCY 455 KC.



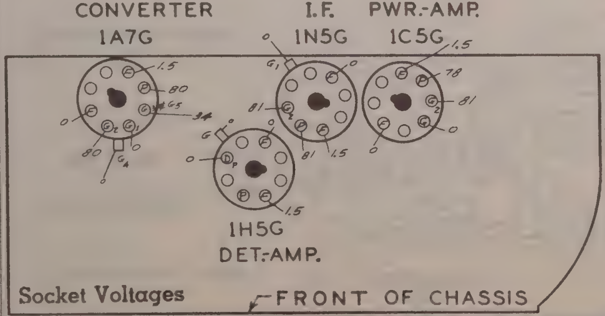
MODEL	SPEAKER	
4K422	49-286	5"
4K435	49-328	6½"
4K465	49-359	8"
4K466	49-342	10"

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts using a fresh Z28 battery pack.

Antenna disconnected — volume control full on.

Location of Tubes and Trimmers



Socket Voltages

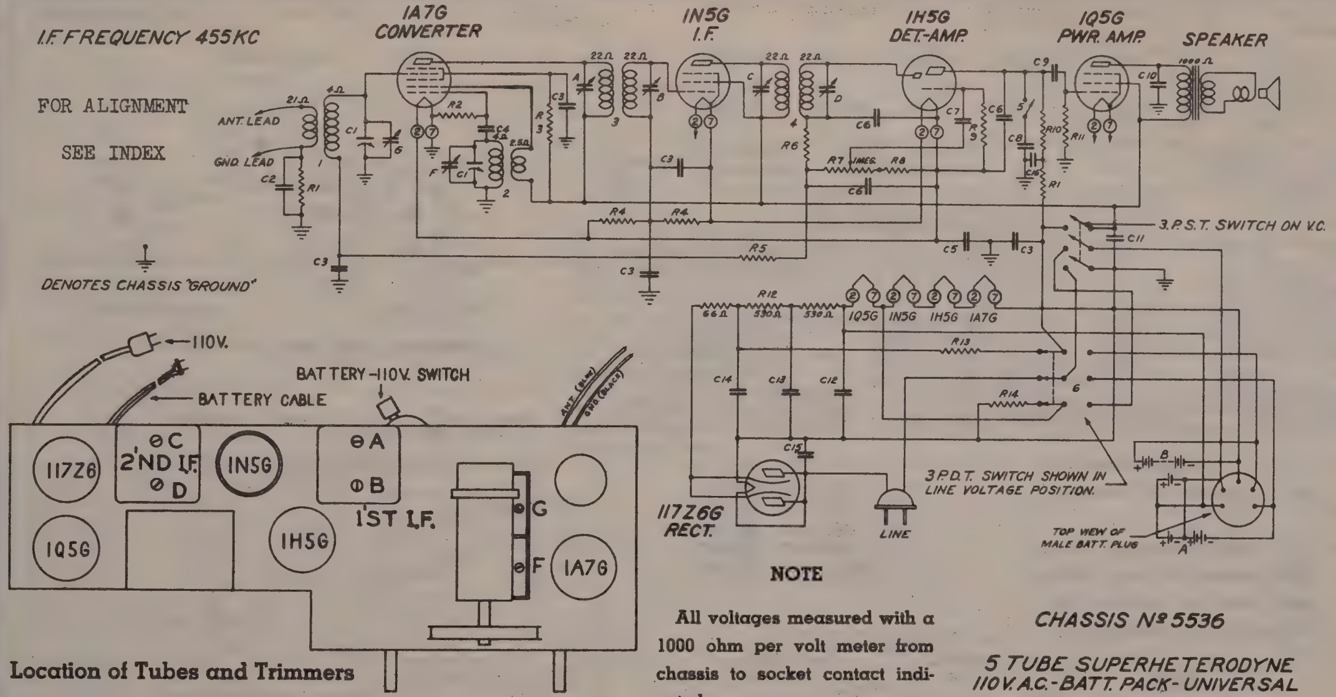
DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R4	63-593	47M OHM	¼ W	4	95-590	2ND I.F. TRANS ASSEM.
C2	22-829	.05 MFD	200V.	R5	63-1072	VOLUME CONTROL				
C3	22-162	.0001 MFD	600V.	R6	63-587	4700 OHM	¼ W.			
C4	22-826	.01 MFD	200V	R7	63-604	10 MEGOHM	¼ W			
C5	22-243	.01 MFD.	400V.	R8	63-271	1 MEGOHM	¼ W	A		1ST I.F. TRANS. PRI.
C6	22-448	.004 MFD	600V.	R9	63-600	2.2 MEGOHM	¼ W.	B		1ST I.F. TRANS. SEC
C7	22-884	8 MFD. ELECTROLYTIC	150V.	R10	63-238	1000 OHM	¼ W.	C		2ND I.F. TRANS. PRI.
								D		2ND I.F. TRANS. SEC.
								F		B'DCAST OSC (ON GANG)
								G		ANT. B'DCAST (ON GANG)
R1	63-654	180M OHM	¼ W.	1	20-208	ANTENNA COIL				
R2	63-594	68M OHM	¼ W.	2	S-7815	OSCILLATOR COIL ASSEM.				
R3	63-669	3.9 MEGOHM	¼ W.	3	95-589	1ST I.F. TRANS. ASSEM.				

ALIGNMENT PROCEDURE
For Chassis 5417, 5420 and 5536

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1A7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Antenna	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Scale

MODELS 5G438,5G467
Chassis 5536
Schematic,Voltage,Socket
Trimmers

ZENITH RADIO CORP.



Location of Tubes and Trimmers

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

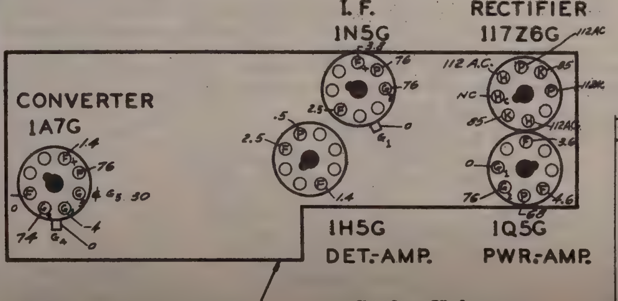
Volume control on full.

Line voltage 112 v. A.C.

CHASSIS Nº 5536

5 TUBE SUPERHETERODYNE
110V. A.C.-BATT. PACK-UNIVERSAL

MODEL	SPEAKER	
5G438	49-332	8"
5G467	49-333	10"



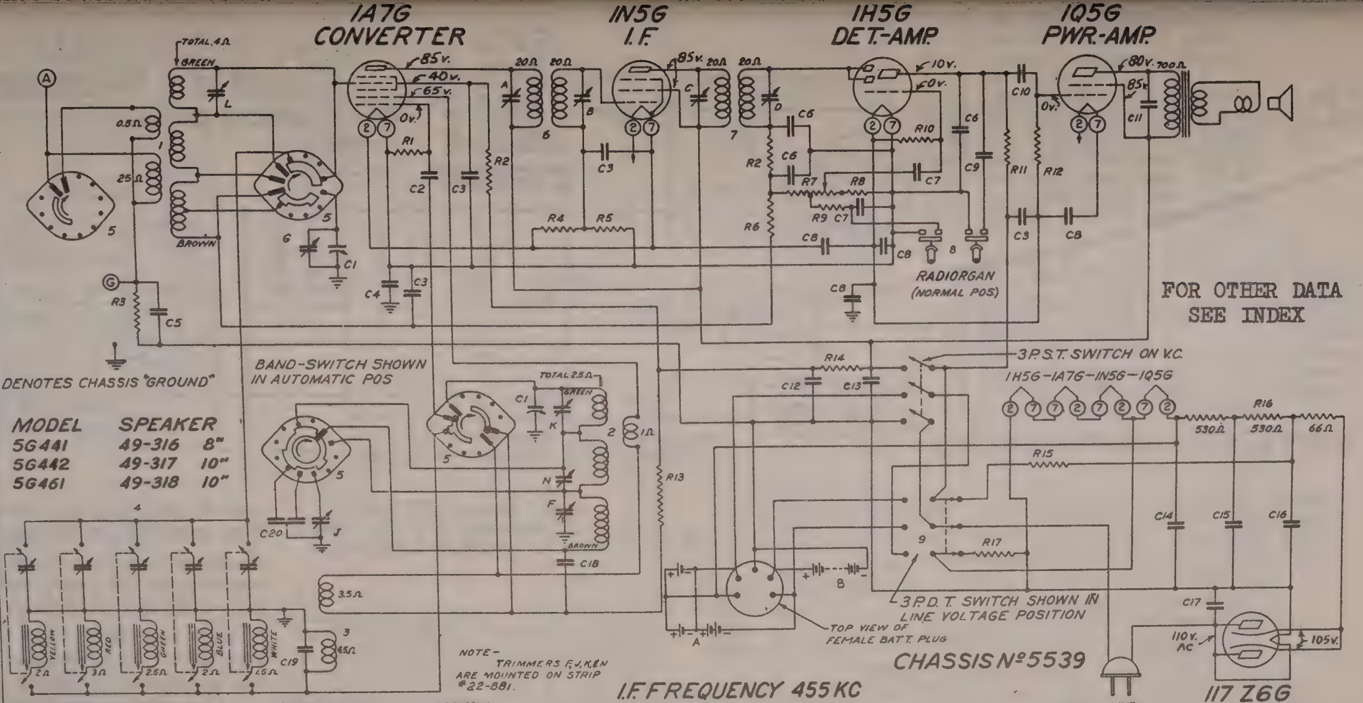
Socket Voltages

FRONT OF CHASSIS

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-910	TWO GANG VARIABLE		R1	63-597	470 M OHM	¼W.	1	20-208	ANTENNA COIL
C2	22-196	.01 MFD.	600V.	R2	63-652	120 M OHM	¼W.	2	S-6381	OSC. COIL ASSEMBLY
C3	22-829	.05 MFD.	200V	R3	63-713	47 M OHM	¼W.	3	95-593	1ST I.F. TRANS.
C4	22-182	.00025 MFD.	600V.	R4	63-296	220 M OHM	¼W.	4	95-594	2ND I.F. TRANS.
C5	22-350	.25 MFD.	200V.	R5	63-669	3.9 MEGOHM	¼W.	5	85-187	TONE CONTROL SWITCH
C6	22-162	.0001 MFD.	600V.	R6	63-593	47 M OHM	¼W.	6	85-198	POWER SWITCH
C7	22-826	.01 MFD.	200V.	R7	63-1081	VOLUME CONTROL				
C8	22-887	TONE CONTROL COND.		R8	63-583	1000 OHM	¼W.			
C9	22-243	.01 MFD.	400V.	R9	63-604	10 MEGOHM	¼W.	A		1ST I.F. TRANS. PRI.
C10	22-448	.004 MFD.	600V.	R10	63-271	1 MEGOHM	¼W.	B		1ST I.F. " SEC.
C11	22-928	40 MFD. ELECTROLYTIC	150V.	R11	63-600	2.2 MEGOHM	¼W.	C		2ND I.F. " PRI.
C12		20 MFD. "	25V.	R12	63-1041	3 SECTION CANDOHM		D		2ND I.F. " SEC.
C13	22-879	60 MFD. "	150V.	R13	63-605	1000 OHM	½W.	F		BROADCAST OSC. (ON GANG)
C14		60 MFD. "	150V.	R14	63-1012	90 OHM WIREWOUND	½W.	G		ANTENNA BDCAST (ON GANG)
C15	22-869	.05 MFD.	400V.							
C16	22-138	.2 MFD.	200V.							

ZENITH RADIO CORP.

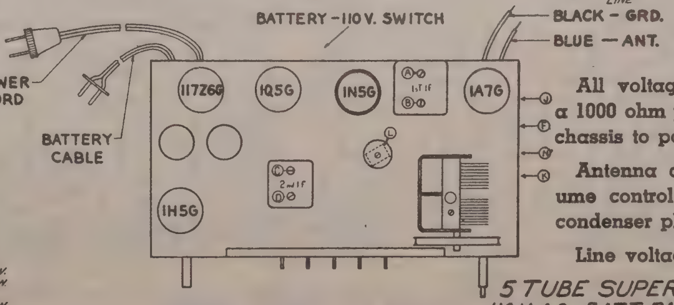
MODELS 5G441,5G442,5G461
Chassis 5539
Schematic,Voltage,Socket Trimmers



MODEL	SPEAKER	
5G441	49-316	8"
5G442	49-317	10"
5G461	49-318	10"

CHASSIS Nº5539

I.F. FREQUENCY 455 KC



Location of tubes and trimmers

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to point indicated.

Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage — 110v.

5 TUBE SUPERHETERODYNE
110V. A.C.-BATT. PACK-UNIVERSAL

C1	22-878	TWO-GANG VARIABLE		1	S7251	ANTENNA COIL ASSEMBLY	
C2	22-239	50 MMFD.	600V.	2	S7252	OSC. COIL ASSEMBLY	
C3	22-829	.05 MFD.	200V.	3	S6992	OSC. COUPLING COIL ASSEM.	
C4	22-350	.25MFD.	200V	4	S7044	AUTO TUNING UNIT ASSEM.	
C5	22-196	.01 MFD.	600V.	5	85-195	BAND SELECTOR SW.	
C6	22-162	100 MMFD	600V.	6	95-607	1ST I.F. TRANSFORMER	
C7	22-826	.01 MFD.	200V.	7	95-614	2ND I F TRANSFORMER	
C8	22-827	.1 MFD.	200V.	8	S6994	TONE CONTROL SW.	
C9	22-887	.001 MFD.	600V.	9	85-196	POWER SW.	
C10	22-243	.01 MFD.	400V.	A		1ST I.F. TRANS. PRI.	
C11	22-448	.004	600V.	B		1ST I.F. " SEC	
C12	22-880	20 MFD. ELECTROLYTIC	150V.	C		2ND I.F " PRI.	
C13		20 " "	150V	D		2ND I.F " SEC.	
C14		20 " "	25V.	F		B'DCAST OSC. (SEE NOTE)	
C15	22-879	60 MFD "	150V	G		ANT B'DCAST (ON GANG)	
C16		60 " "	150V.	J		B'DCAST PADDER (SEE NOTE)	
C17	22-869	.05 MFD.	400V.	K		S.W. OSC. (SEE NOTE)	
C18	22-358	.002 MFD.	600V.	L	22-788	S.W. DETECTOR	
C19	22-868	COMPENSATING COND.		N		POL BAND OSC. (SEE NOTE)	
C20	22-708	OSC PADDER					
R1	63-654	180 M OHM	1/4 W	R10	63-604	10 MEGOHM	1/4 W.
R2	63-593	47 M OHM	1/4 W	R11	63-271	1 MEGOHM	1/4 W
R3	63-597	470 M OHM	1/4 W	R12	63-600	2.2 MEGOHM	1/4 W.
R4	63-649	56 M OHM	1/4 W.	R13	63-640	8200 OHM	1/4 W
R5	63-296	220 M OHM	1/4 W.	R14	63-586	3300 OHM	1/4 W.
R6	63-669	3.9 MEGOHM	1/4 W.	R15	63-605	1000 OHM	1/2 W.
R7	63-1080	VOLUME CONTROL		R16	63-1036	3-SECTION CANDOHM	
R8	63-587	4700 OHM	1/4 W.	R17	63-1012	90 OHM WIREWOUND	1/2 W.
R9	63-591	22 M OHM	1/4 W				

MODELS 5G484,5G484-M
Chassis 5538
Schematic,Volt age
MODELS S7000 to S7003
Wireless Record Player
Schematic

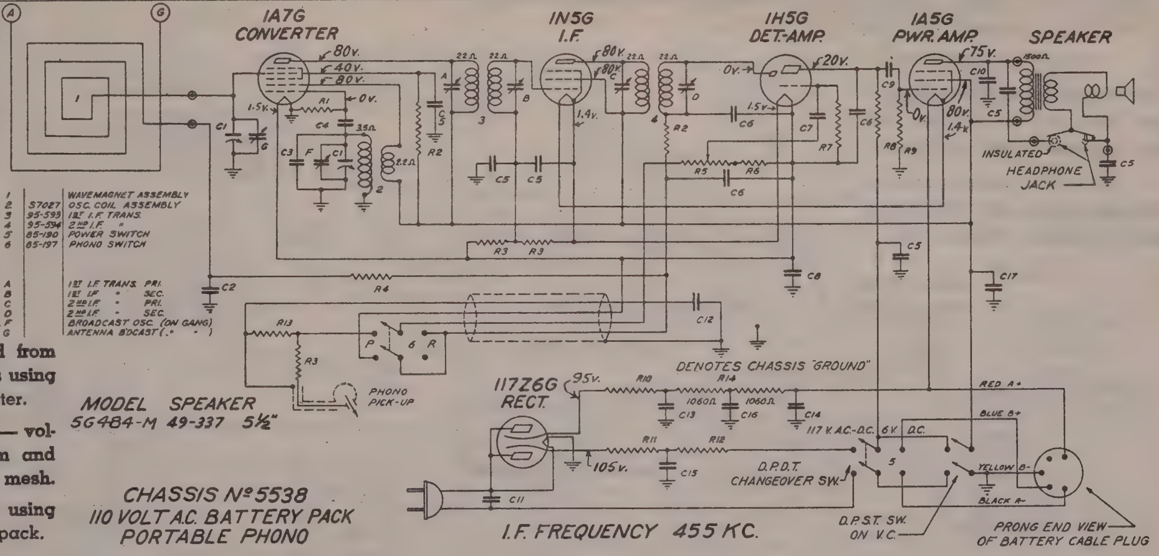
ZENITH RADIO CORP.

C1	22-800	TWO-GANG VARIABLE	
C2	22-138	.2 MFD.	200V.
C3	22-802	30 MMFD.	600V.
C4	22-182	.00025 MFD.	600V.
C5	22-829	.05 MFD.	200V.
C6	22-162	.0001 MFD.	600V.
C7	22-826	.01 MFD.	200V
C8	22-350	.25 MFD.	200V
C9	22-243	.01 MFD.	400V.
C10	22-492	.002 MFD.	600V.
C11	22-869	.05 MFD.	400V
C12	22-827	.1 MFD.	200V.
C13	22-910	40 MFD. ELECTROLYTIC	150V.
C14		20 MFD. "	25V
C15	22-871	20 MFD ELECTROLYTIC	150V.
C16		20 " "	150V
C17		20 " "	150V.

R1	63-652	120 M OHM	¼ W.
R2	63-593	47 M OHM	¼ W.
R3	63-296	220 M OHM	¼ W.
R4	63-669	3.9 MEGOHM	¼ W.
R5	63-1026	VOLUME CONTROL	
R6	63-587	4700 OHM	¼ W.
R7	63-604	10 MEGOHM	¼ W.
R8	63-271	1 MEGOHM	¼ W.
R9	63-600	2.2 MEGOHM	¼ W.
R10	63-1022	150 OHM WIREWOUND	1 W.
R11	63-605	1000 OHM	½ W.
R12	63-803	2200 OHM	½ W.
R13	63-591	22 M OHM	¼ W.
R14	63-1033	2-SECTION CANDOHM	

1		WAVEMAGNET ASSEMBLY
2	S7027	OSC. COIL ASSEMBLY
3	95-593	1ST I.F. TRANS.
4	95-594	2ND I.F. "
5	85-190	POWER SWITCH
6	85-197	PHONO SWITCH

A	1ST I.F. TRANS. PRI.
B	1ST I.F. " SEC.
C	2ND I.F. " PRI.
D	2ND I.F. " SEC.
F	BROADCAST OSC. (ON GANG)
G	ANTENNA B'DCAST (" ")



MODEL SPEAKER
5G484-M 49-337 5½"

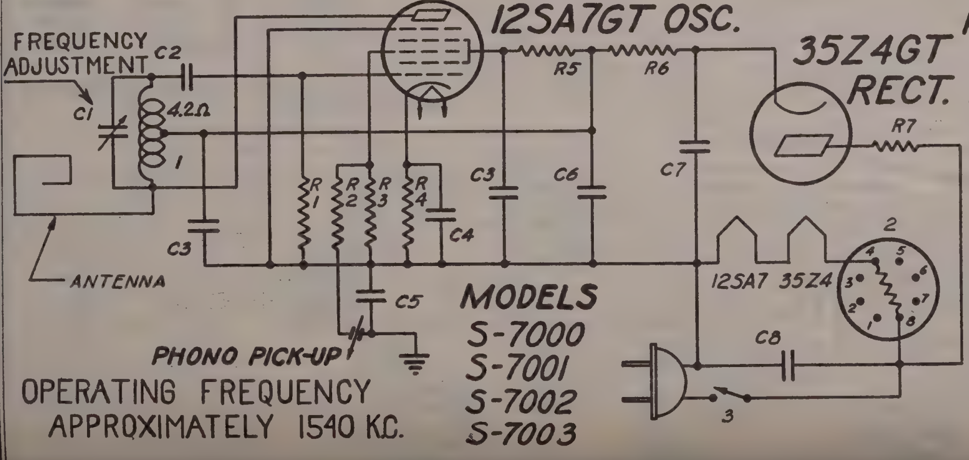
CHASSIS No 5538
110 VOLT A.C. BATTERY PACK
PORTABLE PHONO

I.F. FREQUENCY 455 KC.

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

Antenna disconnected — volume control at minimum and condenser plates in full mesh.

All voltages measured using Zenith No. Z659 battery pack.



MODELS
S-7000
S-7001
S-7002
S-7003

OPERATING FREQUENCY
APPROXIMATELY 1540 KC.

PHONOGRAPH OSCILLATOR

C1	22-690	TUNING CONDENSER	
C2	22-182	.00025 MFD.	600V.
C3	22-243	.01 MFD.	400V.
C4	22-829	.05 MFD.	200V.
C5	22-827	.1 MFD.	200V.
C6	22-876	8 MFD. ELECTROLYTIC	150V.
C7		40 MFD. "	150V.
C8	22-670	.1 MFD.	400V.

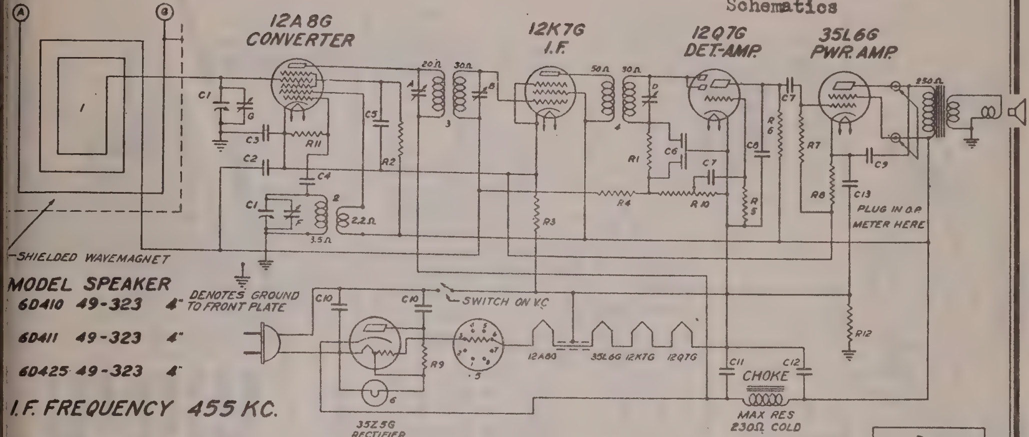
R1	63-591	22 M OHM	¼ W.
R2	63-658	390 M OHM	¼ W.
R3	63-260	100 M OHM	¼ W.
R4	63-583	1000 OHM	¼ W.
R5	63-964	4700 OHM	½ W.
R6	63-803	2200 OHM	½ W.
R7	63-575	47 OHM	¼ W.

1	S6854	OSC. COIL ASSEM
2	100-76	BALLAST TUBE
3	85-170	A C SWITCH

FOR ALIGNMENT
SEE INDEX

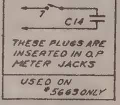
ZENITH RADIO CORP.

MODELS 6D410,6D411,6D425
Chassis 5659,5663
MODELS 6P418,6P419,6P428
6P429,6P430,6P447,6P448
6P457
Chassis 5662,5666
Schematics



MODEL	SPEAKER	
6D410	49-323	4"
6D411	49-323	4"
6D425	49-323	4"

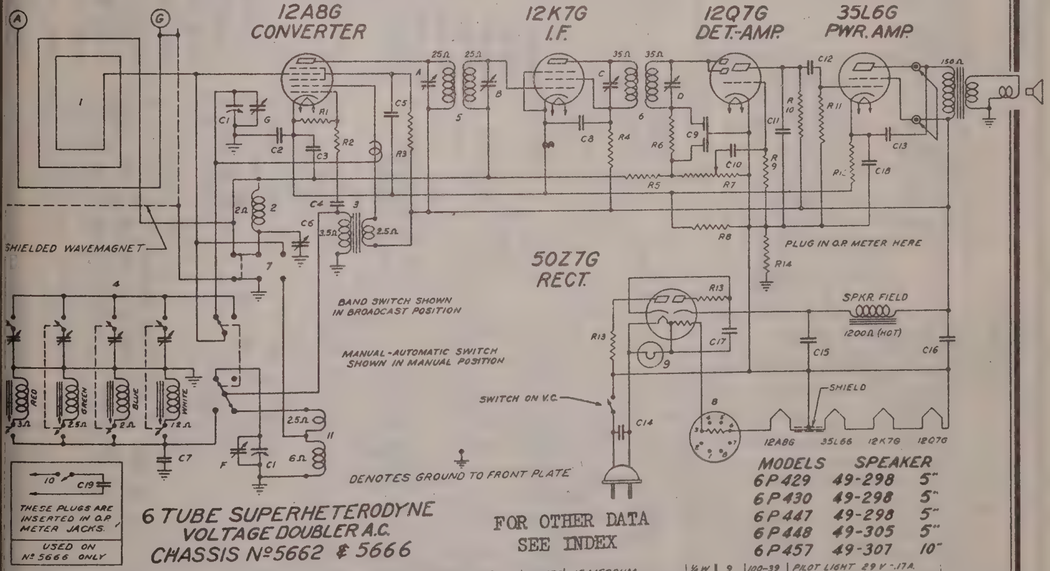
I.F. FREQUENCY 455 KC.



FOR OTHER DATA SEE INDEX

1	22-885	2-GANG VARIABLE		R1	63-593	47 M OHM	¼ W	4	56903	2ND I.F. TRANS
2	22-250	.05 MFD	200V	R2	63-591	22 M OHM	¼ W	5	100-77	BALLAST TUBE
3	22-190	.1 MFD.	200V	R3	63-572	15 OHM	¼ W	6	100-67	PILOT LIGHT 6.3 V. .15 A.
4		100 MMFD.		R4	63-600	2.2 MEGOHM	¼ W	7	MS 517	TONE CONTROL SWITCH
5	22-841	.02 MFD.	200V	R5	63-602	4.7 MEGOHM	¼ W			
6		DUAL 100 MMFD.		R6	63-296	220 M OHM	¼ W			
7	22-837	.01 MFD.	400V	R7	63-597	470 M OHM	¼ W			
8	22-833	.0005 MFD.	600V	R8	63-686	150 OHM WIREWOUND	½ W	A		1ST I.F. TRANS PRI
9	22-836	.03 MFD	400V	R9	63-1017	27 OHM "	½ W	B		1ST I.F. TRANS SEC
10	22-839	.05 MFD.	400V	R10	63-1028	VOLUME CONTROL		D		2ND I.F. TRANS SEC
1	22-835	40 MFD.	150V	R11	63-713	47 M OHM	¼ W.	F		BROADCAST OSC. (ON GANG)
2		16 MFD.	150V	R12	63-717	220 M OHM	¼ W	G		" ANT (" ")
3		20 MFD.	25V	1		WAVEMAGNET ASSEM.				
4	22-844	TONE CONTROL COND		2	56901	OSC. COIL " "				
				3	56902	1ST I.F. TRANS				

6 TUBE SUPERHETERODYNE
CHASSIS Nº 5659-5663 AC-DC



MODELS	SPEAKER	
6P429	49-298	5"
6P430	49-298	5"
6P447	49-298	5"
6P448	49-305	5"
6P457	49-307	10"

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº 5662 & 5666

FOR OTHER DATA SEE INDEX

C1	22-845	TWO-GANG VARIABLE	
C2	22-190	.1 MFD.	200V
C3	22-250	.05 MFD	200V
C4		100 MMFD.	
C5	22-842	.02 MFD.	400V
C6	22-877	TRIMMER CONDENSER	
C7	22-868	COMPENSATING COND.	
C8	22-212	.05 MFD.	400V
C9		DUAL 100 MMFD.	
C10	22-838	.005 MFD	600V
C11	22-833	.0005 MFD.	600V
C12	22-837	.01 MFD.	400V
C13	22-836	.03 MFD.	400V
C14	22-875	.15 MFD	400V

C15	22-840	20 MFD ELECTROLYTIC	350V
C16		20 " "	250V
C17		20 " "	200V
C18		20 " "	25V
C19	22-948	TONE CONTROL COND	
R1	63-712	33 M OHM	¼ W
R2	63-581	470 OHM	¼ W
R3	63-591	22 M OHM	¼ W
R4	63-583	1000 OHM	¼ W
R5	63-722	2.2 MEGOHM	¼ W
R6	63-593	47 M OHM	¼ W
R7	63-1028	VOLUME CONTROL	
R8	63-572	15 OHM	¼ W

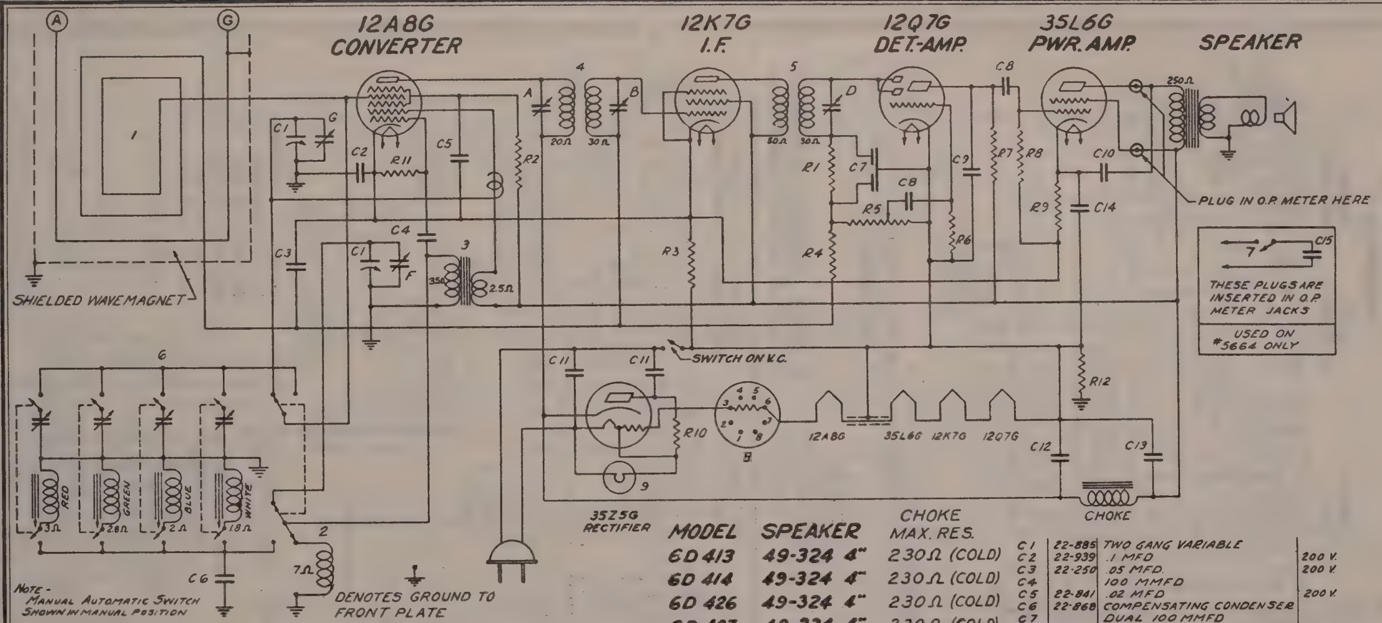
R9	63-976	15 MEGOHM	¼ W
R10	63-296	220 M OHM	¼ W
R11	63-597	470 M OHM	½ W
R12	63-686	150 OHM WIREWOUND	½ W
R13	63-1023	22 OHM WIREWOUND	½ W
R14	63-717	220 M OHM	¼ W
1		WAVEMAGNET ASSEMBLY	
2	57004	ANTENNA SHUNT COIL ASSEMBLY	
3	56942	OSC. COUPLER COIL ASSEMBLY	
4	57024	AUTOMATIC TUNING UNIT ASSEM.	
5	56915	1ST I F TRANS ASSEMBLY	
6	95-598	2ND I F TRANSFORMER	
7	MS-515	BAND SWITCH	
8	100-79	BALLAST TUBE	

9	100-39	PILOT LIGHT 2.9 V - .17 A.
10	MS-517	TONE CONTROL SWITCH
11	S-7006	OSCILLATOR COIL ASSEMBLY
A		1ST I.F. TRANS. PRI
B		1ST I F " SEC
C		2ND I F PRI
D		2ND I F " SEC.
F		BROADCAST OSC (ON GANG)
G		ANTENNA BROADCAST (" ")

I.F. FREQUENCY 455KC

MODELS 6D413,6D414,6D426
6D427,6D446,6D455
Chassis 5660,5664
Schematic,Voltage,Socket

ZENITH RADIO CORP.



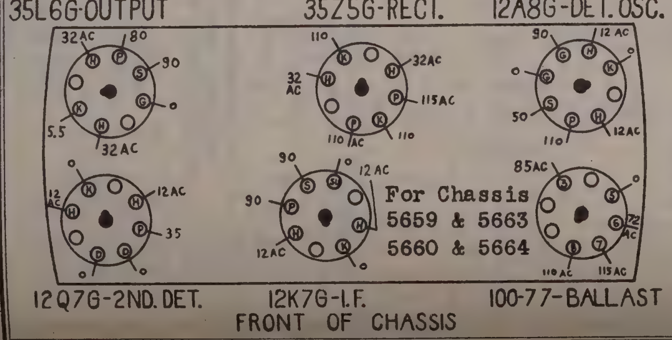
MODEL	SPEAKER	CHOKE MAX. RES.
6D 413	49-324 4"	230Ω (COLD)
6D 414	49-324 4"	230Ω (COLD)
6D 426	49-324 4"	230Ω (COLD)
6D 427	49-324 4"	230Ω (COLD)
6D 446	49-336 5"	325Ω (HOT)
6D 455	49-324 4"	230Ω (COLD)

C 1	22-885	TWO GANG VARIABLE	
C 2	22-939	.1 MFD	200 V.
C 3	22-250	.05 MFD.	200 V.
C 4		100 MMFD	
C 5	22-841	.02 MFD	200 V.
C 6	22-868	COMPENSATING CONDENSER	
C 7		DUAL 100 MMFD	
C 8	22-837	.01 MFD.	400 V
C 9	22-833	.0005 MFD	600 V.
C 10	22-836	.03 MFD	400 V.
C 11	22-839	.05 MFD.	400 V
C 12	22-835	40 MFD ELECTROLYTIC	150 V.
C 13		16 " "	150 V
C 14		20 "	25 V.
C 15	22-844	TONE CONTROL CONDENSER	
R 1	63-593	47 M OHM	¼ W
R 2	63-591	22 M OHM	¼ W
R 3	63-572	15 OHM	¼ W
R 4	63-600	2.2 MEGOHM	¼ W.
R 5	63-1028	VOLUME CONTROL	
R 6	63-602	4.7 MEGOHM	¼ W.
R 7	63-296	220 M OHM	¼ W
R 8	63-597	470 M OHM	¼ W.
R 9	63-686	150 OHM WIREWOUND	½ W
R 10	63-1017	27 OHM WIREWOUND	½ W
R 11	63-713	47 M OHM	¼ W.
R 12	63-717	220M OHM	¼ W
1		WAVEMAGNET ASSEMBLY	
2	S 6927	OSCILLATOR COIL ASSEMBLY	
3	S 6942	OSC COUPLER COIL ASSEMBLY	
4	S6902	1ST I.F. TRANS. ASSEMBLY	
5	S 6903	2ND I.F TRANS ASSEMBLY	
6	S 6997	AUTOMATIC TUNING UNIT ASSEM.	
7	MS 517	TONE CONTROL SWITCH	
8	100-77	BALLAST TUBE	
9	100-67	PILOT LIGHT BULB 6.3 V. –.15 AMP	
A		1ST I F TRANS. PRI	
B		1ST I F TRANS. SEC.	
D		2ND I.F TRANS. SEC.	
F		BROADCAST OSC. (ON GANG)	
G		ANTENNA BROADCAST (ON GANG)	

6 TUBE SUPERHETERODYNE
CHASSIS *5660 &*5664 A.C.-D.C.

FOR OTHER DATA
SEE INDEX

I.F FREQUENCY 455KC.



NOTE

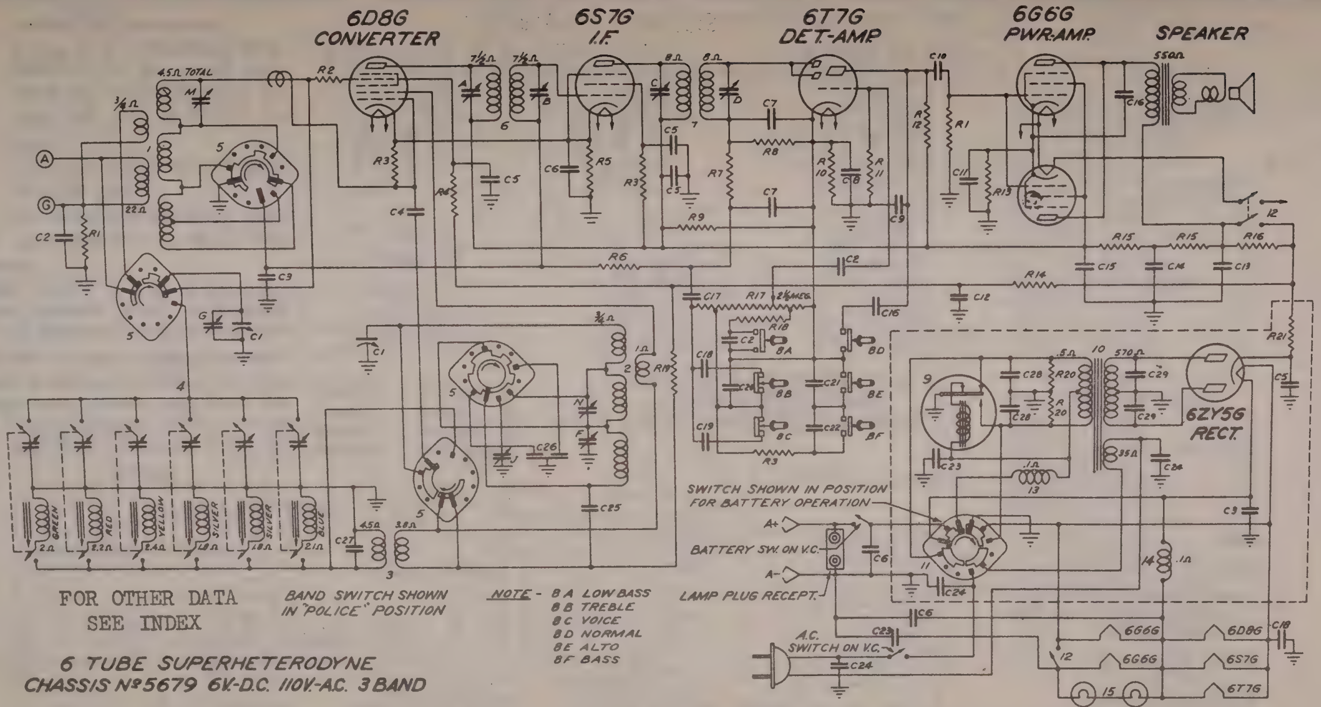
Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

All filament voltages measured across each respective tube, using an A.C. volt-meter.

Line voltage — 110v.

ZENITH RADIO CORP.

MODELS 6J436,6J463
Chassis 5679
Schematic



FOR OTHER DATA
SEE INDEX

BAND SWITCH SHOWN
IN "POLICE" POSITION

NOTE - BA LOW BASS
BB TREBLE
BC VOICE
BD NORMAL
BE ALTO
BF BASS

6 TUBE SUPERHETERODYNE
CHASSIS Nº 5679 6V.-D.C. 110V.-A.C. 3 BAND

DENOTES CHASSIS "GROUND"

I.F. FREQUENCY 455 KC.

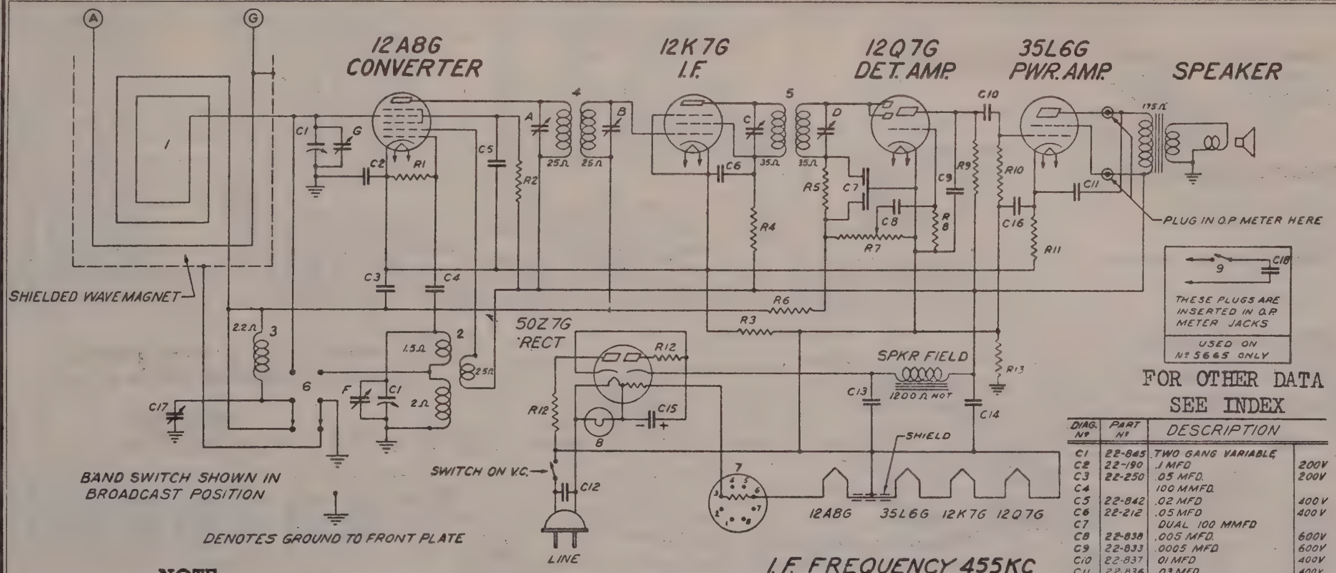
MODEL	SPEAKER
6J436	49-350 8"
6J463	49-348 10"

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-964	TWO GANG VARIABLE	
C2	22-826	.01 MFD.	200V.
C3	22-829	.05 MFD.	200V.
C4	22-289	50 MMFD.	600V.
C5	22-828	.05 MFD	400V.
C6	22-350	.25 MFD.	200V.
C7	22-162	.0001 MFD.	600V.
C8	22-827	.1 MFD.	200V.
C9	22-854	.0005 MFD.	600V.
C10	22-188	.02 MFD.	400V.
C11	22-974	20 MFD. ELECTROLYTIC	25V.
C12		20 MFD. "	250V.
C13	22-771	30 MFD. ELECTROLYTIC	250V.
C14		15 MFD. "	250V.
C15		10 MFD. "	250V.
C16	22-448	.004 MFD	600V.
C17	22-327	.02 MFD.	200V.
C18	22-182	.00025 MFD.	600V.
C19	22-470	.00015 MFD.	600V.
C20	22-716	.0005 MFD.	600V.
C21	22-458	.006 MFD	600V.
C22	22-326	.003 MFD.	400V.
C23	22-199	.5 MFD.	200V.
C24	22-830	.02 MFD.	600V.
C25	22-358	.002 MFD.	600V.
C26	22-973	DUAL OSC. PADDER	
C27	22-868	COMPENSATING. COND.	
C28	22-319	.005 MFD.	200V.
C29	22-972	.015 MFD.	600V.
R1	63-597	470M OHM	½W.
R2	63-576	68 OHM	¼W.
R3	63-593	47M OHM	½W.
R4	63-649	56M OHM	¼W.
R5	63-628	270 OHM	½W.
R6	63-599	1.5 MEGOHM	½W.
R7	63-711	22M OHM	½W.
R8	63-659	470M OHM	½W.
R9	63-160	100M OHM	½W.
R10	63-634	820 OHM	¼W.
R11	63-271	1 MEGOHM	¼W.
R12	63-296	220M OHM	¼W.
R13	63-977	270 OHM WIREWOUND	½W.
R14	63-796	10M OHM	½W.
R15	63-605	1000 OHM	½W.
R16	63-966	4700 OHM	2W.
R17	63-990	VOLUME CONTROL	
R18	63-591	22M OHM	½W.
R19	63-675	5600 OHM	½W.
R20	63-963	120 OHM	½W.
R21	63-577	100 OHM	½W.
1	S7811	ANTENNA COIL ASSEMBLY	
2	S8007	OSCILLATOR COIL ASSEMBLY	
3	S7507	OSC. COUPLER COIL ASSEMBLY	
4	S7649	AUTOMATIC TUNING UNIT ASSEM.	
5	85-210	BAND SELECTOR SWITCH	
6	95-649	1ST I.F. TRANSFORMER	
7	95-650	2ND I.F. TRANSFORMER	
8	S8013	TONE CONTROL SWITCH	
9	190-11	VIBRATOR	
10	95-645	POWER TRANSFORMER	
11	85-177	POWER SUPPLY SWITCH	
12	85-171	BATT. CONSERVER SWITCH	
13	S5043	CHOKE ASSEMBLY	
14	S2778	CHOKE ASSEMBLY	
15	100-39	PILOT LIGHT 2.9V. .17A.	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. " SEC.	
C		2ND I.F. " PRI.	
D		2ND I.F. " SEC.	
F		B'DCAST OSC. (SEE NOTE)	
G		ANT. B'DCAST (ON GANG)	
J		B'DCAST PADDER (SEE NOTE)	
M	22-788	S.W. ANTENNA	
N		POL. BAND OSC. (SEE NOTE)	

NOTE-
TRIMMERS F. J & N
ARE MOUNTED ON STRIP
#22-1002

MODELS 6P416 to 6P419,6P428
Chassis 5661,5665
Schematic,Voltage,Socket
CHASSIS 5662,5666
Voltage,Socket

ZENITH RADIO CORP.



FOR OTHER DATA
SEE INDEX

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-845	TWO GANG VARIABLE	
C2	22-190	.1 MFD	200V
C3	22-250	.05 MFD.	200V
C4		100 MMFD.	
C5	22-842	.02 MFD	400V
C6	22-212	.05 MFD	400V
C7		DUAL 100 MMFD	
C8	22-838	.005 MFD.	600V
C9	22-833	.0005 MFD	600V
C10	22-837	.01 MFD	400V
C11	22-836	.03 MFD	400V
C12	22-875	.15 MFD	400V
C13	22-840	20 MFD ELECTROLYTIC	350V.
C14		20 MFD "	250V
C15		20 MFD "	200V
C16		20 MFD	25V.
C17	22-788	TRIMMER CONDENSER	
C18	22-867	TONE CONTROL COND.	
R1	63-712	33 M OHM	¼ W
R2	63-591	22 M OHM	¼ W
R3	63-572	15 OHM	¼ W
R4	63-583	1000 OHM	¼ W
R5	63-593	47 M OHM	¼ W
R6	63-722	2.2 MEGOHM	¼ W
R7	63-1028	VOLUME CONTROL	
R8	63-976	15 MEGOHM	¼ W.
R9	63-296	220 M OHM	¼ W
R10	63-597	470 M OHM	¼ W
R11	63-686	150 OHM WIREWOUND	½ W
R12	63-1023	22 OHM "	½ W
R13	63-717	220 M OHM	¼ W
1		WAVEMAGNET ASSEMBLY	
2	S6913	OSCILLATOR COIL ASSEM.	
3	S6914	SHUNT ANT " "	
4	S6915	1ST IF TRANS.	
5	95-598	2ND IF TRANS	
6	M5515	BAND SWITCH	
7	100-79	BALLAST TUBE	
8	100-39	PILOT LIGHT 2.9V-.17A	
9	M5517	TONE CONTROL SWITCH	
A		1ST I.F TRANS PRI.	
B		1ST I.F. " SEC.	
C		2ND IF PRI.	
D		2ND I.F " SEC	
F		BROADCAST OSC (ON GANG)	
G		ANTENNA B'DCAST (" ")	

NOTE

Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

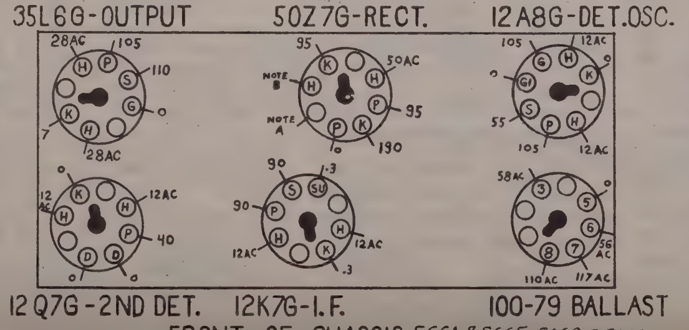
All filament voltages measured across each respective tube, using a 0-50 A.C. voltmeter.

A. This lug is C.T. of fil. and is one side of pilot light supply line.
Lug No. 7 is return for pilot light.

B. This lug (No. 8) has a 50 v. A. C. potential with respect to lug No. 2 and also a 117 v. A.C. potential with respect to line switch.

MODEL	SPEAKER	
6P416	49-303	5"
6P417	49-303	5"
6P428	49-303	5"

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5661 & 5665



FRONT OF CHASSIS 5661 & 5665, 5662 & 5666

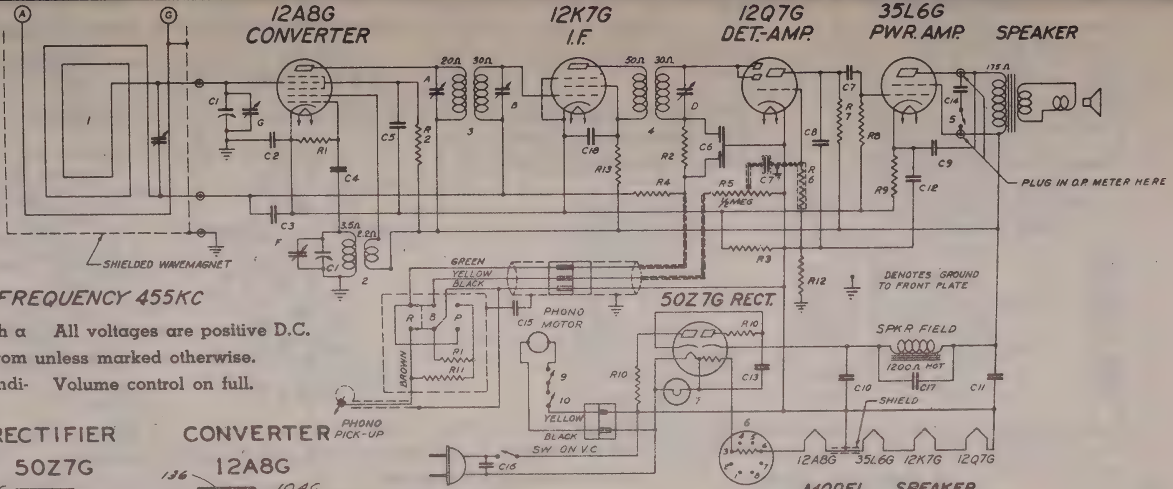
CHASSIS 5672-P
Alignment, Trimmers, Socket

ZENITH RADIO CORP.

MODEL 6R481
Chassis 5675
Schematic, Voltage, Socket
Alignment, Trimmers

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



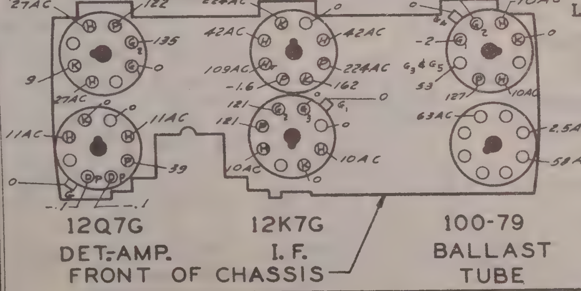
I.F. FREQUENCY 455KC

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise. Volume control on full.

PWR.-AMP. 35L6G — RECTIFIER 50Z7G — CONVERTER 12A8G



12Q7G DET.-AMP. — 12K7G I.F. — 100-79 BALLAST TUBE

FRONT OF CHASSIS

MODEL 6R481 SPEAKER 49-326 5"

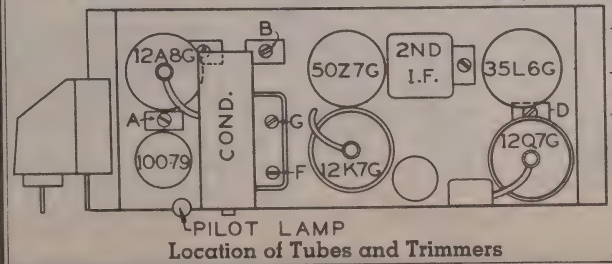
Line voltage 120 A.C.

DIAG No	PART No	DESCRIPTION	
C1	22-885	TWO-GANG VARIABLE	
C2	22-938	.2 MFD.	200V
C3	22-250	.05 MFD.	200V
C4		100 MMFD.	
C5	22-841	.02 MFD.	200V.
C6		DUAL 100 MMFD	
C7	22-837	.01 MFD.	400V
C8	22-833	.0005 MFD	600V.
C9	22-836	.03 MFD.	400V
C10	22-894	20 MFD. ELECTROLYTIC	250V
C11		20 " "	150V.
C12		20 " "	25V
C13	22-893	20 MFD. "	200V
C14	22-844	TONE CONTROL COND.	
C15	22-185	.01 MFD.	200V.
C16	22-875	.15 MFD.	400V
C17	22-980	.04 MFD	400V
C18	22-212	.05 MFD	400V.

R1	63-713	47M OHM	¼ W.
R2	63-593	47 M OHM	¼ W.
R3	63-572	15 OHM	¼ W.
R4	63-600	2.2 MEGOHM	¼ W
R5	63-1028	VOLUME CONTROL	
R6	63-724	4.7 MEGOHM	¼ W
R7	63-296	220M OHM	¼ W.
R8	63-597	470M OHM	¼ W.
R9	63-686	150 OHM WIREWOUND	½ W
R10	63-1023	22 OHM WIREWOUND	½ W.
R11	63-719	470M OHM	½ W.
R12	63-717	220M OHM	¼ W.
R13	63-583	1000 OHM	¼ W.

1		WAVEMAGNET ASSEMBLY
2	S6901	OSC COIL "
3	S6902	1ST I.F. TRANS. "
4	S6903	2ND I.F. TRANS "
5	MS517	TONE CONTROL SWITCH
6	100-79	BALLAST TUBE
7	100-39	PILOT LIGHT 2.9V. 0.17A.
8	85-192	PHONO SWITCH
9	85-181	AUTOMATIC STOP SW
10	85-191	A.C. SWITCH
A		1ST I.F. TRANS PRI
B		1ST I.F. " SEC
D		2ND I.F. " SEC.
F		B'DCAST OSC (ON GANG)
G		ANT. B'DCAST (ON GANG)

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS No 5675



Location of Tubes and Trimmers

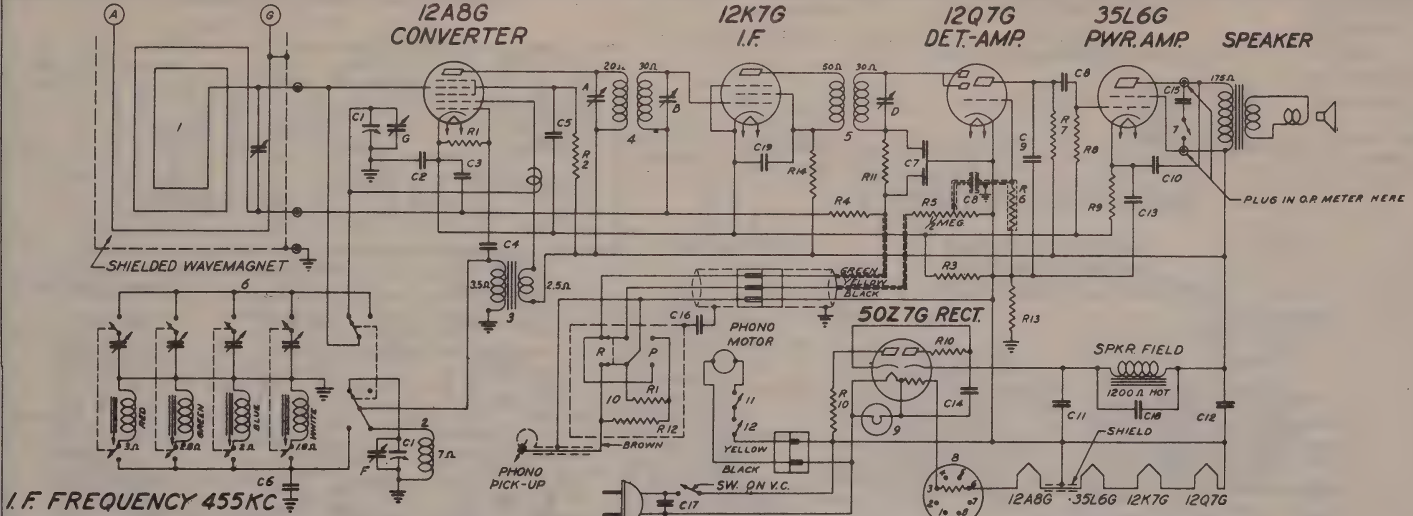
For Chassis
5672-P
5675

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C	I. F. Alignment
2	Single Turn Loop Loosely	——	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Coupled to Wave Magnet	——	1500 Kc.	Broadcast	1500 Kc.	G	Alignment of Antenna

MODEL 6R485
Chassis 5672-P
Schematic, Voltage

ZENITH RADIO CORP.

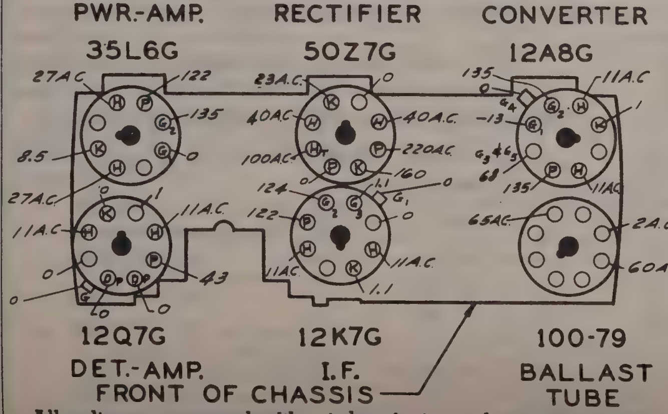


MANUAL AUTOMATIC SWITCH SHOWN IN MANUAL POSITION.

DENOTES GROUND TO FRONT PLATE

MODEL 6R485 SPEAKER 49-320 8"

NOTE
All voltages are positive D.C. unless marked otherwise. Volume control on full. Line voltage 112 v. A.C.



All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-885	TWO-GANG VARIABLE	
C2	22-938	.2MFD.	200V.
C3	22-250	.05MFD.	200V.
C4		100 MMFD.	
C5	22-841	.02 MFD.	200V.
C6	22-868	COMPENSATING COND.	
C7		DUAL 100 MMFD.	
C8	22-837	.01 MFD.	400V.
C9	22-833	.0005 MFD.	600V.
C10	22-836	.03 MFD.	400V
C11	22-894	20 MFD. ELECTROLYTIC	250V.
C12		20 " "	150V.
C13		20 " "	25V.
C14	22-893	20 MFD. "	200V.
C15	22-844	TONE CONTROL COND.	
C16	22-185	.01 MFD.	200V.
C17	22-875	.15 MFD.	400V.
C18	22-980	.04 MFD.	400V.
C19	22-212	.05 MFD.	400V.

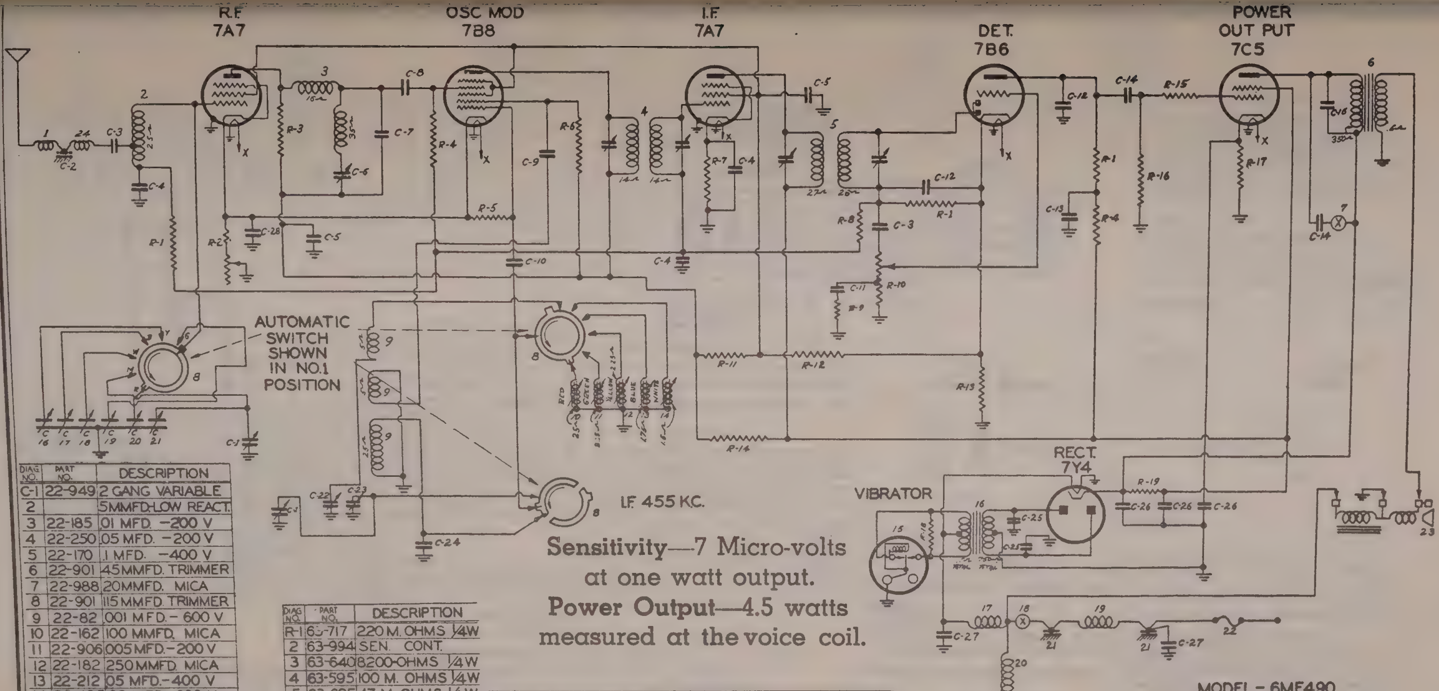
DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-719	47M OHM	¼W.
R2	63-591	22M OHM	¼W.
R3	63-572	15 OHM	¼W.
R4	63-600	2.2 MEGOHM	¼W.
R5	63-1028	VOLUME CONTROL	
R6	63-724	4.7 MEGOHM	¼W.
R7	63-296	220 M OHM	¼W.
R8	63-597	470 M OHM	¼W.
R9	63-686	150 OHM WIREWOUND	½W.
R10	63-1023	22 OHM "	½W.
R11	63-593	47 M OHM	¼W.
R12	63-719	470 M OHM	¼W.
R13	63-717	220 M OHM	¼W.
R14	63-583	1000 OHM	¼W.
1		WAVEMAGNET ASSEMBLY	
2	S6927	OSCILLATOR COIL ASSEM.	
3	S6942	OSC. COUPLER COIL ASSEM.	
4	S6902	1ST I.F. TRANS. ASSEMBLY	
5	S6903	2ND I.F. TRANS. "	
6	S6997	AUTOMATIC TUNING UNIT ASSEM.	
7	MS517	TONE CONTROL SWITCH	
8	100-79	BALLAST TUBE	
9	100-39	PILOT LIGHT BULB 2.9V. .17A.	
10	85-192	PHONO SWITCH	
11	85-181	AUTOMATIC STOP SWITCH	
12	85-191	A.C. SWITCH	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. " SEC.	
D		2ND I.F. " SEC.	
F		BROADCAST OSC. (ON GANG)	
G		ANTENNA BROADCAST (ON GANG)	

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº 5672-P

FOR OTHER DATA
SEE INDEX

ZENITH RADIO CORP.

MODEL 6MF490
Ford Roto-Matic, 01A18805
Schematic, Voltage



Sensitivity—7 Micro-volts at one watt output.

Power Output—4.5 watts measured at the voice coil.

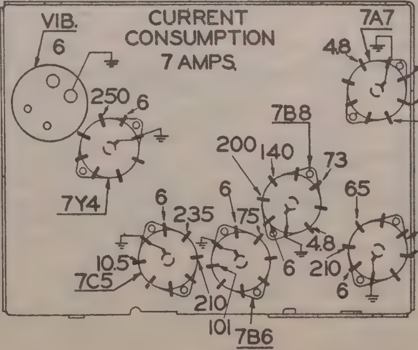
Tuning Range—540-1520 K.C.

DIAG NO.	PART NO.	DESCRIPTION
C-1	22-949	2 GANG VARIABLE
2		5MMFD-LOW REACT.
3	22-185	.01 MFD. -200 V
4	22-250	.05 MFD. -200 V
5	22-170	.1 MFD. -400 V
6	22-901	45 MMFD. TRIMMER
7	22-988	20 MMFD. MICA
8	22-901	115 MMFD. TRIMMER
9	22-82	.001 MFD. - 600 V
10	22-162	100 MMFD. MICA
11	22-906	.005 MFD. - 200 V
12	22-182	250 MMFD. MICA
13	22-212	.05 MFD. - 400 V
14	22-435	.02 MFD. - 600 V
C-15	22-838	.005 MFD. - 600 V
16	22-947	70-375 MMFD. ANTENNA AUTO. TRIMMER STRIP
17		50-300 MMFD.
18		35-250 MMFD.
19		18-160 MMFD.
20		13-160 MMFD.
21		2-18 MMFD.
22	22-902	MAN. OSC. PADDER
23	22-902	MAN. OSC. TRIMMER
24	22-956	500 MMFD. SILVER MICA
25	22-782	.012 MFD. - 800 V
26	22-955	10-10-20 MMFD.-400-350-25-V
27	22-908	5 MFD. - 120 V
28	22-190	.1 MFD. - 200 V

DIAG NO.	PART NO.	DESCRIPTION
R-1	63-717	220 M. OHMS 1/4W
2	63-994	SEN. CONT.
3	63-640	8200-OHMS 1/4W
4	63-595	100 M. OHMS 1/4W
5	63-695	47 M. OHMS 1/4W
6	63-972	15 M. OHMS 1 W.
7	63-410	1200-OHMS 1/4W
8	63-271	1 MEG OHM 1/4W
9	63-592	33 M. OHMS 1/4W
10	63-1073	VOL. CONT. & SW.
R-11	63-947	27 M. OHMS 2 W
12	63-1059	39 M. OHMS 1/2W
13	63-632	560-OHMS 1/4W
14	63-584	1500-OHMS 1/4W
15	63-695	47-OHMS 1/4W
16	63-719	470 M. OHMS 1/4W
17	63-94	330-OHMS 1 W
18	63-971	220-OHMS 1/4W
19	63-968	1800-OHMS 2 W

ALL MEASUREMENTS WITH 1000 OHM PER VOLT METER FROM CHASSIS GROUND TO POINT INDICATED

ANTENNA DISCONNECTED
VOL. AT MIN.
BATTERY VOLTS-6



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
1	S-6868	ANT. MOTOR NOISE CHOKE	15	190-15	VIBRATOR
2	S-7588	ANT. COIL ASSEM.	16	95-641	POWER TRANS.
3	S-7572	R.F. COIL ASSEM.	17	20-213	MAIN HASH CHOKE
4	S-7573	1ST I.F. TRANS.	18		SWITCH ON VOL. CONT.
5	S-7574	2ND I.F. TRANS.	19	S-5844	MOTOR NOISE CHOKE
6	95-640	OUTPUT TRANS.	20	20-217	HEATER LINE CHOKE
7	85-208	TONE CONT. SWITCH	21		LOW REACTOR
8	85-207	AUTOMATIC SWITCH	22	136-11	FUSE
9	S-7544	MAN. OSC. COIL ASSEM.	23	49-341	SPEAKER
10	S-7745	AUTO. OSC. COIL ASSEM.	24	S-7760	MOTOR NOISE CHOKE
11	S-7746				
12	S-7747				
13	S-7748				
14	S-7749				

MODEL 6MF490
Ford Roto-Matic
Alignment,Trimmers,Socket
Tuning Adjustments

ZENITH RADIO CORP.

NOTE:

This receiver is equipped with a fixed-variable sensitivity control located on the side of the chassis as shown in Fig. 3B. The control is set at the factory to a position which gives sensitivity of 7 micro-volts at one watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in motor noise or excessive background noise and unless laboratory equipment is available for measuring sensitivity, it is not advisable to change this setting.

MANUAL DIAL CALIBRATION:

If the frequency of a station does not correspond with the dial reading, it may be corrected by holding the tuning control securely and turning the dial drum with the forefinger until it reads correctly.

ALIGNMENT:

The signal for the entire alignment procedure, both I.F. and R.F., is fed through a special Zenith dummy. Part number S7832. The capacities in the Zenith dummy antenna as shown in Fig. 2 are identical with the standard Ford antenna. If the Zenith dummy is not available at your Zenith distributor, you can substitute the values shown.

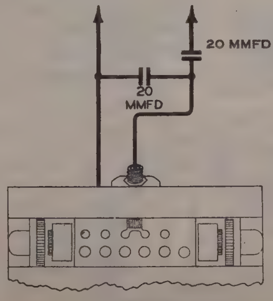


FIG. 2

CAUTION:

Care should be taken while making all adjustments on the receiver to have the volume control turned full on. The intensity of the signal should be reduced only at the signal generator.

I.F.:

The tuning condenser is fully meshed (540 K.C.). The word "dial" must appear in the Roto-matic window. The signal generator is set at 455 K.C. and fed through the special Zenith antenna dummy to the receiver. The wave trap adjustment screw A, see Fig. 3A-3B, is adjusted for maximum response. The adjusting screws B, C, D and E are then adjusted in order for maximum response on the output meter. (See Fig. 3A-3B.)

The wave trap A is then adjusted for minimum response.

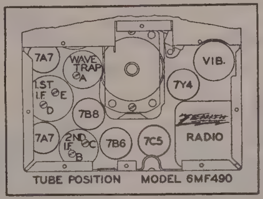


FIG. 3A

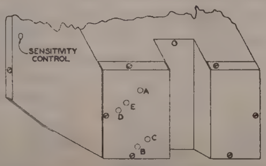


FIG. 3B

R.F.:

The tuning control is rotated until the condenser plates are completely out of mesh (1520 K.C.). Set the signal generator to 1520 K.C. Adjust the 1520 K.C. trimmer shown in Fig. 4 for maximum response.

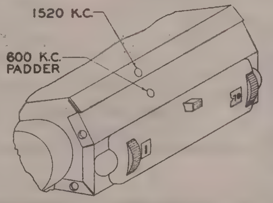


FIG. 4

Set the signal generator to 1400 K.C. Rotate the tuning control until the signal is heard and adjust the 1400 antenna trimmer (see Fig. 5), for maximum response.

Reset the signal generator to 600 K.C. and rotate the tuning control until a signal is heard. The condenser gang is then rocked slightly while adjusting the 600 K.C. padder (see Fig. 4) to maximum reading on the output meter.

The opening below the speaker on the front of the receiver is provided so that the output meter may be connected to the voice coil (see Fig. 6).

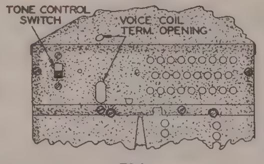


FIG. 6

If you have the type of output meter which is usually connected to the plate of the output tube, it may be adapted for this type of connection by following the instructions shown in Fig. 7.

ROTO-MATIC TUNING ADJUSTMENT:

The receiver should be turned on and allowed to warm up at least 30 minutes before the automatic tuning controls are adjusted.

It is essential that the adjusting screws be set on a weak signal in order to obtain accuracy and the maximum sensitivity. If the received signal is too strong, the antenna should be collapsed to its shortest position. The two screws which hold the escutcheon to the instrument panel are now removed (see Fig. 8). The escutcheon plate is removed, making the adjustment screws accessible. They are then adjusted in the following order:

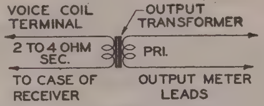


FIG. 7

For a station close to 580 K.C. the adjustment screw over 1 (see Fig. 5) is first adjusted to the desired station. The adjustment screw below 1 is then adjusted for maximum amount of signal.

Number 1 on the adjustment screw (see Fig. 5) corresponds to Fig. 1 on the Roto-matic tuner. For stations 2, 3, etc., on the Roto-matic tuner, set the adjusting screws 2 and 3, the same as for station 1.

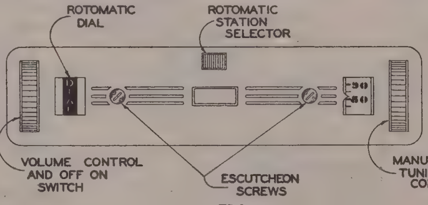


FIG. 8

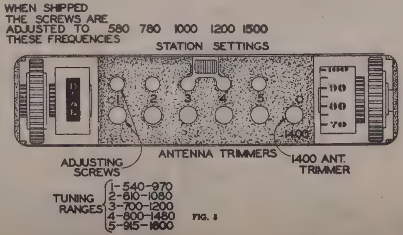


FIG. 5

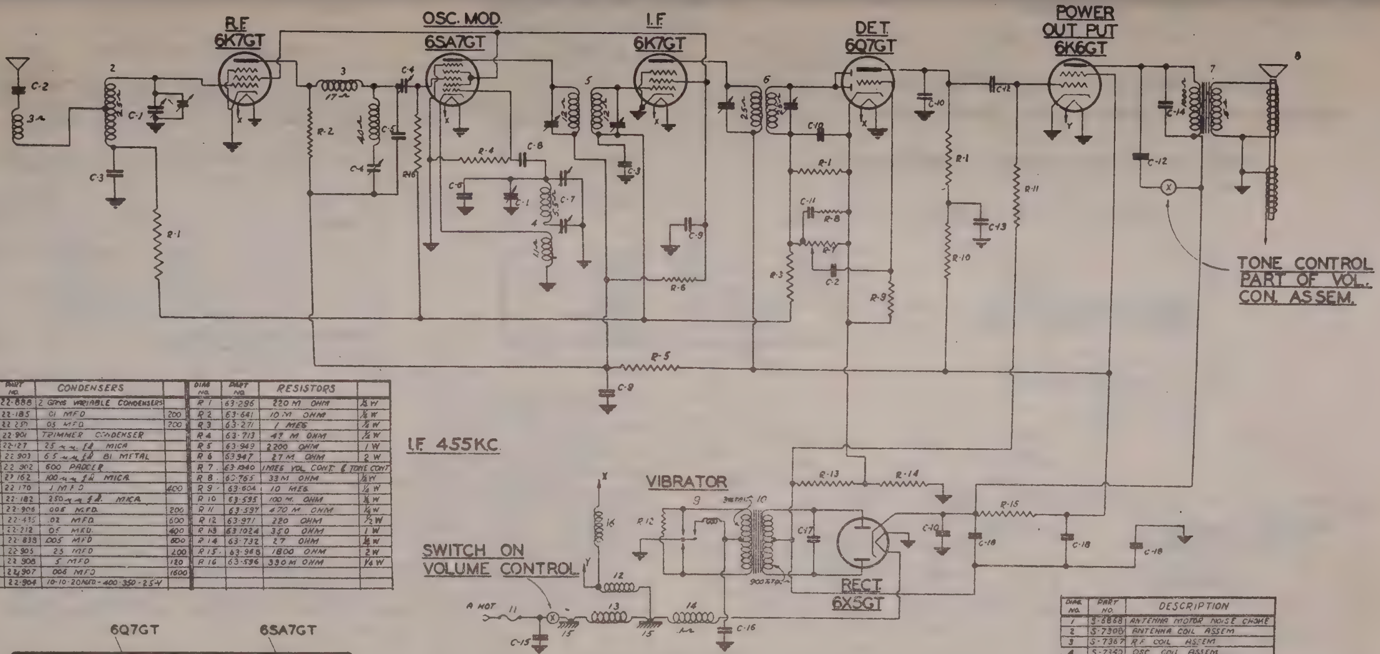
IMPORTANT:

The above procedure should be repeated after the entire five stations are set. This is necessary to make sure that the adjustment screws are peaked for maximum performance.

If difficulty is experienced in setting up the adjusting screws for a desired station, first turn the bottom adjustment screw down tight and then adjust the top screw to the station and follow with an adjustment of the bottom screw for greatest volume.

ZENITH RADIO CORP.

MODEL 6MN495
Nash Special AC4389
Chassis 5673
Schematic,Voltage,Socket
Trimmers



DIAG. NO.	PART NO.	CONDENSERS	
C 1	22-888	2 GANG VARIABLE CONDENSERS	
C 2	22-185	.01 MFD	200
C 3	22 250	.05 MFD	200
C 4	22-901	TRIMMER CONDENSER	
C 5	22-127	25 μμ fd MICA	
C 6	22 903	6.5 μμ fd BI METAL	
C 7	22 902	600 PADDER	
C 8	22 162	100 μμ fd MICA	
C 9	22 170	.1 MFD	400
C 10	22-182	250 μμ fd. MICA	
C 11	22-906	.006 MFD.	200
C 12	22-435	.02 MFD	600
C 13.	22-212	.05 MFD.	400
C 14	22-838	.005 MFD	600
C 15	22-905	.25 MFD	200
C 16	22 908	.5 MFD	120
C 17	22-907	.006 MFD	1600
C 18	22-904	10-10-20MFD-400-350-25-V	

DIAG NO.	PART NO.	RESISTORS	
R 1	63-296	220 M OHM	⅓ W
R 2	63-641	10 M OHM	¼ W
R 3	63-271	1 MEG	¼ W
R 4	63-713	47 M OHM	½ W
R 5	63-949	2200 OHM	1 W
R 6	63-947	27 M OHM	2 W
R 7.	63-1040	1 MEG VOL. CONT. & TONE CONT.	
R 8.	63-765	33 M OHM	⅓ W
R 9.	63-604	10 MEG	¼ W
R 10	63-595	100 M. OHM	⅓ W
R 11	63-597	470 M OHM	¼ W
R 12	63-971	220 OHM	½ W
R 13	63-1024	350 OHM	1 W
R 14	63-732	27 OHM	⅓ W
R 15.	63-968	1800 OHM	2 W
R 16	63-596	330 M OHM	¼ W

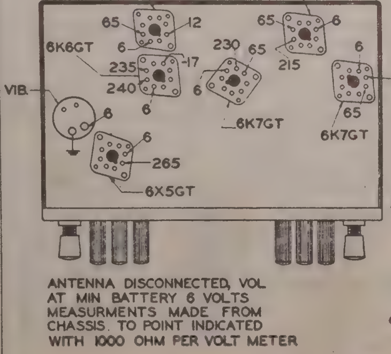
I.F. 455KC.

FOR OTHER DATA
SEE INDEX

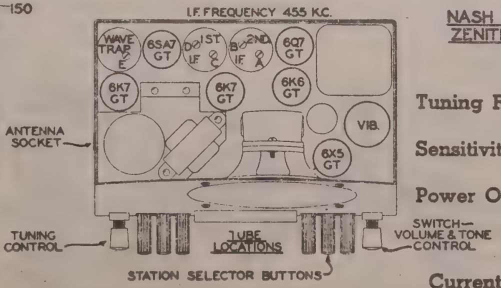
Chassis 5673

NASH SPECIAL AC 4389
ZENITH MODEL-6MN495

DIAG. NO.	PART NO.	DESCRIPTION
1	S-5868	ANTENNA MOTOR NOISE CHOKE
2	S-7308	ANTENNA COIL ASSEM
3	S-7367	R.F. COIL ASSEM
4	S-7340	OSC. COIL ASSEM
5	S-7346	1ST IF TRANSFORMER
6	S-7359	2ND IF TRANSFORMER
7	95-615	OUT PUT TRANSFORMER
8	49-325	ELECTRODYNAMIC SPEAKER
9	190-15	VIBRATOR
10	95-613	POWER TRANSFORMER
11	136-11	FUSE
12	20-212	FIL. "A" CHOKE
13	S-5844	MOTOR NOISE FILTER CHOKE
14	20-213	MAIN HASH CHOKE
15		LOW RESISTORS
16	20-222	FIL. CHOKE



ANTENNA DISCONNECTED, VOL AT MIN BATTERY 6 VOLTS MEASURMENTS MADE FROM CHASSIS. TO POINT INDICATED WITH 1000 OHM PER VOLT METER



Tuning Range: 540 to 1580 K.C.

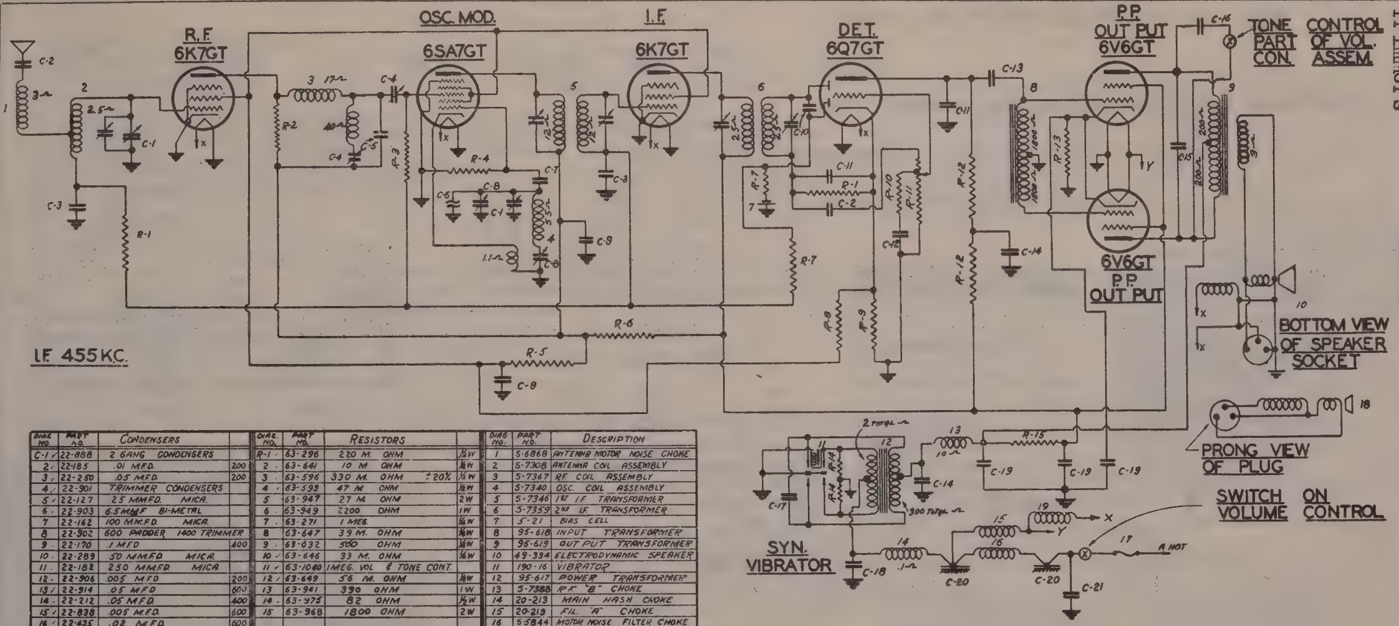
Sensitivity: 10 microvolts at 1 watt output

Power Output: 3.5 watts measured at the voice coil

Current Consumption: 6.8 amperes at 6 volts

MODEL 6MN496
Nash Deluxe AC4289
Chassis 5676
Schematic, Voltage, Socket
Trimmers

ZENITH RADIO CORP.

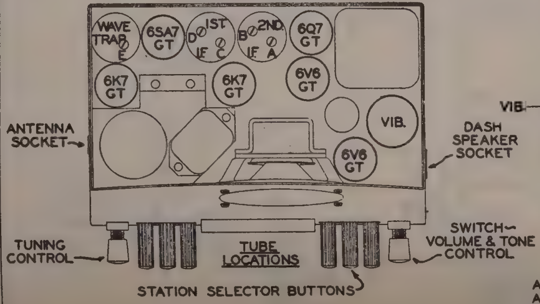


DIAG. NO.	PART NO.	CONDENSERS	
C-1	22-888	2 GANG CONDENSERS	
2	22-185	.01 MFD.	200
3	22-250	.05 MFD.	200
4	22-901	TRIMMER CONDENSERS	
5	22-127	25 MMFD. MICA.	
6	22-903	6.5 MMF BI-METAL	
7	22-162	100 MMFD. MICA.	
8	22-902	600 PADDER 1400 TRIMMER	
9	22-170	.1 MFD	400
10	22-289	50 MMFD MICA.	
11	22-182	250 MMFD MICA	
12	22-906	.005 MFD	200
13	22-914	.05 MFD	600
14	22-212	.05 MFD	400
15	22-838	.005 MFD	600
16	22-435	.02 MFD	600
17	22-913	.007 MFD. BUFFER	1600
18	22-908	.5 MFD	120
19	22-917	20-10-20 450-400-25	
20		LOW REACTOR	
21	22-905	.25 MFD	200

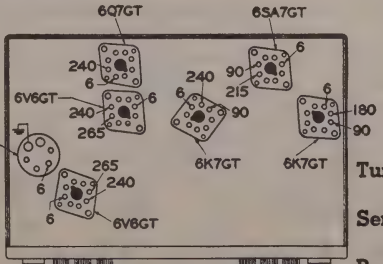
DIAG. NO.	PART NO.	RESISTORS	
R-1	63-296	220 M. OHM	½W
2	63-641	10 M OHM	¼W
3	63-596	330 M. OHM ±20%	½W
4	63-593	47 M OHM	¼W
5	63-947	27 M OHM	2W
6	63-949	2200 OHM	1W
7	63-271	1 MEG.	¼W
8	63-647	39 M. OHM	¼W
9	63-632	560 OHM	¼W
10	63-646	33 M. OHM	¼W
11	63-1040	1 MEG. VOL & TONE CONT.	
12	63-649	56 M. OHM	¼W
13	63-941	390 OHM	1W
14	63-975	82 OHM	½W
15	63-968	1800 OHM	2W

DIAG. NO.	PART NO.	DESCRIPTION
1	S-6868	ANTENNA MOTOR NOISE CHOKE
2	S-7308	ANTENNA COIL ASSEMBLY
3	S-7367	RF COIL ASSEMBLY
4	S-7340	OSC. COIL ASSEMBLY
5	S-7346	1ST IF TRANSFORMER
6	S-7359	2ND IF TRANSFORMER
7	S-21	BIAS CELL
8	95-618	INPUT TRANSFORMER
9	95-619	OUT PUT TRANSFORMER
10	49-334	ELECTRODYNAMIC SPEAKER
11	190-16	VIBRATOR
12	95-617	POWER TRANSFORMER
13	S-7388	RF "B" CHOKE
14	20-213	MAIN HASH CHOKE
15	20-219	FIL. "A" CHOKE
16	S-5844	MOTOR NOISE FILTER CHOKE
17	136-11	FUSE
18	49-335	DASH SPEAKER
19	20-220	HASH CHOKE

I.F. FREQUENCY 455 K.C.



TUBE LOCATIONS



ANTENNA DISCONNECTED VOL AT MIN BATTERY 6 VOLTS MEASUREMENTS MADE FROM CHASSIS TO POINT INDICATED WITH 1000 OHM PER. VOLT METER

Chassis 5676

NASH DELUXE AC 4289
ZENITH MODEL-6MN496

Tuning Range: 540 to 1580 K.C.

Sensitivity: 8 microvolts at 1 watt output

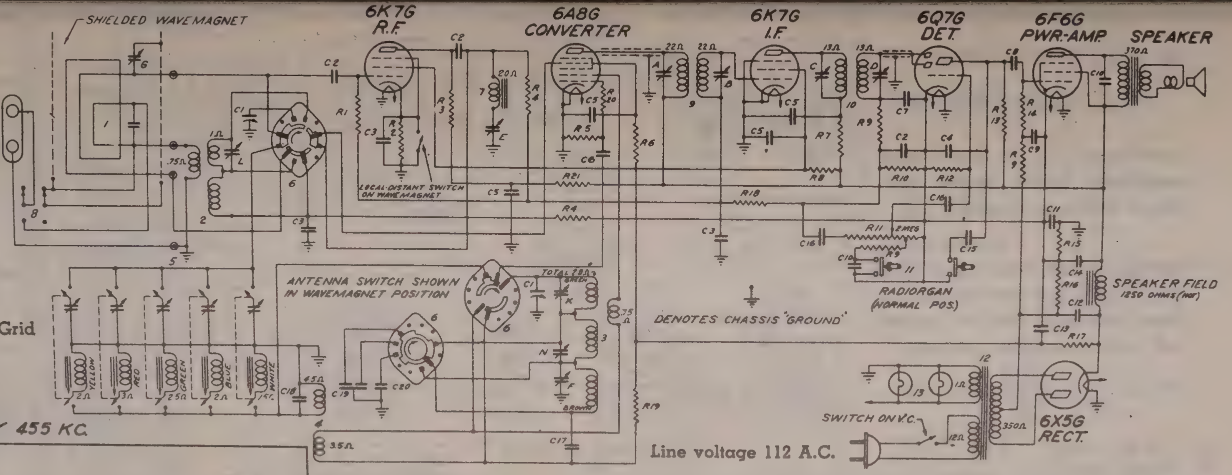
Power Output: 9 watts measured at the voice coil

Current Consumption: 8 amperes at 6 volts.

FOR OTHER DATA
SEE INDEX

ZENITH RADIO CORP.

MODELS 6S439,6S469
Chassis 5678
Schematic,Voltage,Socket
Trimmers

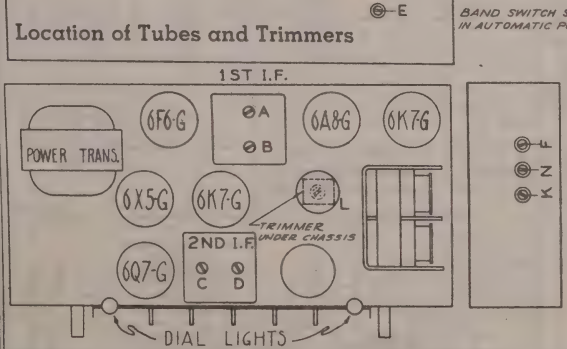


LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode

I.F FREQUENCY 455 KC.

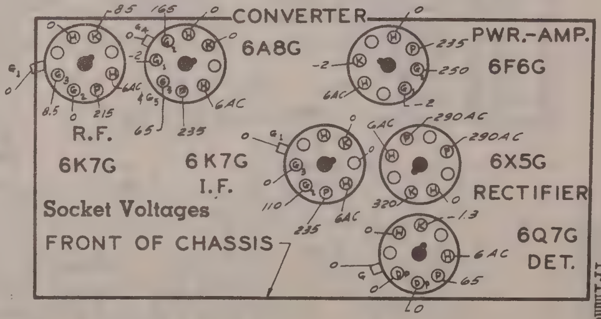
Line voltage 112 A.C.



Location of Tubes and Trimmers

MODEL	SPEAKER
6S439	49-364 6"
6S469	49-344 10"

FOR OTHER DATA
SEE INDEX



Socket Voltages
FRONT OF CHASSIS

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-849	2 GANG VARIABLE		C20	22-866	OSCILLATOR PADDER		R16	63-1056	280 OHM WIREWOUND	1½W.	13	100-36	PILOT LIGHT 6.3V .25A
C2	22-162	0001 MFD	600V.					R17	63-151	15M OHM	1W.			
C3	22-829	05 MFD	200V.					R18	63-599	1.5MEGOHM	⅓W			
C4	22-716	0005 MFD	600V					R19	63-1054	10M OHM	½W			
C5	22-828	05 MFD	400V	R1	63-271	1 MEGOHM	⅓W.	R20	63-739	100 OHM	⅓W.	A		1ST I.F. TRANS. PRI.
C6	22-289	50MMFD	600V	R2	63-588	6800 OHM	⅓W.	R21	63-585	2200 OHM	⅓W	B		1ST I.F " SEC.
C7	22-182	.00025MFD	600V	R3	63-607	15M OHM	½W.					C		2ND I.F " PRI.
C8	22-830	.02 MFD	600V	R4	63-595	100M OHM	⅓W	1		WAVEMAGNET ASSEMBLY		D		2ND I.F " SEC.
C9	22-219	.03 MFD	200V.	R5	63-592	33M OHM	⅓W.	2	S7546	ANTENNA COIL ASSEMBLY		E		WAVE TRAP
C10	22-229	005MFD	600V	R6	63-381	100M OHM	½W	3	S6937	OSCILLATOR COIL ASSEMBLY		F		BROADCAST OSC (SEE NOTE)
C11	22-827	.1 MFD.	200V	R7	63-583	1000 OHM	⅓W.	4	S6992	OSC COUPLER COIL ASSEM		G		ANTENNA BROADCAST
C12	22-975	20 MFD ELECTROLYTIC	450V	R8	63-961	47M OHM	1W	5	S7044	AUTOMATIC TUNING ASSEM.		K		SHORT WAVE OSC (" ")
C13	22-976	10 MFD ELECTROLYTIC	450V	R9	63-593	47M OHM	⅓W.	6	85-205	BAND SELECTOR SWITCH		L	22-788	SHORT WAVE DET.
C14		15 MFD ELECTROLYTIC	350V	R10	63-659	470M OHM	⅓W	7	S7500	WAVE TRAP COIL ASSEMBLY		N		POLICE BAND OSC. (" ")
C15	22-448	.004 MFD	600V	R11	63-1030	VOLUME CONTROL	⅓W	8	85-171	WAVEMAGNET SWITCH				
C16	22-196	01 MFD	600V	R12	63-976	15 MEGOHM	⅓W	9	95-600	1ST I F TRANS.				NOTE
C17	22-358	.002 MFD	600V	R13	63-296	220M OHM	⅓W.	10	95-596	2ND I.F TRANS.				TRIMMERS F, K & N
C18	22-868	COMPENSATING COND		R14	63-597	470M OHM	⅓W.	11	S6994	TONE CONTROL SW ASSEM.				ARE MOUNTED ON
C19	22-853	DUAL OSC PADDER		R15	63-1057	47 OHM WIREWOUND	½W.	12	95-634	POWER TRANS 60~ 115V.				STRIP #22-850

6 TUBE SUPERHETERODYNE
CHASSIS Nº 5678 3BAND

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

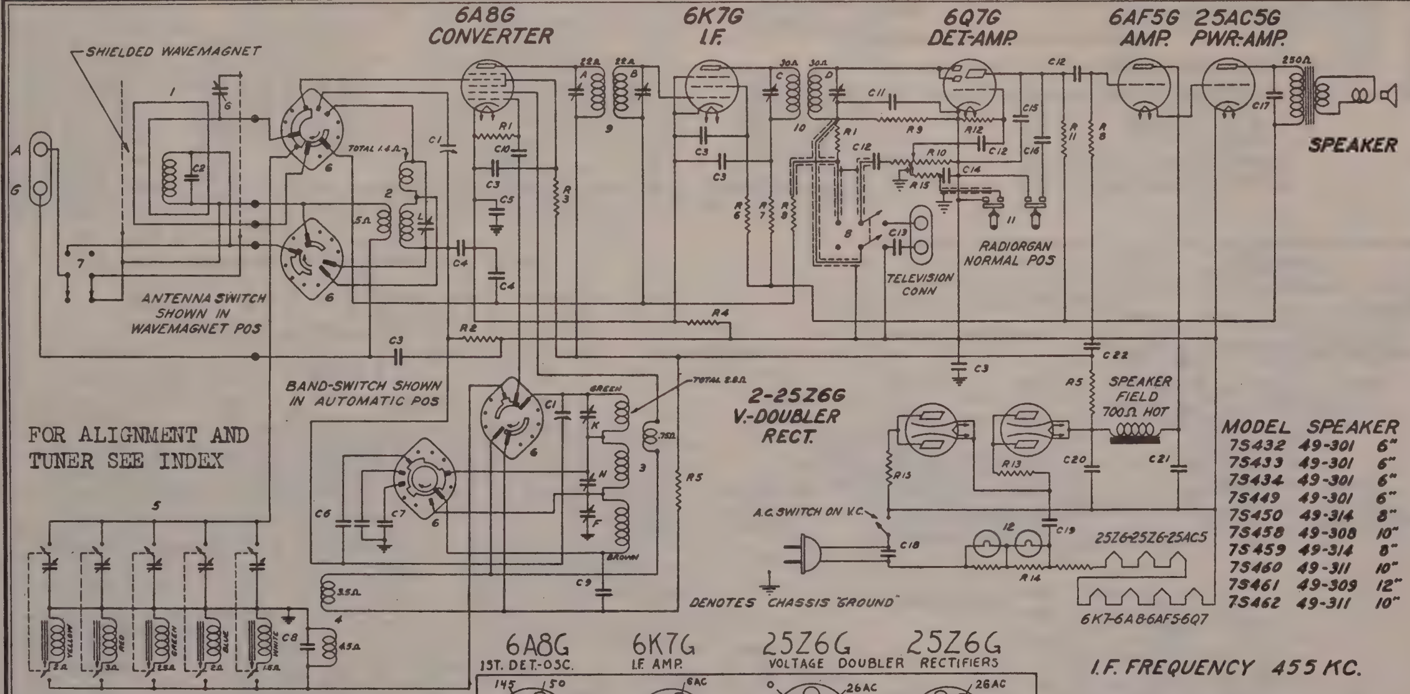
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

MODELS 7S432,7S433,7S434
7S449,7S450,7S458 to 7S462
Chassis 5719
Schematic,Voltage,Socket

ZENITH RADIO CORP.

CHASSIS 5721
Voltage,Socket



FOR ALIGNMENT AND TUNER SEE INDEX

MODEL	SPEAKER	
7S432	49-301	6"
7S433	49-301	6"
7S434	49-301	6"
7S449	49-301	6"
7S450	49-314	8"
7S458	49-308	10"
7S459	49-314	8"
7S460	49-311	10"
7S461	49-309	12"
7S462	49-311	10"

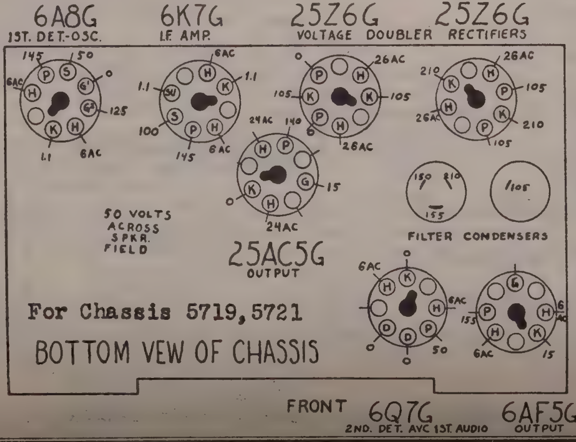
I.F. FREQUENCY 455 KC.

Voltages measured from line switch to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

All filament voltages measured across each respective tube, using an A.C. volt-meter.

VOLTAGE DOUBLER A.C.

CHASSIS Nº5719



For Chassis 5719, 5721

BOTTOM VEW OF CHASSIS

C-1	22-849	TWO-GANG VAR	
C-2	22-182	.00025 MFD.	600V.
C-3	22-828	.05 MFD.	400V.
C-4	22-829	.05 MFD.	200V.
C-5	22-594	.15 MFD.	200V.
C-6	22-863	OSC PADDER	
C-7	22-866	" "	
C-8	22-868	COMPENSATING COND.	
C-9	22-358	.002 MFD.	600V.
C-10	22-289	50 MMFD.	600V.
C-11	22-162	.0001 MFD.	600V.
C-12	22-196	.01 MFD.	600V.
C-13	22-327	.02 MFD.	200V.
C-14	22-229	.005 MFD.	600V.
C-15	22-854	.0005 MFD.	600V
C-16	22-448	.004 MFD.	600V
C-17	22-669	.01 MFD.	600V.
C-18	22-670	.1 MFD.	400V.
C-19	22-852	30 MFD. ELECTROLYTIC	250V.
C-20	22-851	30 MFD. ELECTROLYTIC	350V.
C-21		20 " "	250 V.
C-22		10 " "	250V.
R-1	63-593	47 M OHM	¼ W.
R-2	63-325	150 M OHM	¼ W.
R-3	63-1019	68 M OHM	½ W
R-4	63-1020	68 OHM WIREWOUND	½ W.
R-5	63-150	10 M OHM	½ W.
R-6	63-591	22 M OHM	¼ W.
R-7	63-605	1000 OHM	½ W
R-8	63-271	1 MEGOHM	¼ W
R-9	63-655	220 M OHM	¼ W.
R-10	63-1030	VOLUME CONTROL	
R-11	63-296	220 M OHM	¼ W

R-12	63-976	15 MEGOHMS	¼ W.
R-13	63-1023	22 OHM WIREWOUND	½ W.
R-14	63-1039	3-SECTION CANDOHM	
R-15	63-713	47 M OHM	¼ W.
1		WAVEMAGNET ASSEMBLY	
2	S6936	ANTENNA COIL "	
3	S6937	OSCILLATOR " "	
4	S6992	OSC. COUPLER " "	
5	S7044	AUTOMATIC TUNING UNIT ASSEMBLY	
6	85-185	BAND SELECTOR SWITCH	
7	85-171	WAVEMAGNET "	
8	85-171	TELEVISION "	
9	95-600	1ST I.F TRANSFORMER	
10	95-612	2ND I.F TRANSFORMER	
11	S-6994	TONE CONTROL SWITCH	
12	100-36	PILOT LIGHT 6.3V. .25A.	
A		1ST. I.F TRANS PRI	
B		1ST. I.F " SEC	
C		2ND I.F " PRI	
D		2ND I.F " SEC	
F		BROADCAST OSC. (SEE NOTE)	
G	22-865	ANTENNA BROADCAST	
K		SHORT WAVE OSC. (SEE NOTE)	
L	22-788	SHORT WAVE DETECTOR	
N		POLICE BAND OSC (SEE NOTE)	

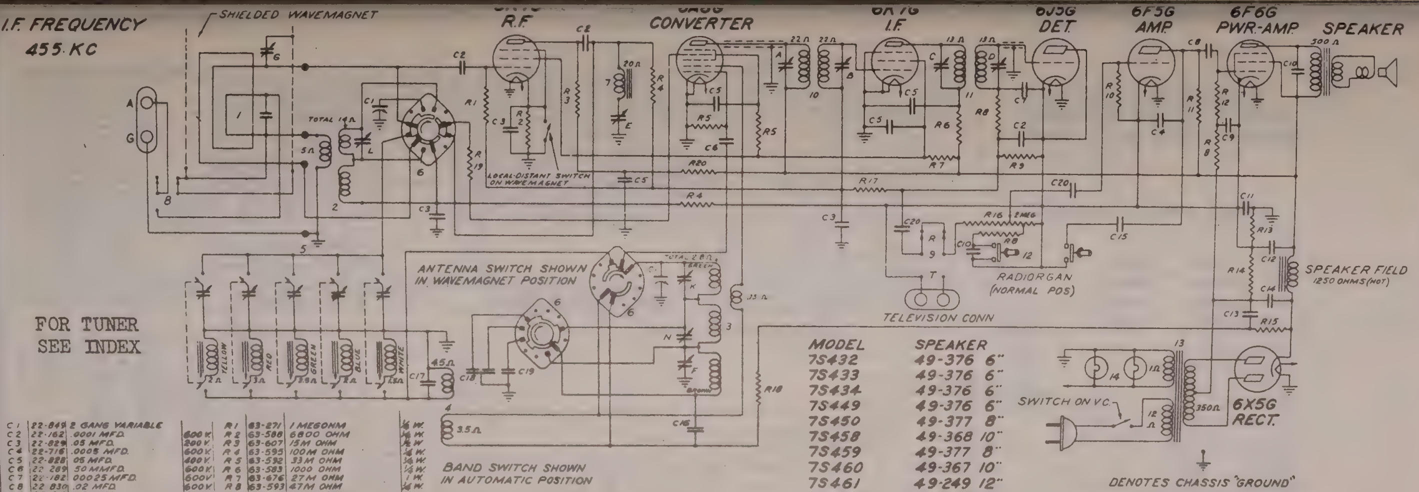
NOTE.
TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850

CHASSIS 5678
Alignment

CHASSIS 5725
Alignment
Trimmers

ZENITH RADIO CORP.

MODELS 7S432,7S433,7S434,7S449
7S450,7S458 to 7S462
Chassis 5724
Schematic,Alignment,Socket
Trimmers



FOR TUNER
SEE INDEX

Model	Speaker
7S432	49-376 6"
7S433	49-376 6"
7S434	49-376 6"
7S449	49-376 6"
7S450	49-377 8"
7S458	49-368 10"
7S459	49-377 8"
7S460	49-367 10"
7S461	49-249 12"
7S462	49-367 10"

For SOCKET VOLTAGES
See Index

BAND SWITCH SHOWN
IN AUTOMATIC POSITION

C1	22-849	2 GANG VARIABLE	
C2	22-162	.0001 MFD.	600 V.
C3	22-829	.05 MFD.	200 V.
C4	22-716	.0005 MFD.	600 V.
C5	22-828	.05 MFD.	400 V.
C6	22-269	50 MMFD.	600 V.
C7	22-182	.00025 MFD.	600 V
C8	22-830	.02 MFD.	600 V.
C9	22-219	.03 MFD.	200 V.
C10	22-229	.005 MFD.	600 V
C11	22-827	1 MFD	200 V.
C12	22-719	16 MFD. ELECTROLYTIC	350 V
C13	22-941	5 MFD ELECTROLYTIC	450 V
C14	22-941	5 MFD ELECTROLYTIC	450 V
C15	22-448	.004 MFD	600 V
C16	22-358	.002 MFD	600 V.
C17	22-868	COMPENSATING COND.	
C18	22-853	DUAL OSC PADDER	
C19	22-866	OSCILLATOR PADDER	
C20	22-196	.01 MFD.	600 V.

R1	63-271	1 MEGOHM	½ W.
R2	63-588	6800 OHM	½ W.
R3	63-607	15 M OHM	½ W
R4	63-595	100 M OHM	¼ W.
R5	63-592	33 M OHM	¼ W.
R6	63-583	1000 OHM	¼ W.
R7	63-676	27 M OHM	1 W.
R8	63-593	47 M OHM	½ W.
R9	63-659	470 M OHM	½ W.
R10	63-976	15 MEGOHM	½ W.
R11	63-296	220 M. OHM	½ W.
R12	63-597	470 M OHM	½ W
R13	63-1057	47 OHM WIREWOUND	½ W
R14	63-1056	280 OHM WIREWOUND	1½ W.
R15	63-1055	22 M OHM	1 W
R16	63-1030	VOLUME CONTROL	
R17	63-599	1.5 MEGOHM	¼ W.
R18	63-1054	10 M OHM	¼ W.
R19	63-577	100 OHM	¼ W.
R20	63-705	2200 OHM	¼ W.

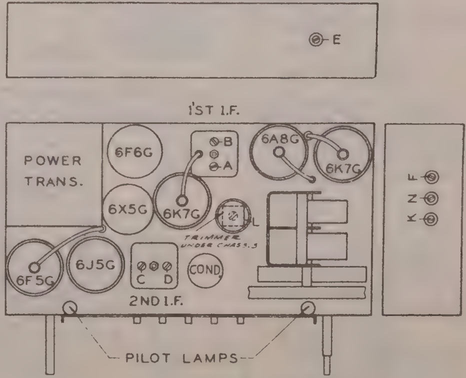
A		1ST I.F. TRANS. PRI
B		1ST I.F. " SEC.
C		2ND I.F. " PRI
D		2ND I.F. SEC
E		WAVE TRAP
F		BROADCAST OSC (SEE NOTE)
G		ANTENNA B'DCAST
K		SHORT WAVE OSC (" ")
L		SHORT WAVE DET.
N		POLICE BAND OSC. (" ")

1		WAVEMAGNET ASSEMBLY
2	S6936	ANTENNA COIL ASSEMBLY
3	S6937	OSCILLATOR COIL ASSEMBLY
4	S6992	OSC COUPLER COIL ASSEM
5	S7044	AUTOMATIC TUNING ASSEM
6	85-205	BAND SELECTOR SWITCH
7	S7500	WAVE TRAP COIL ASSEMBLY
8	85-171	WAVEMAGNET SWITCH
9	85-171	TELEVISION SWITCH
10	95-600	1ST I.F. TRANS.
11	95-596	2ND I.F. TRANS.
12	S6994	TONE CONTROL SW. ASSEM
13	95-634	POWER TRANS. 60~ 115V
14	100-36	PILOT LIGHT 6.3V .25A.

NOTE:
TRIMMERS E, K & N
ARE MOUNTED ON
STRIP #28-850

ALIGNMENT PROCEDURE
For Chassis 5678, 5724 and 5725

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6A8 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	R. F. 6K7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	J	Adjust Wavetrap for Minimum
3	Antenna Post (On Loop)	400 Ohms	18000 Kc.	S. W.	18000 Kc.	F	Set Oscillator to Scale
4	Antenna Post (On Loop)	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max.
5	Antenna Post (On Loop)	400 Ohms	4500 Kc.	Police	4500 Kc.	G	Rock Gang and Adjust for Max.
6	Generator Loosely Coupled to Loop		1500 Kc.	Broadcast	1500 Kc.	H	Set Oscillator to Scale
7	Thru One or Two Turns		1400 Kc	Broadcast	1400 Kc.	K	Alignment of Antenna

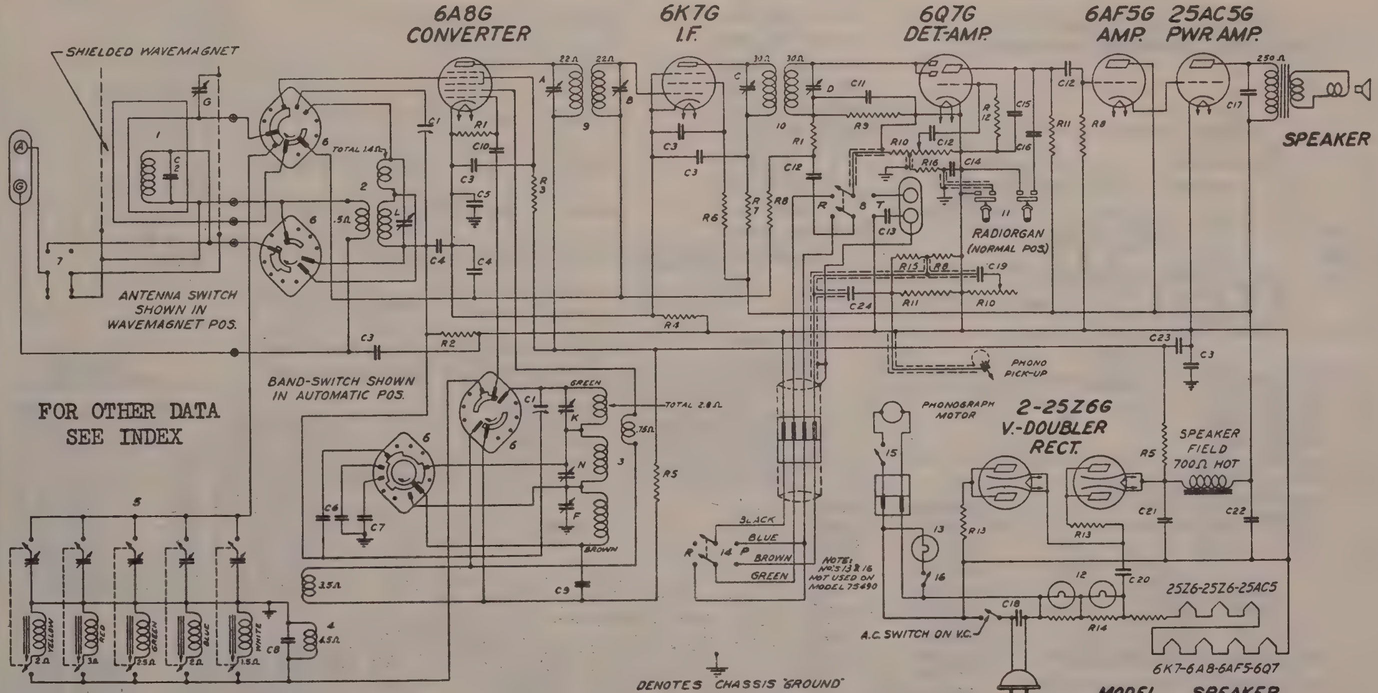


Location of Tubes and Trimmers
For Chassis 5724 and 5725

7 TUBE SUPERHETERODYNE
CHASSIS Nº 5724 3BAND

MODELS 7S487,7S488,7S490
Chassis 5721
Schematic

ZENITH RADIO CORP.



FOR OTHER DATA
SEE INDEX

MODEL	SPEAKER	
7S487	49-312	10"
7S488	49-309	12"
7S490	49-314	8"

I.F. FREQUENCY 455KC

7 TUBE SUPERHETERODYNE
CHASSIS Nº5721 3 BAND
VOLTAGE DOUBLER A.C.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-849	TWO GANG VARIABLE	
C2	22-182	.00025 MFD	600V.
C3	22-828	.05 MFD	400V.
C4	22-829	.05 MFD.	200V.
C5	22-594	.15 MFD	200V.
C6	22-863	OSCILLATOR PADDER	
C7	22-866	OSCILLATOR PADDER	
C8	22-868	COMPENSATING COND.	
C9	22-358	.002 MFD.	600V.
C10	22-289	50 MMFD	600V
C11	22-162	.0001 MFD.	600V.
C12	22-196	.01 MFD.	600V.
C13	22-827	.1 MFD.	200V
C14	22-229	.005 MFD.	600V.
C15	22-854	.0005 MFD	600V
C16	22-448	.004 MFD	600V
C17	22-669	.01 MFD.	600V
C18	22-670	.1 MFD.	400V
C19	22-326	.003 MFD	400V
C20	22-852	30 MFD. ELECTROLYTIC	250V.

DIAG. Nº	PART Nº	DESCRIPTION	
C21	22-851	30 MFD. ELECTROLYTIC	350V.
C22		20 MFD. "	250V.
C23		10 MFD. "	250V.
C24	22-470	150 MMFD.	600V.
R1	63-593	47 M OHM	¼ W.
R2	63-325	150 M OHM	¼ W.
R3	63-1019	68 M OHM	½ W
R4	63-1020	68 OHM WIREWOUND	½ W.
R5	63-150	10 M OHM	½ W
R6	63-591	22 M OHM	¼ W
R7	63-605	1000 OHM	½ W
R8	63-271	1 MEGOHM	¼ W
R9	63-655	220 M OHM	¼ W
R10	63-1035	VOLUME CONTROL	
R11	63-296	220 M OHM	¼ W.
R12	63-976	15 MEGOHM	¼ W
R13	63-1023	22 OHM WIREWOUND	½ W
R14	63-1039	3 SECTION CANDOHM	

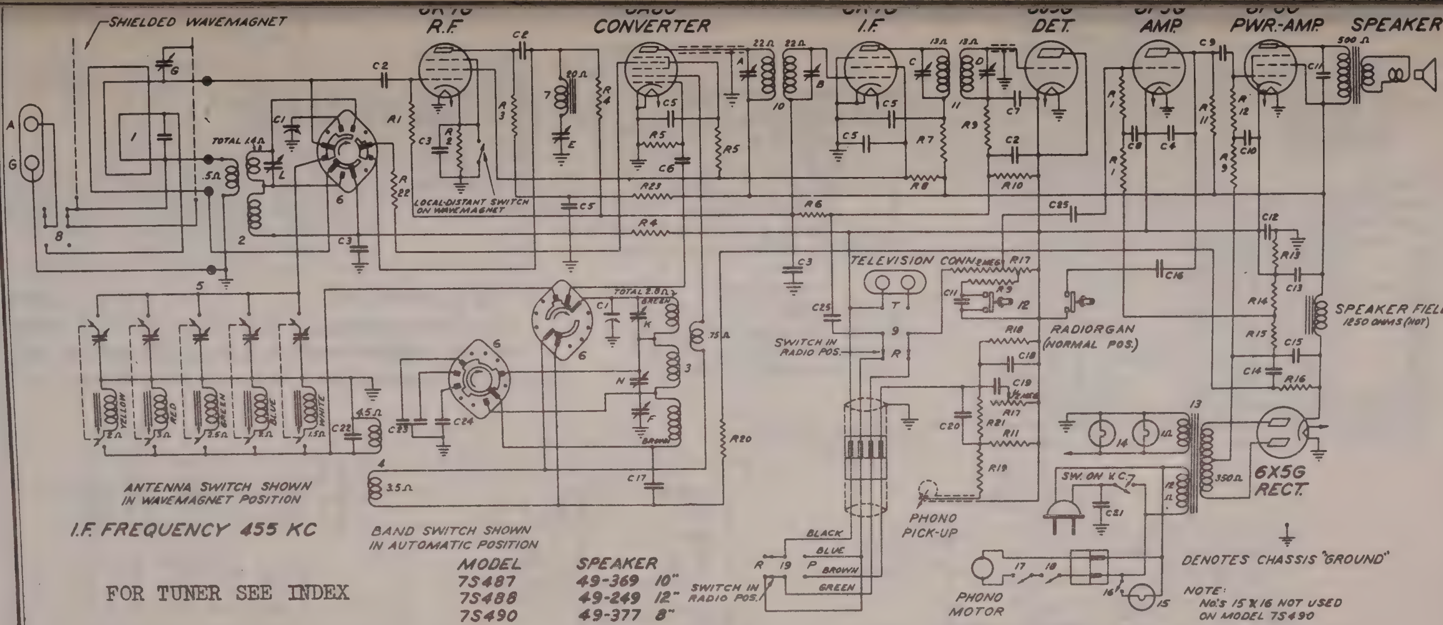
DIAG. Nº	PART Nº	DESCRIPTION	
R15	63-596	330 M OHM	¼ W.
R16	63-713	47 M OHM	¼ W.
1		WAVEMAGNET ASSEMBLY	
2	S6936	ANTENNA COIL ASSEMBLY	
3	S6937	OSCILLATOR COIL ASSEM.	
4	S6992	OSC. COUPLER COIL ASSEM.	
5	S7044	AUTO. TUNING UNIT ASSEM.	
6	85-185	BAND SELECTOR SWITCH	
7	85-171	WAVEMAGNET SWITCH	
8	85-171	TELEVISION SWITCH	
9	95-600	1ST I.F. TRANS.	
10	95-612	2ND I.F. TRANS	
11	S6994	TONE CONTROL SWITCH	
12	100-36	PILOT LIGHT 6.3 V. .25A	
13	100-80	PILOT LIGHT 110V. 7W.	
14	85-192	PHONO SWITCH	
15	85-191	MOTOR SWITCH	

DIAG. Nº	PART Nº	DESCRIPTION
16	85-204 85-203	DOOR SWITCH MODEL 7S487 MODEL 7S488
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
F		BROADCAST OSC. (SEE NOTE)
G	22-865	ANTENNA BROADCAST
K		SHORT WAVE OSC. (SEE NOTE)
L	22-788	SHORT WAVE DETECTOR
N		POLICE BAND OSC. (SEE NOTE)

NOTE:
TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850

ZENITH RADIO CORP.

MODELS 7S487,7S488,7S490
Chassis 5725
Schematic,Voltage,Socket
CHASSIS 5724
Voltage



FOR TUNER SEE INDEX

MODEL	SPEAKER	
7S487	49-369	10"
7S488	49-249	12"
7S490	49-377	8"

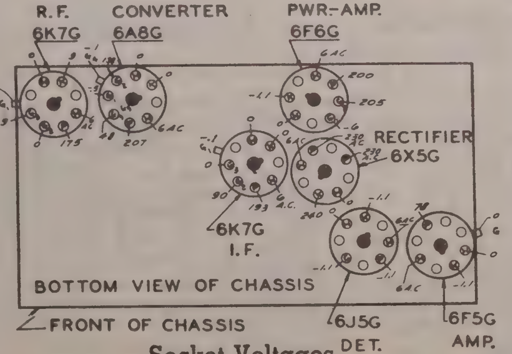
7 TUBE SUPERHETERODYNE CHASSIS Nº 5725 PHONO

DWG. Nº	PART Nº	DESCRIPTION	
C1	22-849	TWO GANG VARIABLE	
C2	22-162	.0001 MFD.	600 V.
C3	22-829	.05 MFD.	200 V.
C4	22-716	.0005 MFD.	600 V.
C5	22-828	.05 MFD.	400 V.
C6	22-289	50 MMFD.	600 V.
C7	22-182	.00025 MFD.	600 V.
C8	22-190	.1 MFD.	200 V.
C9	22-830	.02 MFD.	600 V.
C10	22-219	.03 MFD.	200 V.
C11	22-229	.005 MFD.	600 V.
C12	22-827	.1 MFD.	200 V.
C13	22-719	16 MFD. ELECTROLYTIC	350 V.
C14	22-941	5 MFD. -	450 V.
C15		15 MFD. -	450 V.
C16	22-448	.004 MFD.	600 V.
C17	22-358	.002 MFD.	600 V.
C18	22-954	.00035 MFD.	600 V.
C19	22-326	.003 MFD.	400 V.
C20	22-953	.0002 MFD.	600 V.
C21	22-525	.005 MFD.	1000 V.
C22	22-868	COMPENSATING COND.	
C23	22-853	DUAL OSC. PADDER	
C24	22-866	OSCILLATOR PADDER	
C25	22-196	.01 MFD.	600 K.

R1	63-271	1 MEGOHM	¼ W.
R2	63-588	6800 OHM	¼ W.
R3	63-607	15M OHM	½ W.
R4	63-595	100M OHM	¼ W.
R5	63-592	33M OHM	¼ W.
R6	63-599	1.5 MEGOHM	¼ W.
R7	63-583	1000 OHM	½ W.
R8	63-676	27M OHM	1 W.
R9	63-593	47M OHM	¼ W.
R10	63-659	470M OHM	¼ W.
R11	63-296	220M OHM	¼ W.
R12	63-597	470M OHM	¼ W.
R13	63-1057	47 OHM WIREWOUND	½ W.
R14	63-1056	280 OHM WIREWOUND	1½ W.
R15	63-1066	18 OHM WIREWOUND	½ W.
R16	63-1055	22M OHM	1 W.
R17	63-1035	VOLUME CONTROL	
R18	63-464	1 MEGOHM	¼ W.
R19	63-717	220M OHM	¼ W.
R20	63-1054	10M OHM	½ W.
R21	63-719	470M OHM	¼ W.
R22	63-577	100 OHM	¼ W.
R23	63-705	2200 OHM	¼ W.

1		WAVEMAGNET ASSEMBLY
2	S6936	ANTENNA COIL ASSEMBLY
3	S6937	OSCILLATOR COIL ASSEMBLY
4	S6992	OSC. COUPLER COIL ASSEM.
5	S7044	AUTOMATIC TUNING ASSEM.
6	85-205	BAND SELECTOR SWITCH
7	S7500	WAVE TRAP COIL ASSEMBLY
8	85-171	WAVEMAGNET SWITCH
9	85-171	TELEVISION SWITCH
10	95-600	1ST I.F. TRANS.
11	95-596	2ND I.F. TRANS.
12	S6994	TONE CONTROL SW. ASSEM.
13	95-634	POWER TRANS. 60~ 115 V.
14	100-36	PILOT LIGHT 6.3 V. .25 A.
15	100-80	PILOT LIGHT 110 V. 7 W.
16	85-204 85-203	DOOR SWITCH MODEL 7S487 DOOR SWITCH MODEL 7S488
17	85-181	AUTOMATIC STOP SW.
18	85-191	MOTOR SWITCH
19	85-192	PHONO SWITCH
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E		WAVE TRAP
F		BROADCAST OSC. (SEE NOTE)
G		ANTENNA BROADCAST
K		SHORT WAVE OSC. (" ")
L		SHORT WAVE DET.
N		POLICE BAND OSC. (" ")

NOTE:
TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850.

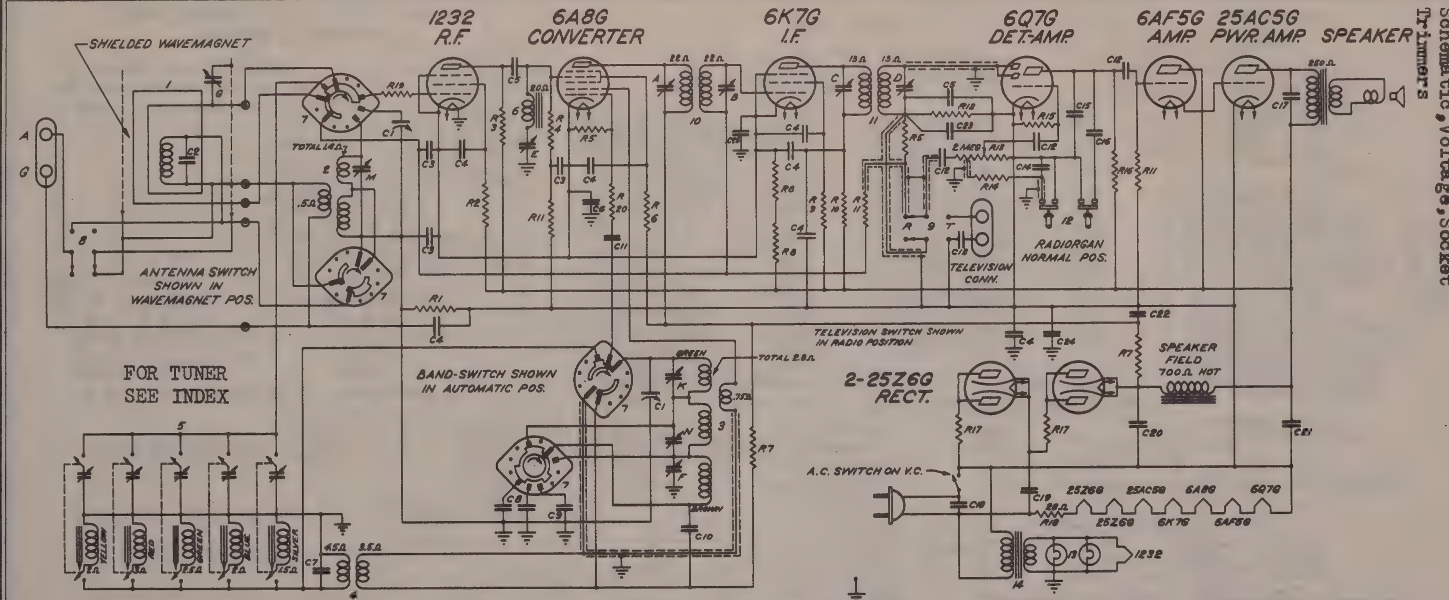


Socket Voltages
For Chassis 5724 and 5725

For ALIGNMENT and LOCATION
of TUBES and TRIMMERS
See Index

MODELS 8S432,8S433,8S434,8S449
8S450,8S458 to 8S462
Chassis 5810
Schematic,Voltage,Socket
Trimmers

ZENITH RADIO CORP.



DENOTES CHASSIS "GROUND"

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.
Volume control on full.
Line voltage 120 A.C.

I.F. FREQUENCY 455 KC.
8 TUBE SUPERHETERODYNE
CHASSIS №5810 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

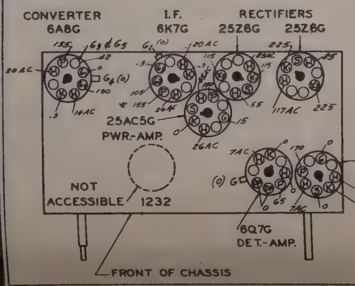
DIAG. №	PART №	DESCRIPTION	
C1	22-849	TWO-GANG VARIABLE	
C2	22-182	.00025 MFD.	600V.
C3	22-829	.05 MFD.	200V.
C4	22-828	.05 MFD.	400V.
C5	22-162	.0001 MFD.	600V.
C6	22-594	.15 MFD.	200V.
C7	22-868	COMPENSATING COND.	
C8	22-863	DUAL OSC. PADDER	
C9	22-866	OSCILLATOR PADDER	
C10	22-358	.002 MFD.	600V.
C11	22-289	50 MMFD.	600V.
C12	22-196	.01 MFD.	600V.
C13	22-327	.02 MFD.	200V.
C14	22-229	.005 MFD.	600V.
C15	22-854	.0005 MFD.	600V.
C16	22-448	.004 MFD.	600V.
C17	22-669	.01 MFD.	600V.
C18	22-670	.1 MFD.	400V.
C19	22-852	30 MFD. ELECTROLYTIC	250V.

DIAG. №	PART №	DESCRIPTION	
C20	22-851	30 MFD. ELECTROLYTIC	350V.
C21		20 MFD. ELECTROLYTIC	250V.
C22		10 MFD. ELECTROLYTIC	250V.
C23	22-470	150 MMFD.	600V.
C24	22-350	.25 MFD.	200V.
C25	22-827	.1 MFD.	200V.
R1	63-325	150M OHM	½W.
R2	63-712	33M OHM	½W.
R3	63-709	10M OHM	½W.
R4	63-715	100M OHM	½W.
R5	63-593	47M OHM	½W.
R6	63-1019	68M OHM	½W.
R7	63-150	10M OHM	½W.
R8	63-1020	68 OHM WIREWOUND	½W.
R9	63-591	22M OHM	½W.
R10	63-605	1000 OHM	½W.
R11	63-271	1 MEGOHM	½W.
R12	63-655	220M OHM	½W.
R13	63-1030	VOLUME CONTROL	
R14	63-713	47M OHM	½W.

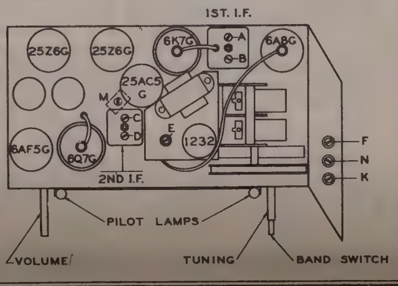
DIAG. №	PART №	DESCRIPTION	
R15	63-976	15 MEGOHMS	½W.
R16	63-296	220 M OHM	½W.
R17	63-1023	22 OHM WIREWOUND	½W.
R18	63-1039	CANDOHM	
R19	63-577	100 OHM	½W.
R20	63-576	68 OHM	½W.
1		WAVEMAGNET ASSEMBLY	
2	S6936	ANTENNA COIL ASSEMBLY	
3	S6937	OSCILLATOR COIL ASSEM.	
4	S6992	OSC. COUPLER COIL ASSEM.	
5	S7044	AUTOMATIC TUNING ASSEM.	
6	S7500	WAVE TRAP ASSEMBLY	
7	85-185	BAND SELECTOR SWITCH	
8	85-171	WAVEMAGNET SWITCH	
9	85-171	TELEVISION SWITCH	
10	95-600	1ST I.F. TRANSFORMER	
11	95-596	2ND I.F. TRANSFORMER	
12	S6994	TONE CONTROL SWITCH	
13	100-36	PILOT LIGHT 6.3V. .25 A.	

DIAG. №	PART №	DESCRIPTION
14	95-678	FILAMENT TRANS. 117 VOLTS 50-60 CYCLE
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E		WAVE TRAP
F		BROADCAST OSC. (SEE NOTE)
G	22-865	ANTENNA BROADCAST
K		SHORT WAVE OSC. (SEE NOTE)
M	22-788	SHORT WAVE ANTENNA
N		POLICE BAND OSC. (SEE NOTE)

NOTE:
TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850.

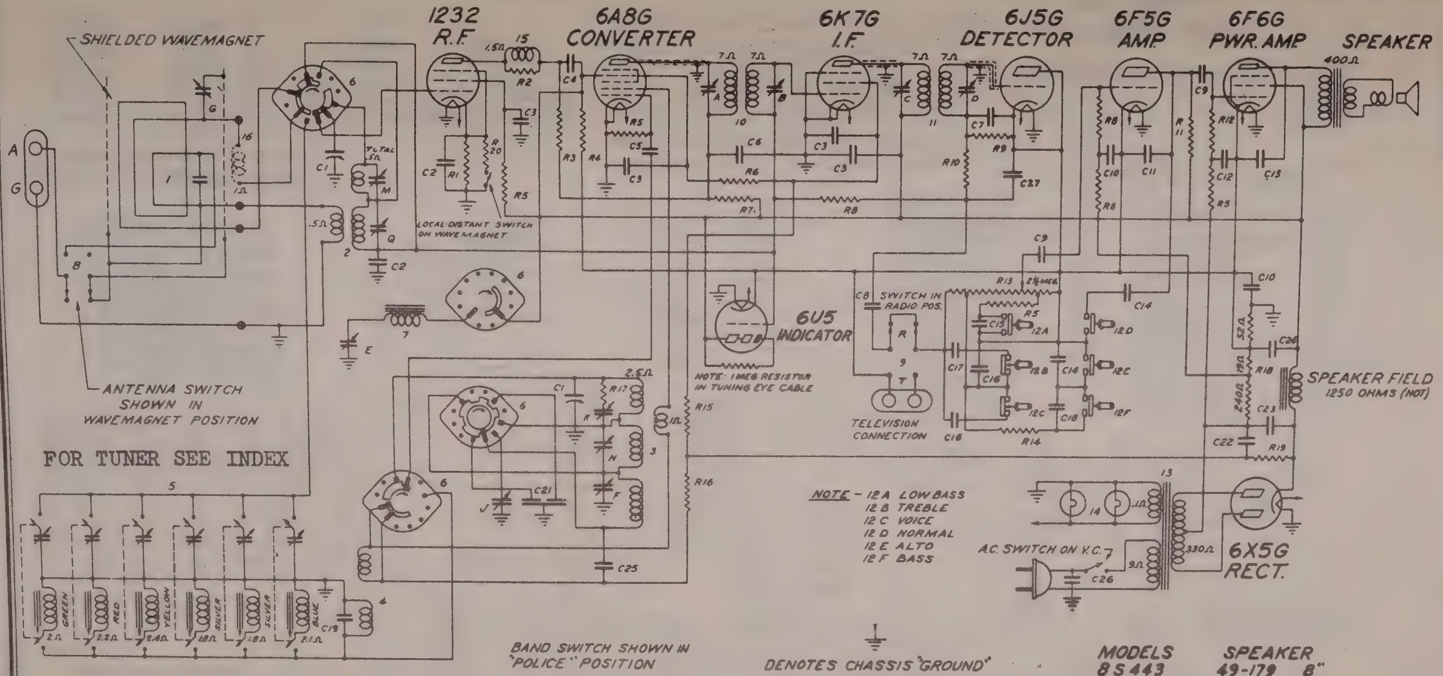


MODEL	SPEAKER	
8S432	49-301	6"
8S433	49-301	6"
8S449	49-301	6"
8S450	49-314	8"
8S458	49-308	10"
8S459	49-314	8"
8S460	49-311	10"
8S461	49-309	12"
8S462	49-311	10"



ZENITH RADIO CORP.

MODELS 8S443,8S451,8S463
Chassis 5808
Schematic



MODELS	SPEAKER	
8S443	49-179	8"
8S451	49-179	8"
8S463	49-380	10"

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-927	TWO GANG VARIABLE		C22	22-933	6 MFD. ELECTROLYTIC	450V.	R14	63-594	68 M OHM	¼ W.	13	95-627	POWER TRANS. 60~115V.
C2	22-829	05 MFD.	200V	C23		16 MFD. "	450V.	R15	63-677	33 M OHM	1 W.	14	100-36	PILOT LIGHT 6.3V. .25A.
C3	22-828	05 MFD	400V	C24	22-719	16 MFD	350V	R16	63-796	10 M OHM	½ W.	15	S7526	R.F. CHOKE
C4	22-716	0005 MFD	600V	C25	22-358	002 MFD	600V.	R17	63-576	68 OHM	¼ W.	16	S8142	LOOP LOADING COIL ASSEM
C5	22-127	25 MMFD.	600V	C26	22-525	.005 MFD	1000V.	R18	63-992	3 SECTION CANDOHM				(NOTE: USED ON SOME MODELS)
C6	22-825	.1 MFD	400V	C27	22-162	.0001 MFD	600V.	R19	63-151	15 M OHM	1 W.			
C7	22-182	00025 MFD	600V					R20	63-574	33 OHM	¼ W.	A		1ST I.F. TRANS. PRI.
C8	22-327	02 MFD	200V									B		1ST I.F. " SEC.
C9	22-830	02 MFD	600V	R1	63-589	10 M OHM	¼ W.					C		2ND I.F. " PRI.
C10	22-827	.1 MFD	200V	R2	63-1077	18 M OHM	1 W	1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C11	22-854	.0005 MFD	600V	R3	63-587	4700 OHM	¼ W	2	S7504	ANTENNA COIL ASSEMBLY		E		WAVE TRAP
C12	22-219	03 MFD	200V	R4	63-595	100 M OHM	¼ W	3	S7641	OSCILLATOR COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C13	22-627	002 MFD	1000V	R5	63-593	47 M OHM	¼ W.	4	S7507	OSC. COUPLER COIL ASSEM		G		ANTENNA BROADCAST
C14	22-448	004 MFD	600V	R6	63-643	18 M OHM	¼ W.	5	S7649	AUTOMATIC TUNING UNIT "		K		SHORT WAVE OSC (SEE NOTE)
C15	22-229	005 MFD	600V	R7	63-605	1000 OHM	½ W.	6	85-200	BAND SELECTOR SWITCH		M	22-962	SHORT WAVE DET.
C16	22-470	00015 MFD	600V	R8	63-271	1 MEGOHM	¼ W.	7	S7559	WAVE TRAP COIL ASSEMBLY		N		POLICE BAND OSC (SEE NOTE)
C17	22-954	00035 MFD	600V	R9	63-774	220 M OHM	¼ W.	8	85-171	WAVEMAGNET SWITCH		Q	22-962	POLICE BAND DET.
C18	22-492	002 MFD	600V	R10	63-711	22 M OHM	¼ W	9	85-171	TELEVISION SWITCH		J	22-463	BROADCAST PADDER
C19	22-868	COMPENSATING COND		R11	63-296	220 M OHM	¼ W	10	95-625	1ST I.F TRANS				NOTE: TRIMMERS F.K & N
				R12	63-597	470 M OHM	¼ W.	11	95-663	2ND I.F TRANS				ARE MOUNTED ON
C21	22-930	DUAL OSC PADDER		R13	63-1075	VOLUME CONTROL		12	S7643	TONE CONTROL SW. ASSEM.				STRIP # 22-850

I.F. FREQUENCY 455 KC

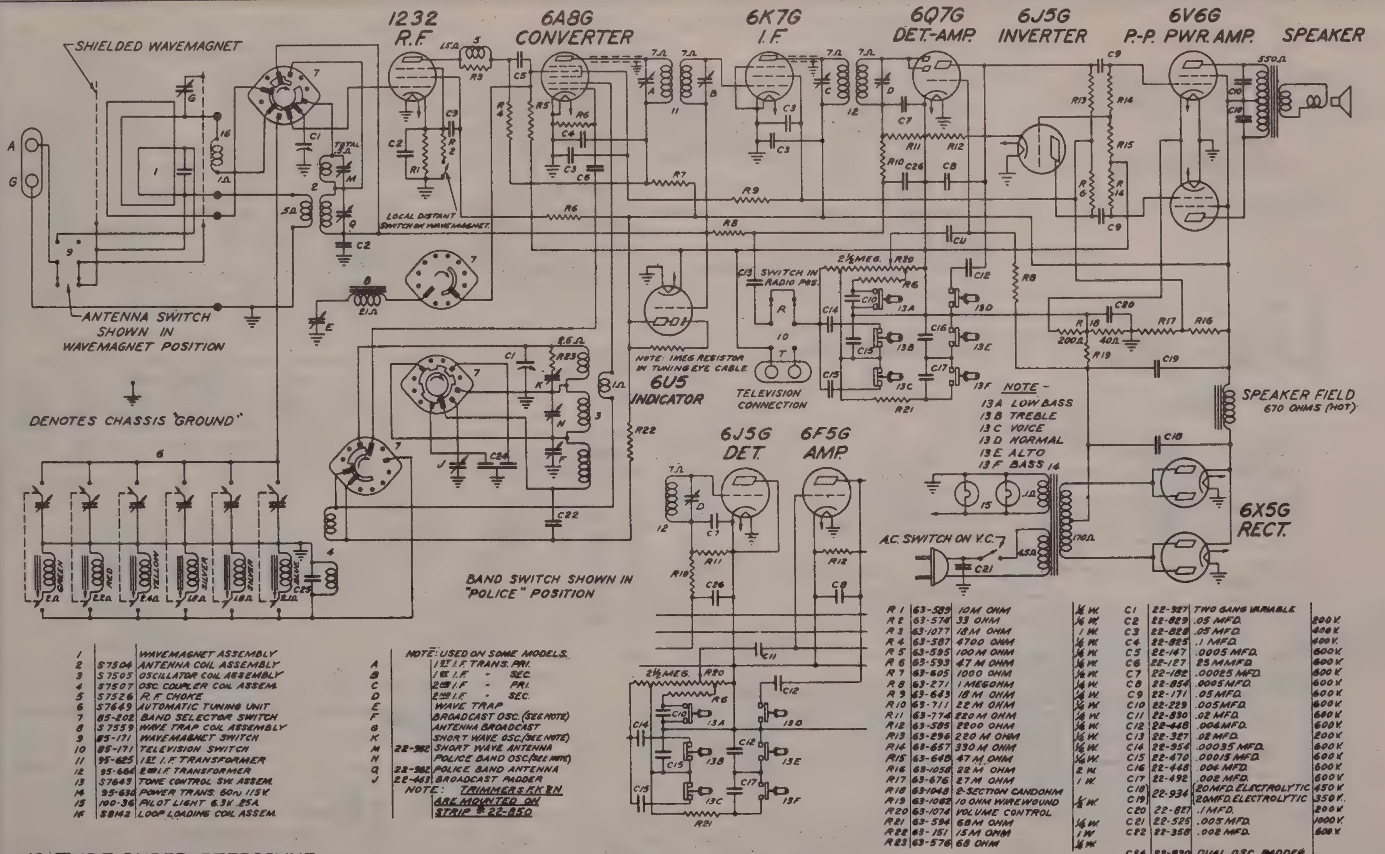
FOR OTHER DATA
SEE INDEX

8 TUBE SUPERHETERODYNE
CHASSIS Nº 5808 3BAND

MODELS 10S443,10S452,10S464
10S470,10S491,10S492
Chassis 1005

ZENITH RADIO CORP.

MODEL 11S474
Chassis 1103
Schematics



R 1	63-589	10M OHM	½ W.
R 2	63-574	33 OHM	½ W.
R 3	63-1077	18M OHM	1 W.
R 4	63-587	4700 OHM	¼ W.
R 5	63-595	100 M OHM	½ W.
R 6	63-593	47 M OHM	½ W.
R 7	63-605	1000 OHM	½ W.
R 8	63-271	1 MEGOHM	¼ W.
R 9	63-643	18 M OHM	¼ W.
R10	63-711	22 M OHM	¼ W.
R11	63-774	220 M OHM	¼ W.
R12	63-585	2200 OHM	½ W.
R13	63-296	220 M OHM	½ W.
R14	63-657	330 M OHM	½ W.
R15	63-648	47 M OHM	¼ W.
R16	63-1058	22 M OHM	2 W.
R17	63-676	27 M OHM	1 W.
R18	63-1048	2-SECTION CANDOHM	
R19	63-1062	10 OHM WIREWOUND	½ W.
R20	63-1074	VOLUME CONTROL	
R21	63-594	68M OHM	½ W.
R22	63-151	15M OHM	1 W.
R23	63-576	68 OHM	½ W.

C1	22-927	TWO GANG VARIABLE	
C2	22-829	.05 MFD.	200 V.
C3	22-828	.05 MFD.	400 V.
C4	22-825	.1 MFD.	400 V.
C5	22-147	.0005 MFD.	600 V.
C6	22-127	25 MMFD.	600 V.
C7	22-182	.00025 MFD.	600 V.
C8	22-854	.0005 MFD.	600 V.
C9	22-171	.05 MFD.	600 V.
C10	22-229	.005 MFD.	600 V.
C11	22-830	.02 MFD.	600 V.
C12	22-448	.004 MFD.	600 V.
C13	22-327	.02 MFD.	200 V.
C14	22-954	.00035 MFD.	600 V.
C15	22-470	.00015 MFD.	600 V.
C16	22-448	.004 MFD.	600 V.
C17	22-492	.002 MFD.	600 V.
C18	22-934	20 MFD. ELECTROLYTIC	450 V.
C19		20 MFD. ELECTROLYTIC	350 V.
C20	22-827	.1 MFD.	200 V.
C21	22-525	.005 MFD.	1000 V.
C22	22-358	.002 MFD.	600 V.
C24	22-930	DUAL OSC. PADDER	
C25	22-868	COMPENSATING COND.	
C26	22-162	.0001 MFD.	600 V.

1		WAVEMAGNET ASSEMBLY
2	S7504	ANTENNA COIL ASSEMBLY
3	S7505	OSCILLATOR COIL ASSEMBLY
4	S7507	OSC. COUPLER COIL ASSEM.
5	S7526	R.F. CHOKE
6	S7649	AUTOMATIC TUNING UNIT
7	85-202	BAND SELECTOR SWITCH
8	S7559	WAVE TRAP COIL ASSEMBLY
9	85-171	WAVEMAGNET SWITCH
10	85-171	TELEVISION SWITCH
11	95-625	1ST I.F. TRANSFORMER
12	95-686	2ND I.F. TRANSFORMER
13	S7643	TONE CONTROL SW. ASSEM.
14	95-630	POWER TRANS. 60~ 115V.
15	100-36	PILOT LIGHT 6.3V .25A
16	S8142	LOOP LOADING COIL ASSEM.

NOTE: USED ON SOME MODELS.

A		1ST I.F. TRANS. PRI.
B		1ST I.F. - SEC.
C		2ND I.F. - PRI.
D		2ND I.F. - SEC.
E		WAVE TRAP
F		BROADCAST OSC. (SEE NOTE)
G		ANTENNA BROADCAST
K		SHORT WAVE OSC. (SEE NOTE)
M	22-982	SHORT WAVE ANTENNA
N		POLICE BAND OSC. (SEE NOTE)
Q	22-982	POLICE BAND ANTENNA
J	22-463	BROADCAST PADDER

NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP # 22-850

10 TUBE SUPERHETERODYNE
CHASSIS Nº 1005 A.C. 3 BAND

MODEL	SPEAKER	
10S443	49-346	8"
10S452	49-351	10"
10S470	49-353	12"
10S464	49-379	10"
10S491	49-356	15"
10S492	49-352	12"

11 TUBE SUPERHETERODYNE
CHASSIS Nº 1103 A.C. 3 BAND

MODEL	SPEAKER	
11S474	49-352	12"

Schematic of Chassis 1103 same as for Chassis 1005 except that two tubes are used in place of the 6Q7G.

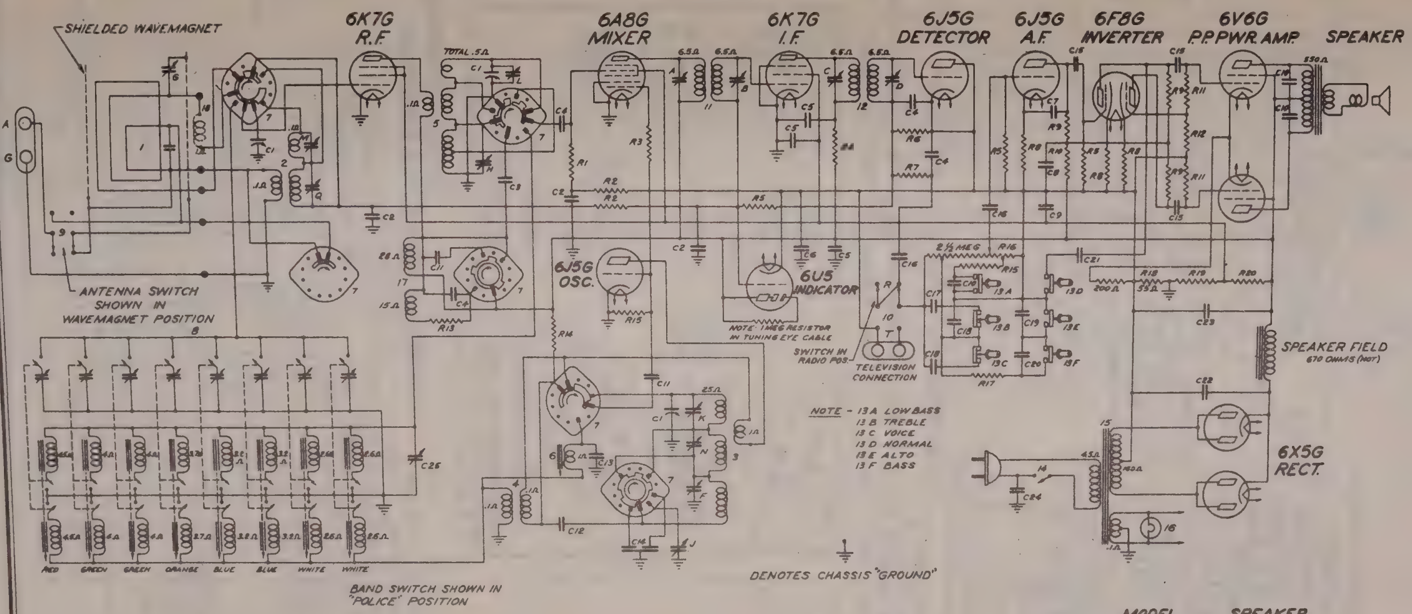
Above partial schematic applies to Chassis 1103 only.

I.F. FREQUENCY 455 KC.

FOR OTHER DATA
SEE INDEX

ZENITH RADIO CORP.

MODELS 12S445, 12S453, 12S471
12S475, 12S494
Chassis 1207
Schematic



NOTE - 13A LOW BASS
13B TREBLE
13C VOICE
13D NORMAL
13E ALTO
13F BASS

⏚ DENOTES CHASSIS "GROUND"

I.F. FREQUENCY 455 KC.

MODEL	SPEAKER	
12S445	49-346	8"
12S453	49-351	10"
12S471	49-352	12"
12S475	49-354	15"
12S494	49-355	15"

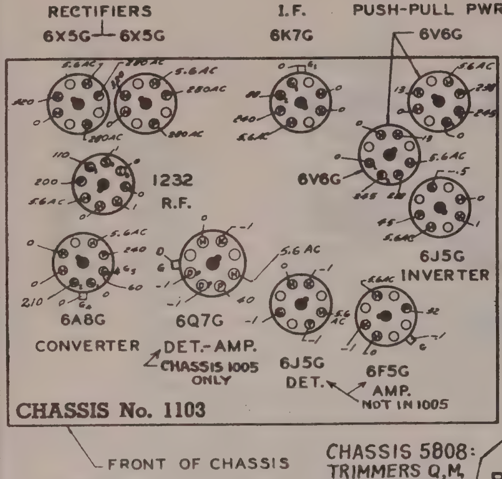
12 TUBE SUPERHETERODYNE
CHASSIS Nº 1207 A.C. 3BAND

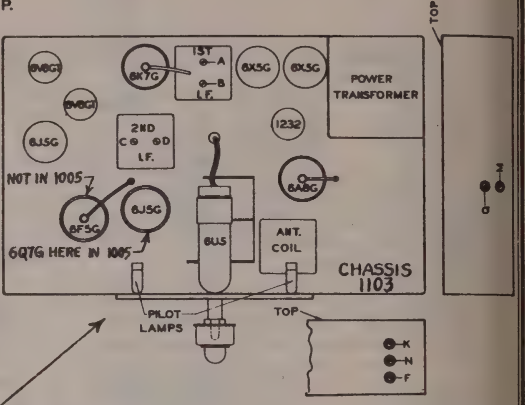
DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-951	THREE GANG VARIABLE		C24	22-998	.02 MFD.	600 V.	R19	63-676	27 M OHM	1 W.			
C2	22-829	.05 MFD	200 V.	C25		TRIMMER COND. (SEE NOTE)		R20	63-1058	22 M OHM	2 W.			
C3	22-289	50 MMFD	600 V.									A		1st I.F. TRANS. PRI.
C4	22-162	.0001 MFD	600 V.									B		1st I.F. " SEC.
C5	22-828	.05 MFD	400 V									C		2nd I.F. " PRI.
C6	22-827	.1 MFD	200 V	R1	63-597	470 M OHM	½ W.	1		WAVEMAGNET ASSEMBLY		D		2nd I.F. " SEC.
C7	22-854	.0005 MFD	600 V	R2	63-595	100 M OHM	½ W.	2	S7798	ANTENNA COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C8	22-991	16 MFD. ELECTROLYTIC	350 V	R3	63-581	470 OHM	½ W	3	S7666	OSCILLATOR COIL ASSEMBLY		G		ANTENNA BROADCAST
C9		16 MFD.	200 V	R4	63-605	1000 OHM	½ W	4	S7666	OSC COUPLER COIL ASSEM		H		DETECTOR BROADCAST
C10	22-229	.005 MFD	600 V	R5	63-271	1 MEGOHM	½ W	5	S7667	DETECTOR COIL ASSEMBLY		K		SHORT WAVE OSC. (SEE NOTE)
C11	22-127	25 MMFD.	600 V.	R6	63-655	220 M OHM	¼ W	6	S7636	TRIMMER COIL ASSEMBLY		L		SHORT WAVE DET. (ON GANG)
C12	22-358	.002 MFD.	600 V	R7	63-591	22 M OHM	½ W	7	85-209	BAND SELECTOR SWITCH		M		SHORT WAVE ANTENNA
C13	22-944	COMPENSATING COND.		R8	63-282	2200 OHM	½ W	8	S7807	AUTOMATIC TUNING UNIT		N		POLICE BAND OSC. (SEE NOTE)
C14	22-930	DUAL OSC PADDER		R9	63-648	47 M OHM	½ W	9	85-171	WAVEMAGNET SWITCH		Q		POLICE BAND ANTENNA
C15	22-171	.05 MFD.	600 V.	R10	63-680	10 M OHM	1 W	10	85-171	TELEVISION SWITCH		J	22-463	BROADCAST PADDER
C16	22-327	.02 MFD.	200 V.	R11	63-657	330 M OHM	½ W	11	95-637	1st I.F. TRANSFORMER				NOTE
C17	22-954	.00035 MFD.	600 V	R12	63-647	39 M OHM	½ W	12	95-638	2nd I.F. TRANSFORMER				(1) TRIMMERS F.K.N & C25
C18	22-470	.00015 MFD.	600 V	R13	63-586	3300 OHM	½ W	13	S7776	TONE CONTROL SW ASSEM.				ARE MOUNTED ON
C19	22-448	.004 MFD	600 V	R14	63-1065	15 M OHM	1 W	14	85-148	A.C. SWITCH				STRIP #22-881
C20	22-492	.002 MFD	600 V	R15	63-593	47 M OHM	½ W	15	95-639	POWER TRANS 60~ 117V.				
C21	22-196	.01 MFD	600 V	R16	63-1078	VOLUME CONTROL		16	100-36	PILOT LIGHT 6.3 V .25 A				(2) TRIMMERS M & Q
C22	22-970	20 MFD. ELECTROLYTIC	450 V	R17	63-596	68 M OHM	½ W	17	20-216	PLATE CHOKE COIL				ARE MOUNTED ON
C23		20 MFD. ELECTROLYTIC	350 V.	R18	63-1052	2 SECTION CANDOHM		18	S8111	LOOP LOADING COIL ASSEM. (NOTE: USED ON SOME MODELS)				STRIP #22-982

FOR OTHER DATA
SEE INDEX

CHASSIS 1005 CHASSIS 1103
CHASSIS 1207 CHASSIS 5808
Voltage,Socket,Trimmers

ZENITH RADIO CORP.



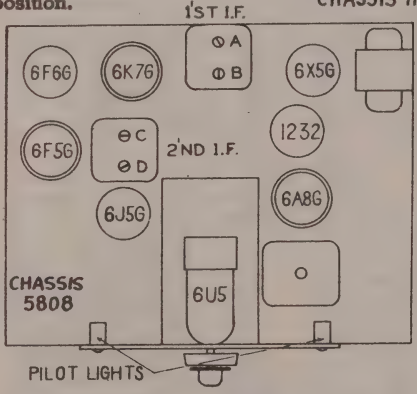


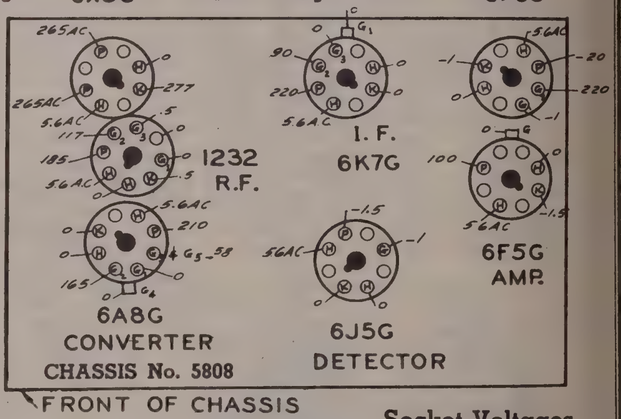
CHASSIS 5808: TRIMMERS Q,M, K,N & F AS IN CHASSIS 1103

Sensitivity switch in distance position.

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

Volume control full on.
Line voltage 112 A.C.

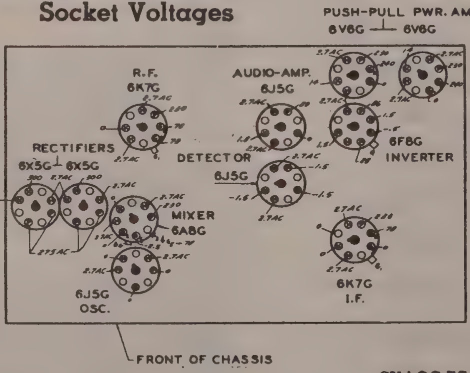


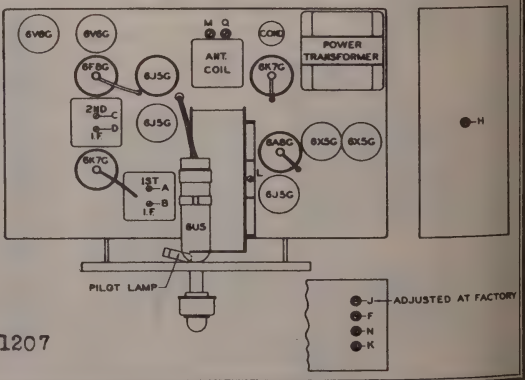


All voltages are positive D.C. unless marked otherwise.

Socket Voltages

Socket Voltages
Location of Tubes and Trimmers

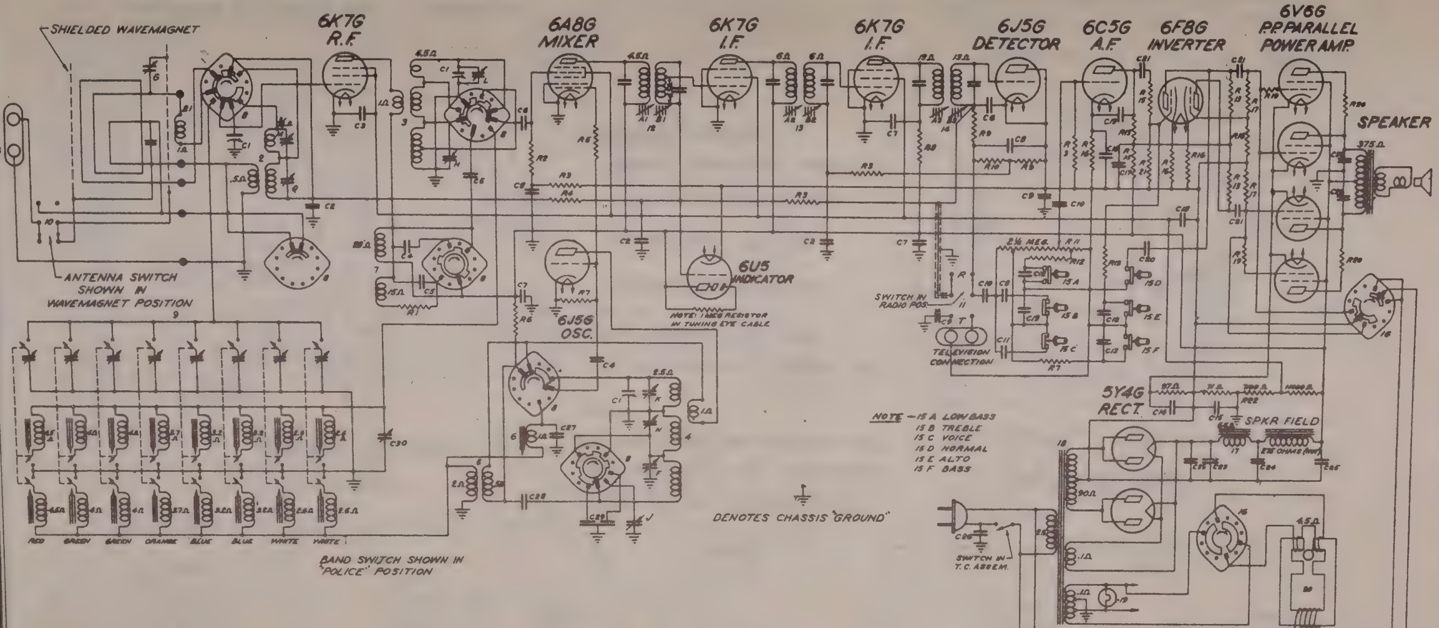




CHASSIS 1207

ZENITH RADIO CORP.

MODELS 15S479,15S495
Chassis 1503
Schematic



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-951	THREE GANG VARIABLE		C28	22-358	.002 MFD	600V.	R21	63-660	560 M OHM	¼ W.	A1		1ST I F TRANS. PRI
C2	22-829	05 MFD.	200V	C29	22-930	DUAL OSC PADDER		R22	63-986	4 SECTION CANDOHM		B1		1ST I.F " SEC.
C3	22-825	.1 MFD	400V	C30		TRIMMER CONDENSER						A2		2ND I.F. " PRI.
C4	22-127	25 MMFD	600V.			(SEE NOTE 1)						B2		2ND I.F. " SEC.
C5	22-289	50 MMFD	600V									A3		3RD I.F. " PRI.
C6	22-168	.0001 MFD	600K					1		WAVEMAGNET ASSEMBLY		B3		3RD I.F. " SEC.
C7	22-828	.05 MFD	400V					2	S7959	ANTENNA COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE 1)
C8	22-182	00025 MFD	600V	R1	63-586	3300 OHM	¼ W.	3	S7960	DETECTOR COIL ASSEMBLY		G		ANTENNA BROADCAST
C9	22-827	1 MFD	200V	R2	63-597	470 M OHM	¼ W.	4	S7666	OSCILLATOR COIL ASSEMBLY		H	22-959	DETECTOR BROADCAST
C10	22-327	02 MFD	200V	R3	63-271	1 MEGOHM	¼ W.	5	S7759	OSC COUPLER COIL ASSEM		K		SHORT WAVE OSC (SEE NOTE 1)
C11	22 470	00015 MFD	600V	R4	63-595	100 M OHM	¼ W	6	S7656	TRIMMER COIL ASSEMBLY		L		SHORT WAVE DET (ON GANG)
C12	22-326	003 MFD	400V	R5	63-581	470 OHM	¼ W	7	20-216	PLATE CHOKE COIL		M		SHORT WAVE ANT (SEE NOTE 2)
C13	22-448	004 MFD.	600V.	R6	63-608	15 M OHM	1 W.	8	85-209	BAND SELECTOR SWITCH		N		POLICE BAND OSC. (SEE NOTE 1)
C14	22 960	40 MFD ELECTROLYTIC	25 V.	R7	63-593	47 M OHM	¼ W.	9	S7807	AUTOMATIC TUNING UNIT		Q		POLICE BAND ANT (SEE NOTE 2)
C15		40 MFD "	25 V	R8	63-605	1000 OHM	½ W.	10	85-171	WAVEMAGNET SWITCH		J	22-465	BROADCAST PADDER
C16		20 MFD "	25 V.	R9	63-649	56 M OHM	¼ W.	11	85-171	TELEVISION SWITCH				NOTE
C17	22-747	16 MFD "	450 V	R10	63-655	150 M OHM	¼ W	12	S8103	1ST I.F. TRANSFORMER				(1) TRIMMERS F,K,N & C30
C18		40 MFD "	200V	R11	63-980	VOLUME CONTROL		13	S6375	2ND I.F. TRANSFORMER				ARE MOUNTED ON
C19	22-147	.0005 MFD	600V	R12	63-591	22 M OHM	¼ W.	14	S6376	3RD I.F. TRANSFORMER				STRIP #22-881
C20	22-196	01 MFD	600V	R13	63-648	47 M OHM	¼ W.	15	S7992	TONE CONTROL SW. ASSEM.				(2) TRIMMERS M & Q
C21	22-171	.05 MFD	600V.	R14	63-680	10 M OHM	1 W.	16	85-156	MOTOR CONTROL SWITCH				ARE MOUNTED ON
C22	22-455	01 MFD	200K	R15	63-655	220 M OHM	¼ W.	17	95-442	POWER CHOKE				STRIP #22-982
C23	22-569	12 MFD ELECTROLYTIC	450V	R16	63-582	2200 OHM	¼ W.	18	95-533	POWER TRANS. 50-60~, 117 V				
C24	22-727	10 MFD "	450 V	R17	63-657	330 M OHM.	¼ W	19	100-36	PILOT LIGHT 6.3V. .25A				
C25		10 MFD "	450 V.	R18	63-647	39 M OHM	¼ W.	20	MI-51	MOTOR				
C26	22 992	.02 MFD	600V	R19	63-577	100 OHM	¼ W.	21	S8111	LOOP LOADING COIL ASSEM.				
C27	22-944	COMPENSATING COND.		R20	63-618	22 OHM	¼ W.							

MODEL	SPEAKER
15S479	49-374 15"
15S495	49-375 15"

I.F. FREQUENCY 455 KC.

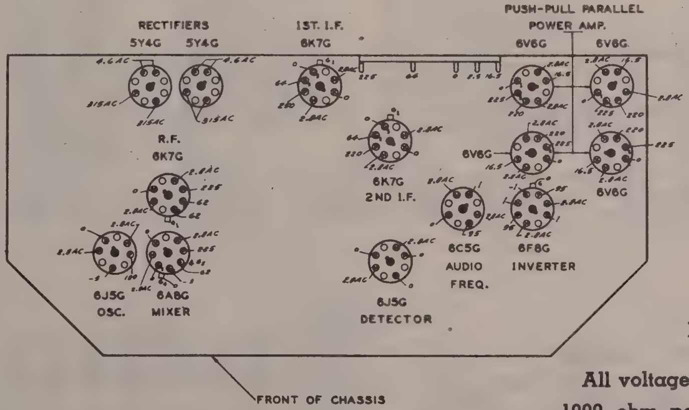
15 TUBE SUPERHETERODYNE
CHASSIS Nº 1503 A.C. 3 BAND

FOR OTHER DATA
SEE INDEX

CHASSIS 1503
CHASSIS 5679
Voltage,Socket
Trimmers

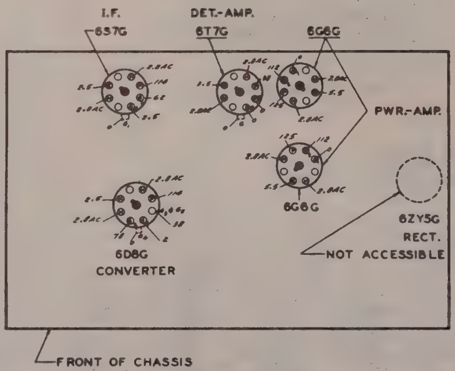
ZENITH RADIO CORP.

CHASSIS No. 1503



Socket Voltages

CHASSIS No. 5679



Socket Voltages

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

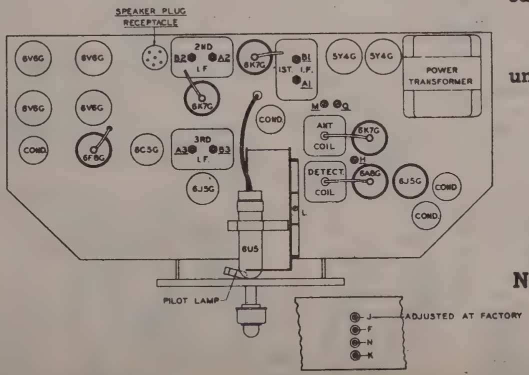
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

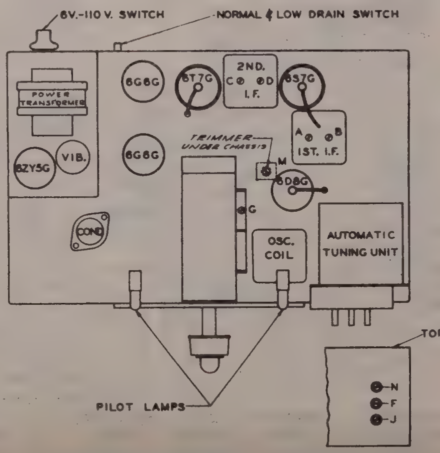
Line voltage 112 A.C.

Model 5679 Only

Battery conserver switch in NORMAL position.



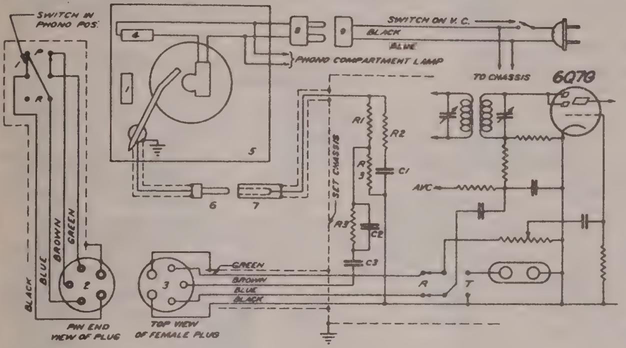
Location of Tubes and Trimmers



Location of Tubes and Trimmers

ZENITH RADIO CORP.

MODELS 10S491,10S492
Chassis 1007
MODEL 12S494,Ch.1208
MODEL 15S495,Ch.1504
Phono.Circuit Schematics

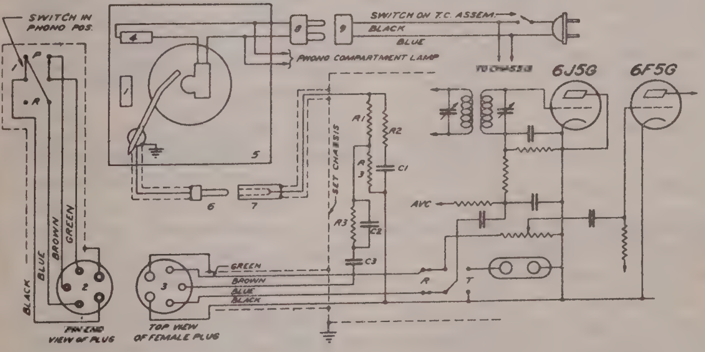


DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-319	.005 MFD.	200V.
C2	22-954	.00035 MFD.	600V.
C3	22-887	.001 MFD.	600V.
R1	63-719	470 M OHM	½W.
R2	63-649	56 M OHM	½W.
R3	63-271	1 MEGOHM	½W.
1 2	S7224	PHONO SW. & WIRE ASSEMBLY	
3	S8070	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH ®M-93 PLUG	
7	S8069	RECEPTACLE & WIRE ASSEM.	
8		CINCH ®M-21 PLUG WITH P-7002 CAP & LINER	
9	S8068	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA

MODEL	SPEAKER
10S491	49-356 15"
10S492	49-352 12"

CHASSIS Nº1007

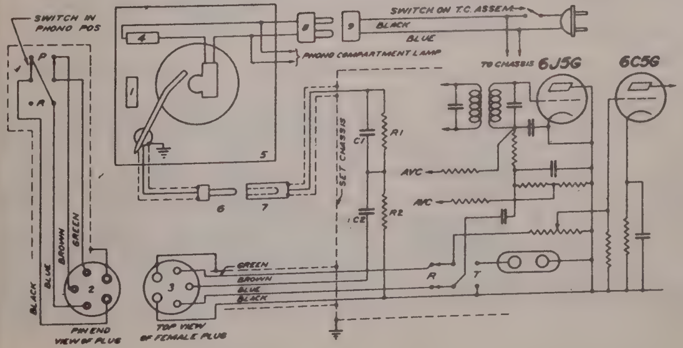


DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-319	.005 MFD.	200V.
C2	22-954	.00035 MFD.	600V.
C3	22-887	.001 MFD.	600V.
R1	63-719	470 M OHM	½W.
R2	63-649	56 M OHM	½W.
R3	63-271	1 MEGOHM	½W.
1 2	S7224	PHONO SW. & WIRE ASSEMBLY	
3	S8094	PLUG & WIRE ASSEMBLY	
4	85-191	AC SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH ®M-93 PLUG	
7	S8093	RECEPTACLE & WIRE ASSEM.	
8		CINCH ®M-21 PLUG WITH P-7002 CAP & LINER	
9	S8092	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA

MODEL	SPEAKER
12S494	49-355 15"

CHASSIS Nº1208



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-182	.00025 MFD.	600V.
C2	22-887	.001 MFD.	600V.
R1	63-597	470 M OHM	½W.
R2	63-649	56 M OHM	½W.
1 2	S7224	PHONO SW. & WIRE ASSEMBLY	
3	S8108	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH ®M-93 PLUG	
7	S8107	RECEPTACLE & WIRE ASSEM	
8		CINCH ®M-21 PLUG WITH P-7002 CAP & LINER	
9	S8106	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA

MODEL	SPEAKER
15S495	49-375 15"

CHASSIS Nº1504

MODELS See Below
Alignment,Trimmers,Socket

ZENITH RADIO CORP.

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	16000 Kc.	M	Alignment of Antenna
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	N	Set Oscillator to Scale
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	1400 Kc.	F	Set Oscillator to Scale
7	Loop Switch in Wave Magnet Position		1400 Kc.	Broadcast	1400 Kc.	G (On Loop)	Alignment of Antenna

Chassis 1005, 1103, 5808

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Loop Switch	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	....	600 Kc.	SEE *BELOW A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	Ant.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	Ant.	16000 Kc.	L-M	Alignment of Det.—Rock Gang & Adjust for Max.
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	Ant.	4500 Kc.	N	Rock Gang & Adjust for Max. Output
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	Ant.	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave Magnet	1400 Kc.	F	Set Oscillator to Scale
7	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	H	Alignment of R. F.
8	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	G (On Loop)	Alignment of Loop
9			Chassis 1207, 1503				J Adjusted at Factory	*1503 TRIMMERS: A1,B1;A2,B2;A3,B3

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 mfd.	455	Br'dc't	600	A B C D	I. F. Alignment
2	Rec. Ant. Wire	400 ohms	18000	S. W.	18000	K	Set. Osc. to Scale
3	" " "	400 ohms	16000	S. W.	16000	L	Rock gang & adj. for max. output Alignment of Ant.
4	" " "	400 ohms	6000	Police	6000	N	Rock gang & adj. for max. output
5	" " "	200 mmf.	1400	Br'dc't	1400	F	Rock gang & adj. for max. output
6	" " "	200 mmf.	600	"	600	J	Rock gang & adj. for max. output
7	" " "	200 mmf.		"		Repeat F & J	Chassis 5539

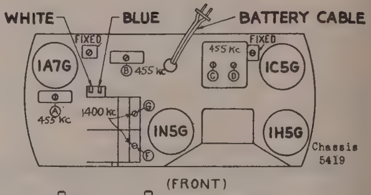
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6D8 R. F. Grid	0.5 Mfd.	455 Kc.	I. F.	600 Kc.	A, B, C, D	I. F. Alignment
2	Rec. Ant. Post	200 Mfd.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Rec. Ant. Post	200 Mfd.	1500 Kc.	Broadcast	1500 Kc.	G	Alignment of Antenna
4	Rec. Ant. Post	200 Mfd.	600 Kc.	Broadcast	600 Kc.	J	Rock Gang and Adjust for Max. Output
5	Rec. Ant. Post	200 Mfd.		Broadcast		F, G	Repeat 2 and 3
6	Rec. Ant. Post	400 Ohms	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
7	Rec. Ant. Post	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max. Output
8	Rec. Ant. Post	400 Ohms	6000 Kc.	Police	6000 Kc.	N	Rock Gang and Adjust for Max. Output

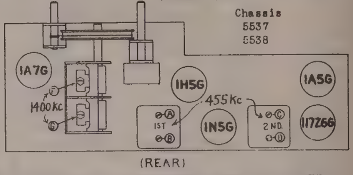
Chassis 5679

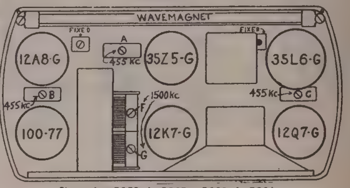
Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	5 mfd.	455	B'dcast	600	A B C D	I. F.
2	Single *x Turn Coil	—	1500	"	1500	F	Set Osc. to Scale
3	" "	—	1500	"	1500	On Wave Magnet	Alignment of Wave Magnet
4	Rec. Ant. Post **	400 ohms	18000	S.W.#2	18000	K	Set Osc. to Scale
5	"	"	16000	"	16000	L	Rock gang & adj. for max. output
6	"	"	4500	S.W. #1	4500	N	"

* Loosely coupled to Wave Magnet
x Switch in Wave Magnet Position
** Switch in Antenna Position

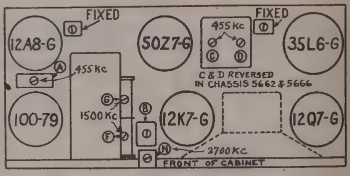
CHASSIS 5719, 5721, 5810.







Chassis 5659 & 5663, 5660 & 5664



Chassis 5661 & 5665, 5662 & 5666

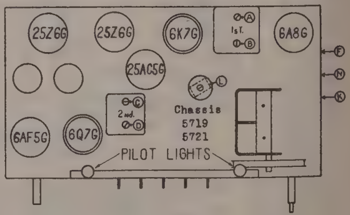
ALIGNMENT PROCEDURE

Chassis 5419, 5537, 5538
5659 & 5663, 5660 & 5664
5661 & 5665, 5662 & 5666

Set dial at 600 kc; connect 0.5-mf dummy to 1st det. grid and align I.F. at 455 kc.

Connect test oscillator to single-turn loop loosely coupled to Wave Magnet.

Set receiver dial to aligning frequency and adjust trimmers to maximum as follows:
(1) Osc. trimmer F
(2) Ant. trimmer G
(3) S-W trimmer N



ZENITH RADIO CORP.

CHASSIS 1005,1103,1207,1503
5539,5660,5664,5662,5666
5672P,5678,5679,5719,5721
5724,5725,5808 Tuner

AUTOMATIC TUNING ADJUSTMENTS

GENERAL:

Each button and its associated tuning adjustment will tune over a portion of the broadcast band, and any station within its tuning range may be selected for automatic tuning on that button.

To adjust the automatic tuning proceed as follows:

PRELIMINARY OPERATIONS:

TUNING RANGES of BUTTONS:

or Chassis 1005, 1103, 5679, 5808:

Remove the automatic cover plate by pressing the catch pin on the inner side and lifting away from the escutcheon.

Place sensitivity switch in LOCAL position.

Select a station within the range of the No. 1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial - then turn band switch to Automatic position.

No. 1 button—upper left	545 K.C. to 940 K.C.
No. 2 button—upper center	600 K.C. to 1050 K.C.
No. 3 button—upper right	660 K.C. to 1150 K.C.
No. 4 button—lower left	740 K.C. to 1300 K.C.
No. 5 button—lower center	880 K.C. to 1550 K.C.
No. 6 button—lower right	880 K.C. to 1550 K.C.

or Chassis 1207, 1503:

Remove the automatic cover plate by pressing on latch pin and lifting away from escutcheon.

Select a station within the range of the No. 1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial - return band switch to Automatic position.

No. 1 button	545 K.C. to 850 K.C.
No. 2 "	620 K.C. to 970 K.C.
No. 3 "	620 K.C. to 970 K.C.
No. 4 button	680 K.C. to 1090 K.C.
No. 5 "	790 K. C. to 1290 K.C.
No. 6 "	790 K.C. to 1290 K.C.
No. 7 button	980 K.C. to 1550 K.C.
No. 8 "	980 K.C. to 1550 K.C.

or Chassis 5539, 5678, 5719, 5721, 5724, 5725:

Remove the automatic cover plate by gently lifting it under one end.

Select a station within the range of the No. 1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial.

No. 1 or left hand button	545 K.C. to 930 K.C.
No. 2 or second button	600 K.C. to 1050 K.C.
No. 3 or third button	650 K.C. to 1200 K.C.
No. 4 or fourth button	750 K.C. to 1370 K.C.
No. 5 or right hand button	900 K.C. to 1550 K.C.

or Chassis 5660 & 5664, 5662 & 5666, 5672-P:

Remove the automatic cover plate by gently lifting it under one end.

Select a station within the range of the top or No. 1 button. See list of frequency ranges at right.

Press the lowest or "Dial" button, and then tune in the selected station on the dial.

1 or top button	545 K.C. to 1040 K.C.
2 or second button	620 K.C. to 1170 K.C.
3 or third button	720 K.C. to 1370 K.C.
4 or fourth button	850 K.C. to 1550 K.C.
5 or bottom button	Dial or manual tuning.

DJUSTMENT PROCEDURE - ALL Chassis:

Press the No. 1 button and tune in the same station on the adjacent automatic adjustments by using the special wrench furnished with the receiver. First, adjust the screw and then the hexagonal nut to the setting which gives the loudest and clearest reception on the desired station (See Fig. 2). Repeat the operation for greatest accuracy.

Select and remove the call letters of the station selected from call letter sheets in this booklet. Moisten the rear surface and place in position on the automatic cover plate opposite the corresponding button.
Follow the above procedure in setting remaining buttons, always selecting a station within the range of the button being set.

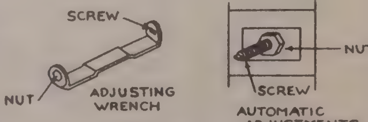


Fig. 2

ZENITH RADIO CORP.

SERVICE NOTES

GENERAL:

Noisy when jarred — orange resistor on loop loading coil grounding against chassis.

Broken or loose leads in 6U5 socket.

Black wire on S.W. antenna coil not grounded properly to aeroplane terminal.

Noisy wavemagnet—rubber insulation of loop lead touching trimmer lug, antenna terminal, or other end of loop winding. Noise will be most noticeable at higher frequencies.

Poor connection to loop shields.

CHASSIS 5808 — 1005 — 1103

Oscillates at 550 K.C.—improper adjustment of wave trap—too high resistance in plate circuit of 1232 tube.

Automatic dead or antenna trimmer won't peak—usually due to open winding on compensating coil.

Noisy tuning—Ground braid of gang rubbing against flywheel—Burrs on drive shaft shorting to volume control shaft.

Dial pulley rubbing against dial or chassis.

Tuning Indicator inoperative—resistor inside socket shorting to socket prong—loose lead in socket—cathode lug on voltage divider grounded by solder.

Set blocks—usually due to broken resistor in A.V.C. circuit of first detector.

CHASSIS 5724 — 5725

- Noisy tuning on automatic.
  - Poor contact in speaker socket.
  - Washer on latch bar grounding lug.
  - Poor contact on band switch.
  - Aeroplane lug on automatic grounding to No. 5 push rod.
  - Automatic trimmer shorting.
- Signal cuts out above 1400 K.C.
  - 5 megacycle trimmer screwed in too tight.
- Signal cuts out on local—distance switch.
  - Defective 6A8 tube.
- No change on treble button.
  - Insulation of blue tone control lead cut by fastening lug.
- Weak audio.
  - Poor contact in television switch.
  - Open coupling condenser.
- Oscillates.
  - Open screen bypass.
  - Grid lead of 6K7 near A.V.C. lug or near plate lead of 6A8.
  - Wave trap open or not properly adjusted.

PHONO MODELS

Insensitivity—check phono switch and plug contacts.

Weak phono—check shield on lead from crystal for poor ground.

1205 — 1503 CHASSIS

Improper action of volume control is usually caused by 6J5G in audio stage.

Poor radiorgan action is often caused by defective 6F8G in audio.

In many cases a ground lead may be eliminated by connecting the ground terminal on the wavemagnet to the chassis base.

The operation of the bass radiorgan button in chassis 5719-5721 can often be improved by connecting a 1 megohm resistor from the high side of the volume control to the tap on same.

Noisy operation of the automatic tuning may be caused by the leads to the automatic assembly or coil leads laying against the metal frame of the assembly.

Excessive oscillation in Model 4K401 will be caused by the 1A7 tube which should be replaced.

Motorboating in Model 4K401 will be due to a poor ground connection on the electrolytic condenser at the rivet which fastens it to the chassis.

Care should be taken that the leads from the tone control condenser and switch in all six tube bakelite models be kept away from the 6Q7 tube, otherwise the tone will be affected.

Excessive hum in AC-DC or voltage doubler chassis can be corrected by reversing the power plug in the light socket.

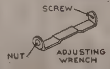
Cutting out in the portable receivers will usually be due to poor connections at the battery pack plug. Slight bending of the prongs will correct this condition.

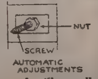
Excessive regeneration in 5659 chassis may be corrected in most cases by moving the 12A8G grid lead away from the oscillator section of the gang condenser.

AUTOMATIC RANGES

Button No. 1 tunes from 550 K.C. to 950 K.C.
" 2 " " 600 K.C. " 1100 "
" 3 " " 650 K.C. " 1200 "
" 4 " " 730 K.C. " 1390 "
" 5 " " 900 K.C. " 1550 "

The use of a wavemagnet requires two adjustments for each automatic button. These adjustments are made with a special wrench (part No. 68-1) supplied with each receiver. The center or screw adjustment controls the oscillator circuit and the nut tunes the wavemagnet or antenna input — see illustration at right.





The minimum tuning range covered by each pair of adjustments is shown above and will usually exceed the frequencies shown.

The adjustments covering the highest frequency range is in all cases either at the bottom when the buttons are vertical or closest to the band switch when the buttons are arranged horizontally.

ALIGNMENT

ZENITH 6MN495
ZENITH 6MN496

NASH SPECIAL AC 4389
NASH DELUXE AC 4289

We would suggest that the service man procure a ⅜" box wrench (small size) for removing the cap screws from the grille of the car.

I.F. — The volume control is placed in the maximum position, and the tone control in the brilliant position for all the following adjustments:

A weak signal at 455 K.C. is fed directly into the grid cap of the 6K7GT R.F. tube through a .1 mfd condenser. The wave trap trimmer, E, (see Fig. 1 and 2) is adjusted for maximum response. The I.F. trimmers are then adjusted in the following order A, B, C and D, for greatest output. The signal level is then increased double or more and the wave trap trimmer, E, see Fig. 1 and 2, is adjusted to minimum response on the output meter.

IMPORTANT — Unless certain dummy antenna capacities are employed with either the signal generator, or in making the adjustments on stations, a receiver will not respond properly. The capacities provided in the Zenith dummy antenna part No. S7694 shown in Fig. 3 are identical with the conditions found in the Nash car, and if adjusted accordingly, the instrument will operate properly when reinstalled in the automobile.

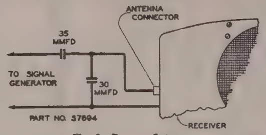


Fig. 3. Dummy Antenna

R. F. — The tuning condenser is rotated until the plates are completely out of mesh (1580 K.C.) Set the signal generator to 1580 K.C. Remove the generator leads from the R.F. tube, remove the .1 mfd. condenser from the leads, and connect the leads to a Zenith dummy antenna, part No. S-7694 to the antenna socket on the receiver. The high frequency oscillator trimmer F (See Fig. 4) is then peaked for maximum response on the output meter. Reset the signal generator to 1400 K.C., rotate the tuning control until a signal is heard, and adjust the 1400 antenna trimmer G (Fig. 4) for maximum response.

Reset the signal generator to 600 K.C. and rotate the tuning control until a signal is heard. The condenser gang is then rocked slightly when adjusting the 600 K.C. oscillator padder H (see Fig. 4) to maximum resonance on the output meter.

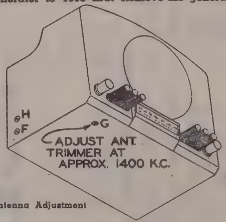


Fig. 4. Antenna Adjustment

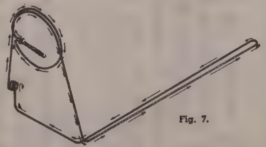


Fig. 7.

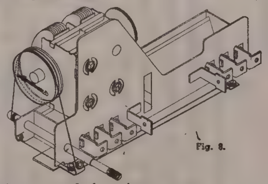


Fig. 8.

Figures 7 and 8 show how the dial cable is strung on both receivers.

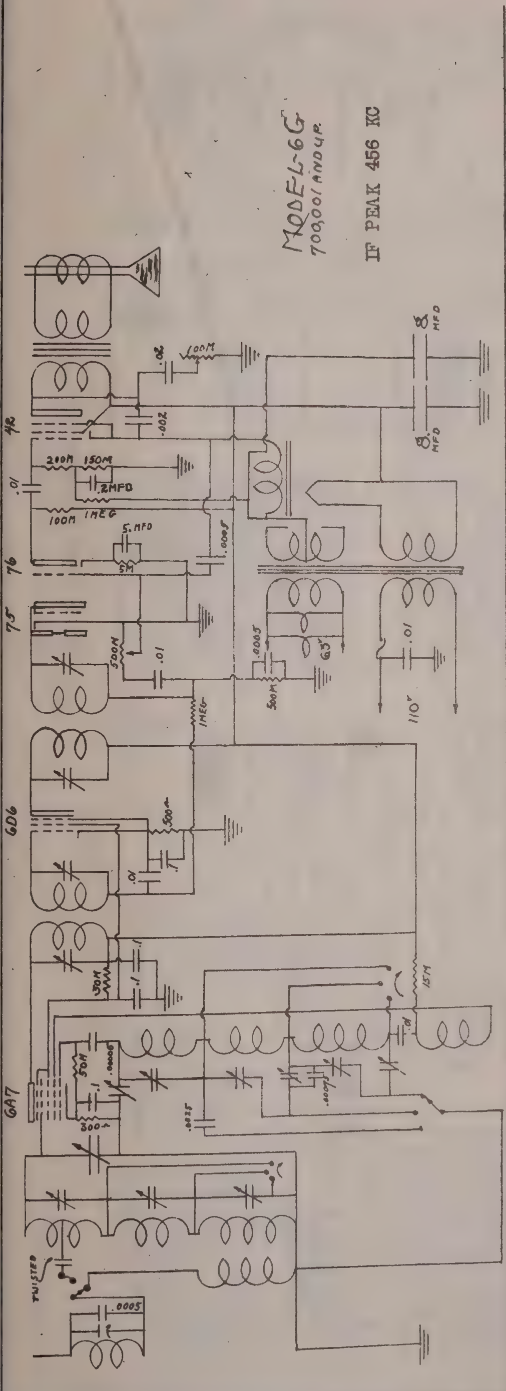
AUTOMATIC TUNING — The automatic tuning mechanism, being entirely mechanical and extremely simple in construction, will require no attention except the original adjustments for the desired stations. It consists of push rods which operate a cam and gear assembly which rotates the tuning condenser to any prearranged position. Each automatic button or push rod may be set for any station in the tuning range of the receiver.

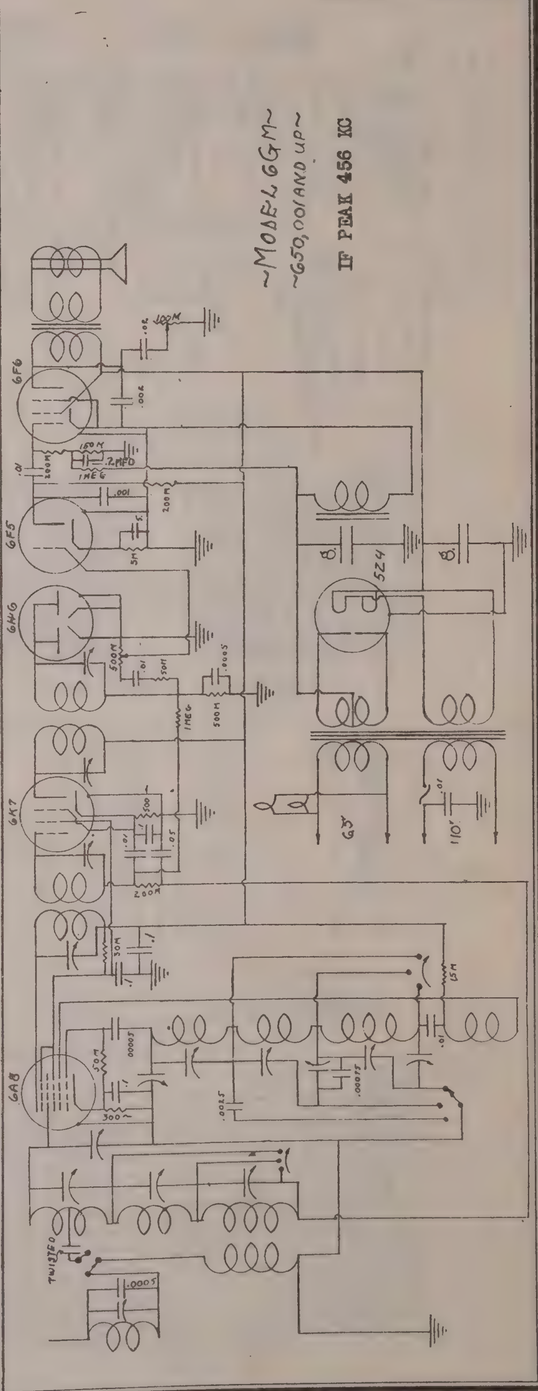
To set the automatic buttons, first select six desired stations. Unscrew the left hand automatic button one-half turn and press all the way in. While holding the button in this position, manually tune in the selected station of lowest frequency. Then release the button and tighten. This button will then automatically tune this station whenever it is pushed in.

The same procedure should be followed on the five remaining buttons and stations. The station which has been tuned automatically will be indicated by the dial pointer.

ZEPHYR RADIO CO.

MODEL 6G
MODEL 6GM
Schematics





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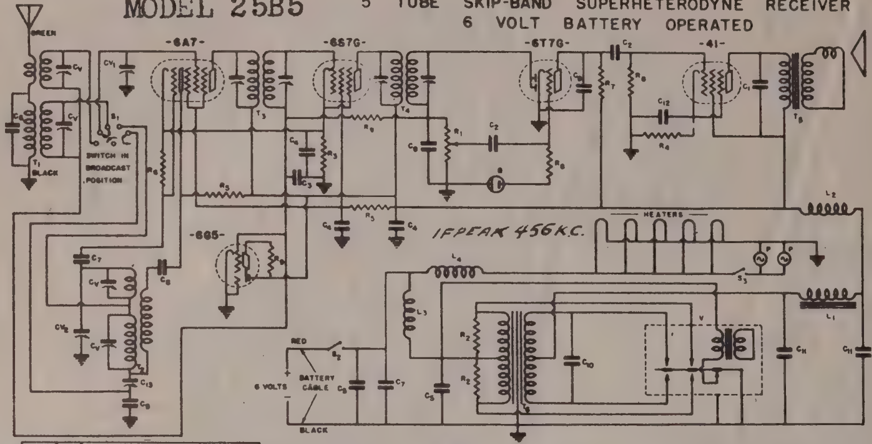
MODEL 25B5
Schematic
MODEL 43X5
Schematic,Socket

ZEPHYR RADIO CO.

MODEL 25B5

5 TUBE SKIP-BAND SUPERHETERODYNE RECEIVER
6 VOLT BATTERY OPERATED



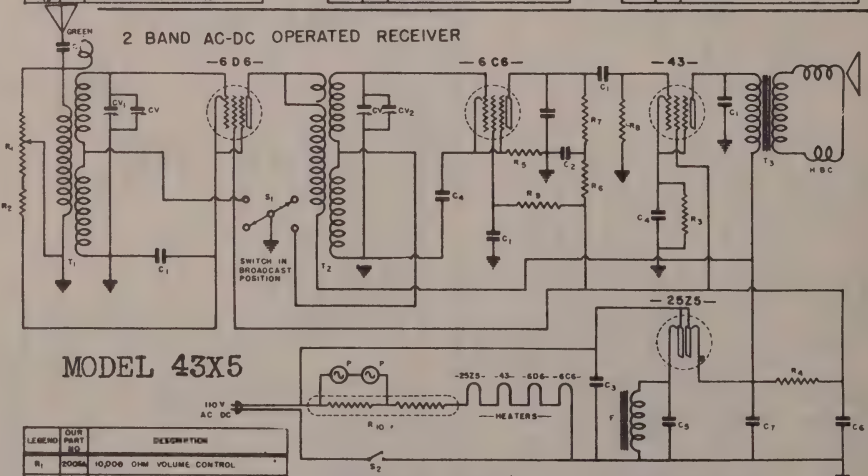
LEGEND	OUR PART NO.	DESCRIPTION
C_1	218	.002 MFD. 600 V. TUBULAR CONDENSER
C_2	211	.01 MFD. 400 V. TUBULAR CONDENSER
C_3	203	.1 MFD. 200 V. TUBULAR CONDENSER
C_4	204	25 MFD. 200 V TUBULAR CONDENSER
C_5	217	8 MFD 100 V. TUBULAR CONDENSER
C_6	412	50 MMFD MICA CONDENSER
C_7	400	100 MMFD MICA CONDENSER
C_8	401	250 MMFD MICA CONDENSER
C_9	411	0018 MFD. MICA CONDENSER
C_{10}	219	.01 MFD. 1000 W.V. OIL FILLED BUFFER COND
C_{11}	324	9 MFD. 250 W.V. WET ELECTROLYTIC COND.
C_{12}	304	10 MFD. 35 W.V. WET ELECTROLYTIC COND
C_{13}	507	5 PLATE PADDING CONDENSER

CV_{1-2}	612-A	2 GANG VARIABLE CONDENSER
C_V	900	5-30 MMFD. TRIMMER CONDENSER.
T_1	1228	SKIP-BAND ANTENNA COIL
T_2	1412	SKIP-BAND OSCILLATOR COIL
T_3	1503	INPUT I.F. TRANSFORMER
T_4	1507	DIODE I.F. TRANSFORMER
T_5	IN 813	5" P.M. DYNAMIC SPEAKER TRANSFORMER
T_6	1018	VIBRATOR TRANSFORMER
S_1	1920	BAND SELECTOR SWITCH
S_2	—	LINE SWITCH ON VOLUME CONTROL
S_3	—	PILOT LIGHT SPRING SWITCH
P	2901	MAZDA #40 PILOT LIGHTS
V	2801	PLUG IN VIBRATOR
B	3000	BIAS CELL

R_1	[illegible]	300,000 OHM VOLUME CONTROL
R_2	148	100 OHM ½ WATT CARBON RESISTOR
R_3	101	150 OHM ½ WATT CARBON RESISTOR
R_4	104	600 OHM ½ WATT CARBON RESISTOR
R_5	109	10,000 OHM ½ WATT CARBON RESISTOR
R_6	113	50,000 OHM ½ WATT CARBON RESISTOR
R_7	116	250,000 OHM ½ WATT CARBON RESISTOR
R_8	117	500 000 OHM ½ WATT CARBON RESISTOR
R_9	119	1 MEGOHM ½ WATT CARBON RESISTOR
L_1	1100	FILTER CHOKE
L_2	1618	R.F. "B" CHOKE
L_3	1619	R.F. "A" CHOKE
L_4	1620	R.F. "A" CHOKE

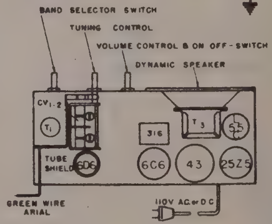
MODEL 43X5

2 BAND AC-DC OPERATED RECEIVER



LEGEND	OUR PART NO	DESCRIPTION
R_1	2006A	10,000 OHM VOLUME CONTROL
R_2	IN 2006A	275 OHM (Minimum on Volume Control)
R_3	104	600 OHM ½ WATT CARBON RESISTOR
R_4	108	5000 OHM ½ WATT CARBON RESISTOR
R_5	111	25,000 OHM ½ WATT CARBON RESISTOR
R_6	142	51,000 OHM ½ WATT CARBON RESISTOR
R_7	116	250,000 OHM ½ WATT CARBON RESISTOR
R_8	117	500,000 OHM ½ WATT CARBON RESISTOR
R_9	120	3 MEGOHM ½ WATT CARBON RESISTOR
R_{10}	2904	L-55-C BALLAST TUBE
T_1	1224	ANTENNA COIL
T_2	1316	INTERSTAGE COIL
T_3	IN 808	OUTPUT TRANSFORMER

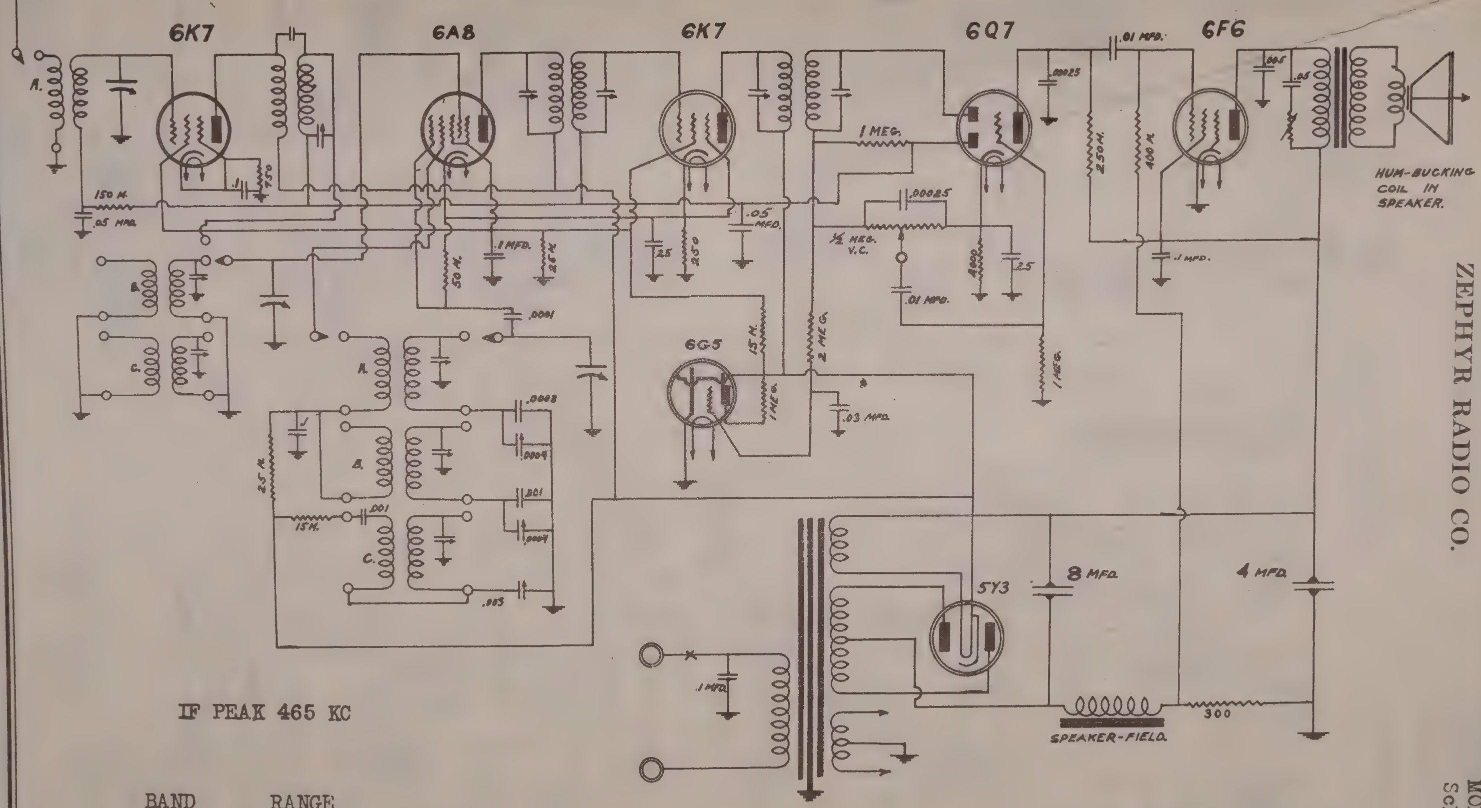
F	IN 808	SPEAKER FIELD (2500 OHMS)
C_1	211	.01 MFD 400 V TUBULAR CONDENSER
C_2	216	.018 MFD 400 V TUBULAR CONDENSER
C_3	210	1 MFD 400 V TUBULAR CONDENSER
C_4	IN 316	5 MFD. 35 V ELECTROLYTIC COND
C_5	IN 316	4 MFD 200 V ELECTROLYTIC COND
C_6	IN 316	8 MFD 200 V ELECTROLYTIC COND
C_7	IN 316	14 MFD 200V ELECTROLYTIC COND
S_1	1919	BAND SWITCH
CV_{1-2}	615	2 GANG VARIABLE CONDENSER
S_2	IN 2006A	SWITCH ON VOLUME CONTROL
P	2921	MAZDA #44 PILOT LIGHTS



MODEL 32Y6
Schematic

MODEL 32Y6

6 Tube All - Wave
with tuning indicator.



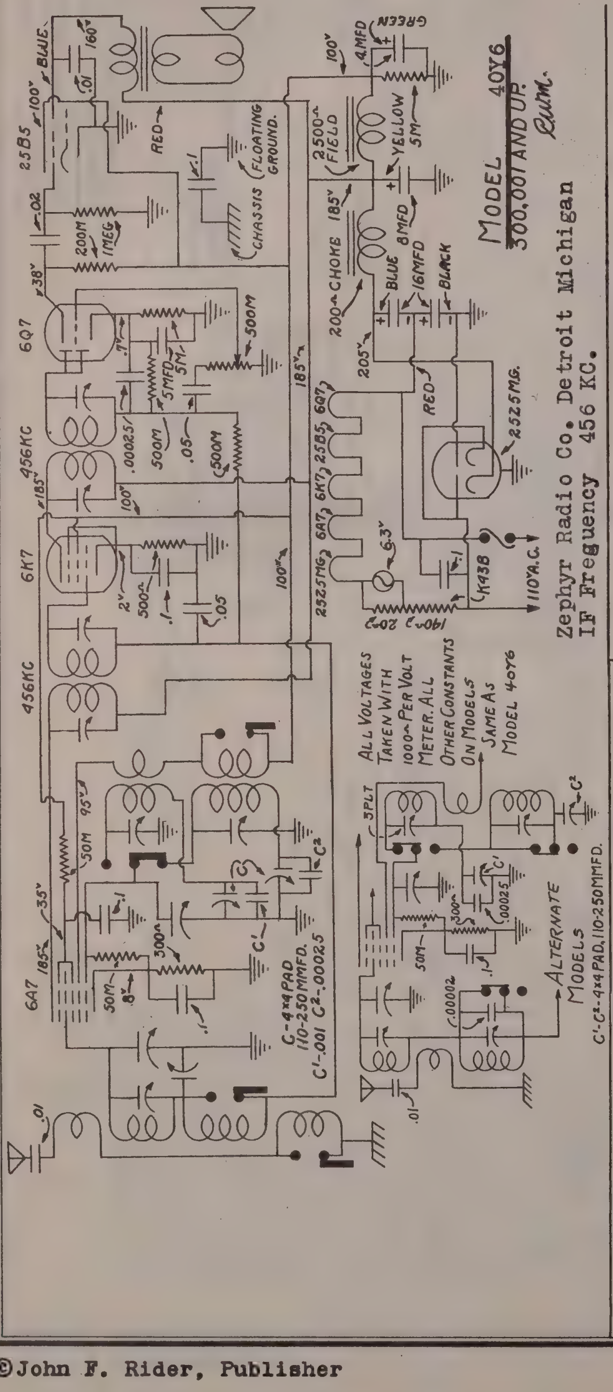
IF PEAK 465 KC

BAND	RANGE
A	540 - 1740 KC
B	1750 - 5800 KC
C	5.8 - 18.0 MC

3-BAND -AC ~ 7-TUBES
ENGINEERING — DEPARTMENT.
dr. by | App. by. LWG | 1937 -60-

MODELS 35X5,36X5
MODEL 40X4
Schematics,Socket
MODEL 40Y6
Schematic,Voltage

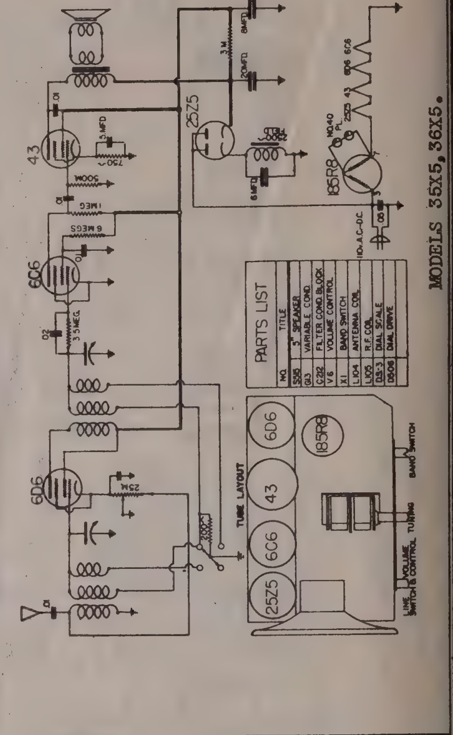
ZEPHYR RADIO CO.



MODEL 40Y6
300,001 AND UP.

Zephyr Radio Co. Detroit Michigan
IF Frequency 456 KC.

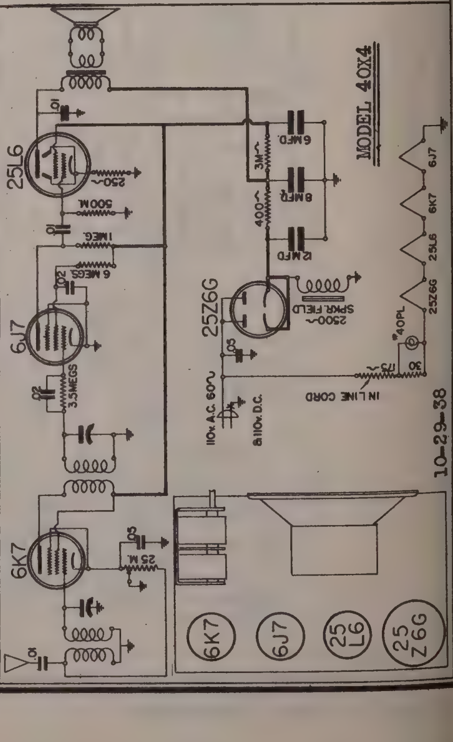
ALL VOLTAGES TAKEN WITH 1000~ PER VOLT METER. ALL OTHER CONSTANTS ON MODELS SAME AS MODEL 40Y6



PARTS LIST

NO.	TITLE
535	5" SPEAKER
613	VARIABLE COND.
G232	FILTER COND. BLOCK
V6	VOLUME CONTROL
X1	BAND SWITCH
L104	ANTENNA COIL
L105	R.F. COIL
D3-3	DIAL SCALE
D606	DIAL DRIVE

MODELS 35X5, 36X5.



MODEL 40X4

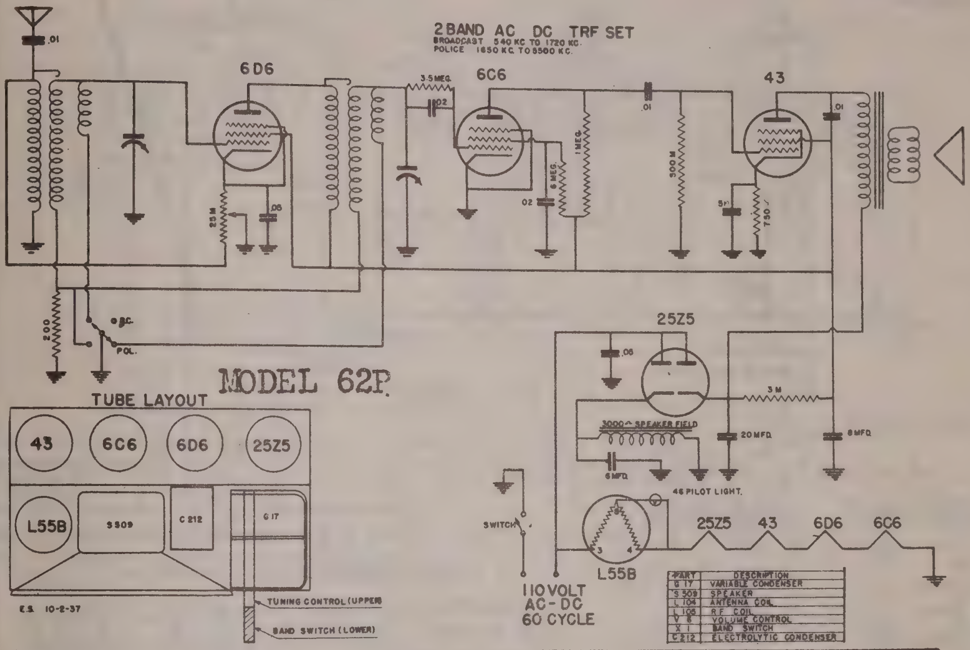
10-29-38

ZEPHYR RADIO CO.

MODEL 62P
MODEL 62X8
Schematics,Socket

2 BAND AC DC TRF SET

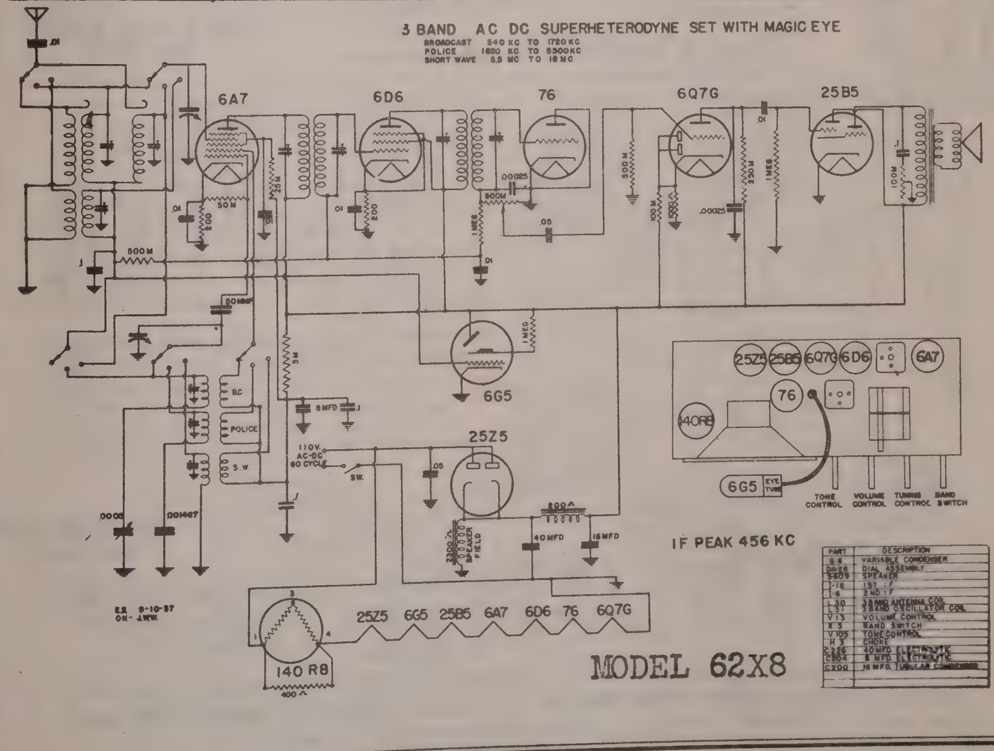
BROADCAST 540 KC TO 1720 KC.
POLICE 1650 KC TO 5500 KC.



PART	DESCRIPTION
G 17	VARIABLE CONDENSER
S 509	SPEAKER
L 104	ANTENNA COIL
L 105	R F COIL
V 6	VOLUME CONTROL
X 1	BAND SWITCH
C 212	ELECTROLYTIC CONDENSER

3 BAND AC DC SUPERHETERODYNE SET WITH MAGIC EYE

BROADCAST 540 KC TO 1720 KC
POLICE 1650 KC TO 5500 KC
SHORT WAVE 5.8 MC TO 18 MC



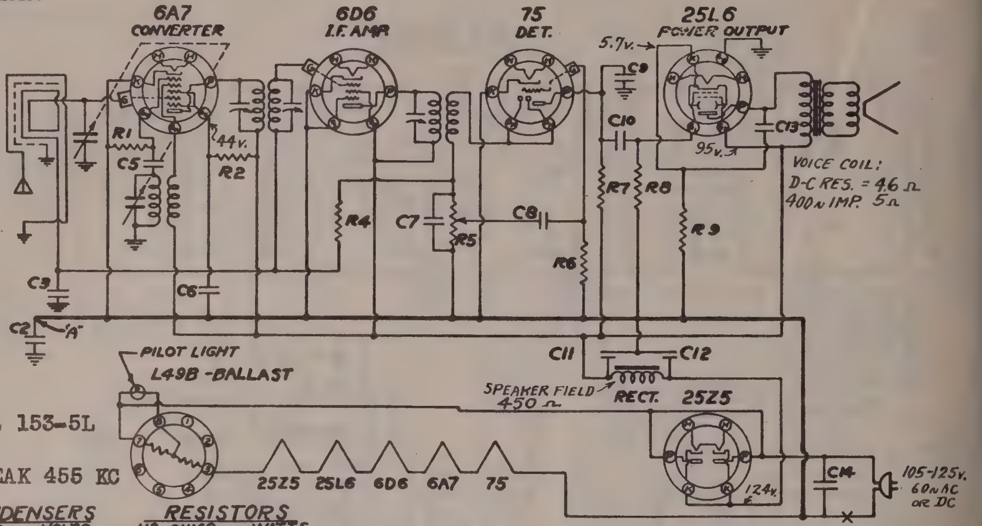
IF PEAK 456 KC

PART	DESCRIPTION
G 6	VARIABLE CONDENSER
DA-26	DIAL ASSEMBLY
S 509	SPEAKER
I-10	1ST I F
I-6	2ND I F
L 30	3 BAND ANTENNA COIL
L 31	3 BAND OSCILLATOR COIL
V 13	VOLUME CONTROL
X 5	BAND SWITCH
V 105	TONE CONTROL
H 3	CHOKE
C 226	40 MFD ELECTROLYTIC
C 204	8 MFD ELECTROLYTIC
C 200	16 MFD TUBULAR CONDENSER

MODEL 62X8

MODEL 153-5L
MODEL 352-5R
Schematics, Voltage
Alignment

ZEPHYR RADIO CO.



MODEL 153-5L

IF PEAK 455 KC

CONDENSERS		
Nº	MFD.	VOLTS
C2	.25	200
C3	.02	400
C5	.00005	MICA
C6	05	400
C7	.00025	MICA
C8	.01	400
C9	.00025	MICA
C10	.01	400
C11	20.	150
C12	20.	
C13	.005	600
C14	.05	400

RESISTORS		
Nº	OHMS	WATTS
R1	50000	½
R2	30000	½
R4	2,000,000	½
R5	500,000	VOL CONT
R6	5,000,000	½
R7	250,000	½
R8	500,000	½
R9	150	½ ±10%

⏚ IND. CHASSIS GND.

NOTE: C2 USED ON MODEL 5LL ONLY.
ON MODEL 5L POINT "A" IS CONNECTED TO CHASSIS

VOLTAGES: Line 115 v. AC; meter 1000 ohms per volt.

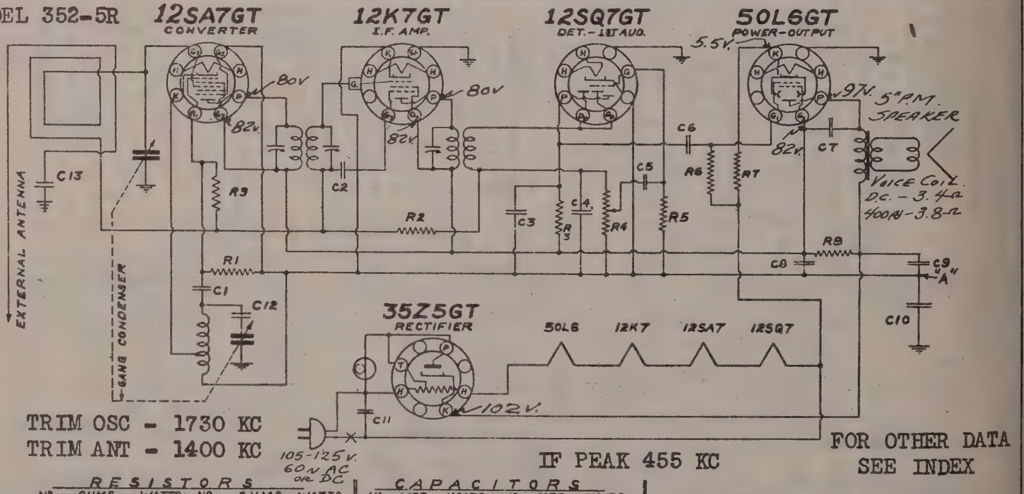
POWER CONSUMPTION: 44 watts.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

FOR SOCKET LAYOUT
SEE INDEX

MODEL 352-5R



TRIM OSC - 1730 KC
TRIM ANT - 1400 KC

IF PEAK 455 KC

FOR OTHER DATA
SEE INDEX

RESISTORS					
Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150 ± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS					
Nº	MFD.	VOLTS	Nº	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

C10 and C14 used in model 5RL only   On model 5R point "A" is connected to ground.

Voltages: From point indicated to "A"; line 115 v. AC; meter 1000 ohms per volt - 150-volt scale. Power consumption: 30 watts.

ODELS 666-6J-669-6J inc.
ODELS 696-6M,697-6M
ocket,Trimmers

ZEPHYR RADIO CO.

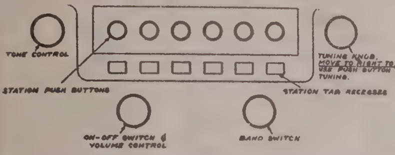
MODEL 381-7H
MODEL 605-7C
Tuner,Socket,Trimmers
MODEL 153-5L

PROCEDURE FOR SETTING UP PUSH BUTTONS

FOR MODELS 381 - 7H and 605 - 7C

There are six push buttons by means of which six stations may be selected (See Fig. 1). Make a list of six stations tuned in regularly. Push the tuning knob to the right until it clicks, this throws it out of engagement with the dial drum, thus when the push buttons are used the tuning knob does not turn. (A slight turn of the knob will automatically throw it back into engagement with the dial drum for manual tuning.)

Fig. 1—Front View


TONE CONTROL
STATION PUSH BUTTONS
TUNING KNOB. MOVE TO RIGHT TO USE PUSH BUTTON TUNING.
STATION TAB RECESSES
ON-OFF SWITCH & VOLUME CONTROL
BAND SWITCH

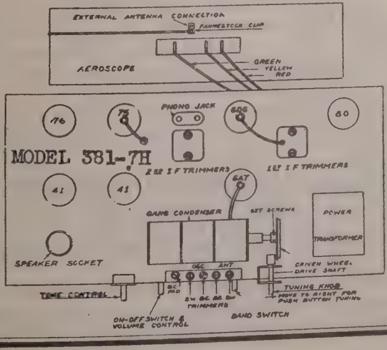
Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector wheel. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

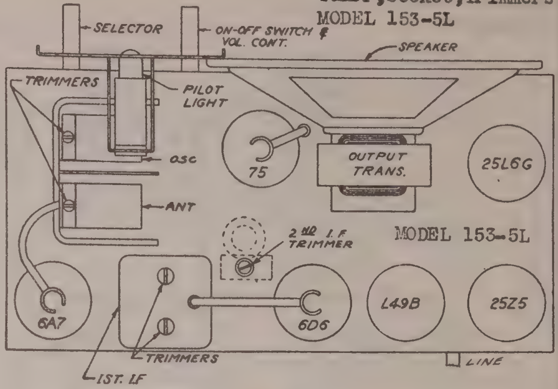
Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

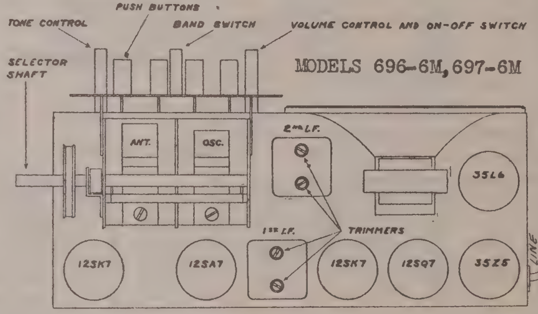
If it is desired to change a button to a different station simply loosen the push button and re-set.

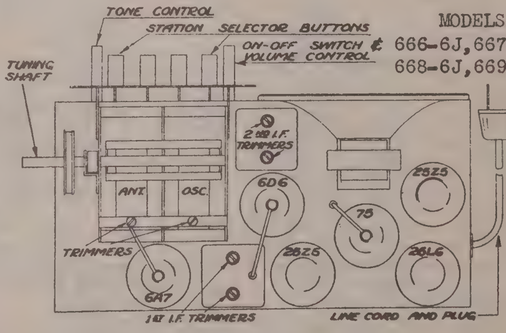
Punch the correct station call letter tabs from the set of sheets supplied and insert them into the recesses under the push buttons.

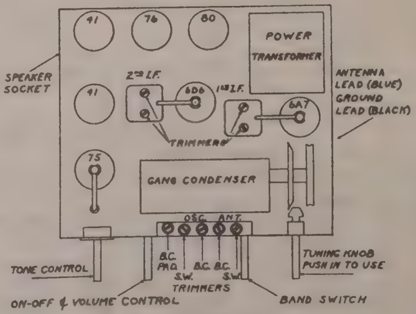
The dial is now set up for quick tuning and all that is necessary is to push the tuning knob to the right until it clicks and then push the button above the desired station all the way in and then release.


MODEL 381-7H


MODEL 153-5L

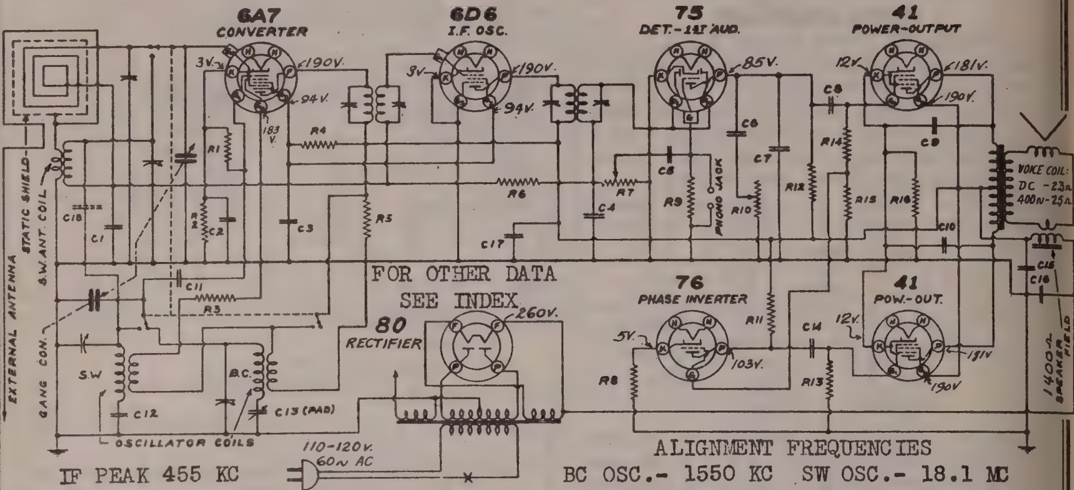

MODELS 696-6M,697-6M


MODELS 666-6J,667-6J
668-6J,669-6J


MODEL 605-7C

MODEL 381-7H
MODEL 605-7C
Schematics, Voltage
Alignment

ZEPHYR RADIO CO.



FOR OTHER DATA
SEE INDEX

IF PEAK 455 KC

SWITCHES SHOWN IN BROADCAST POSITION

BOTTOM VIEW OF SOCKETS SHOWN.

MODEL 381-7H

ALIGNMENT FREQUENCIES
BC OSC.- 1550 KC SW OSC.- 18.1 MC
BC ANT.- 1400 KC SW OSC.- 16.0 MC
BC PAD - 600 KC

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

POWER CONSUMPTION: 60 watts.

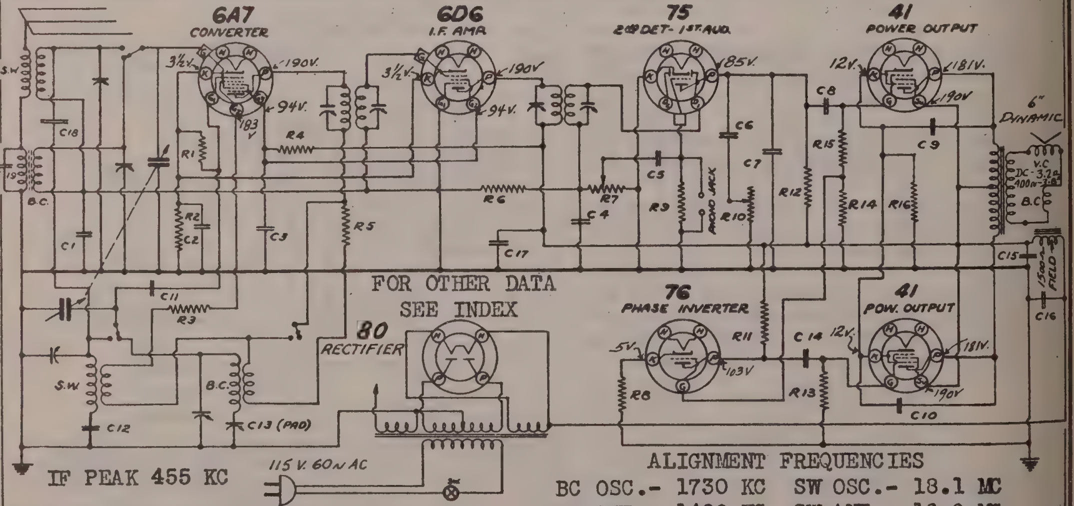
VOLTAGES: Taken from socket terminals
to ground; 20,000 ohms-per-volt meter.

GANG CONDENSER CAPACITY 443 μμfds.

No	MFDS	VOLTS	No	MFDS.	VOLTS
C1	.05	200	C10	.005	600
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004 ±5%	MICA
C4	.00025	MICA	C13	300-600 μμfds.	
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	GIMMICK	

No	OHMS	WATTS
R1	50,000	½
R2	300	½
R3	250	½
R4	20,000	½
R5	1,000	½
R6	2 MEG.	½
R7	500,000	VOL. CON.
R8	3,000	½
R9	5 MEG.	½

No	OHMS	WATTS
R10	500,000	TONE CON.
R11	50,000	½
R12	250,000	½
R13	500,000	½
R14	400,000	½
R15	100,000	½
R16	300	½



FOR OTHER DATA
SEE INDEX

IF PEAK 455 KC

BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN

MODEL 605-7C

ALIGNMENT FREQUENCIES
BC OSC.- 1730 KC SW OSC.- 18.1 MC
BC ANT.- 1400 KC SW ANT.- 16.0 MC
BC PAD - 600 KC

CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

POWER CONSUMPTION: 60 watts.

VOLTAGES: Taken from socket terminals
to ground; 20,000 ohms-per-volt meter.

GANG CONDENSER CAPACITY 443 μμfds.

No.	MFDS	VOLTS	No.	MFDS	VOLTS
C1	.06	200	C11	.0001	MICA
C2	.25	200	C12	.004±5%	MICA
C3	.05	400	C13	300-600μμfd	PADDER
C4	.00025	MICA	C14	.01	400
C5	.01	400	C15	10.0	350
C6	.005	600	C16	10.0	350
C7	.00025	MICA	C17	.05	400
C8	.01	400	C18	GIMMICK	
C9	.005	600	C19	.0001	MICA
C10	.005	600			

No.	OHMS	WATTS
R1	50,000	½
R2	200	½
R3	250	½
R4	20,000	½
R5	1,000	½
R6	2 MEG	½
R7	500,000	VOL. CON.
R8	3,000	½
R9	5 MEG	½
R10	500,000	TONE CON.

No.	OHMS	WATTS
R11	50,000	½
R12	250,000	½
R13	500,000	½
R14	100,000	½
R15	400,000	½
R16	300	½

MODEL 352-5R
Tuner, Socket, Trimmers

ZEPHYR RADIO CO.

MODELS 576-5Q, 577-5Q
Schematic, Voltage, Socket
Alignment, Trimmers, Tuner

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

ALIGNMENT FREQUENCIES

BC OSC -------- 1730 KC
BC ANT -------- 1400 KC

RESISTORS

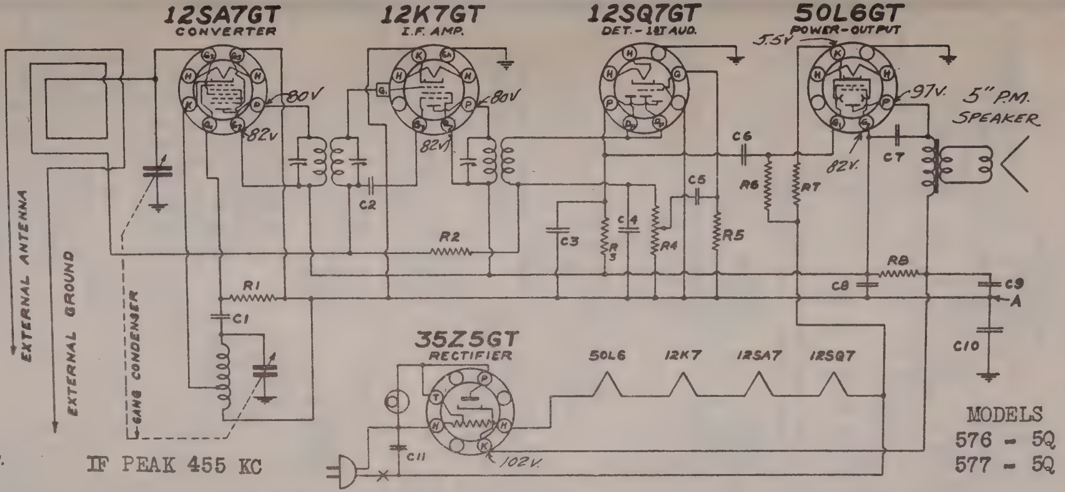
No	OHMS	WATTS	No	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C.			
R5	5 MEG.	½			

CAPACITORS

No	MFD.	VOLTS	No	MFD.	VOLTS
C1	.0001	MICA	C7	01	400
C2	.02	400	C8	20 0	150
C3	.0005	MICA	C9	30 0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	05	400
C6	.002	600			

TUBES SHOW BOTTOM VIEW

C10 USED ON MODEL 5QL ONLY.
ON MODEL 5Q. POINT "A"
IS CONNECTED TO CHASSIS.



IF PEAK 455 KC

MODELS
576 - 5Q
577 - 5Q

VOLTAGES:- Taken from socket terminals to point "A"; 115 V. line; AC power consumption 30 watts; volume control at maximum ; antenna shorted to ground; using a 100 ohm per volt meter.

Voice Coil
DC Resistance - 3.4 Ω
At 400 cycles - 3.8 Ω

MODELS 352-5R; 576-5Q, 577-5Q.

PROCEDURE FOR SETTING UP PUSH BUTTONS

There are four push buttons located on the top by means of which four stations may be selected (See Fig. 1). Make a list of four stations tuned in regularly. Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

If it is desired to change a button to a different station simply loosen the push button and re-set.

MODELS 352-5R, 576-5Q, 577-5Q.

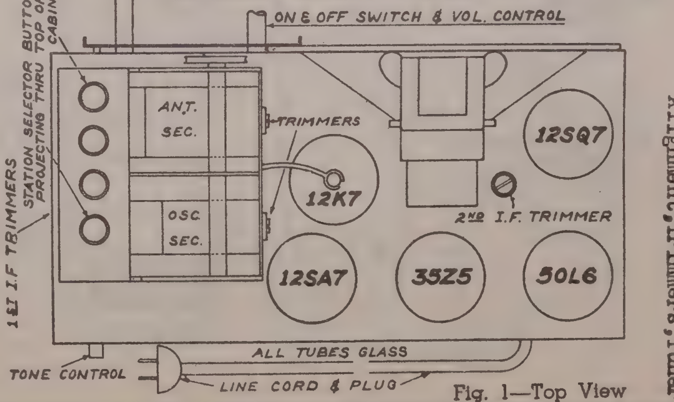
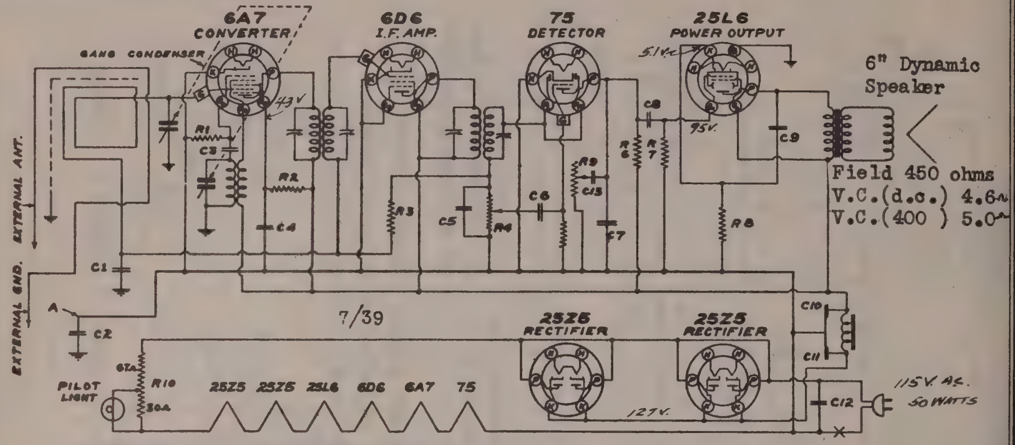


Fig. 1—Top View

MODELS 666-6J to 669-6J
MODELS 696-6M,697-6M
Schematics,Voltage

ZEPHYR RADIO CO.



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RESISTORS

Nº	OHMS	WATTS
R1	50,000	½
R2	30,000	½
R3	2,000,000	½
R4	500,000	VOL. CONT.
R5	5,000,000	½
R6	250,000	½
R7	500,000	½
R8	150 ± 10%	½
R9	500,000	TONE CONT.
R10	67 & 30	10

CONDENSERS

Nº	MFDS.	VOLTS	Nº	MFDS.	VOLTS
C1	.02	200	C10	20.	150
C2	.25	200	C11	20.	150
C3	.00005	MICA	C12	0.05	400
C4	.05	200	C13	0.005	600
C5	.00025	MICA			
C6	.01	400			
C7	.00025	MICA			
C8	.01	400			
C9	.02	400			

NOTE:- C2 USED ON MODEL 6JL ONLY ON MODEL 6J POINT "A" IS CONNECTED TO CHASSIS.

I.F. 456 K.C.
⏚ INDICATES CHASSIS GROUND

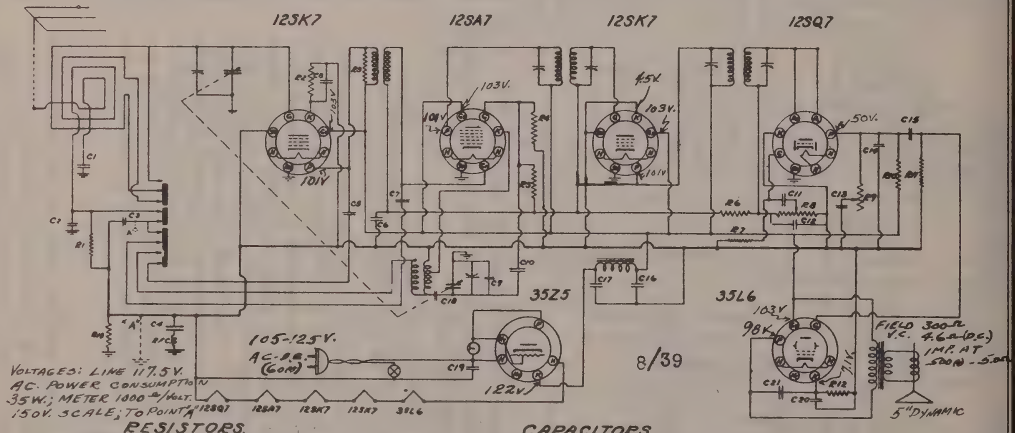
VOLTAGES: Taken with 1000 ohms per volt meter to ground; antenna shorted to ground.

MODELS 666-6J, 667-6J,
668-6J, 669-6J.

I.F. ALIGNMENT CONVENTIONAL
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

SEE SPECIAL SECTION
VOLUME VIII

(See Index for tube layout)



VOLTAGES: LINE 117.5V. AC. POWER CONSUMPTION 35W.; METER 1000 Ω/VOLT. 150V. SCALE; TO POINT "A"

8/39

RESISTORS.

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	150K±10%	½	R8	500K-V.C.	½
R2	600±10%	½	R9	500K-T.C.-	½
R3	5K±10%	½	R10	150K.	½
R4	15 Meg.	½	R11	250K	½
R5	25K	½	R12	200±10%	½
R6	2 Meg	½	R13	150K	½
R7	5 Meg	½			

CAPACITORS.

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS.	Nº	MFD.	VOLTS
C1	.001	600	C8	.05	200	C15	.01	400
C2	.00127±5%	Mica	C9	.000010	Mica.	C16	20.	150
C3	.05	400	C10	.00005	Mica.	C17	20.	150
C4	.25	200	C11	.01	400	C18	.02	400
C5	.00006±5%	Mica.	C12	.00025	Mica.	C19	.05	400
C6	.05	200	C13	.005	600	C20	20.	25
C7	.00006±5%	Mica	C14	.0005	Mica.	C21	.02	400

I.F. 455 K.C.

In model 6M only C3, C4, C18, R13 and the R.F. choke (RFC) are not used and points "A" are connected to chassis.

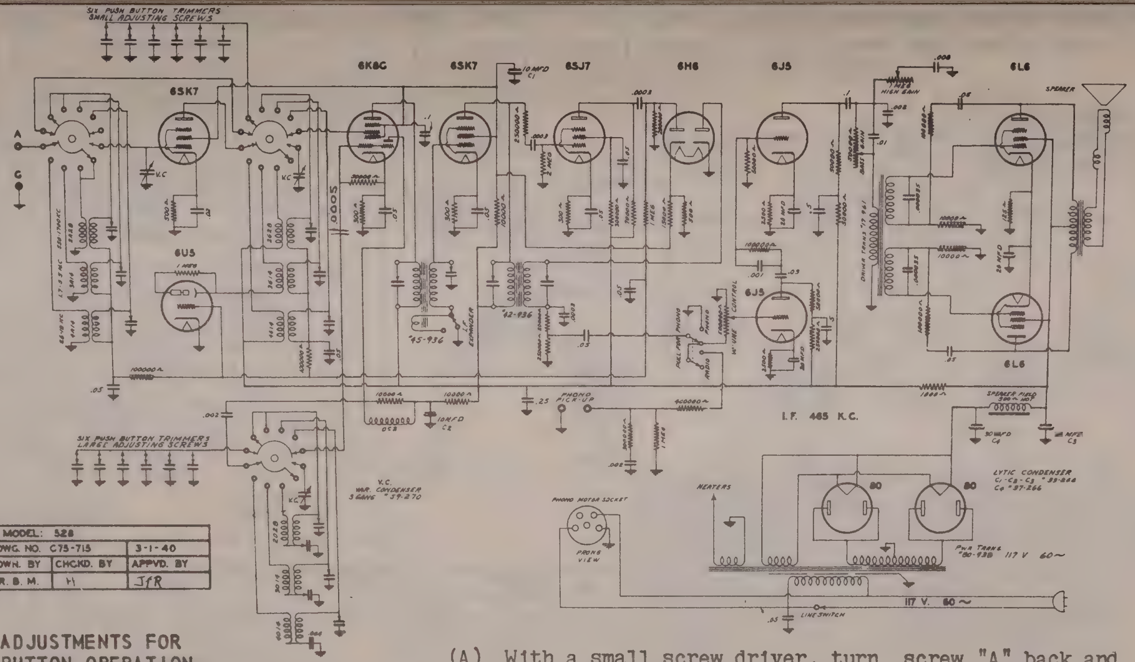
I.F. ALIGNMENT CONVENTIONAL
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

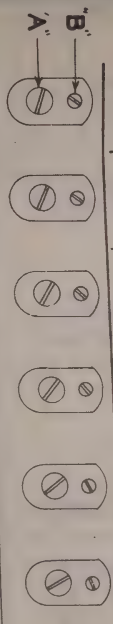
SEE SPECIAL SECTION
VOLUME VIII

MODELS 696-6M, 697-6M
(See Index for tube layout)

BARKER BROS.

MODEL Tempo Tone
Schematic,Tuner





700 TO 540 K.C.	900 TO 600 K.C.	1300 TO 800 K.C.	1300 TO 800 K.C.	1300 TO 800 K.C.	1500 TO 1000 K.C.

PRE-ADJUSTMENTS FOR PUSH BUTTON OPERATION

(1) Leave set turned on at least twenty minutes allowing receiver circuits to reach their normal operating condition before starting push button adjustment.

(2) Remove screws holding escutcheon plate for push buttons.

(3) Note the ranges shown on label above adjusting screws. For example: 700 to 540 KC means you should adjust this set of screws for any station having a frequency between 700 and 540 KC. This rule applies for the other five ranges. There is, of course, some overlapping of range coverage.

(4) Select a station by manual tuning in the regular way. Assuming it is within the 700 to 540 KC range, turn Band Switch to "Push Button" position and push in on button covering the range.

As will be noted, the adjustments consist of two screws, one with a large head (A) and one with a small head (B).

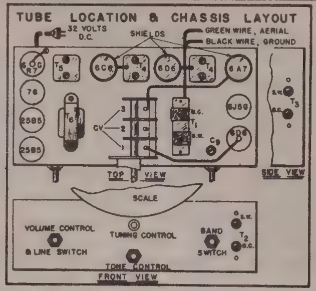
(A) With a small screw driver, turn screw "A" back and forth until you locate the station. It is suggested that you switch back to manual tuning if necessary to recognize the particular type program to help you find it when you again turn the adjusting screw.

(B) After the "A" Screw has been set to exact resonance by watching the tuning eye deflection, turn the small screw "B" for the maximum deflection of the tuning eye. Now recheck screw "B". When all six buttons have been set, repeat the "trimming" process for accuracy.

IT WILL BE OF IMPORTANCE TO NOTE THAT IF THE STATION CANNOT AT FIRST BE LOCATED BY MOVING SCREW "A" IN AND OUT, PERHAPS YOU WILL FIND ADJUSTMENT "B" TOO FAR IN OR TOO FAR OUT. In such a case, check its position by turning it in all the way (to the right) then reverse it about a turn or two and try screw "B" again.

MODEL BC
MODEL 289
MODELS 9722,9822
Schematics,Socket
Alignment,Trimmers

F. J. FITZGERALD CO.
HAMILTON RADIO CO.
KENT



W.F.S.

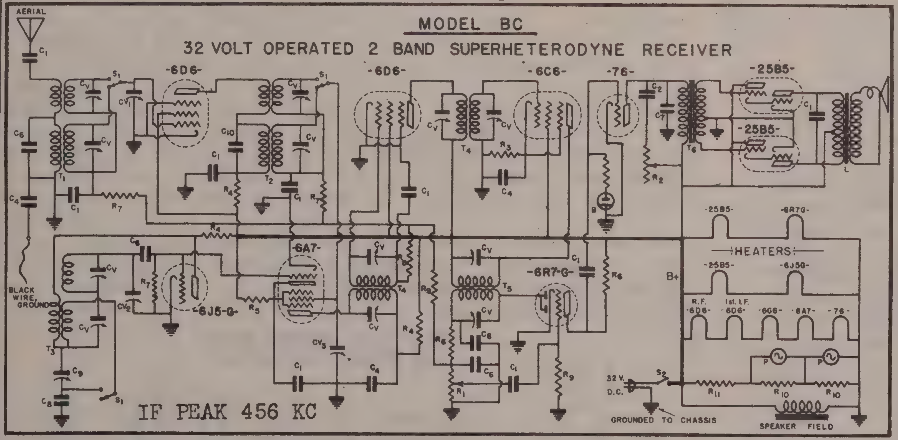
LEGEND	OUR PART NO.	DESCRIPTION
C_1	211	.01 MFD. 400 V. TUBULAR CONDENSER
C_2	216	.02 MFD. 400 V. TUBULAR CONDENSER
C_3	212	.06 MFD. 200 V. TUBULAR CONDENSER
C_4	203	.1 MFD. 200 V. TUBULAR CONDENSER
C_5	204	.25 MFD. 200 V. TUBULAR CONDENSER
C_6	400	100 MMFD MICA CONDENSER
C_7	401	250 MMFD. MICA CONDENSER
C_8	406	4600 MMFD. MICA CONDENSER
C_9	507	5 PLATE PADDING CONDENSER
C_{10}	402	50 MMFD. MICA CONDENSER
$CV_{1\text{-}2\text{-}3}$	636	3 GANG VARIABLE CONDENSER
C_V	500	5-30 MMFD. TRIMMER CONDENSER
R_1	2025	500,000 OHM VOLUME CONTROL
R_2	2024	TONE CONTROL (7500 OHMS)
R_3	103	250 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	134	2000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	111	25,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR

LEGEND	OUR PART NO.	DESCRIPTION
T_1	1226	ANTENNA COIL
T_2	1322	INTERSTAGE COIL
T_3	1417	OSCILLATOR COIL
T_4	1515	1st. I.F. TRANSFORMER
T_5	1507	2nd. I.F. TRANSFORMER
T_6	1021	PUSH PULL A.F. TRANSFORMER
S_1	1924	BAND SELECTOR SWITCH
S_2	IN 2025	ON-OFF SWITCH ON VOLUME CONTROL
P	2901	MAZDA #40 PILOT LIGHT.
B	3000	BIAS BUTTON
L	IN 856	SPEAKER TRANSFORMER
R_6	113	50,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_7	115	100,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_8	117	$\frac{1}{2}$ MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_9	119	1 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_{10}	IN 150	VOLTAGE DIVIDER STRIP (110 OHM 2 WATT)
R_{11}	IN 150	VOLTAGE DIVIDER STRIP (110 OHM 5 WATT)

F.J. FITZGERALD CO.

MODEL BC

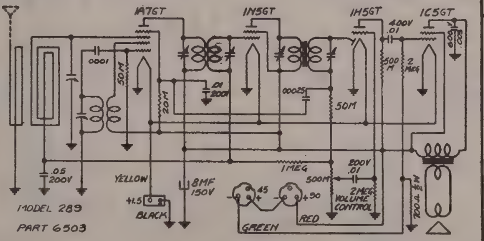
32 VOLT OPERATED 2 BAND SUPERHETERODYNE RECEIVER



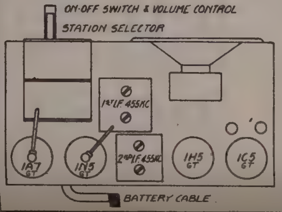
IF PEAK 456 KC

HAMILTON RADIO COMPANY

Model 289



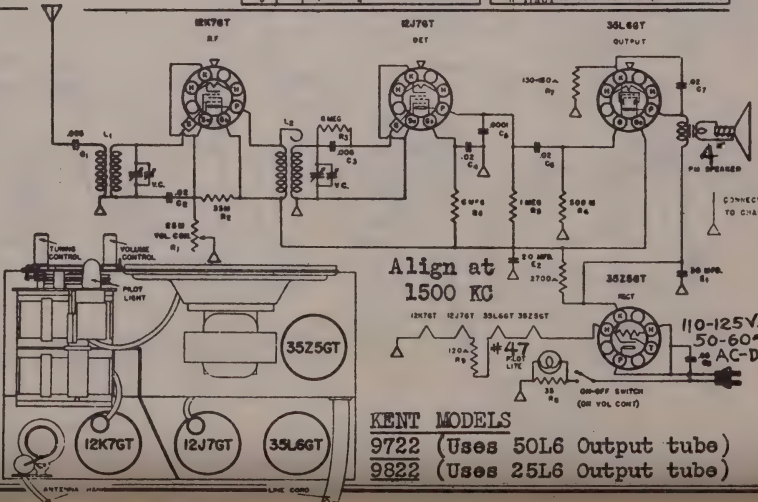
IF PEAK 455 KC



ALIGNMENT PROCEDURE

I.F. Frequency 455 KC. Set Range 540 1600 KC. Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7GT tube, and the ground side to the terminal on the back of the chassis. An output meter should be connected across the voice coil leads of the speaker to indicate resonance. Align the I.F. trimmers at 455 KC for maximum meter reading.

Adjust the trimmer on the back of the variable condenser at or near 1400 KC at full volume on a weak broadcast signal. When aligning the set do not set the receiver on or near a metal work bench or other large metal object, as it will affect the tracking of the receiver.



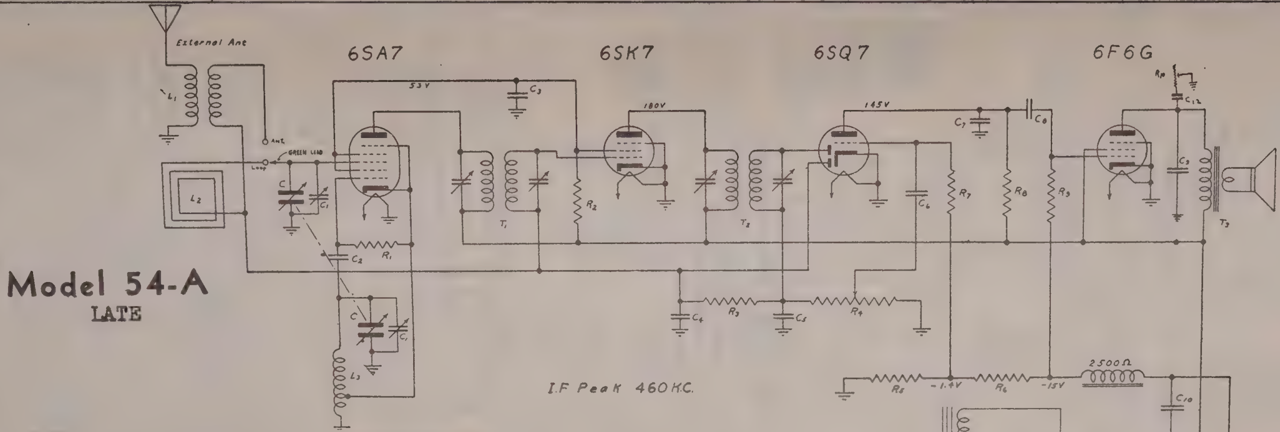
Align at
1500 KC

KENT MODELS
9722 (Uses 50L6 Output tube)
9822 (Uses 25L6 Output tube)

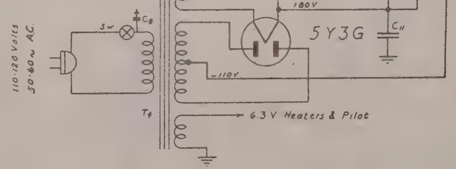
GILFILLAN BROS., INC.

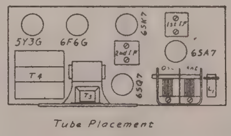
MODEL 5AD
MODEL 54-A Late
Schematics,Socket

Model 54-A
LATE



I.F Peak 460 KC.





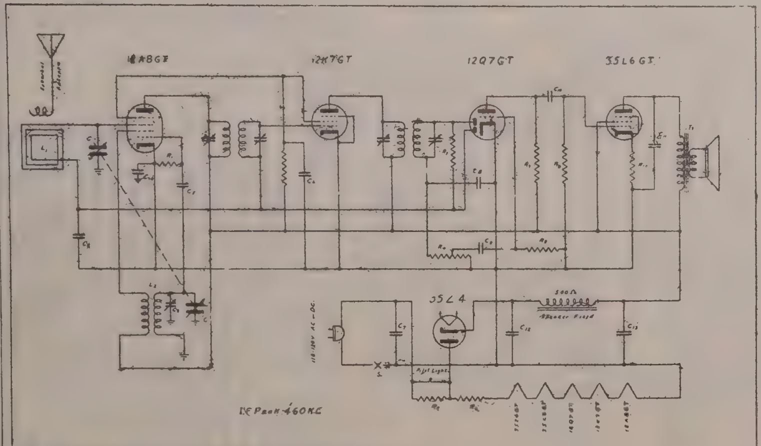
Tube Placement

Gilfillan Bros. Inc.

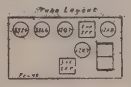
Model 54 A
(LATE)

	Condensers		Resistors		Misc
C	2 Gang Variable Condenser	R1	25000 Ohms ¼ Watt	L1	Antenna Coil
C1	Variable Trimmer	R2	25000 " " "	L2	Loop Antenna
C2	250 MMF Mica	R3	2 Meg. " " "	L3	Oscillator Coil
C3	.01 MF 600V Tubular	R4	500000 " Vol. Control	T1	1st IF Transformer
C4	.05 MF 200V "	R5	40 " ¼ Watt	T2	2nd I.F. "
C5	250 MMF Mica	R6	350 " ½ "	T3	Output "
C6	.01 MF 200V Tubular	R7	2 Meg " ¼ "	T4	Power "
C7	.001 MF 600V "	R8	250000 " "		
C8	.05 MF 400V "	R9	500000 " "		
C9	.006 MF 800V "	R10	50,000 " TONE CONTROL		
C10	8. MF } Dual Unit 450V				
C11	8. MF } Electrolytic				
C12	.03 MFD. 600 V Tubular				

Power Consumption at 115V · 60 cycle supply is 40 Watts.
All voltages measured to ground with a 1000 Ohms-per-volt meter at 115 Volts 60~ Supply



I.F Peak 460 KC



	Condensers		Resistors		Misc
C	2 Gang Variable Condenser	R1	100000 Ohms ½ watt	L1	Ant. Loop.
C2	.05 MF 400V	R2	20000 " " "	L2	Osc. Coil
C3	1-30 MMF Trimmer	R3	2 Meg " " "		
C4	500 MMF Padder	R4	500000 " Vol Control	T1	1st IF Transformer
C5	110 MMF Mica	R5	36 " 2 Watt	T2	2nd I.F.
C6	.05 MF 400V Tubular	R6	46 " 2 "	T3	Output
C7	.03 MF 400V	R7	250000 " ½ Watt		
C8	250 MMF Mica	R8	500000 "		Pilot Light-150MA 6-8 Volts
C9	.01 MF 200V Tubular	R9	4 Meg "		
C10	.01 MF 600V "	R10	130 " ½		
C11	.02 MF 600V "				
C12	20 MF 150V Elec				
C13	20 MF 150V "				
C14	15 MF 400V Tubular				

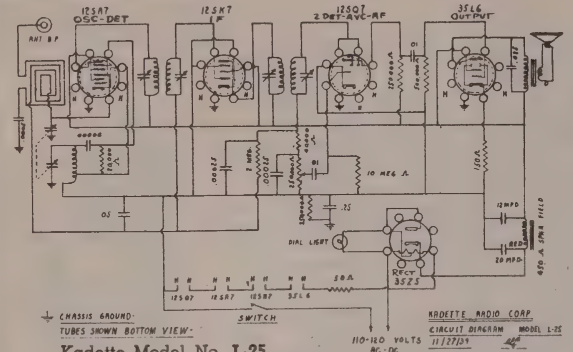
Gilfillan Bros. Inc.

5 Tube AC DC Receiver
Model, 5AD
1939

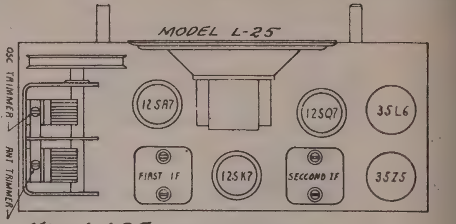
MODEL L25
MODEL L40
MODEL L41

KADETTE RADIO CORP.

Schematics, Socket
Trimmers, Notes, Voltage



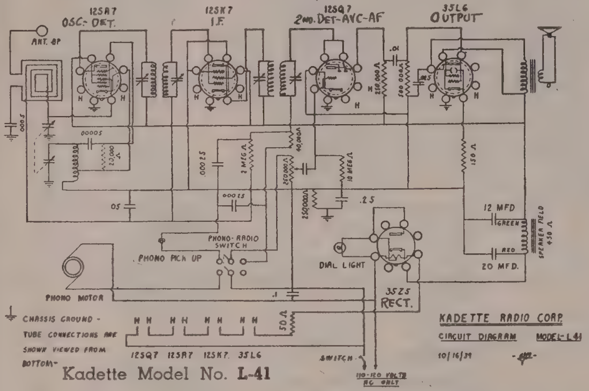
Kadette Model No. L-25



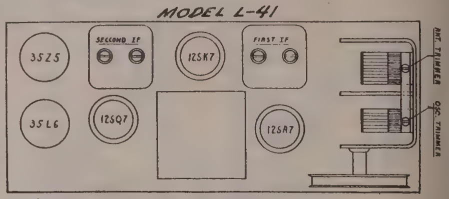
MODEL L-25 Voltage Readings

The following are the approximate readings when using a 1000 ohms per volt voltmeter. Line voltage should be 117 volts.

Voltmeter Scale	300 Volt Plate To B—	300 Volt Screen To B—	30 Volt Cathode To B—
12SA7	93	93	
12SK7	93	93	
12SQ7	45	93	5.3



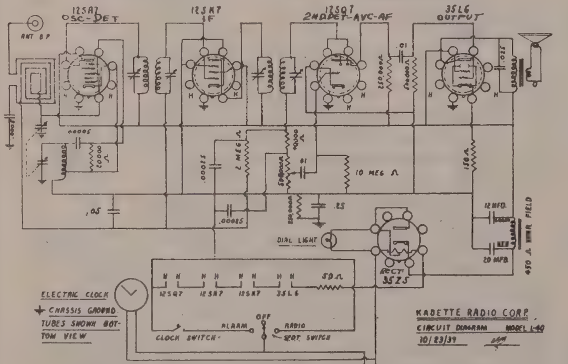
Kadette Model No. L-41



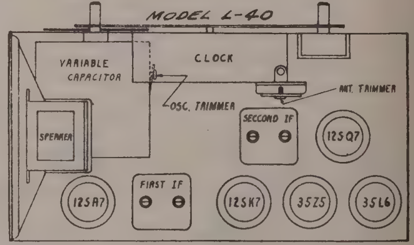
MODEL L-40 L-41 Voltage Readings

The following are the approximate readings when using a 1000 ohms per voltmeter. Voltage across speaker field is approximately 30 volts. Line voltage 117 volts.

Voltmeter	300 Volt Plate To-B—	300 Volt Screen To B—	30 Volt Cathode To B—
12SA7	105	105	
12SK7	105	105	
12SQ7	49		
35L6	97	105	6



Kadette Model No. L-40



Start clock by turning starting knob (at rear) in direction of arrow. Set clock by turning "Set" knob (at rear) in direction of arrow. Clock remains running regardless of any power switch position, including "OFF", and will continue to run as long as cord is plugged into a power supply outlet. Power current interuptions will stop the clock and it must be re-started.

For continuous operation on radio, throw toggle switch (at rear) to RADIO. Note this switch has three positions, "RADIO", "OFF" and "ALARM"

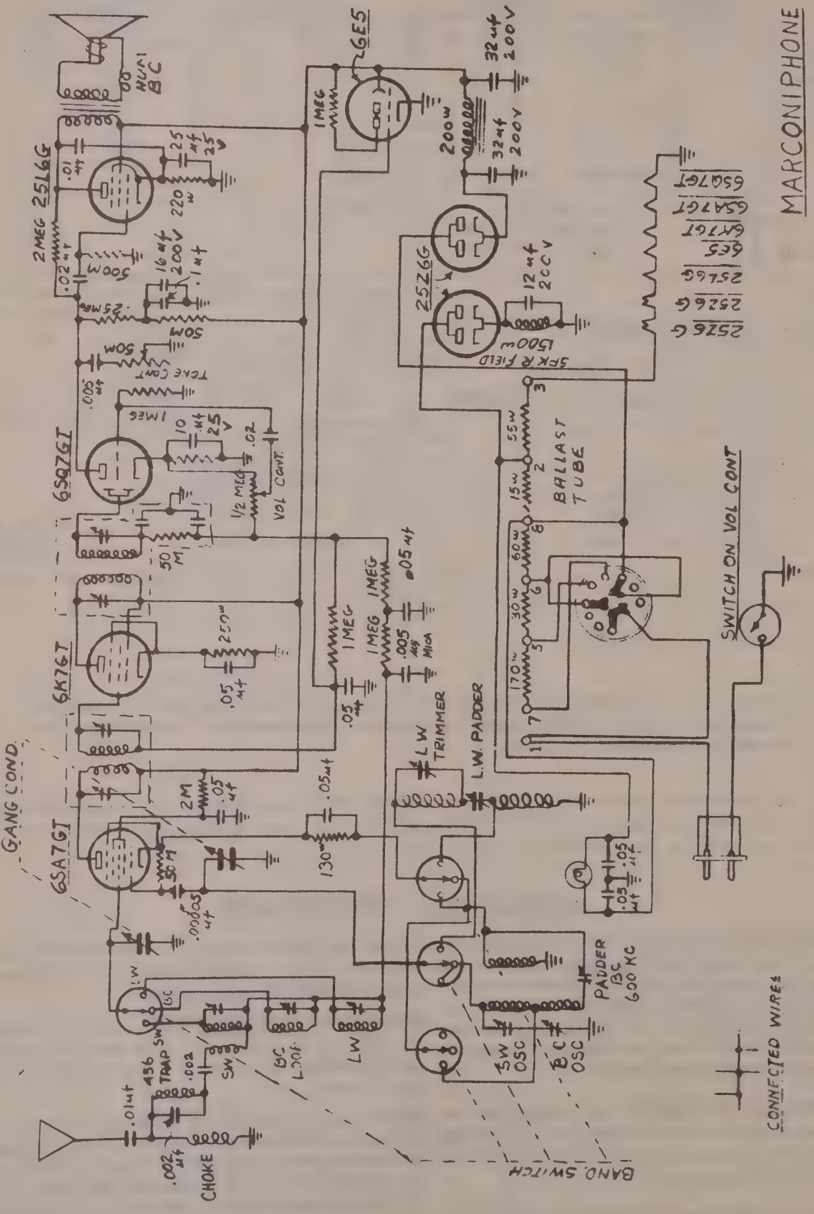
To pre-set a desired station: (1) Throw toggle switch to "RADIO" (2) Tune in station desired with selector knob. (3) Turn volume well up (volume control knob). (4) Turn "ALARM" setting knob, at rear, in direction of arrow until the desired time for radio to turn appears at the calibration mark in the alarm set window on the clock dial (top-center of clock face). (5) Throw the toggle switch to "ALARM". (6) Radio will turn "ON" at the time thus set, and will continue to operate for about 1½ hours—then turn off. (7) Do not pre-set more than ten hours prior to the time of desired program.

To pre-set radio to TURN OFF at a predetermined time: (1) With radio playing, place toggle switch at rear, at "ALARM" position. (2) Turn "ALARM" set-knob, at rear, in direction of arrow until the desired time to shut off is indicated by the small **Roman numerals** in the upper portion of the alarm set window on the clock face.

NOTE: Do not pre-set to turn off for longer than 1½ hours.

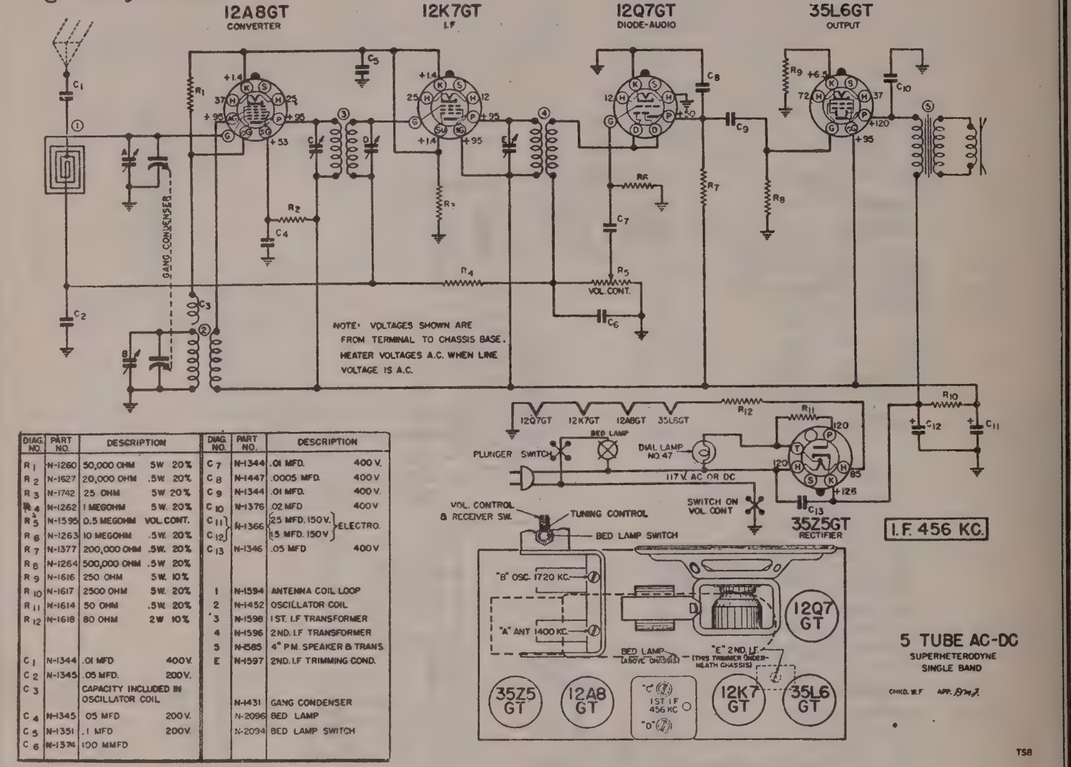
MARCONIPHONE INC.

MODEL D-11
Schematic



MODEL Lullaby Combination
and Bed Lamp
Schematic, Voltage, Socket
Alignment, Trimmers

MITCHELL MFG. CO.



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES A.C. WHEN LINE VOLTAGE IS A.C.

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R 1	N-1260	50,000 OHM 5W 20%	C 7	N-1344	.01 MFD. 400 V.
R 2	N-1627	20,000 OHM .5W 20%	C 8	N-1447	.0005 MFD. 400 V
R 3	N-1742	25 OHM 5W 20%	C 9	N-1344	.01 MFD. 400 V.
R 4	N-1262	1 MEGOHM 5W. 20%	C 10	N-1376	.02 MFD 400 V
R 5	N-1595	0.5 MEGOHM VOL. CONT.	C 11	N-1366	25 MFD. 150 V. ELECTRO.
R 6	N-1263	10 MEGOHM .5W. 20%	C 12		15 MFD. 150 V
R 7	N-1377	200,000 OHM .5W. 20%	C 13	N-1346	.05 MFD 400 V
R 8	N-1264	500,000 OHM .5W 20%			
R 9	N-1616	250 OHM 5W. 10%			
R 10	N-1617	2500 OHM 5W. 20%	1	N-1594	ANTENNA COIL LOOP
R 11	N-1614	50 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
R 12	N-1618	80 OHM 2W 10%	3	N-1598	1ST. I.F TRANSFORMER
			4	N-1596	2ND. I.F TRANSFORMER
			5	N-1585	4" P.M. SPEAKER & TRANS.
C 1	N-1344	.01 MFD 400V.	E	N-1597	2ND. I.F TRIMMING COND.
C 2	N-1345	.05 MFD. 200V.			
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL		N-1431	GANG CONDENSER
C 4	N-1345	.05 MFD 200 V.		N-2096	BED LAMP
C 5	N-1351	.1 MFD 200V.		N-2094	BED LAMP SWITCH
C 6	N-1374	100 MMFD			

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

POWER SUPPLY. This receiver is designed to operate on any alternating current supply (AC) ranging from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (DC) ranging from 110 to 120 volts.

LAMP USED. Show case reflector lamp 120 volt, 25 watts with medium screw base with spring contact. (Never use a lamp larger than 25 watts.)

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

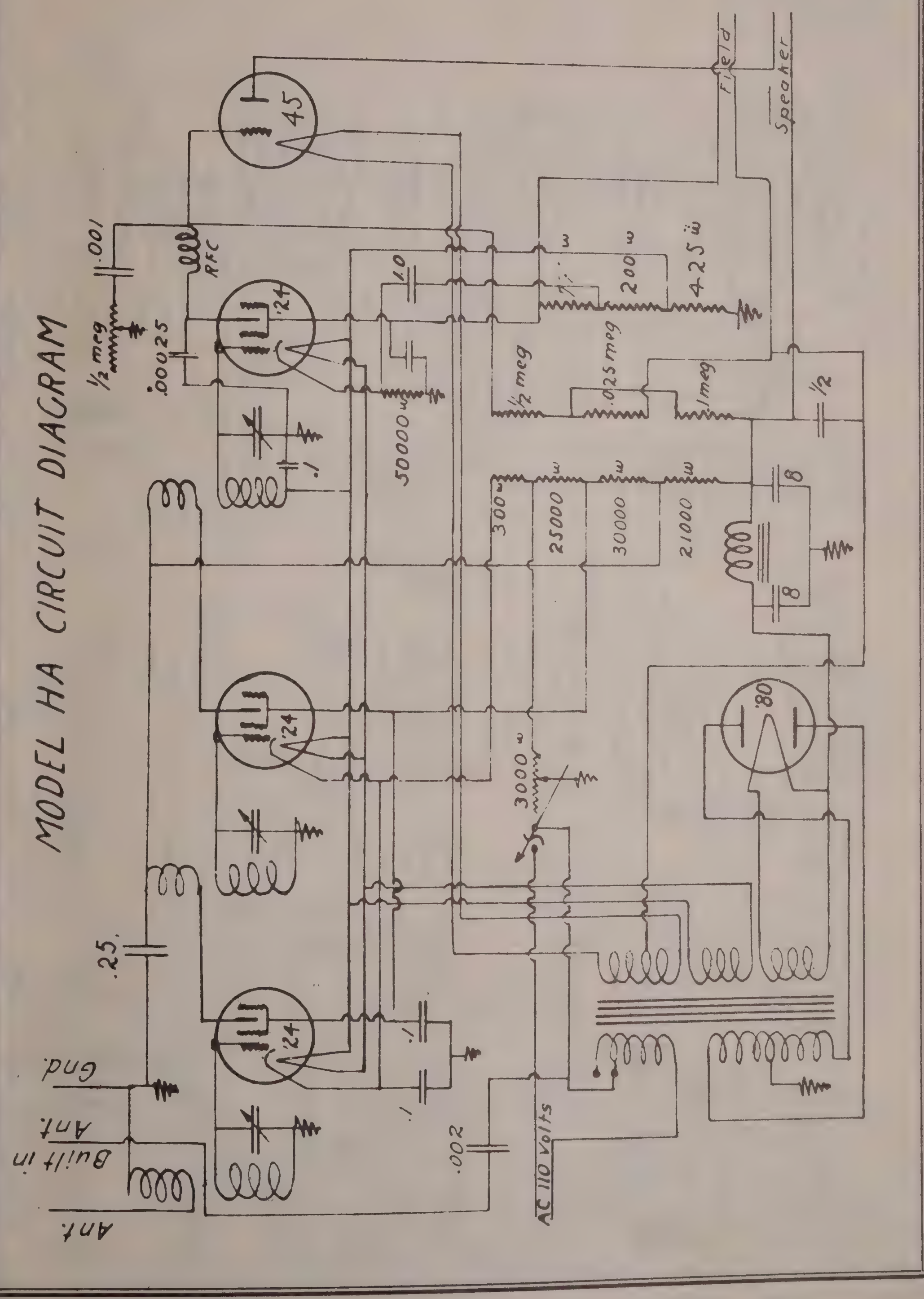
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis from cabinet and set it up on the bench. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

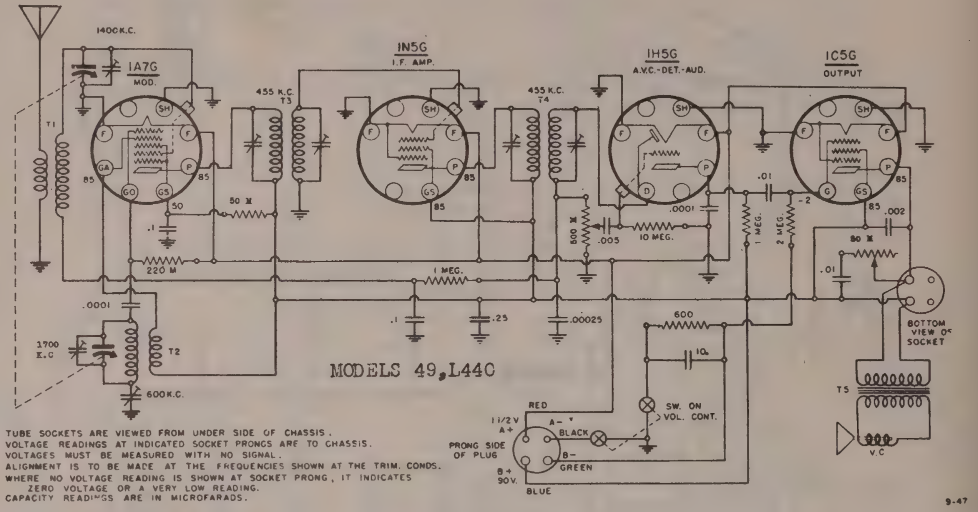
SIMPLEX RADIO CO.

MODEL HA
Schematic



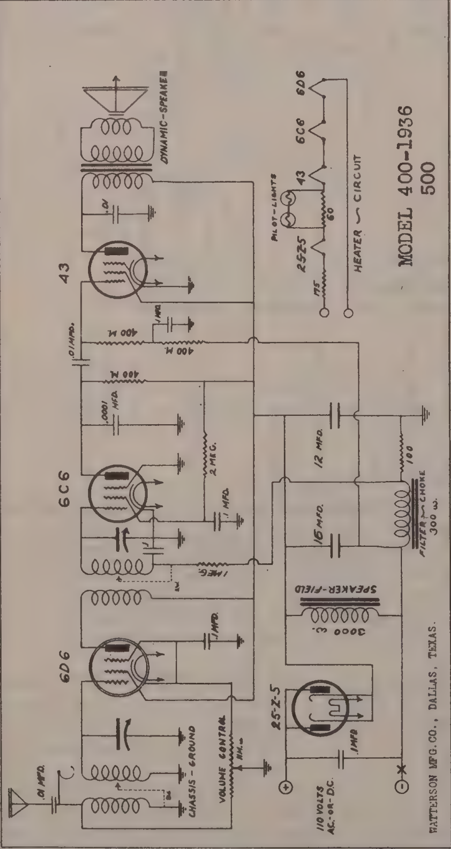
MODELS 49,L440
MODELS 68,69,95
MODELS 400-1936,500
Schematics

WATTERSON RADIO MFG. CO.



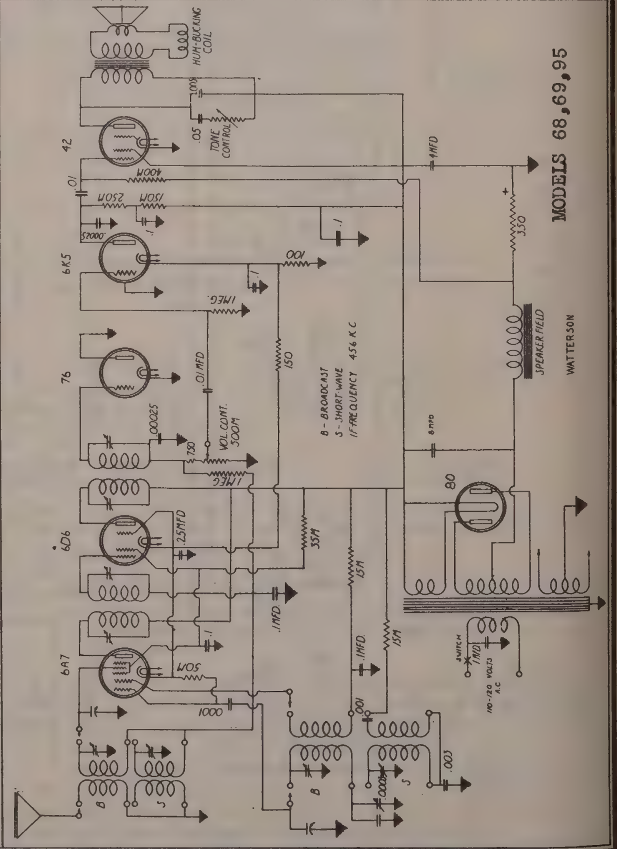
MODELS 49,L440

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIM. CONDS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS.



MODEL 400-1936
500

WATTERSON MFG.CO., DALLAS, TEXAS.

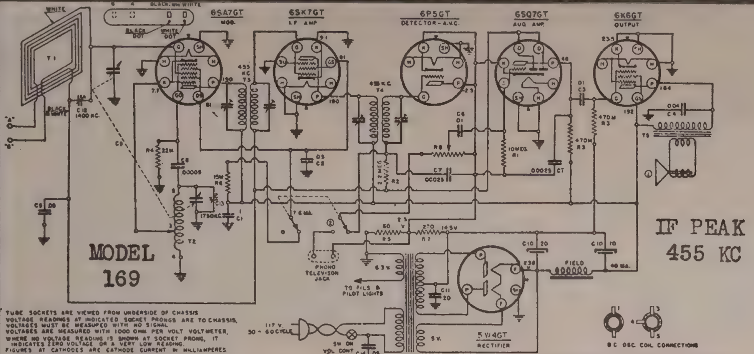


MODELS 68,69,95

WATTERSON

WESTERN AUTO SUPPLY OF CALIF.

MODEL 169
MODEL 279
Schematics,Voltage
Socket,Trimmers
Alignment,Tuner



MODEL 169

IF PEAK 455 KC

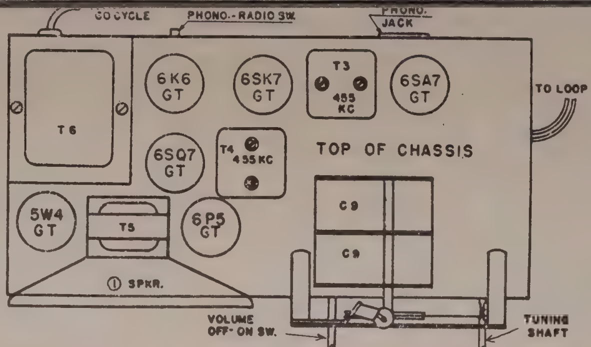
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS

TUNING RANGE: 540 to 1750 KC

CODE	PART NO	DESCRIPTION.
C1	16-118	1 MFD 400V TUBULAR CONDENSER
C2	1607	05 " " " "
C3	16-119	01 " " " "
C4	1631	004 " 600V " "
C5	1622	05 " 200V " "
C6	16 121	01 " " " "
C7	1304	00025" MICA CONDENSER
C8	1303	00005" " "
C9	19-164	2 GANG VARIABLE CONDENSER(C13)
C10	18-254	20X 10 MFD 350 W V ELECTROLYTIC
C11	18-243	20 MFD 25V ELECTROLYTIC
C12	20-129	TRIMMER (ON LOOP)
C14	17-100	.05 MFD. 600 V. MOLDED CONDENSER

CODE	PART NO	DESCRIPTION
R1	60 193	10 MEGOHM 1/4 W RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-185	22 M " " "
R5	60-182	60 " 1/2 W. "
R6	60-236	15 M " 1 W "
R7	60-245	270 " " "
R8	24-145	500 M " VOLUME CONTROL (WITH SW)

CODE	PART NO	DESCRIPTION D-68
T1	82 10	LOOP ANTENNA
T2	10 311	B C OSCILLATOR COIL
T3	10-317	1ST. I. F TRANSFORMER
T4	10-312	2ND I F TRANSFORMER
T5		OUTPUT TRANSFORMER (ON SPKR)
T6	80-183	POWER TRANSFORMER
1	79-294	9" DYNAMIC SPEAKER
2	69-140	PHONO SWITCH



Follow the procedure outlined below, in order to adjust the push-buttons properly:

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

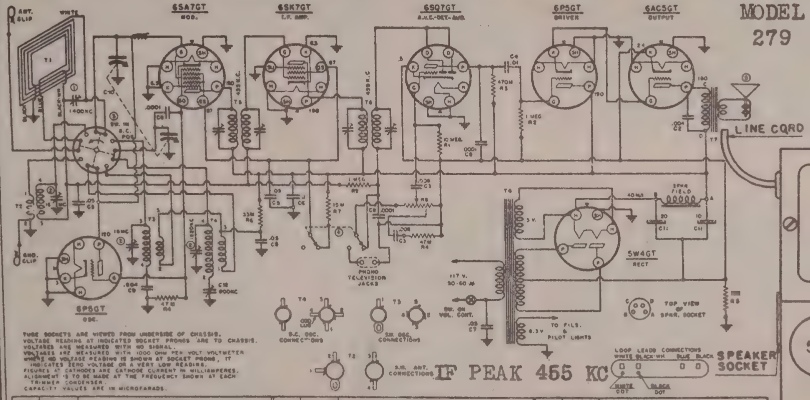
4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holders.

Follow through with this same procedure, setting up the other 3 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

MODEL 279



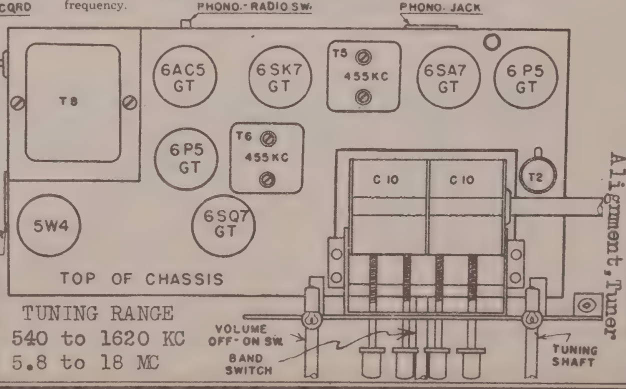
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READING AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

IF PEAK 455 KC

CODE	PART NO	DESCRIPTION
C1	1622	05 MFD 200 V TUBULAR CONDENSER
C2	16-123	.004 " 400 V. " "
C3	16 128	[illegible] " " " "
C4	16-119	01 " " " "
C5	1607	05 " " " "
C6	16-118	1 " " " "
C7	17 100	05 " 400 V MOLDED
C8	15-171	0001 " MICA CONDENSER
C9	15 145	.004 " " "
C10	93 13	2 GANG TUNING CONDENSER
C11	18 254	20 x 10 MFD. 350 W V ELECTROLYTIC
C12	20 130	PADDING CONDENSER

CODE	PART NO	DESCRIPTION
R1	60-193	[illegible] 1/4 W RESISTOR
R2	60-195	1 " " "
R3	60-178	470M OHM " "
R4	60-177	47 M " " "
R5	60-230	100 " " " ± 10%
R6	60-431	33 M " 1/2 W " "
R7	60 236	15 M " 1 W. " "
R8	24-147	500 M " VOLUME CONTROL (WITH SW.)

CODE	PART NO	DESCRIPTION 10-71
T1	82 16	LOOP ANTENNA (B C)
T2	10-347	ANTENNA COIL (S W)
T3	10-346	OSCILLATOR COIL (S W)
T4	10-345	OSCILLATOR COIL (B C)
T5	10-317	1ST I F TRANSFORMER
T6	10-318	2ND " "
T7	------	OUTPUT TRANSFORMER (ON SPKR.)
T8	80-183	POWER TRANSFORMER
1	20-129	TRIMMER (ON LOOP)
2	20-127	TRIMMER BLOCK
3	69-148	BAND SWITCH
4	69-140	PHONO "
5	79-293	DYNAMIC SPEAKER 6 1/2"



TUNING RANGE
540 to 1620 KC
5.8 to 18 MC

Andrea Television Model 1-F-5

Before carrying out any type of service work, remove the 2Y2 or 879 high-voltage rectifier tube from the socket. Be certain that the high-voltage cover plate on bottom of chassis is in place, and remove both sides of high-voltage transformer primary leads from the terminal strip connecting them to power line input before adjustments of any nature are attempted. In this way, no danger from shock from the high-voltage supply is possible.

Bear in mind that the high-voltage supply plays no part in your service work. Therefore, no need exists for this section of the receiver functioning during any work you may undertake. Should repairs be necessary on the high voltage section, all tests may be conducted accurately by resistive or continuity measurements to localize the difficulty without resorting to any voltage measurements.

Remember, first thoroughly investigate the nature of the complaint to determine if the effect is in the receiver before attempting adjustments.

Sound I-F System

See notes on high voltage.

The 6J5 oscillator must be stopped by connecting 70 or 120 ohms from the junction of HC-143 and HC-147 to ground. Do not short the oscillator or remove tube. The schematic will be found on *Andrea page* 10-1, 2, *in Rider's Volume X.*

Connect the high side of signal generator through a .1-mf, 600 V. condenser to prong 4 of 1852 modulator tube See *page* 10-4 *of Rider's Volume X* for socket layout. Set signal generator frequency very accurately to 8.25 mc. (8250 kc). Connect rectifier type a-c voltmeter across voice coil of sound speaker. Allow receiver to warm up 15 minutes before making any realignment settings.

After carefully carrying out the above, adjust television sound trimmer condensers D, C and B, located as shown in socket layout, for maximum deflection on the rectifier output meter across the speaker voice coil.

Be certain your generator frequency and trimmer adjustments are accurate or poor sound performance will result.

This completes the television sound i-f alignment.

Video I-F System and 14.25-MC Adjacent Sound-Trap Adjustment

See notes on high voltage.

The video intermediate frequency is 12.75 megacycles (12,750 kc) for the position of the video carrier and extends substantially flat to 10 mc and requires no alignment adjustment, as all tuning is of a fixed type which will not develop misalignment. In order to signal-trace this circuit to locate any defective tubes or component parts, the following procedure may be used:

Remove the picture-tube socket cable from the 18Q5P4 tube. Connect a .5-mf600 V. condenser in series with one side of a rectifier type output meter (0-1 or 0-1.5 volts). Connect the side of rectifier meter containing the condenser to pin No. 10 of the picture-tube cable socket; the other connection from meter to ground.

The 6J5 oscillator must be stopped by connecting 70 or 100 ohms from the junction of HC-143 and HC-147 to ground. Do not short the oscillator or remove tube.

Turn contrast control to maximum contrast. Connect the signal generator high lead in series with .1-mf600 V. condenser to pin No. 4 of modulator tube; ground side of generator to chassis and note the output reading on picture-tube output meter. If no signal results, replace generator connection to pin No. 4 of first video i-f tube. If a signal is obtained, trouble exists between modulator and 1st video i-f tube. Should no signal result, replace generator lead to pin No. 4 of 2nd video i-f tube. Use same reasoning as above. In this manner the video i-f continuity can be checked.

In the event that no signal is obtained, a check of the video system itself can be made as follows:

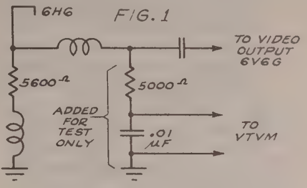


FIG. 1

Leave generator connected to pin No. 4 of 2nd video i-f tube and connect the circuit shown in Fig. 1. A reading on the VTVM will prove continuity of video detector system. Be sure in this test signal-generator output is on maximum. Also that the VTVM will read a minimum of .25 volt. If not, this method cannot be used.

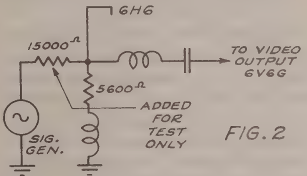


FIG. 2

To test the video system from video detector output to output of video output tube, connect a 15,000-ohm resistor in series with lug 8 of the 6H6 tube. Remove this tube from circuit—between one side of 15,000-ohm resistor and ground, connect standard signal generator (Fig. 2)—set for 300 or 500 kc and increase output attenuator until a signal is obtained on the output meter. Obviously, no signal indicates trouble in the associated parts proceeding or following the video output tube or the picture-tube connecting cable. Hence, test continuity of parts in input and output of 6V6G video output tube along with checking output tube and voltages.

When the above test indicates an actual signal up to picture-tube pin No. 10 (grid), and trouble still exists, the difficulty is then in picture tube.

14.25-MC Adjacent Sound Traps

With rectifier meter connected from pin No. 10 of picture-tube cable to ground, connect signal generator from pin No. 4 of the 1852 modulator tube and ground through a .1-mf, 600V. condenser. Set generator accurately to 14.25-mc (14,250 kc).

Use highest output of the signal generator and adjust 14.25-mc trimmers "A" and "E" (see tube layout) for minimum output. This test must be carried out accurately, or picture quality will be materialyl impaired.

Radio-Frequency Alignment

Since the r-f unit of this receiver is aligned with great precision at the factory, and because the designs of the parts have been found exceedingly staple under all operating conditions, it is most unlikely that realignment will be necessary. However, in case the adjustments are changed for any reason, realignment should be carried out in the following manner:

Note: These instructions apply to television channels 1 and 2. If your set is equipped for receiving other channels, follow the special data supplied by the Andrea factory. Accurate realignment will result only when the bottom plate is fastened to the chassis during adjustment.

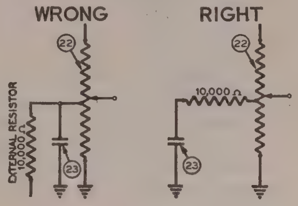
1. Because of the design of the r-f unit, band 2 must be aligned first, and band 1 last. Incorrect settings will be obtained if band 1 is aligned first.
2. Be sure that the sound i-f system has been adjusted accurately to 8.25 mc. Otherwise, the r-f alignment will not be correct.
3. Set sound sensitivity trimmer so that rotor plate is half maximum capacity (half-open)
4. A signal generator capable of generating accurately frequencies from 40 to 60 mc. (40,000 to 60,000 kc), 400 cycles modulated, is required for the r-f alignment. Bear in mind that accurate frequency setting is essential and any attempt to use harmonics will invariably produce bad misalignment and poor or no results.
5. Connect ground side of signal generator in series with 70-ohm carbon resistor to terminal "A" of antenna post. Connect high side of generator directly to other terminal "A" on antenna strip. Do not connect a ground to the receiver. Set generator accurately to 55.75 mc. (55,750 kc).
6. Turn channel switch to channel 2.
7. Connect a rectifier-type meter 0-1 volt across the voice coil of the loudspeaker.
8. Loosen the brass top cup locknut on oscillator condenser 2, tube layout, so that the plunger moves easily but is not loose. A tool with a side pin to hook into hole in the plunger will provide more accurate adjustment.
9. Adjust the oscillator condenser 2 (tube layout) plunger for maximum output deflection on the meter across speaker voice coil. Tighten the brass top cup locknut part way. When the brass top cup locknut is nearly tight, readjust the plunger. Then tighten the brass top cup locknut firmly and watch output deflection on meter to see that tuning is not changed. If so, readjust.
10. Connect a rectifier type meter 0-1.0 volt from pin No. 10 on the picture-tube socket to the ground through a .5-mf, 600V. paper condenser.
11. Adjust the signal generator frequency to 52.5 mc (52,500 kc).
12. Turn the chassis on its side for ease of alignment. Set antenna trimmer so plunger is all in (max. cap.) and slip a metal Spintite wrench through the hole in the under shield cover of chassis so that end of metal spintite fits over the tubular bottom end of antenna condenser 2, thereby detuning the circut. Be certain that metal spintite does not ground to chassis.

Note: If this is not carried out, no realignment can be made.

13. Leave metal spintite as above and loosen the brass top cup locknut on grid condenser 2 (socket layout), and adjust this plunger for maximum output as indicated on the meter in the picture cable circuit. Then tighten the brass top cup locknut part way, readjust plunger again, and tighten the brass top cup locknut firmly, noting that peak tuning point is not reduced by tightening. If so, readjust.
14. Remove the metal spintite from antenna condenser 2, and put it on grid condenser 2.
15. Loosen the brass top cup locknut on antenna condenser 2, and adjust the plunger for maximum picture output, as indicated by the meter. Then tighten the brass top cup locknut part way, readjust the plunger, and tighten the brass top cup locknut firmly, noting that peak tuning is not reduced by tightening.
16. To align Band 1, carry out the same steps to 15 using 49.75 mc for the signal generator (step 5), put the band switch on channel 1 (step 6), and adjust oscillator condenser 1 (step 9).
17. Use 46.5 mc for the signal generator (step 11) and use antenna condenser 1 for step 12, and adjust grid 1 for step 13. For step 14 use grid condenser 1, and antenna 1 for step 15.

Philco 39-25

A few of the early production Model 39-25 Philco receivers had the bass-compensating condenser in the volume-control circuit improperly connected. The indication of such incorrect connection is a lack of high notes at low settings of the volume control. Above is shown the incorrect and the correct connections. The schematic of this receiver shown on *page 10-9 of Rider's Volume X* shows the correct connections.



If a Philco 39-25 lacks high notes at low settings of the volume control, check to see how the bass-compensating condenser is connected. These partial schematics tell the story.

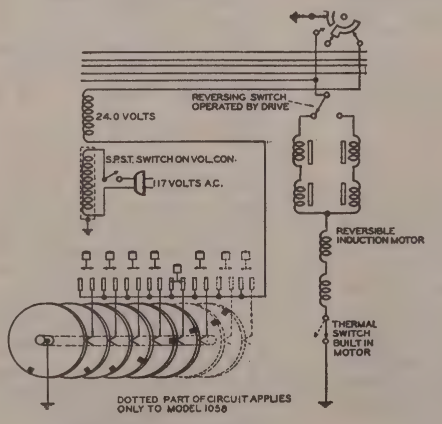
●

Majestic 11056, 11057, 11058

Models 11056 and 11058 are found on *pages 9-8 to 9-10 of Rider's Volume IX*. The data given there also apply to Model 11057. A new electric tuning system has been incorporated in later runs of all these receivers, and is illustrated in Fig. 1. The procedure for indexing the tuning system for desired stations is as follows:

(1) Set receiver to Standard Broadcast band.
(2) Place "Manual-Electric" lever in "Manual" position, which is extreme counter-clockwise. Be sure the tone control is in the "Normal" position as shown by the indicator.
(3) Pull out Indexing Rod located at the center bottom half of the escutcheon. This rod has numbers on it which correspond to the push buttons (counting from left to right).
(4) Set Indexing Rod so that the number on the rod corresponding to the push button you wish to index is in line with the escutcheon plate.
(5) Turn tuning knob until the pointer has covered the entire dial. This is essential to engage the tuning disc.
(6) Tune in the desired station accurately, using the tuning eye.
(7) Push Indexing Rod all the way in, and that particular station will always be tuned in automatically when that particular button is depressed while the "Manual-Electric" lever is in the "Electric" position.
To index more than one station, go through steps (3) to (6) for each station desired and when finished, push the Indexing Rod back as far as it will go.

Caution: When using electric tuning, do not depress more than one button at a time. Depressing two buttons will cause the motor to run continuously or until the automatic thermal switch operates to prevent the motor from burning out. If this happens it may take fifteen minutes for the motor to become cool enough for the electric tuning to become operative again.


REVERSING SWITCH OPERATED BY DRIVE
24.0 VOLTS
S.P.S.T. SWITCH ON VOL. CON.
117 VOLTS A.C.
REVERSIBLE INDUCTION MOTOR
THERMAL SWITCH BUILT IN MOTOR
DOTTED PART OF CIRCUIT APPLIES ONLY TO MODEL 1058

●

A new electric tuning system has been incorporated in later runs of Majestic models 11056, 11057, and 11058, the schematic being shown at the left. Note that the dotted portion of the drawing applies only to the last named model number.

●

Philco 620

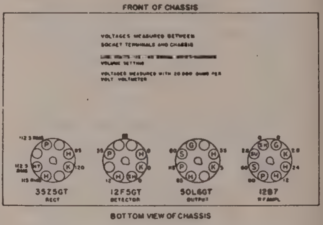
Certain oscillator trimmers are incorrectly numbered on *pages 6-26 and 6-27 of Rider's Volume VI* (early Model 620 Philco). In the parts list on *page 6-26*, the reference numbers should be changed as follows: Change 13 to 16; change 14 to 17; change 16 to 13; change 17 to 14. The same changes should be made on *page 6-27* in Fig. 2 and in the alignment instructions located below this figure. These changes must be made so that the reference numbers will agree with those shown on the schematic which appears on *page 6-25*. Do NOT alter the numbers on the schematic.

These errors in numbering also appear in the parts list for the late Model 620 Philco. Therefore the reference numbers on *page 7-90 of Rider's Volume VII* must be changed as follows: Change 13 to 16; change 14 to 17; change 16 to 13; change 17 to 14.

●

G.E. H-400

The final service bulletin on this receiver was not available at the time *Rider's Volume X* went to press and the preliminary schematic, chassis layout, and alignment notes were run on *page 10-45*. The final service notes show no changes in any of these data. Herewith will be found the socket layout showing the voltages. Make a note on the schematic that the power consumption of this receiver is 25 watts and that the impedance at 400 cycles of the voice coil is 3.5 ohms.


FRONT OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
VOLUME SETTING
VOLTAGES MEASURED WITH 20,000 OHMS PER VOLT VOLTMETER
35Z5GT RECT
12F5GT DETECTOR
50L6GT OUTPUT
12B7 R F AMPL
BOTTOM VIEW OF CHASSIS

Socket layout and voltages for the General Electric model H-400.

●

Emerson CF-255

Two different type speakers have been used during production of this receiver. In the specifications listed on *page 10-23 of Rider's Volume X*, mention is made of a 4-inch magnetic speaker, but in some chassis a permanent magnet dynamic speaker has been used. In those chassis which employ the latter, the condenser, C-10, in the output circuit, has been changed to 0.024 mf. When the magnetic speaker is used, C-10 is 0.005 mf.

On receivers having serial numbers above 2,637,480, the detector coil, T2, has been changed. The part number is now 6FT-462A.

●

Remler 49, 171

The Remler Model 171 is identical with Model 49, shown on *page 9-3 of Rider's Volume IX*. The following additional information, not included on *page 9-3*, is now available.

The antenna-RF coil is located near the back of the chassis and is trimmed by the trimmer on the rear section of variable condenser. The detector coil is located under the chassis and is trimmed by the trimmer on the front section of the variable condenser.

The following table shows the d-c voltages to ground with no signal and the volume control at full volume.

Tube	Plate	Screen	Cathode
6D6	180	180	4.5
6C6	70	180	9.0
41	170	180	0

The d-c voltage of the bias supply for the 41 grid is a 15-volt drop across resistor (9) in the negative side of the power supply.

•

Airline 62-362 Issue B

Several changes are included in Issue B of the Model 62-362 Airline receiver (above serial number 8J285-200) as compared with the Model 62-362 shown on *Montgomery-Ward pages 9-45 to 9-47 of Rider's Volume IX*. Fig. 1 shows that condensers C1, C4, C5, C6, and C9 are mounted in the same unit in Model 62-362, Issue B. Fig. 1 of course corresponds to the layout shown in the upper left-hand corner of *page 9-45*.

Fig. 2 shows the output end of the schematic for Issue B of Model 62-362. By comparing Fig. 2 with the corresponding portion of the schematic shown on *page 9-45*, you will notice the new position of the tone control consisting of R14 and C20, and also the two resistors R16 and R17 added across the winding of the phonograph pickup coil.

The accompanying table lists the part numbers and descriptions for Model 62-362 Issue B which are different from those listed on *page 9-45*.

Schematic Reference	Part Number	Description
R5	BE130144	15,000 ohms, 1 w.
R16	BE130238	400,000 ohms, ⅓ w.
R17	BE13020	100,000 ohms, ⅓ w.
C1	BE12456	3-35 mmf adjustable trimmer
C4	BE12456	2-15 mmf " "
C5	BE12456	2-15 mmf " "
C6	BE12456	2-15 mmf " "
C9	BE12456	450 mmf working capacity, series pad
C20	BE1292	.0005 mf, mica
C22	BE10092	.001 mf, 600 v

•

Philco 630, 630PF

Certain oscillator trimmers are incorrectly numbered on *pages 6-32 and 6-33 of Rider's Volume VI* (early model 630 Philco). In Fig. 2 and in the alignment instructions, both on *page 6-32*, the reference numbers should be changed as follows: Change 13 to 16; change 14 to 17; change 16 to 13; change 17 to 14. The same changes should be made in the parts list on *page 6-33*. These changes must be made so that the reference numbers will agree with those shown on the schematic which appears on *page 6-31*. Do NOT alter the numbers on the schematic.

These errors in numbering also appear in the parts list for the late Model 630 and the Model 630PF Philco. Therefore the reference numbers on *page 7-98 of Rider's Volume VII* must be changed as follows: Change 13 to 16; change 14 to 17; change 16 to 13; change 17 to 14.

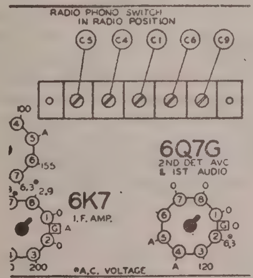


Fig. 1, above. The five trimmers, C1, C4, C5, C6, and C9 are contained in a single unit and located on the chassis as shown in Issue B of the Airline model 62-362.

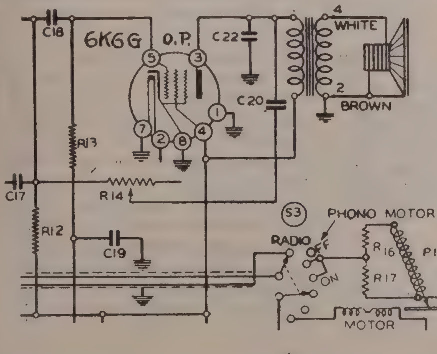
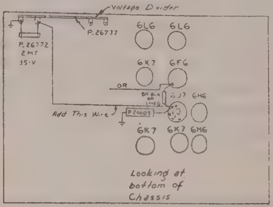


Fig. 2, left. The partial schematic of the output circuit of the Issue B shows the change in the tone control and two new resistors across the pickup coil.

•

Stromberg 160-L

Variations in new 6J7 tubes have occasionally caused distortion in the automatic tone-control circuit of the Stromberg Model 160-L receiver as first released. These tubes function correctly after "aging" a few hours.



By adding the wire indicated, distortion can be eliminated from the automatic tone control circuit of the Stromberg Model 160-L

This possibility of distortion can also be eliminated by adding a wire as shown in the accompanying layout. This change stabilizes the screen voltage; it was put in effect at the factory in all 160-P and 180-L receivers, and in all 160-L receivers produced after October 23, 1936.

•

Philco 37-62

In order to eliminate oscillation, the screen resistor, No. 11, has been changed from 25,000 ohms to 32,000 ohms. See schematic on *page 8-19 in Rider's Volume VIII*.

•

Fairbanks-Morse 12A

Refer to the schematic shown on *page 8-11 of Rider's Volume VIII*. During production, the 47,000-ohm resistor in the AVC line which was connected to the bottom of the antenna coil secondary, and the condenser (4) were removed. The r-f secondary was then grounded directly, thus removing AVC from the 6L7G mixer tube, and the bottom of the antenna coil secondary was connected directly to the resistor (16). The condenser (33) in the grid circuit of the 6C5G oscillator was changed from 50 mmf to 100 mmf to increase sensitivity on the u-h-f band.

Wells Gardner Tuning Indicators

It may happen in some 1938 and 1939 receivers in which is incorporated either a 6U5 or 6AB5 tuning indicator tube that distortion or overloading will result when strong signals are tuned in. Such troubles may be caused by grid current in the tuning indicator tube. An example of such receivers are those whose schematics appear on *page 10-13 and 10-27 of Rider's Volume X.*

It will be noted that the control grid of the triode section of the 6U5 and 6AB5 tubes is connected to the avc circuit and consequently any grid current that flows will affect the avc voltage. It is suggested by the manufacturer that if such troubles occur, that one or more new tubes be tried and the results checked.

•

RCA 9TX-31, -32, -33

In cases where repeated failure of the 24-ohm, dial lamp resistor, and the lamp itself have occurred, the following revisions are suggested:

Remove all the connections from terminals Nos. 2 and 4 of the terminal board—see Fig. 1—and from terminals Nos. 2, 5 and 6 of the 35Z4GT tube socket.

Resolder the pilot lamp lead, which was removed from the No. 4 terminal of the terminal board, and the power lead that was removed from No. 6 terminal of the tube socket, to the No. 2 terminal of the rectifier socket. See Fig. 2.

Resolder the pilot lamp lead that was removed from the No. 6 terminal of the socket, to the No. 3 terminal. Add a jumper between the Nos. 3 and 5 terminals of this same socket.

Resolder the 0.05-mf condenser lead that was removed from the No. 6 terminal to the No. 5 terminal of the same socket. The other side of this condenser remains connected to the No. 1 terminal of the terminal board.

Insert an 86-ohm resistor in the lead between the No. 7 terminal of the rectifier tube socket and the No. 2 terminal of the 35L6GT output tube socket.

Replace the 35Z4GT rectifier tube with a 35Z5GT and the No. 47 pilot lamp with a No. 51.

The schematic of this receiver will be found on *page 10-43 of Rider's Volume X.*

•

Silvertone 6109, 6110, 6111

A later production run of these models, which is identified by the chassis No. 101.508-1, has had a new model number assigned, 6109. Please add that to your index and on *page 10-78 of Rider's Volume X.*

The condenser, C9, in the cathode circuit of the detector, has been changed in this new chassis from 0.25 mf to 10 mf. This is a 10-volt electrolytic condenser, the part number being 101209144.

If trouble should be experienced from hum in the original chassis, 101.508, it can be corrected by connecting a 10-mf condenser across the 0.25-mf condenser, C9, mentioned above. The positive lead of the condenser should be connected to the cathode of the 6J7 detector tube and the negative lead to the chassis.

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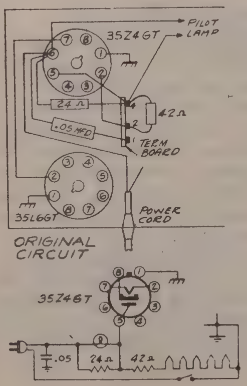
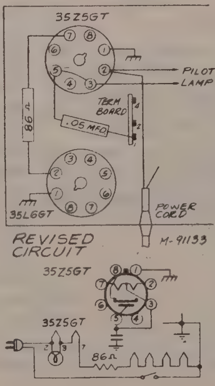




•

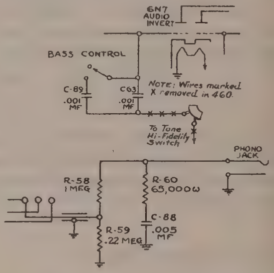
Fig. 1, left, shows the rectifier circuit of the RCA 9TX-31 series before changes were made and Fig. 2, right, the revised rectifier circuit.

•

Stromberg-Carlson 460-PF

The servicing data for the model 360 which appeared on *pages 10-35 to 10-39 inclusive in Rider's Volume X,* apply to this new model with the following exceptions:

A volume-control motor is installed in these receivers and a remote control unit that is identified as P-31860 may be easily connected if so desired. This unit permits the operation of the receiver from a remote point.



Additional phonograph compensation is incorporated in the Stromberg-Carlson Model 460-PF as shown in the above partial schematics.

An automatic record changer is used in this receiver, which will automatically play up to eight records, 10 or 12 inch, in any order. Additional phonograph compensation has been added, as shown in the accompanying diagrams.

•

Halson 40A1X

The same schematic applies to this model as applied to models 104, 106 which was published on *Halson page 8-4 in Rider's Volume VIII,* with the exception that a 6K8G replaces the 6A7 first detector-oscillator tube.

The socket layout, which appears on the same page as the schematic, can be also applied to this new model if the following exceptions are taken into consideration: The positions of the 80 and 41 tubes are interchanged, i.e., the 80 is now immediately beside the power transformer. The 76 and 6F5 tubes are interchanged, i.e., the 76 is now at the rear of the chassis. The wave-trap trimmer is now reached from the back of the chassis—between the 6D6 tube socket and the first i-f transformer—instead of the right side and the broadcast oscillator series trimmer is now located just to the left of the gang condenser on the top of the chassis, instead of the front.

•

G.E. H-500, 501, 510, 511, 520, 521

The preliminary data on these receivers that were published in *Rider's Volume X, page 10-47,* are the same as the final with the exception of the condenser, C-12, in the volume control circuit. This has been changed from 0.002 mf to 0.03 mf for the improvement of performance.

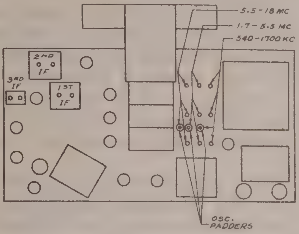
At the time *Volume X* went to press, the voltage data and the chassis wiring diagram were not available. These are reproduced in the accompanying illustrations. The special servicing information that is the subject of the article on page 1 of this issue applies to these receivers and should be used when checking over the circuits.

The following notations apply to the chassis wiring diagram. The parts shown in solid lines are those of Model 520. The same parts apply to Model 521 with the addition of R-11 and C-19, which are shown in dotted lines. For Models 500 and 510, the parts are the same as for Model 520, except that the Beamascope parts and C-20 are omitted but C-1, shown in dotted lines, is included. Models 501 and 511 have the same parts as Model 521 with the exception of the Beamascope and C-20, which are omitted, and the inclusion of C-1.

●

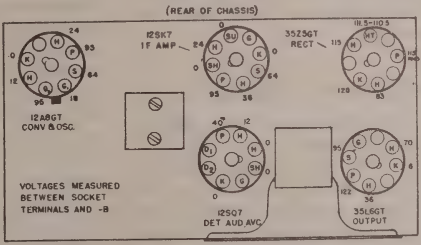
Capehart 200-F

The alignment procedure for Model 200-F is the same as that for Model 110-G, shown on *page 10-4 of Rider's volume X,* the only exception being that Model 200-F uses a 6L7 first detector instead of a 6A8. The accompanying simplified chassis layout shows where the trimmers are located in Model 200-F.

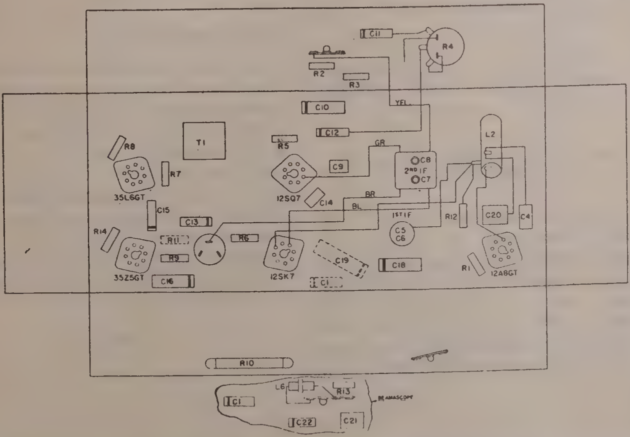


Location of trimmers on Capehart Model 200-F

On the right is the socket layout for the G.E. Models H-500, H-501, H-510, H-511, H-520, and H-521 with the voltages indicated at the prongs. Below is the chassis wiring diagram for the same models. See accompanying text for exceptions.



BOTTOM VIEW OF CHASSIS



G.E. GM-125

A second method for aligning the frequency-modulated General Electric receiver Model GM-125, the service data for which appear *on pages 10-34 to 10-36 inclusive in Rider's Volume X,* will be found below. This method of alignment does not require the special signal generator mentioned in the first published instructions.

To align the i-f amplifier, connect an electronic voltmeter (or any other d-c voltmeter which has a high input resistance) across R15. Feed a 3-mc signal to the grid of the third i-f tube. Temporarily shunt the secondary winding of T7 with a 10,000 or 15,000-ohm resistor and adjust C48 until the voltmeter reading is a maximum. Then remove the secondary shunting resistor and adjust C49 for maximum reading on the voltmeter. Then connect the shunting resistor across T6 secondary, feed the 3-mc signal to the second i-f grid and peak the trimmers of T6 in the same manner. Repeat this process for each of the i-f transformers in turn until all are aligned.

The frequency demodulator circuit may also be aligned with the voltmeter and signal generator. Feed a 3-mc signal to the input of the i-f amplifier and connect the voltmeter from the cathode connection of R18 to ground. A small voltage reading usually will be indicated if the circuit is slightly out of adjustment. If not, adjust C51 until a reading is secured. Then adjust C50 until the voltage reading is a maximum. After this is done, adjust C51 until the voltmeter reads zero. The discriminator alignment is then complete.

The r-f and oscillator stages are aligned by feeding a 42.8 mc signal to the antenna terminals and, with the receiver tuned to this point on the dial scale, adjusting the oscillator trimmer C4 for maximum reading on the voltmeter, which should be connected across R15. Then peak the antenna and r-f trimmers (C2 and C3) in the same manner.

●

RCA R-98

If a complaint is received of excessive hum in this model, the schematic of which will be found on *page 10-95 of Rider's Volume X,* the dress of the lead to the pilot light should be checked. This lead should be placed towards the rear of the chassis base, well away from the audio circuits.

Crosley 758

The alignment instructions for this receiver were released too late for publication in *Rider's Volume X* in which the schematic and chassis layouts will be found on *page 10-23*. It should be noted that two sets of i-f transformers are used; one set is tuned to 455 kc and the i-f peak of the other set is 3000 kc, the latter being designated as "H.F." in the layout.

The output meter is connected to the two plates of the 6N6 output tube with a 0.1-mf or larger (non-electrolytic) condenser in series with one of the leads.

I-F Alignment at 455 kc:

Connect the signal generator through a 0.02-mf condenser to the grid cap of the 6K8, leaving the grid clip in place and the ground lead to the black lead of the receiver. Keep the generator leads as far away as possible from the grid leads of the other screen grid tubes. Tuning condenser plates out of mesh. Volume control to right, "on." Band switch to broadcast. Signal generator set at 455 kc.

Adjust the two rear trimmers on top of the third i-f diode transformer for maximum output. Adjust both trimmers on top of the first B.C. i-f transformer for maximum output.

I-F Alignment at 3000 kc:

Connect signal generator set at 3000 kc to the grid of the 6SK7 tube through a 0.02-mf condenser. Clip on the green lead with spade lug soldered to the band switch. Condenser gang all the way open; band switch to H.F.

Open the front trimmer on the 2nd H.F. i-f transformer. Adjust the front trimmer on the 3rd i-f diode transformer and then the rear trimmer on the 2nd H.F. i-f transformer for maximum output. Align front trimmer on the 2nd H.F. i-f transformer for minimum output. Touch up the front trimmer only on the 3rd i-f (diode).

Transfer the signal generator to the top cap of the 6K8 tube, leaving grid cap in place. Align both trimmers on top of H.F. 1st i-f transformer for maximum output.

B.C. R-F Alignment:

Connect output lead of signal generator set to 1570 kc to blue lead of receiver through a 0.0002-mf condenser; ground lead of generator to black lead. Band switch to B.C. and gang condenser open full.

Adjust B.C. oscillator trimmer (second from end on rear chassis flange) for maximum output. Set generator to 1400 kc and adjust B.C. antenna trimmer (first from end on rear chassis flange) for maximum output.

H.F. R-F Alignment:

Connect signal generator set to 24 megacycles through a 250-ohm resistor to the blue antenna lead. Close gang condenser and open H.F. oscillator shunt trimmer (right trimmer on top of gang) ¾ turn.

Peak 24-mc signal by adjusting the position of the insulated lead, fastened from oscillator trimmer to gang, with relation to the end of the coil.

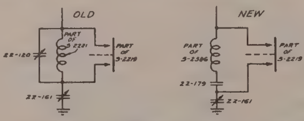
Set generator to 47 mc and open gang condenser. Adjust H.F. oscillator shunt trimmer for maximum output.

Set generator to 45 mc and tune in this signal with gang condenser and then adjust antenna shunt trimmer (left on top of gang) for maximum output.

Set generator to 25 mc and tune in with gang. Repeak antenna circuit by adjusting position of wire from antenna trimmer to gang with relation to the end of the antenna coil. If this wire requires much moving, the antenna alignment at 45 mc should be checked.

Zenith 210-5, 211-5, 270-5, 510-5

Chassis 2046, used in Zenith Models 210-5, 211-5, 270-5 and 510-5, contains a few changes as compared with the schematic shown on *page 3-1 of Rider's Volume III and on page 2729 of the Rider-Combination Manual.* The only changes in the schematic are found in the oscillator circuit; the accompanying illustration shows these changes, including both the early and more recent designs. Note that a new part has been added, Part No. 22-179, a series padder; Part No. 22-120 has been removed. In the more recent design, the oscillator coil has been changed from Part No. S-2221 to Part No. S-2586, and the preselector coil has been changed from Part No. S-2222 to Part No. S-2587. Condenser Part No. 22-137, listed on *pages 3-1 and 2729* as having a value of 0.5 mf, should be listed as 0.05 mf; please make this change in your Manual. Also note the additional model, Model 510-5, using Chassis 2046.



Old and new oscillator circuits in the Zenith chassis 2046.

The following table of d-c voltages applies to Chassis 2046. All readings are taken from socket connections to ground, using a 1000 ohms-per-volt meter; the volume control is turned to the maximum position and the line voltage corresponding to these readings is 117 volts.

Tube Type	Position	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
58	RF	260	3.5	120	3.5	9.0
24A	1st Det.	260	5.5	120	..	0.2
27	Osc.	120	0	..	..	4.2
58	IF	260	3.5	120	3.5	8.4
27	2nd Det.	180	10.	..	..	0.3
47	Power	240	..	260	..	30.
80	Rect.	120	..	..	..	30.
		120	..	..	..	30.

The trimmers on the condenser gang should be adjusted at 1500 kc, the series oscillator padder at 600 kc.

●

Montgomery-Ward 62-403

If distortion occurs of a type which seems as if the receiver were being overloaded and which can not be accounted for in any other way, check the capacity of the 5-mmf coupling condenser, C-33, in the i-f circuit. If this can not be done, substitute another of the same capacity. This condenser has a tolerance of 5% and some cases have been encountered in which the capacity has been raised from 12 to 20 mmf due to an internal short circuit. The schematic diagram of this receiver will be found on *page 9-59, 9-60 in Rider's Volume IX.*

●

Wells-Gardner A-12

If mushy reproduction is encountered on a medium or strong signal after the receiver has been operating about ten minutes, it probably is due to grid current in the 6U7G r-f and i-f tubes. Change the 4-megohm resistor, R-14, to a 2-megohm resistor. If this does not clear up the signals, replace either the 6U7G r-f or i-f tubes or perhaps both of them. The schematic of this receiver will be found on *page 9-35 of Rider's Volume IX.*

●

CROSLEY SERVICE SUPPLEMENT

February, 1938 No. 185

MODEL A-158 AND A-258 (Roamio)

SPECIFICATIONS

This model Crosley Roamio is a single unit five-tube superheterodyne receiver. It incorporates an unusual push button tuning system of rugged mechanical design that is positive, accurate, and easy to adjust and operate. A highly efficient superheterodyne circuit employs five tubes to the utmost advantage as follows: one 6A8G as an oscillator and mixer or modulator, one 6U7G as an intermediate frequency amplifier, one 6Q7G as detector, A. V. C. and 1st A. F. amplifier, one 6K6G as power output amplifier and a 6X5G as a rectifier. A full wave vibrator is used. Bias for the 6A8G and 6U7G tubes is obtained across item 27 (60 ohm resistor), for the 6Q7G tube across item 28 (40 ohm resistor) and for the 6K6G across the "B" Filter choke, item 7, and items 27 and 28.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and the receiver chassis. Voltage readings taken with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range D-C voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Ga	Go
6A8-G	Oscillator-Modulator	6.0	190	100	—	0	102	0
6U7-G	I-F Amplifier	6.0	190	100	0	0	—	—
6Q7-G	Diode Detector & A-F Amp.	6.0	85	—	—	−2.3	—	—
6K6-G	Output	6.0	185	200	—	0	—	—
6X5-G	Rectifier	6.0	—	—	—	200	—	—

Power Output approximately 4 Watts.
Battery Drain approximately 5.7 Amperes at 6 Volts.

SOCKET VOLTAGE LAYOUT

The socket layout in the illustration Fig. 5, shows the voltage readings taken between the tube prongs and receiver chassis. It will be noted that certain unused terminals are used as junction blocks while others are not used at all. All readings are taken with the receiver in operating condition and no signal input.

SETTING PUSH BUTTONS

Should it become necessary to realign the circuits of the receiver, it may also be necessary to reset the push buttons. The push buttons may be quickly and accurately set, either with the receiver in the case or with the case removed.

Insert a small screw driver in the hole through each push button and loosen (do not remove) the set screw in the bottom of the hole. By means of the conventional tuning knob, tune-in AS ACCURATELY AS POSSIBLE the favorite station having the highest frequency—that is, the station nearest the left-hand end of the dial. Completely depress and hold the No. 1 push button on the left and tighten the set screw SECURELY.

The push button tuning system is now correctly set for the 1st station. Follow through with this same procedure, setting the other four stations in the order of their frequency (kilocycles).

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 6U7G I. F. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely disengaged and turn Vol. Cont. to maximum position (RIGHT).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I. F. trimmer condensers for maximum output. Fig. 3.

(e) Transfer generator lead to top of 6A8G Osc.-Mod. tube, leaving the tube's grid clip in place.

(f) Adjust both trimmers located on the 1st I-F transformer for maximum output.

(g) Repeat operations (d) and (f) for more accurate adjustments.

IN ORDER TO PREVENT A. V. C. ACTION ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

To obtain the greatest gain from the R. F. amplifier,

the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna havinig a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READJUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser, located between the control knobs on the front of the chassis, for maxiumum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "Ant" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

REPLACING DIAL DRIVE CORDS

Two dial drive cords are used and should the innermost cord break, it will be necessary to remove the outer cord and large pulley before the inner cord can be replaced.

To replace the inner cord:

(1) After removing the broken cord, place the chassis on end with the push buttons "up" and the speaker toward you.

(2) Thread an 18" length of drive cord through the hook on one end of the tension spring which was removed from the pulley on the end of the push button rocker plate.

(3) Insert both ends of this cord through the eyelet in the rocker plate pulley from the inside. Pull the cord through until the tension spring is pulled into the pulley, then hook the free end of the spring over the catch in the pulley in the side opposite the eyelet.

(4) Open the condenser gang all the way.

(5) Pull all but approximately 4½" of the cord through the eyelet. Loop the 4½" end of the cord around the lower half of the pulley.

(6) Loop the long end of the cord over the top of the pulley and back over the brass idler pulley to the drive shaft. Continue the cord around the drive shaft, threading from the inside and over the top. Wrap four complete turns of the cord around the drive shaft and continue the cord over the top of the rocker plate pulley.

(7) Pull on the short end of the cord until the tension spring in the pulley is stretched to within ⅛" of the eyelet. Maintain this tension and tie a knot in the two ends of the cord over the catch which holds the spring. Loop the cord over the spring catch so that the knot is turned in. (A drop of bees' wax on the knot would be an added protection against coming untied.)

To replace the outer cord:

(1) Place the chassis in a horizontal position with the push buttons to the left and the speaker toward you.

(2) Close the condenser gang and mount the large drive pulley on the shaft. Place the pulley on the condenser shaft so that the shaft is flush with the outside of the pulley bushing and the eyelet in the pulley is horizontal with the shaft and toward the dial.

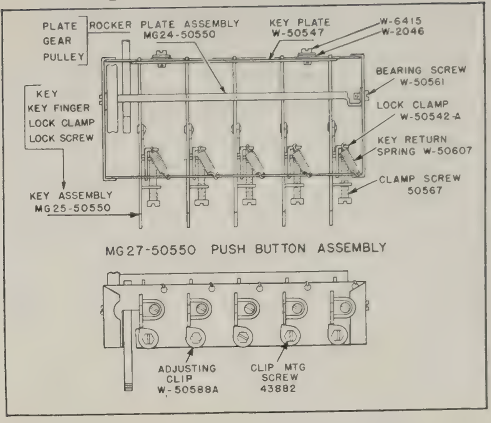
(3) Cut a 22" length of drive cord and tie a knot ½" from the two ends.

(4) Hook one end of the tension spring over the catch provided in the pulley and hook the other end over the drive cord at the knot.

5) Thread the cord through the eyelet in the pulley and extend one side up and over the vertical brass pulley. Loop this lead around the horizontal idler pulley at the left-hand side of the dial and then around the idler pulley at the right-hand side of the dial and then over the top of the large drive pulley. The tension on the spring should be sufficient to stretch it to within approximately ½" of the eyelet.

(6) With the gang closed, move the pointer to the extreme right-hand end of the dial. Press the cord into the slots in the back of the pointer and check to see that the pointer travels from one end of the dial to the other as the gang is opened and closed. It may be advisable to place some Aratex or other liquid adhesive on the cord where it fits into the pointer.

Fig. 4 Push Button Assembly



PARTS LIST—MODEL A-258

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G167—32000	Ant. Coil
2	G167—32002	Osc. Coil
3	G185—32004	1st I-F Assy., 455 Kc.
4	G186—32004	2nd I-F Assy., 455 Kc.
5	G19 —32977	Motor Noise Check
6	G27 —28067	"A" Filter Choke
7	G16 —29535	"B" Filter Choke
8	G50 —33001	2 Section Gang Cond.
9	—50054B	Ant. Compensating Cond.
	C —50623	Glass Dial Face
	W —50545	L. H. Dial Mtg. Clip
	W —50560	R. H. Dial Mtg. Clip
	W —50517B	Dial Mask (Maroon)
	W —50518	Pointer
	B —78	Screw—Dial Clip Mtg.
	MG23—50550	Dial Mtg. Bracket Assy. (Riveted to Chassis)
	MG28—50550	Manual Drive Shaft-Brkt. Assy.
	G8 —43564	Pulley and Hub Assy.
	W —23877	Set Screw—Hub
	—41582	Drive Cord—40 Inches
	W —50590	Spring—Cord Tension—Large Pulley
	W —43561	Spring—Cord Tension—Small Pulley
	W —50524B	Manual Drive Shaft
10	G3 —50369	Temp. Compensating Cond.
11A	W —32380	Condenser, .05 Mf. 200 V.
11B	W —32380	Condenser, .05 Mf. 200 V.
11C	W —32380	Condenser, .05 Mf. 200 V.
11D	W —32380	Condenser, .05 Mf. 200 V.
12	W —37226	Condenser, .02 Mf. 160 V.
13	W —23191A	Condenser, .01 Mf. 400 V.
14	W —50203	Condenser, .0065 Mf. 1,000 V.
15A	W —50161	Condenser, .5 Mf. 120 V.
15B	W —50161	Condenser, .5 Mf. 120 V.
16A	W —50105	Condenser, .1 Mf. 160 V.
16B	W —50105	Condenser, .1 Mf. 160 V.
17Z	W —50528	Condenser, 4. Mf. 350 V.
17Y		Condenser, 4. Mf. 350 V.
	W —50224	Cond. Clamp
18	G1 —34002	Condenser, .00025 Mf. Molded
19	G3 —34002	Condenser, .0005 Mf. Molded
20	—35600	Resistor, 100,000 Ohm ¼W.
21A	—35601	Resistor, 300,000 Ohm ¼W.
21B	—35601	Resistor, 300,000 Ohm ¼W.
22A	—36322	Resistor, 500,000 Ohm ¼W.
22B	—36322	Resistor, 500,000 Ohm ¼W.
23	—23616	Resistor, 15,000 Ohm 1W.
24	—35602	Resistor, 1. Megohm ¼W.
25	—35927	Resistor, 2. Megohm ¼W.
26	—50641	Resistor, 750 Ohm ½W.
27	—50643	Resistor, 60 Ohm ½W.
28	—50642	Resistor, 40 Ohm ½W.
29Z	—50526	Volume Control, 1. Meg.
29Y		On-Off Switch

Item No.	Part No.	Description
30	G178—36400	8 Prong Socket
	W —50176	Tube Shield Half (2 Req.)
	W —31210	Tube Shield Ring
31	G105—28807	Vib. Socket
	W —50123A	Vib. Gnd. Clip
32	278-BL-7"U"	Speaker, Mfg. Spec. 5B-122
	—45889	Output Trans.
33	B —50644	Power Trans.
	W —50130	Power Trans. Can
34	G1 —50631	Dial Light Bulb—6-8 V.
35Z	G29 —32750	"A" Lead—Set to Fuse
35Y	G27 —32750	"A" Lead—Fuse to Ammeter
36A	—38915	Resistor, 100 Ohm ½W. W. W.
36B	—38915	Resistor, 100 Ohm ½W. W. W.
37	G2 —34002	Condenser, .0001 Mf. Molded
38	G10 —38000	Vibrator, Interchangeable
	G13 —38000	Vibrator
	W —32757	Fuse (12 Amp.)
	W —32776	Fuse Insulator
		Miscellaneous Mechanical Parts
	MG27—50550	Push Button Unit Assy.
	MG25—50550	Key Assy.
	W —50542A	Key Clip (Lock Clamp)
	—50567	⅞"—6x32 Screw (Clamp)
	W —50607	Spring—(Key Return)
	W —50588A	Adjusting Clip (Heart Shaped)
	—43882	¼" No. 8 P. K. Screw (Clip Mtg.)
	W —50547	Key Plate (Rear Guide)
	MG24—50550	Rocker Plate Assy.
	W —50561	⅛"—6x40—Fil. H. Screw (Rocker Plate Bearing)
	W —45553B	Push Button
	W —50551A	Celluloid Cover
	—50549	Call Letter Sheet
	D —50503B	Case (Rear Half) FS49
	C —50554A	Case (Front Half) FS49
	W —50589	Felt (Dial Window)
	—50505	Knob (2 Req.)
		Mounting Parts
	W —38038D	Distributor Suppressor
	W —29754C	Generator Condenser
	—25846	¾" No. 10 P. K. Screw (Set Mtg.)
	—6213	¼"—20 Hex. Nut (Brkt. Mtg.)
	—35065	¼"—20 Screw (Brkt. Mtg.)
	W —38205	¼" Lock Washer (Brkt. Mtg.)
	—32783	Ant. Cable (Accessory)
	W —50167	Mtg. Bracket (Set)
	W —50395	Ammeter Cond. (Accessory)
	W —38935	Case Ground Clip

the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna havinig a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READJUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser, located between the control knobs on the front of the chassis, for maximum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "Ant" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

REPLACING DIAL DRIVE CORDS

Two dial drive cords are used and should the innermost cord break, it will be necessary to remove the outer cord and large pulley before the inner cord can be replaced.

To replace the inner cord:

(1) After removing the broken cord, place the chassis on end with the push buttons "up" and the speaker toward you.

(2) Thread an 18″ length of drive cord through the hook on one end of the tension spring which was removed from the pulley on the end of the push button rocker plate.

(3) Insert both ends of this cord through the eyelet in the rocker plate pulley from the inside. Pull the cord through until the tension spring is pulled into the pulley, then hook the free end of the spring over the catch in the pulley in the side opposite the eyelet.

(4) Open the condenser gang all the way.

(5) Pull all but approximately 4½″ of the cord through the eyelet. Loop the 4½″ end of the cord around the lower half of the pulley.

(6) Loop the long end of the cord over the top of the pulley and back over the brass idler pulley to the drive shaft. Continue the cord around the drive shaft, threading from the inside and over the top. Wrap four complete turns of the cord around the drive shaft and continue the cord over the top of the rocker plate pulley.

(7) Pull on the short end of the cord until the tension spring in the pulley is stretched to within ⅛″ of the eyelet. Maintain this tension and tie a knot in the two ends of the cord over the catch which holds the spring. Loop the cord over the spring catch so that the knot is turned in. (A drop of bees' wax on the knot would be an added protection against coming untied.)

To replace the outer cord:

(1) Place the chassis in a horizontal position with the push buttons to the left and the speaker toward you.

(2) Close the condenser gang and mount the large drive pulley on the shaft. Place the pulley on the condenser shaft so that the shaft is flush with the outside of the pulley bushing and the eyelet in the pulley is horizontal with the shaft and toward the dial.

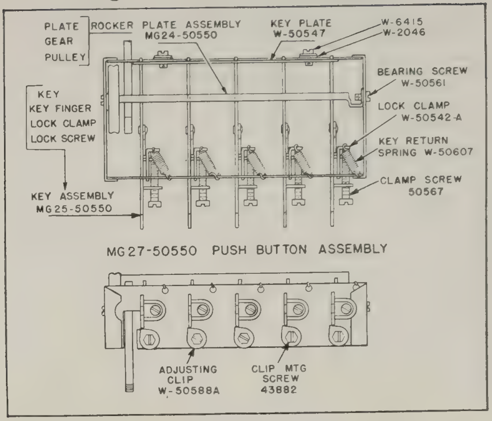
(3) Cut a 22″ length of drive cord and tie a knot ½″ from the two ends.

(4) Hook one end of the tension spring over the catch provided in the pulley and hook the other end over the drive cord at the knot.

5) Thread the cord through the eyelet in the pulley and extend one side up and over the vertical brass pulley. Loop this lead around the horizontal idler pulley at the left-hand side of the dial and then around the idler pulley at the right-hand side of the dial and then over the top of the large drive pulley. The tension on the spring should be sufficient to stretch it to within approximately ½″ of the eyelet.

(6) With the gang closed, move the pointer to the extreme right-hand end of the dial. Press the cord into the slots in the back of the pointer and check to see that the pointer travels from one end of the dial to the other as the gang is opened and closed. It may be advisable to place some Aratex or other liquid adhesive on the cord where it fits into the pointer.

Fig. 4 Push Button Assembly



PARTS LIST—MODEL A-258

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G167—32000	Ant. Coil
2	G167—32002	Osc. Coil
3	G185—32004	1st I-F Assy., 455 Kc.
4	G186—32004	2nd I-F Assy., 455 Kc.
5	G19 —32977	Motor Noise Check
6	G27 —28067	"A" Filter Choke
7	G16 —29535	"B" Filter Choke
8	G50 —33001	2 Section Gang Cond.
9	—50054B	Ant. Compensating Cond.
	C —50623	Glass Dial Face
	W —50545	L. H. Dial Mtg. Clip
	W —50560	R. H. Dial Mtg. Clip
	W —50517B	Dial Mask (Maroon)
	W —50518	Pointer
	B —78	Screw—Dial Clip Mtg.
	MG23—50550	Dial Mtg. Bracket Assy. (Riveted to Chassis)
	MG28—50550	Manual Drive Shaft Brkt. Assy.
	G8 —43564	Pulley and Hub Assy.
	W —23877	Set Screw—Hub
	—41582	Drive Cord—40 Inches
	W —50590	Spring—Cord Tension—Large Pulley
	W —43561	Spring—Cord Tension—Small Pulley
	W —50524B	Manual Drive Shaft
10	G3 —50369	Temp. Compensating Cond.
11A	W —32380	Condenser, .05 Mf. 200 V.
11B	W —32380	Condenser, .05 Mf. 200 V.
11C	W —32380	Condenser, .05 Mf. 200 V.
11D	W —32380	Condenser, .05 Mf. 200 V.
12	W —37226	Condenser, .02 Mf. 160 V.
13	W —23191A	Condenser, .01 Mf. 400 V.
14	W —50203	Condenser, .0065 Mf. 1,000 V.
15A	W —50161	Condenser, .5 Mf. 120 V.
15B	W —50161	Condenser, .5 Mf. 120 V.
16A	W —50105	Condenser, .1 Mf. 160 V.
16B	W —50105	Condenser, .1 Mf. 160 V.
17Z 17Y	W —50528	Condenser, 4. Mf. 350 V. Condenser, 4. Mf. 350 V.
	W —50224	Cond. Clamp
18	G1 —34002	Condenser, .00025 Mf. Molded
19	G3 —34002	Condenser, .0005 Mf. Molded
20	—35600	Resistor, 100,000 Ohm ¼W.
21A	—35601	Resistor, 300,000 Ohm ¼W.
21B	—35601	Resistor, 300,000 Ohm ¼W.
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22B	—36322	Resistor, 500,000 Ohm ¼W.
23	—23616	Resistor, 15,000 Ohm 1W.
24	—35602	Resistor, 1. Megohm ¼W.
25	—35927	Resistor, 2. Megohm ¼W.
26	—50641	Resistor, 750 Ohm ½W.
27	—50643	Resistor, 60 Ohm ½W.
28	—50642	Resistor, 40 Ohm ½W.
29Z 29Y	—50526	Volume Control, 1. Meg. On-Off Switch
30	G178—36400	8 Prong Socket
	W —50176	Tube Shield Half (2 Req.)
	W —31210	Tube Shield Ring
31	G105—28807	Vib. Socket
	W —50123A	Vib. Gnd. Clip
32	278-BL-7"U"	Speaker, Mfg. Spec. 5B-122
	—45889	Output Trans.
33	B —50644	Power Trans.
	W —50130	Power Trans. Can
34	G1 —50631	Dial Light Bulb—6-8 V.
35Z	G29 —32750	"A" Lead—Set to Fuse
35Y	G27 —32750	"A" Lead—Fuse to Ammeter
36A	—38915	Resistor, 100 Ohm ½W. W. W.
36B	—38915	Resistor, 100 Ohm ½W. W. W.
37	G2 —34002	Condenser, .0001 Mf. Molded
38	G10 —38000	Vibrator, Interchangeable
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	W —32757	Fuse (12 Amp.)
	W —32776	Fuse Insulator
		Miscellaneous Mechanical Parts
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	MG25—50550	Key Assy.
	W —50542A	Key Clip (Lock Clamp)
	—50567	⅞″—6x32 Screw (Clamp)
	W —50607	Spring—(Key Return)
	W —50588A	Adjusting Clip (Heart Shaped)
	—43882	¼″ No. 8 P. K. Screw (Clip Mtg.)
	W —50547	Key Plate (Rear Guide)
	MG24—50550	Rocker Plate Assy.
	W —50561	⅛″—6x40—Fil. H. Screw (Rocker Plate Bearing)
	W —45553B	Push Button
	W —50551A	Celluloid Cover
	—50549	Call Letter Sheet
	D —50503B	Case (Rear Half) FS49
	C —50554A	Case (Front Half) FS49
	W —50589	Felt (Dial Window)
	—50505	Knob (2 Req.)
		Mounting Parts
	W —38038D	Distributor Suppressor
	W —29754C	Generator Condenser
	—25846	¾″ No. 10 P. K. Screw (Set Mtg.)
	—6213	¼″—20 Hex. Nut (Brkt. Mtg.)
	—35065	¼″—20 Screw (Brkt. Mtg.)
	W —38205	¼″ Lock Washer (Brkt. Mtg.)
	—32783	Ant. Cable (Accessory)
	W —50167	Mtg. Bracket (Set)
	W —50395	Ammeter Cond. (Accessory)
	W —38935	Case Ground Clip

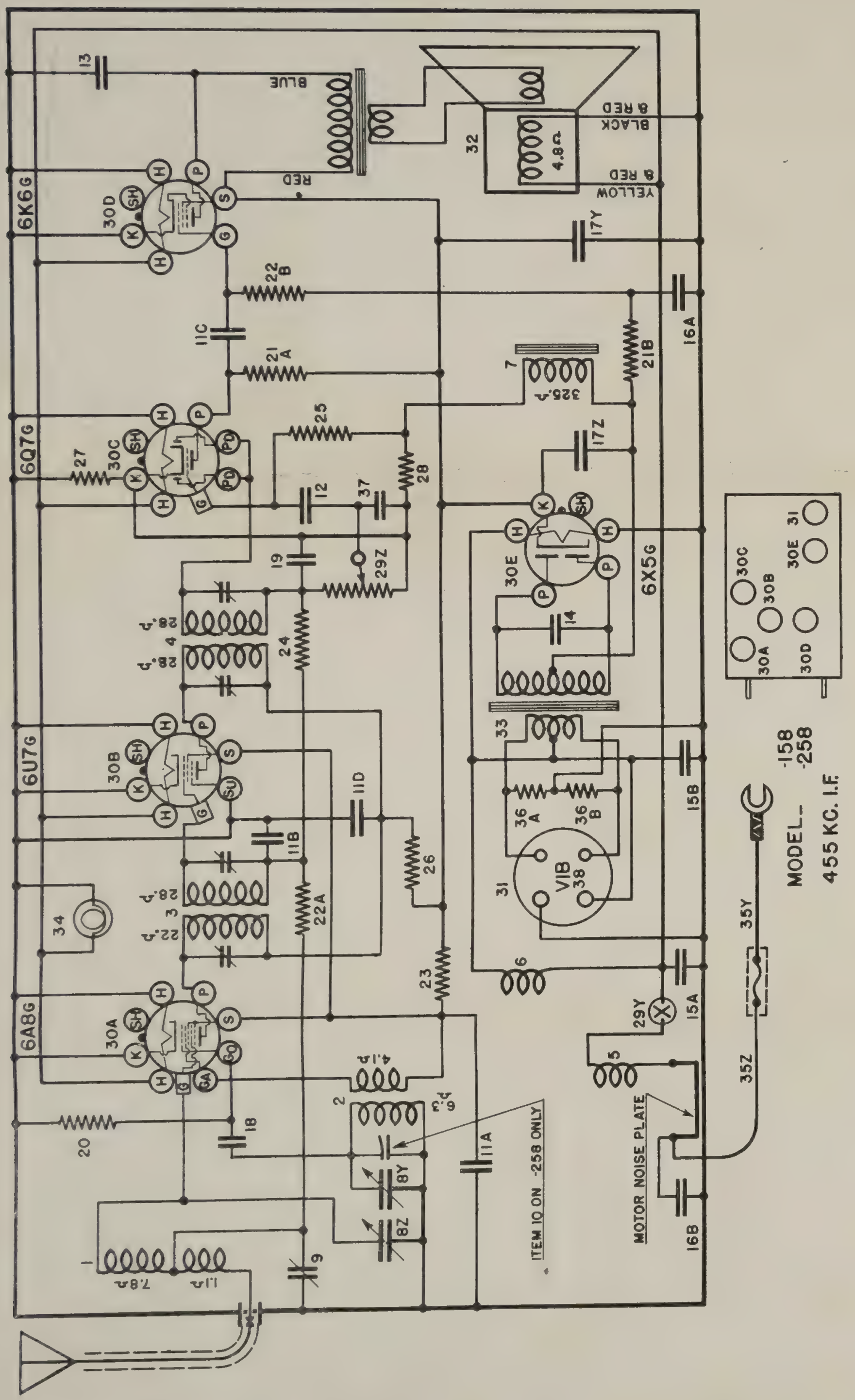

FIG. 1—WIRING DIAGRAM—MODEL A-258

MODEL A-158

The model A-158 and the model A-258 are the same electrically with the exception of a few minor parts. Mechanically they differ in that the A-258 has Push Button Tuning and the A-158 is manually tuned. When referring to the A-258 Parts List for replacement parts for the A-158 disregard all parts listed between Items 7 and 11 and all parts listed under the heading Miscellaneous Mechanical Parts.

The following are parts to fill the above deletions to complete Parts List for the A-158:

PARTS LIST — MODEL A-158

Item No.	*Part No.*	*Description*
8	G49—33001	2 Section Gang Condenser
	C —50455B	Glass Dial Face
	MG23—50500	Dial Support Bracket (Riveted to chassis)
	W —43549	Retaining Washer (Drive Shaft)
	W —50512	Drive Shaft
	G9 —43564	Pulley & Hub assembly
	—41582	Drive Cord (30 in.)
9	W —50054B	Ant. Comp. Condensor
16B	W —50105	Condensor 0.1 Mf. 160 V.
	W —50589	Felt (Dial window)
	D —50503B	Case (Rear section)
	C —50504B	Case (Front section)
	—50505	Knob (2 Required)

REPLACING THE A-158 DRIVE CORD

1.—Remove the broken cord and the cord tension spring.

2.—Cut a 30 inch length of drive cord and tie the tension spring approximately 4 inches from one end. Thread both ends through the eyelet in the large pulley from the inside. Hook the other end of the spring to the catch in the pulley and bend catch to secure spring.

3.—Close the condenser gang and see that the eyelet in pulley is on top and that the end of the condenser shaft is flush with the inside of the pulley.

4.—Take the long end of cord and place on small brass idler pulley on the right side of the dial bracket. Loop around pulley in a clockwise direction and then around idler pulley on the left side of the dial bracket, continue on over the top of the large pulley and down to the drive shaft. From the under side of drive shaft wrap 2 turns around shaft in a counter-clockwise direction, bringing cord up on the left side of large pulley. Be sure the cord is on all the pulleys then tie a knot, pulling with sufficient force to stretch the tension spring to within ½ inch of the edge of pulley.

5.—Close gang and place the pointer on the cord at the extreme left end of the dial. Check to see that pointer travels full lenghth of the dial. It may be advisable to place some "ARATEX" or other liquid adhesive on cord where it fits into the pointer.

THE ALIGNMENT PROCEDURE IS THE SAME AS THAT OF MODEL A-258.

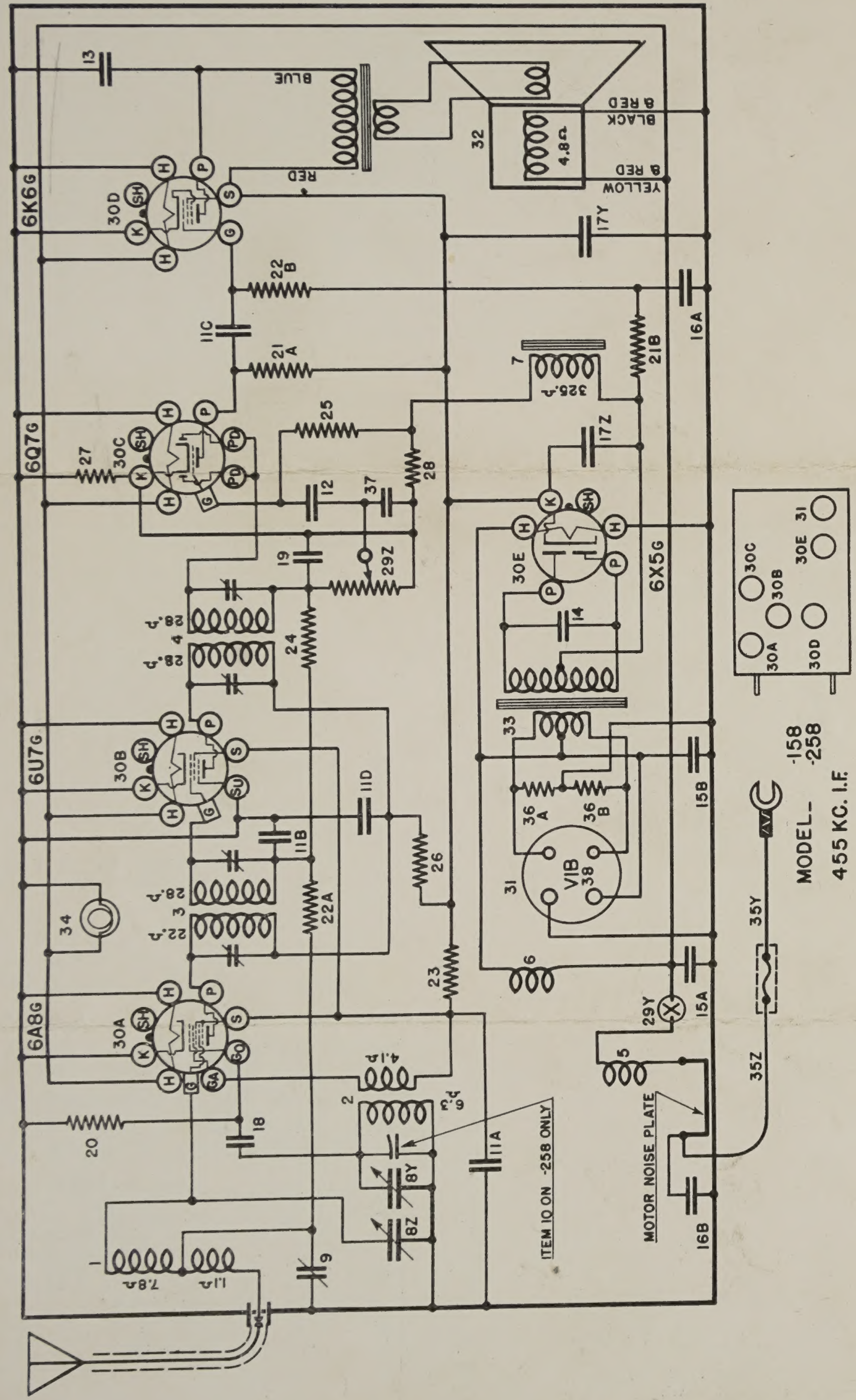

FIG. 1—WIRING DIAGRAM—MODEL A-258

MODEL A-158

The model A-158 and the model A-258 are the same electrically with the exception of a few minor parts. Mechanically they differ in that the A-258 has Push Button Tuning and the A-158 is manually tuned. When referring to the A-258 Parts List for replacement parts for the A-158 disregard all parts listed between Items 7 and 11 and all parts listed under the heading Miscellaneous Mechanical Parts.

The following are parts to fill the above deletions to complete Parts List for the A-158:

PARTS LIST — MODEL A-158

Item No.	*Part No.*	*Description*
8	G49—33001	2 Section Gang Condenser
	C —50455B	Glass Dial Face
	MG23—50500	Dial Support Bracket (Riveted to chassis)
	W —43549	Retaining Washer (Drive Shaft)
	W —50512	Drive Shaft
	G9 —43564	Pulley & Hub assembly
	—41582	Drive Cord (30 in.)
9	W —50054B	Ant. Comp. Condensor
16B	W —50105	Condensor 0.1 Mf. 160 V.
	W —50589	Felt (Dial window)
	D —50503B	Case (Rear section)
	C —50504B	Case (Front section)
	—50505	Knob (2 Required)

REPLACING THE A-158 DRIVE CORD

1.—Remove the broken cord and the cord tension spring.

2.—Cut a 30 inch length of drive cord and tie the tension spring approximately 4 inches from one end. Thread both ends through the eyelet in the large pulley from the inside. Hook the other end of the spring to the catch in the pulley and bend catch to secure spring.

3.—Close the condenser gang and see that the eyelet in pulley is on top and that the end of the condenser shaft is flush with the inside of the pulley.

4.—Take the long end of cord and place on small brass idler pulley on the right side of the dial bracket. Loop around pulley in a clockwise direction and then around idler pulley on the left side of the dial bracket, continue on over the top of the large pulley and down to the drive shaft. From the under side of drive shaft wrap 2 turns around shaft in a counter-clockwise direction, bringing cord up on the left side of large pulley. Be sure the cord is on all the pulleys then tie a knot, pulling with sufficient force to stretch the tension spring to within ½ inch of the edge of pulley.

5.—Close gang and place the pointer on the cord at the extreme left end of the dial. Check to see that pointer travels full lenghth of the dial. It may be advisable to place some "ARATEX" or other liquid adhesive on cord where it fits into the pointer.

THE ALIGNMENT PROCEDURE IS THE SAME AS THAT OF MODEL A-258.

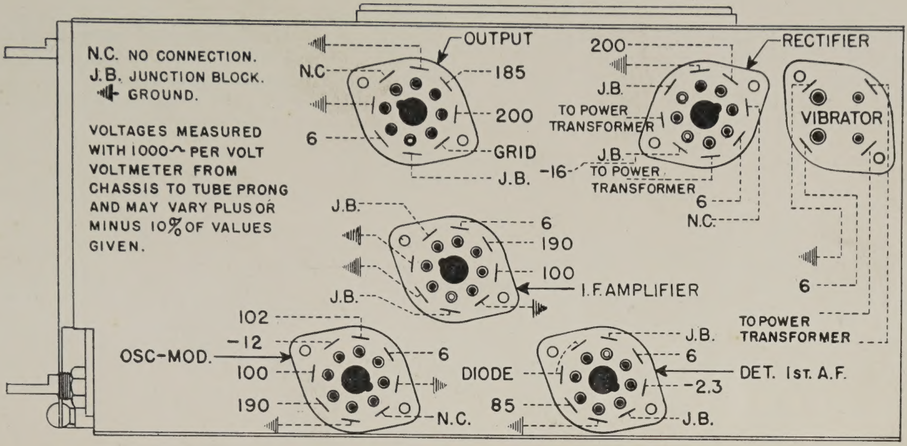

Fig. 5 Socket Voltage Layout

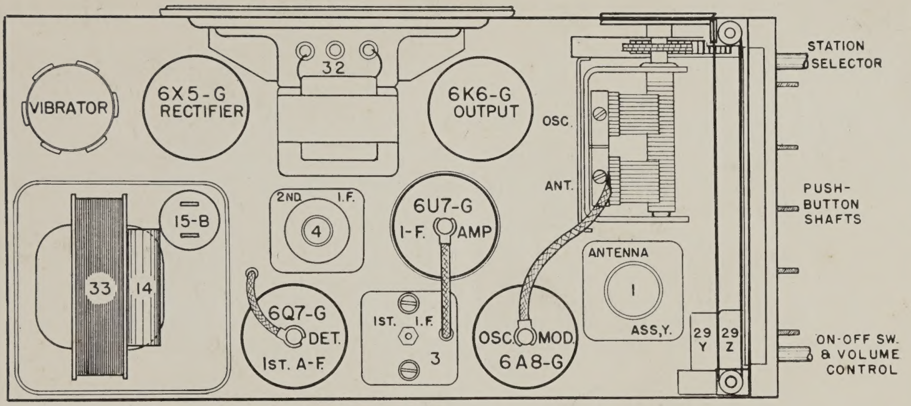

Fig. 2. Top View A-258

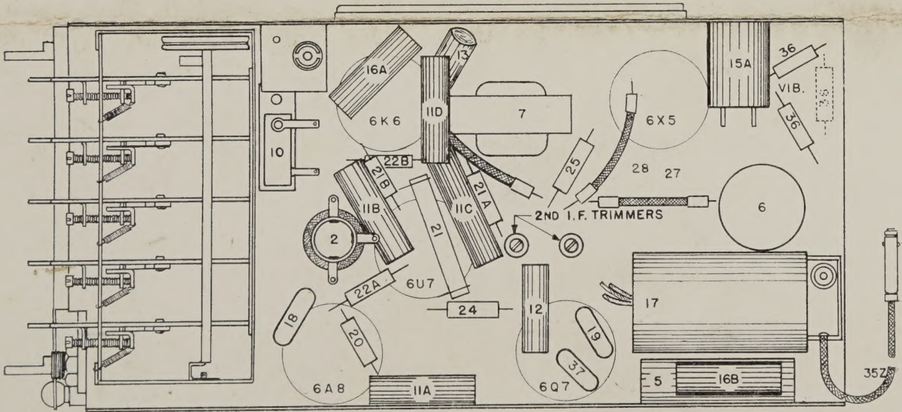

Fig. 3 Bottom View A-258